

**A Multilevel Study of Partnership Building to Support Early Childhood Development
Across Different Education Contexts***

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Abstract

First five years are identified as a critical period of child growth in scientific literature. In 1998, California voters passed Proposition 10 that appropriated a 50 cent per pack tax on cigarettes and other tobacco products to support early childhood development. As a result, Kern County Children and Families Commission administered over \$10 million in FY 2013-14 to fund 40 programs in focus areas of *Child Health, Family Functioning, and Child Development*. In this study, variability of partnership strength is partitioned at the *program* and *focus area* levels. The result indicates co-existence of program effects with the significant funding impact, including *center-based vs. home-based* services, *initiation* or *collaboration* in partnership building, Summer-Bridge learning, referral support, and program outreach in hard-to-reach communities.

Keywords: First 5 Kern, Early Childhood Support, Partnership Building

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Scientific discoveries revealed importance of brain growth during first 5 years of child life (Bruner, 1999). To support early childhood development, California voters passed Proposition 10 that appropriated a 50 cent per pack tax on cigarettes and other tobacco products. The state revenue was designated to fund local programs in each county since 1998. As a result, Kern County Children and Families Commission (First 5 Kern) was established to support children ages 0-5 and their families in the southern part of California Central Valley.

In Fiscal Year (FY) 2013-14, First 5 Kern administered over \$10 million to support 40 programs. Kern County has a land area as large as the state of New Jersey. Besides the vast rural communities, Bakersfield is the county seat that has an urban population size surpassed well-known cities like St Louis. Thus, First 5 Kern is expected to serve children in one of the fastest growing regions in California.

While service needs have been recognized across culturally diversified communities, current research literature indicates that “developmental research has rarely explored associations between urbanicity and children’s development” (Miller, & Votruba-Drzal, 2013, p. 234). Therefore, a purpose of this research is to fill this void by examining multilevel partnership buildings in diversified communities. According to Resnick (2012),

An important goal of First 5 funding is to act as a catalyst for change in each county’s systems of care. ... Increases in coordination and collaboration would indicate that agencies are better able to share resources and clients, reduce redundancies and service gaps, and increase efficiency. (p. 1)

These returns have supported justification of service integration as a focus area in First 5 Kern's (2014) strategic plan.

Research Questions

Due to the recent economic recession, "Health and human services programs that serve children are among the most seriously affected by this lack of funding" (California Assembly Committee on Budget, 2011, p. 1). Hence, local programs are expected to supplement their budgets by recruiting additional money from other sources. In FY 2013-14, service providers leveraged \$3,801,596 from their partners, an over 22.5% increase from FY 2012-13 (Wang, 2015). On the basis of collaborative efforts, multilevel data have been gathered to address three research questions:

- (1) What is the multilevel impact of First 5 Kern funding on partnership building in early childhood development?
- (2) What program factors influence the outcome of service integration?
- (3) How does program outreach influence the partnership building across different geographic locations?

Literature Review

"Too often child health is viewed as separate and distinct from early childhood care and learning" (Bruner, 2009, p. 1). To address this persistent issue, strategic planning is required for each county to enhance service integration. It was stipulated by Proposition 10 that "No county strategic plan shall be deemed adequate or complete until and unless the plan describes how programs, services, and projects relating to early childhood development within the county will

be integrated into a consumer-oriented and easily accessible system” (p. 10). Therefore, service networking is part of the capacity building to support children ages 0-5 and their families.

Significance of this Investigation

While children represent the future of community, it takes a village to raise children. As Senator Carol Liu (2014), Chair of Education Committee in California Assembly, pointed out, “The most effective way to help babies and toddlers is to promote positive parent-child relationships” (p. 3). In addition to child support, parent education programs are funded in communities to enhance family functioning. According to the state commission, “While counties design their programs to fit their specific local needs, they must provide services in each of the following four focus areas: Family Functioning, Child Development, Child Health, [and] Systems of Care” (First 5 California, 2013, p. 15). *Systems of Care* are built on service integration in the first three focus areas (First 5 California, 2013).

Based on the well-structured template from state guidelines, First 5 Kern funded 13 programs in Child Health, 17 programs in Family Functioning, and 10 programs in Child Development during a five-year funding cycle (Wang, 2015). Prior to the fund allocation, specific steps have been taken in 2009 to solicit community input and ensure program alignment with local needs (see Harniman, 2009). Because service providers are nested within focus areas, a multilevel analysis is needed to examine the impact of partnership building across programs (Question 1).

Cross, Dickman, Newman-Gonchar, and Fagen (2009) cautioned that “Evaluating interagency collaboration is notoriously challenging because of the complexity of collaborative efforts and the inadequacy of existing methods” (p. 310). On the basis of an axiom that the whole could be larger than the sum of its parts, creative approaches should be taken to assess the

capacity building beyond service outcomes within each program. In particular, the intent of Proposition 10 was to establish county commissions “as the ‘glue’ to bring services together and fill critical gaps that no other funding source is able to address” (First 5 Association of California, 2009 p. 7). Hence, network strength is examined in this study as an outcome of institutional learning across service providers (Question 2).

The emphasis on outcome measures conformed to a model of Outcome-Based Accountability that was adopted by Proposition 10. Friedman (2011) highlighted that “OBA [Outcome Based Accountability] keeps population accountability separate from performance accountability” (p. 4). While performance accountability is important at the program level to justify service effectiveness (Friedman, 2005), population accountability ensures service deliveries for children across different communities.

Based on the geographic location of Kern County, outreach effort is needed to serve families with young children in remote areas. Waller (2005) observed that “In rural areas, public transportation options are scarce and have limited hours of service” (p. 2). To eliminate this barrier, First 5 Kern funded mobile services to extend oral healthcare and immunization in hard-to-reach communities. In addition, three programs incorporated transportation support for 767 families with children ages 0-5. Another program provided 2,041 transportation services to families in poverty-stricken areas of Bakersfield (Wang, 2015). Hence, outreach support is examined in this study to assess the impact of partnership building across various geographic locations (Question 3).

While intellectual merit of each research question is grounded on current literature and local needs, generalizability of this study hinges on its capacity of tackling difficult challenges in education. According to Brookings Institution (2010), Kern County was ranked as one of the

lowest regions in adult education across the United States. For the urban population, Zumbrun (2008) concurred that Bakersfield was classified as one of the least educated metropolitan areas in the country.

Poverty has been found inseparable from education preparation. It was reported that “Among Kern County families whose householder had less than a high school diploma, 36.5% lived in poverty during 2012” (Kern County Network for Children, 2014, p. 8). Thus, service integration in Kern County demands accessibility to basic services, such as transportation and mobile program deliveries, that are crucial to family functioning and early childhood development.

In summary, this study is naturally derived from the funding structure in which programs are nested within focus areas. Following the OBA model, network building is considered as an outcome of institutional learning to enhance service integration across focus areas. To sustain program effectiveness, first two research questions have been adduced to reflect the intention of establishing *Systems of Care* in Proposition 10. In addition, population accountability of the OBA model is addressed by Question 3 to support children ages 0-5 across geographic communities.

Theoretical Framework

Cross et al. (2009) pointed out, “Existing research has demonstrated that two primary features of networks, network structure and the strength of ties, have distinct effects on outcomes of interest” (p. 311). In this study, network structure is examined among programs that receive funding from First 5 Kern. For 40 programs in this funding cycle, each program may collaborate with 39 partners. Thus, the network structure could contain a total of 1,560 (or 40x39) links.

Although network counts represent the extent of program outreach, Outcome-Based Accountability (OBA) places more emphasis on the strength of network building. Albert Einstein (No Date) cautioned that "not everything that counts can be counted" (p. 1). In pursuing network development, Cross et al. (2009) listed the strength of ties as a distinct outcome from institutional learning. Tom Angelo (1999), former director of the national assessment forum, maintained, "Though accountability matters, learning still matters most" (¶. 1).

To date, however, no model has been unanimously accepted by the research community to describe partnership strength. Project Safety Net of Palo Alto (2011) synthesized past literature and suggested a five-level model for network categorization. Nevertheless, Wang (2014) examined these categories and found them not mutually exclusive. In that model, "formal communication" was featured as a characteristic for a *Cooperation* category. Because communications could be described as frequent, prioritized, and/or trustworthy, it remained unclear whether a partnership should be placed in other categories that feature the same characteristics. The ambiguity undermined feasibility of using the model to assess network capacity.

Opposite to the lack of mutual exclusiveness was an issue of incomprehensiveness. For example, it was indicated in an annual evaluation report of First 5 Fresno (2013) that

During this time period the coordination and collaboration (highest levels of interaction) decreased from 42% to 38%. It is speculated that decrease in direct funding, staff turnover, and other economic pressures resulted in organization becoming more insular thus decreasing their collaboration with other organizations. (p. 102)

Treating *coordination* and *collaboration* as the highest levels of interaction might have inadvertently left no room for partnership improvement. Limitations of the Fresno model

imposed two problems for program evaluation: (1) it did not conform to Bloom's taxonomy that labeled creation above integration (Airasian & Krathwohl, 2000), and (2) It downplayed adequacy of *Co-Existing* partnerships for program referrals. Consequently, Fresno's model seemed too simplistic to describe the capacity of service integration in local communities.

To enrich the existing knowledge, this research is based on a 4C model to conceive service integration in the context of institutional learning. The model has literature support from a well-established SOLO [Structure of the Observed Learning Outcome] taxonomy (Atherton, 2013; Biggs & Collis, 1982). Among numerous applications in the past, the SOLO taxonomy was employed in a validity study of national board certification (see Smith, Gorden, Colby, & Wang, 2005). Four levels of learning outcomes were specified in the SOLO taxonomy beyond the initial pre-structural category. Each level has been clearly defined with specific benchmarks.

Insert Table 1 Around Here

In Table 1, a one-to-one match has been established to illustrate a clear alignment between the SOLO taxonomy and the 4C model for assessing service integration. Following the SOLO template, the 4C model is both comprehensive and mutually exclusive. The model was also field-tested in the past two years to assess partnership strength at *Co-Existing*, *Collaboration*, *Coordination*, and *Creation* levels in First 5 Kern reports (Wang, 2013; 2014). In this investigation, the 4C model is employed to support analyses of network strength among multiple organizations.

Depending on the partnership roles, a program can be identified as an active initiator (i.e., the "I" perspective) or a passive collaborator (the "me" perspective) in network building (Wang,

2007; Wang, Oliver, & Staver, 2008). In the past, First 5 Kern hosted contractor gatherings to enhance awareness of program features among service providers. While program referrals rely on the familiarity of service providers, delivery of direct services depends on program involvement in active network creation. To differentiate the outreach effort, programs were given an opportunity to identify the number of links “from” and “to” specific service providers.

In summary, both confirmatory and exploratory approaches have been taken to build a theoretical framework for this study. In the confirmatory examination, the 4C model responded to a strong need of Proposition 10 to justify program improvement in service integration. The taxonomy also filled a void of research literature to explore partnership building as an outcome of institutional learning. With clear categorizations for network connection, the new paradigm added a useful tool to assess progress in the local capacity building: (1) it classified different kinds of partnership structure to delineate program accountability, and (2) it differentiated the strength of network connection to support service improvement.

Methods

Data Collection

Interview data were gathered to identify the number of links that involved each program as an initiator or a partner. While frequency counts described the partnership scope, strength of the ties has been evaluated by the 4C model to monitor network enhancement. Program affiliations were incorporated to clarify categorization of First 5 Kern funding in each focus area. Figure 1 shows the percent of annual program budget funded by First 5 Kern. Dummy variable codes were created to differentiate whether programs offered transportation, parent education, child development, and referral supports. The information triangulation is designed to support a

study of the funding impact on partnership building across 40 programs in *Child Health, Family Functioning*, and *Child Development*.

Insert Figure 1 Around Here

Multilevel Modeling

Besides strengthening program links across service providers, First 5 Kern further supported incorporation of multiple services within each program. For instance, Thompson and Uyeda (2004) pointed out,

Family resource centers have also emerged as a key platform for delivering family support services in an integrated fashion. They serve as “one-stop” community-based hubs that are designed to improve access to integrated information and to provide direct and referral services on site or through community outreach and home visitation. (p. 14)

In determining focus area affiliation, each program singled out a primary service according to its fund allocation. Therefore, the entire scope of program services may bridge across multiple focus areas. Multilevel modeling is employed in this study to partition variability of network strength between *focus area* and *program* levels.

By definition, “Systems of Care addresses system-wide structural supports which allow county commissions to effectively work towards achievement in the other three result areas of Family Functioning, Child Health and Development” (First 5 California, 2013, p. 40). In *Child Health and Family Functioning*, First 5 Kern funded programs to support parent education in both home-based and center-based settings. Meanwhile, additional programs are funded to support home-based child development and Summer Bridge learning. Because of the offering of several services, program features are included to model partnership strengths according to the

4C model. Model fit indices are computed to confirm the support of theoretical framework from multilevel data across focus areas.

Social Network Analysis

Kern County spans across 8,161.42 square miles. Program co-existence alone might be insufficient to sustain active *collaboration*, *coordination*, and *creation* in partnership building. Hence, development of stronger network is indispensable to enhance program outreach across widely scattered communities. Provan, Veazie, Staten, and Teufel-Shone (2005) observed,

In the academic literature, network analysis has been used to analyze and understand the structure of the relationships that make up multi-organizational partnerships. But this tool is not well-known outside the small group of researchers who study networks, and it is seldom used as a method of assisting communities. (p. 603).

In last decade, the method of Social Network Analysis (SNA) has attracted more attention. Computer software packages, such as Netdraw, were introduced to support analyses of partnership capacities (Borgatti, 2002). In this study, Netdraw is adopted to depict the network links among service providers in Kern County.

In summary, multilevel data have been gathered to examine effectiveness of First 5 Kern funding on partnership building. A 4C model was developed from solid research literature to assess the strength of networking in early childhood services. The SNA method has been adopted and the Newdraw software was applied to facilitate analyses of program partnership in different geographic locations.

Results

Interview data were collected from 40 programs to document the level of program networking in FY 2013-14. The results showed a total of 921 links at the *Co-Existing* level, 375

links at the *Collaboration* level, 188 links at the *Coordination* level, and 76 links at the *Creation* level. With fewer links at higher levels, the findings reconfirmed a hierarchical structure of the 4C model for partnership categorization in Figure 2.

Insert Figure 2 Around Here

Because programs are nested within focus areas, variability of the partnership building is partitioned in multilevel analyses. An Intra-Class Correlation (ICC) has been computed to indicate variability of network strength *among focus areas* and *across programs*. According to O'Connell and Reed (2012),

In a two-level design, the ICC represents the proportion of total variance in the outcome that is captured by differences between the clusters or groups. When no variability is present between the clusters or groups, the value of the ICC is zero. (p. 6)

In this study, programs are clustered within focus areas. Using the notation of Hierarchical Linear Model (HLM) (Raudenbush & Bryk, 2005), the ICC value is

$$ICC = \frac{\tau_{00}}{\tau_{00} + \sigma^2} = \frac{.02}{.02 + .76} = .023$$

The small ICC value indicated that the program clustering under focus areas did not account for a large portion of variability in the strength of partnership building. This result is consistent with overlap of multiple program services across focus areas.

Insert Figure 3 Around Here

Figure 3 shows that programs in each focus area have expanded their service delivery beyond the boundaries of *Child Health*, *Family Functioning*, and *Child Development*. Built on the fact that much of the variability was allocated at the program level, explanatory variables are introduced to describe network strength among service providers. To enhance utility of statistical modeling, Sloane (2008) suggested that “We change the basic research question from what works to what works for whom and in what contexts” (p. 43). In this investigation, *Context* features are reflected by the outreach efforts to address the needs of transportation, referral, and mobile services at the program level. The funding resources are incorporated in the *Input* phase to show the proportion of program budget sponsored by state tax (Figure 1). *Process* of partnership building is demonstrated through delivery of program services, including networking of parent education and child development programs on home-based and/or center-based platforms. Following the paradigm of *Context*, *Input*, *Process*, and *Product* (CIPP), significant variables have been identified in Table 2 to describe the strength of networking delineated in the 4C model.

Insert Table 2 Around Here

Coefficient of determination is employed to assess the model fit. Renaud and Victoria-Feser (2010) observed, “To assess the quality of the fit in a multiple linear regression, the coefficient of determination or R^2 is a very simple tool, yet the most used by practitioners” (p. 1852). This statistic indicates how well the estimated regression line fits the actual data (Mahnoney, 2014). The R^2 value ranges between 0 and 1 to represent proportion of the variation in the dependent variable that has been explained by independent variables in the

model. In this study, R^2 value reached .79, much higher than most investigations in social sciences (Heeringa, West, & Berglund, 2010). The large R^2 value also indicated comprehensiveness of CIPP paradigm in supporting the model confirmation for partnership building.

In addition, “Another statistic provided in determining the ‘best’ model is the C_P criterion” (Horsley, 2014, p. 1). The C_P criterion is in reference to the number of predictors (P) in the model. According to Colin Mallow (1973), the developer of C_P , the value of C_P is expected to equal P . Deviation from the expected value suggests model biasness (Daniel & Wood, 1980). In Table 1, $P=9$. The C_P index from this model also equaled 9, which indicated unbiased prediction of parameters in Table 2.

Olbricht (2014) further advocated the C_P index for its parsimonious features. The use of C_P measure supports the simplest model that demonstrates consistent fit to the empirical database. With the outcome of $C_P=P$, parameter estimates in Table 2 composed a parsimonious model for explaining network strengths in the regression analysis.

Insert Figure 4 Around Here

Ramanadhan et al. (2012) pointed out, “Networks that are highly centralized can spread information and resources effectively from the influential members” (p. 3). Figure 4 shows a highly centralized network among 40 programs beyond the *Co-Existing* level. Two of the central nodes represent Kern County Children's Dental Health Network (KC_Dental) and Children's Mobile Immunization Program (CMIP) for offering mobile services in urban, suburban, and rural communities. The other central nodes belong to these programs that incorporate transportation

services. Programs in Figure 4 come from focus areas of *Child Health* (blue nodes), *Family Functioning* (olive nodes), and *Child Development* (brown nodes).

Krebs (2011) pointed out that “Common wisdom in personal networks is ‘the more connections, the better.’ This is not always so. What really matters is where those connections lead to -- and how they connect the otherwise unconnected!” (¶. 4). Although Wind in the Willows (WIW) program has one link in Figure 4, its partnership with KC_Dental plays an indispensable role to serve children at the eastern board of Kern County. The incorporation of transportation and outreach services was intended to expand support for all children and their families across different geographic locations (Figure 5).

Insert Figure 5 Around Here

Discussion

Although early childhood services have been supported by voters in California, “the demands for First 5 funding has become more pressing because of a decline in other government funding for social services” (Branan, 2009, p. 1). In many counties, First 5 is the only funder of dental care for low income children in many counties (First 5 Association of California, 2014). Guided by its strategic plan, First 5 Kern (2014) has invested more than \$160 million since its inception to “support child development programs throughout Kern County” (p. 1). These programs were designed to ensure that all children are healthy and prepared to enter school.

As California’s third-largest county by land area, “Kern is also one of the State’s youngest counties with children constituting almost one in three of the people living within the County during 2013” (Kern County Network for Children, 2014, p. 1). The growth of child

population demands enhancement of program partnerships in service delivery. In part because of First 5 Kern's consistent push for partnership building among service providers, a very small value of ICC (i.e., $ICC=.023$) was found in this study, which confirmed small variability of network strength at the *focus area* level. Guided by the result from multilevel data analyses, additional variables are introduced at the *program* level to examine the strength of network building in this investigation.

For more than a century, California has led the nation in providing center-based childcare for working parents (see Arbegast, 2010). Meanwhile, it was reported that "For many working parents, hiring a caregiver to work in their home is the best solution for their child care and household needs" (Child Care Inc., 2012, p. 1). Unlike center-based programs for an entire cohort of families, home-based programs catered the need of children in specific households. Loutzenhiser (2001) noted that "The family context is thought to play a particularly important role in the cognitive and socio-emotional development of young children ... This is because the family is at times a child's entire social and interactive world" (p. 31-32).

Similar to childcare, parent education may choose between center-based and home-based options. In particular, court-mandated programs are well-structured across service providers. Home-based services are strictly grounded on local context, and thus, become less generalizable over the partnership network. Accordingly, network strength was positively linked to programs that included court-mandated parent education programs on a center-based platform (Table 2). Home-based programs seemed to be more self-contained, which delimited information sharing among service providers. The barrier has been recognized by Council on Community Pediatrics (2009), i.e., "Although much energy and research have gone into the development of home-

visiting programs, the extent of potential benefits is still inadequately delineated and understood" (p. 598).

It was projected in Proposition 10 that "There is a further compelling need in California to ensure that early childhood development programs and services are universally and continuously available for children until the beginning of kindergarten" (p. 1). Preschool learning is offered by Summer Bridge (SB) programs to support preparation for kindergarten entry. Snell (2014) reported that "In the last half-century, U.S. preschool attendance has gone up to nearly 70% from 16%." In California, "Preschool attendance is correlated with improved kindergarten readiness and kindergarten readiness is associated with long-term achievement" (First 5 California, 2013, p. 17). Guided by the statewide kindergarten entry requirement, Table 2 showed a significant impact of SB offerings on enhancement of network connections.

Because education is under local control, preparation for school readiness also depends on the *Context* of socioeconomic status and geographic location. Miller and Votruba-Drzal (2013) noted that "Lower achievement for rural children was partly explained by less advantageous home environments" (p. 234). Nonetheless, Rice (2010) reviewed literature over the past 30 years, and concluded that "Studies have not focused, however, on programs in rural areas" (p. 43). Results from this study confirmed special issues in rural areas, such as transportation barriers that hindered networking among programs (Table 2).

Under the CIPP paradigm, resource *Input* from First 5 Kern funding is demonstrated as a significant factor in partnership building (Table 2). Furthermore, the *Process* of network construction depends on program role as an initiator, partner, or supporter for referrals. These process factors were significant in enhancing network strength in the *Product* phase. The model

fit was assessed by Coefficient of Determination (R^2). As Heeringa, West, and Berglund (2010) pointed out,

Analysts who are new to regression modeling of social science, education, or epidemiological data should not fret if the achieved R^2 values are lower than those seen in their textbook training. Physicists may be disappointed with $R^2 < 0.98-0.99$ and chemists with $R^2 < 0.90$, but social scientists and others who work with human populations will find that their best regression model will often explain only 20%-40% of the variation in the dependent variable. (p. 194)

In this study, R^2 value was .79, much higher than the range of 20%-40% indicated by Heeringa et al. (2010). In addition, Mallows's (1973) C_p statistic was employed to measure bias from a regression model. C_p statistic is widely used for selecting multivariate linear regression models (Yanagiharaa & Satoh, 2010; Zhang, 2014). The C_p value equals 9, which met the criterion of $C_p=p$ for an unbiased model (Friendly, 2014). Through applying the C_p criterion, the regression approach maintains a parsimonious feature for "getting a good model that contains as few variables as possible" (Olbricht, 2014, p. 7)

In summary, "In multilinear regression, a common task is to determine the "best" set of independent variables to use in the fit" (National Institute of Standards and Technology, 2014, p. 1). In this study, significant factors have been identified from the CIPP paradigm to account for the variability of partnership strength across 40 programs. Since its inception in the 1960s, the CIPP model supported evaluation of numerous projects to address needs of various stakeholders (Stufflebeam, 1983; Wang, 2011). Meanwhile, the model itself matured through a process of developing national evaluation standards over the past four decades (Program Evaluation Standards, 2010; Yarbrough, Shulha, Hopson, & Caruthers, 2010). As a proven example, White

(1981) has acknowledged that the Context, Input, Process, and Product (CIPP) paradigm represents “the most comprehensive evaluation model” in the field (p. 217).

Henderson (2013) pointed out, “With one in four California children living in poverty, there is still much work to do, but First 5 Kern is steadily improving family stability in Kern County” (¶. 8). Results of the social network analysis indicated more network connections involving programs in *Family Functioning* (see olive-colored nodes in Figure 4). Beyond the level of program co-existence, outreach support has been extended to address transportation needs for families in poverty-stricken neighborhoods and remote communities. In FY 2013-14, Southeast Neighborhood Partnership Family Resource Center (SENP) responded to 2,041 transportation requests to sustain service access for children ages 0-5 in urban ghetto communities of Bakersfield (Wang, 2015). In addition, Indian Wells Valley Family Resource Center (IWVFC) and Mountain Communities Family Resource Center (MCFRC) covered transportation needs for families in remote valley and mountain communities. The Differential Responses (DR) program incorporated transportation support to manage 308 cases of child abuse and neglect. Hence, outreach effort has been made to deliver services in *Family Functioning*.

Figure 4 also showed involvement of 13 programs in the partnership networking from the focus area of *Child Development*. In particular, South Fork Preschool (SFP) offered regular transportation services for rural children to attend preschool. To facilitate child development, researchers found that “healthy children are more likely to grow into healthy adults. Sound health also provides a foundation for the construction of sturdy brain architecture and the associated achievement of a broad range of abilities and learning capacities” (Center on the Developing Child at Harvard University, 2010, p. 2). Therefore, service integration is expanded between child health and education. In FY 2013-14, Children’s Mobile Immunization Program

(CMIP) of San Joaquin Community Hospital provided 16,259 vaccines to support immunization services for 3,486 children ages 0-5 at 178 clinics throughout Kern County (Wang, 2015). Meanwhile, 245 dental homes were established by Kern County Children's Dental Health Network (KC_Dental). The service outcome was represented by completion of 4,757 oral health examinations, 3,429 dental cleanings, 1,978 fluoride treatments, 1,855 dental indices, and 306 fissure sealants. The program outreach has impacted partnership building across different geographic locations. As reported by Kern County Network for Children (2013), "Working collaboratively is vitally important and is something Kern does well" (p. i).

Smith et al. (2009) observed that "While many entities purportedly provide care coordination, there is a lack of communication among the multiple agencies serving the same child" (p. 7). Under the leadership of First 5 Kern, geographic distributions of service providers were not confined within Bakersfield, but spread across five electoral districts across Kern County, including hard-to-reach communities in Mojave Desert and mountain communities (Figure 5).

In conclusion, the effective networking is illustrated by the *Systems of Care* across 40 programs in Figure 4 with centroids at CMIP, DR, IWVFRC, KC_Dental, MCFRC, SENP, and SFP. Johns (2010) further noted that "There is a paucity of research into the development of intersectoral collaborations designed to support early childhood development in rural communities" (p. 40). The social network analysis revealed the impact of program outreach in expanding the service network across different geographic locations.

Whereas First 5 Kern funding was identified as a significant factor for network connection, the state tax revenue has inevitably declined for less cigarette consumption. However, the service demand remained at a high level as more children born each year.

Henderson (2013) noted that “A local fiscal impact report shows that every \$1 of First 5 Kern monies spent produces a \$17.49 return to Kern County's economy” (¶. 8). Besides monitoring program effectiveness according to the Results-Based Accountability, enhancement of service integration has been identified as a focus area to sustain the much needed support for children ages 0-5 and their families (First 5 Kern, 2014). This approach is supported by this study for explaining 79% of the variability in partnership strength by significant factors of early childhood development across multiple focus areas.

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Table 1

Alignment Between SOLO Taxonomy and the 4C Model

SOLO	The 4C Model
Uni-Structural: Limited to one relevant aspect	Co-Existing: Confined in a simple awareness of co-existence
Multi-Structural: Added more aspects independently	Collaboration: Added mutual links for partnership support
Relational: United multiple parts as a whole	Coordination: United multiple links with structural leadership
Extended Abstract: Generalized the whole to new areas	Creation: Expanded capacity beyond existing partnership

Table 2

Significant Factors of Network Strength at the Program Level

Factor	Parameter	Standard Error	F	p
Funding	.1805	.0159	129.64	.0001
Link Initiator	.0428	.0032	181.93	.0001
Link Partner	.0126	.0036	12.14	.0005
Center-based Parent Education	.1888	.0565	11.18	.0008
Home-based Parent Education	-.3309	.0625	20.07	.0001
Summer Bridge Program	.1967	.0694	8.03	.0047
Home-based Childcare	-.3151	.0866	13.24	.0003
Referral	.2598	.0610	18.13	.0001
Transportation	-.1808	.0780	5.37	.0206

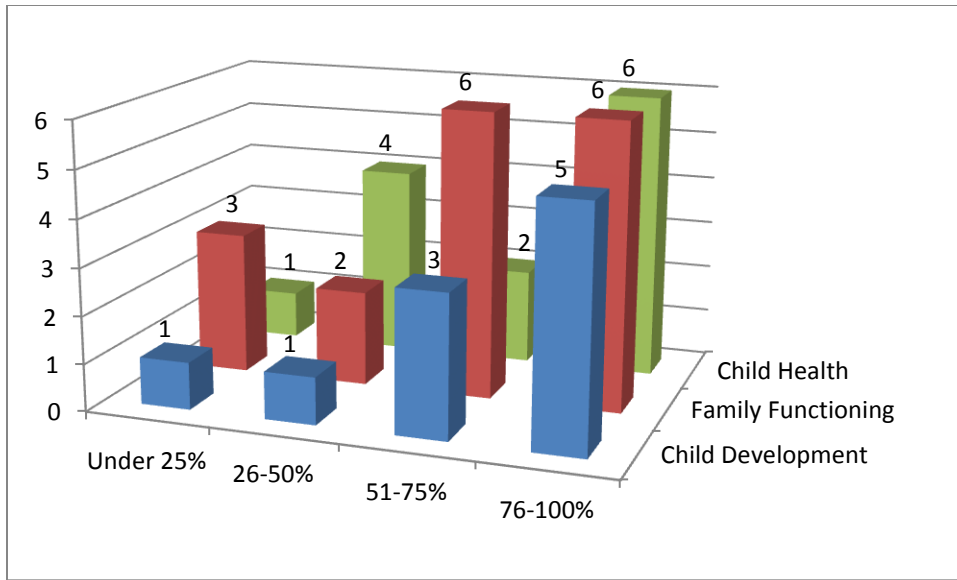


Figure 1. Funding distribution across programs

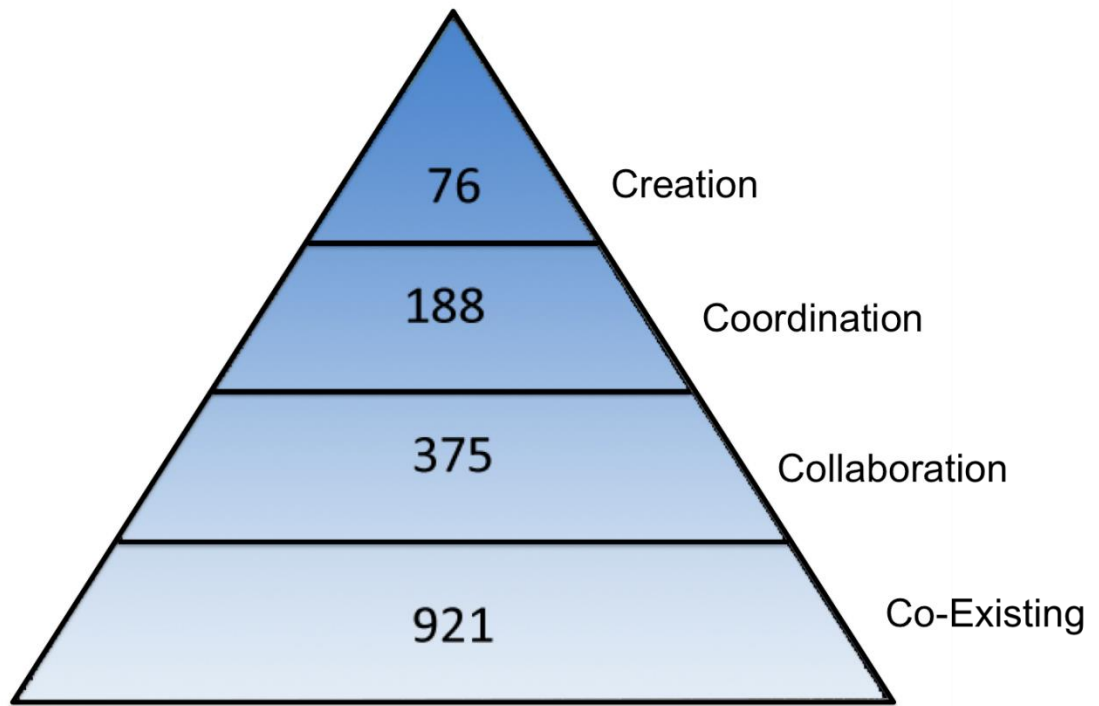


Figure 2. Pyramid of Partnership Building across 4C Levels

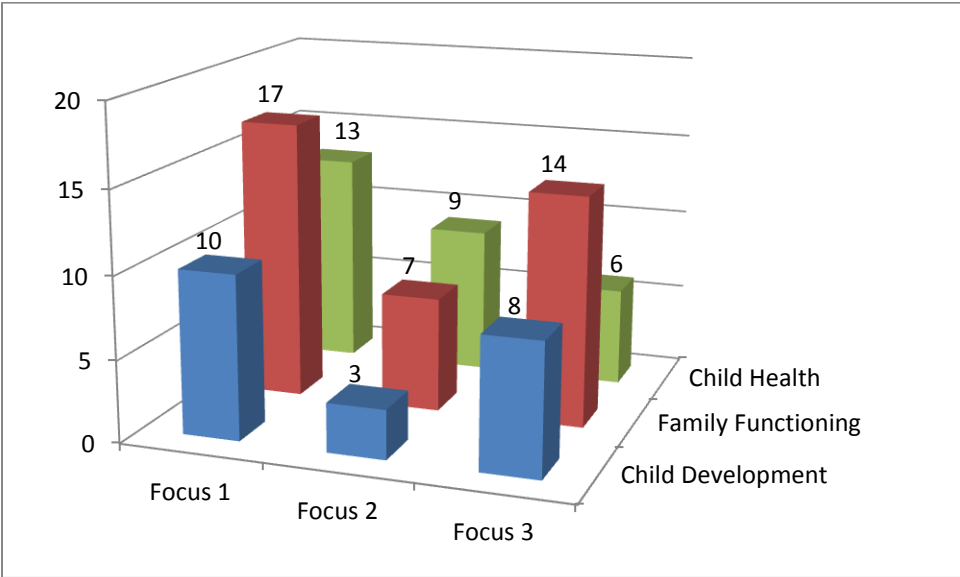


Figure 3. Service Integration across focus areas

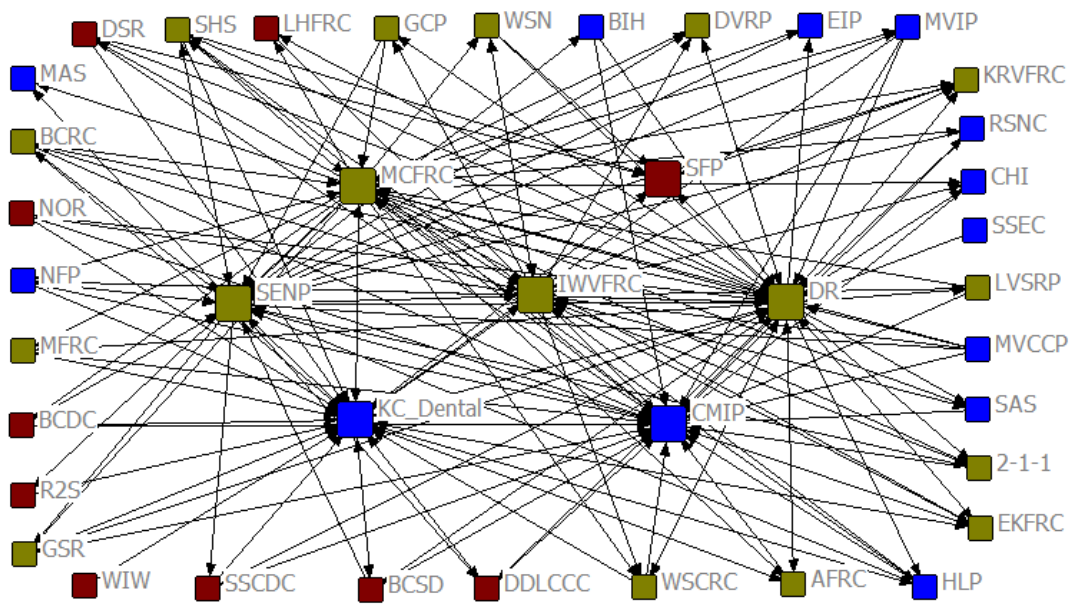


Figure 4. Network Links Beyond Co_Existing Level