Community resilience, quality childcare, and preschoolers' mental health: A three-city comparison

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Abstract

Many studies suggest that quality childcare can positively influence children's outcomes in a wide range of domains, including mental health. While an extensive literature on the effects of childcare on *individual* children exists, how quality childcare programs contribute to trends at the *population* level is yet to be established. In this study, we examine community differences in the quality of childcare and the mental health of children attending childcare centres in three communities in British Columbia, Canada. Previous research on Kindergarten children conducted in these communities indicated that two exhibited expected outcomes (based on socioeconomic criteria, these communities were classified as "better off" and "worse off"), and one exhibited better than expected outcomes and was therefore labeled "resilient." We hypothesized that the better than expected child outcomes in the resilient community were due to better quality childcare in this community. To test this hypothesis, we assessed 621 children and their 24 respective childcare centres, and conducted extensive observations of the three study communities. As expected, teachers (but not parents) from the resilient community reported fewer children's mental health problems and childcare quality was found to be higher in the resilient community than in the comparison communities. However, city differences were lost in the hierarchical linear regressions suggesting that the community effects were mediated through childcare quality. To interpret these findings we turned to our observations that indicated that the resilient community was markedly different from the other two in terms of the social capital and developmental assets that it possessed.

Introduction

A wealth of evidence indicates that early childhood development is one of the strongest determinants of health over the entire life span (Irwin et al., 2007; Marmot, 1997; Power & Hertzman, 1997). Even though genetic and biological predispositions are recognized as important determinants, childhood and adolescent mental health problems tend to be explained as the result of exposure to poverty, social deprivation, and socioeconomic disadvantage (Brooks-Gunn & Duncan, 1997; Duncan et al., 2002; Hill et al., 2005; Kaniel & Lubow, 1986; Lupien et al., 2001; Mezzacappa, 2004; Noble et al., 2005). For example, sociological theories, such as social disorganization theory, ague that mental health problems arise when children are exposed to highly disorganized environments, characterized by crime and delinquency (Sampson, 1997; Sampson & Laub, 1994; Shaw & McKay, 1942), and when children lack community resources, positive role models, or social capital (Furstenberg, 1993; Furstenberg et al., 1998). These factors, which characterize some neighbourhoods and communities, have yet to be studied in relation to another important influence on child development: participation in quality childcare. This is surprising given that some of the most progressive approaches to early childhood education (e.g., Reggio Emilia, Italy) consider connections between childcare centres and the local community as an essential element of their programming (Comune di Reggio Emilia, 1998).

The connection between communities and childcare is also of interest to an emerging school of thought that argues that childcare centres are critically positioned as agencies promoting social cohesion and intersectoral collaborations (Hayden & MacDonald, 2001). In this view, childcare centres are conceived as producers of social capital. Particularly relevant to our

study is the work by Small (2009) who demonstrated with an in-depth analysis of several US

childcare centres, that these organizations 'produced' social capital in the form of increased

opportunities for networking and access to resources, that in turn resulted in better mental health

outcomes among mothers of children attending childcare centres. This finding is consistent with

research indicating that social capital can lead to better mental health not only of individuals, but

also of entire communities (McKenzie & Harphan, 2006).

While social capital research has documented benefits at the level of communities,

childcare research has focused almost exclusively on the effects of quality of care on the

individual child. This extensive body of research has documented particularly positive effects for

children from socioeconomically vulnerable families (Bornstein et al., 2006; Field, 1991; Field et

al., 1988; Lamb, 1998) pointing to the long-term positive effects in language, literacy and

numeracy, self-regulation, and socialization skills (for a recent review see Pinta, Barnett,

Burchinal & Thornburg, 2009). Yet we still know very little about the effect of childcare on

groups of children attending childcares in different communities. If the intent is to understand

the role of childcares as potential agencies for promoting early child development as well as

social capital, we need to approach this issue from a population-based perspective.

Population approaches make an essential contibution to our understanding of how broad

societal factors such as social capital influence the early learning experiences of young children

(D'Angiulli, Warburton, Dehinten & Hertzman, 2009; Lloyd and Hertzman, 2009). Such

approaches also allow the identification of neighbourhoods and communities in which

developmental outcomes are different from what might be expected based on local

socioeconomic status (SES) (Kershaw, Forer, Lloyd, Hetzman, Boyce, Zumbo et al., 2009).

It is this rationale that has motivated us to conduct the present study, which explores the links between quality childcare, community social capital and the mental health of children from three distinct communities. The current study was conducted to follow up on results from a large population-level study of school readiness conducted in British Columbia, Canada: the HELP (Human Early Learning Partnership) EDI (Early Development Instrument) Mapping Project. This project assessed approximately 40,000 4–5 year-old children in the Province of British Columbia, Canada, between the years 2000 and 2004. The EDI (Janus & Offord, 2007), a tool developed to assess children's skills and behaviours at the community level, was used to measure school readiness (for a detailed description, see Guhn et al., 2007).

Three waves of HELP EDI Mapping Project assessments have been completed. The results of the first wave indicated that children's levels of school readiness were generally distributed along a social gradient: "worse off" communities (as indexed by SES characteristics) had higher proportions of vulnerable children than "better off" communities (Kershaw et al., 2005). However, there were exceptions to this pattern—that is, places where a greater proportion of children did either better or worse than expected, given the socioeconomic characteristics of their community. Because they would not be near the diagonal regression line that defines the gradient, these communities were dubbed "off diagonal" communities.

Resilient off-diagonal communities (i.e., those doing better than expected) are of particular interest to researchers attempting to understand how social environments can positively influence outcomes in children (Kershaw et al., 2009). There may be important insights to be gained from understanding *how* vulnerable communities manage to meet the developmental needs of their children, contributing to better outcomes. One possible mechanism

underlying community resiliency may be access to quality childcare, the central focus of this paper. However, there may be a range of other factors operating at the community level that affect the development of children. In fact, it makes sense to think of socioeconomic disadvantage as a multidimensional "space" (Grusky & Kanbur, 2006) where economic capital, while crucial, is only one of many factors that influence child outcomes (Benson et al., 1998). One of the central findings of the rapidly growing literature on social capital (Farr, 2004; Szreter & Woolcock, 2004) is that when relations of trust and respect characterize social networks, citizens are better able to cooperate in the pursuit of common ends. Such circumstances can enhance the wellbeing of young children, as education and care become a shared responsibility of citizens rather than of parents alone. This is the idea behind the well know African proverb: "it takes a village to raise a child".

It can be argued that in some circumstances this shared responsibility could lead to a better than expected distribution of quality childcares. Alternatively, it can be argued that this shared responsibility, in combination with other community resources, might affect children independently of specific childcare effects. Adults in a community might feel a collective obligation for the wellbeing of children, and a willingness to mentor children or to support services (not necessarily childcares) that benefit children. It is reasonable to expect that community resources like social capital, in addition to geographic factors like the location of the community relative to larger urban centres, will contribute to the outcomes associated with resilience. We address these larger questions of socioeconomic disadvantage and community resilience in the discussion section of this paper.

Methods

Selection of study communities

The study communities were identified upon examination of the *British Columbia Atlas of Child Development* (Kershaw et al., 2005), which reports findings from the first wave of EDI assessments (conducted between 2000 and 2004). Three communities were identified for the purposes of this study: Vernon, Merritt, and Kamloops. Located approximately 90 km to 180 km apart, these communities are typical of a region highly dependent on resource-based economies and composed of a number of small to medium size towns (a few thousands dwellings). There are only two medium size cities in the region, of which Kamloops (with approximately 65,000 people) is one. Vernon was identified as a resilient off-diagonal community, since it had proportionally fewer vulnerable children than expected, given its SES (Kershaw et al., 2005). Kamloops and Merritt, in contrast, were identified as communities consistent with the social gradient. Kamloops, a better off community, had a lower proportion of vulnerable children, consistent with its higher SES. Merritt, a worse off community, had the highest proportion of vulnerable children, consistent with its lower SES. As Figure 1 indicates, these patterns remained fairly stable over the following two EDI assessments (2005/2007 and 2008/2009), although a general increase in the rate of vulnerability was observed across the whole province.

-------- Insert Figure 1 --------

Social capital of the study communities

In this study, we focused on the local early childhood coalitions as an indicator of social capital and examined the role that this organization played in the context of the three study communities and their childcare centres. All three communities had a coalition promoting early child development, as mandated by the Province of British Columbia. While Kamloops and

Vernon had their own local coalition, Merritt formally fell under the jurisdiction of the

Kamloops' coalition. At the same time, Merritt had a small number of early childhood educators

that functioned as a small, informal, coalition of their own and was primarily concerned with the

brokering of specialized services for children, which often required speech pathology

intervention.

The mandate of the coalitions in Kamloops and Vernon were very similar, both

concerned with enhancing community's ability to support the healthy development of young

children. However, there is an important difference between these coalitions. The coalition in

Vernon mentions research in its mission statement as an important activity for the achievement

its goals (North Okanagan Early Childhood Development Coalition, n.d.) while the Kamloops'

coalition focuses more clearly around service planning and delivery (Make Children First, 2009).

In documenting our interactions with the local coalitions and their potential function as

facilitators of our study, we realized that the apparently small difference in mandates played a

prominent role in our research. We examine the relevance of this point in the discussion section.

The children

Participants were children attending childcare centres in the communities of Kamloops,

Vernon, and Merritt. All group childcare centres licensed for 10 children or more, registered with

the local licensing office, were invited to participate in the Daycare/Preschool Project (Maggi &

Miller, 2007). Of the 31 centres contacted, 24 (77%) participated.

A passive consent procedure was used, so that children participated unless their parents

explicitly refused. In view of our mainly observational assessments, the relevant university

Ethics Committee approved this procedure. Refusal rate was less than 1%. A total of 610

children between the ages of 3 and 5 participated in the study (Kamloops, 13 centres, 307 children; Vernon, 9 centres, 255 children; Merritt, 2 centres, 48 children). Although Merritt contributed only two centres, this is proportionate to its population, which is one-tenth that of Kamloops.

After teachers assessed children attending their childcare facilities, and research assistants assessed the centres, parents were asked to describe their children's mental health (using the Child Behavior Checklist [CBCL]; Achenbach, 1991) and to complete a Parent Questionnaire that gathered information about SES, parenting styles and parent–child relationships, parental stress, and neighbourhood safety. A total of 240 parents (39% of the initial sample) gave informed consent and participated in this phase of the study. In our analyses of program characteristics and children's mental health (below) we used these two groups—the 240 children for whom we had additional data (the SES group) and the remaining 381 children (the non-SES group)—to test whether findings replicated.

Measures

For a full description of procedures and measures used in the Daycare/Preschool Project, see Maggi and Miller (2007). Here we describe only the tools relevant to the present paper.

SES and demographic measures

All SES and demographic measures were parent-reported, as noted above. For gender, girls = 1, boys = 0. Age was reported in years. Marital status was coded to distinguish between two-parent and single parent families (1 = married, common-law; 0 = divorced, separated, single). Education was scored in 6 categories: 1 = less than high school; 2 = high school; 3 = some postsecondary; 4 = trade diploma or certificate; 5 = BA; 6 = postgraduate degree. Income was re-

ported in 9 steps, from 1 = less than $10,000 to 9 = more than $80,000. In order to more accurately assess low income, steps 2 and 3 incremented by 5,000 (2 = $10,000–$14,999; 3 = $15,000–$19,999), while steps 4 through 7 incremented by 10,000 (4 = $20,000–$29,000; 5 = $30,000–$39,999, etc.), and step 8 incremented by 20,000 (6 = $60,000–$79,999). To approximate a ratio scale, steps were replaced by their mean values (1 = $5,000; 2 = $12,500; 3 = $17,500; 4 = $25,000, etc.). Step 9 was arbitrarily recoded so that the $15,000 increment from step 8 ($70,000) to step 9 ($85,000) matched the increment from step 7 ($55,000) to step 8 ($70,000).

Childcare quality

Once we obtained access to childcare centres in the three study communities, we visited them one at a time to assess the quality of the programs offered. We chose the Early Childhood Environment Rating Scale, Revised Edition (ECERS-R; Harms et al., 1998) because it was designed to assess both structural and procedural aspects of childcare quality, and because it is the most widely used instrument in the literature on childcare quality. Although the ECERS-R can be completed after 3 hours of observation per classroom, we observed for a full day because the participating childcares embraced a variety of different program philosophies (e.g., conventional, Reggio Emilia, Montessori) and we wanted to adequately capture such diversity in our assessments. The 43 items of the ECERS-R were completed by a trained research assistant who spent one full day (from opening to closure) at each participating centre, using both observational methods and brief staff interviews, as required. Items were rated from 1 (inadequate) to 7 (excellent). The ECERS-R is organized into seven subscales: 1) Space and Furnishings (including displays and room arrangement), 2) Personal Care Routines (e.g., meals

and snacks, toileting and cleanliness), 3) Language–Reasoning (books available to children, how children and staff use language), 4) Activities (number and types of activities, including art, and availability of equipment and materials), 5) Interaction (supervision and staff–child interactions), 6) Program Structure (scheduling and time allotted for different types of activities), and 7) Parents and Staff (provisions for parent information and staff needs, including evaluation and professional development). In addition to being analyzed separately, subscale scores were averaged to form an overall measure of quality for each centre. Although in our analyses we preferred to use subscale scores, we also included individual items, on the grounds that their greater specificity could be informative. We trusted that our requirement of replication across groups (SES and non-SES) would protect us from false positives.

Children's mental health

A caregiver or teacher who had known the child for at least 2 months described the child's behaviour using the Teacher Report Form (TRF; Achenbach, 1997). The child's parent (or parent figure) completed the Child Behavior Checklist (CBCL; Achenbach, 1991). The TRF and CBCL describe specific behaviours, and the parent or teacher responds by indicating whether the child always/often, sometimes, or rarely/never displays the behaviour. Behaviours are grouped into scales based on either syndromes (e.g., aggressive behaviour) or mental health diagnostic categories (such as attention deficit/hyperactivity problems) defined in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994). In addition to these specific scales, behaviours and mental health problems are usually grouped into three summary scales (Total Problems, Internalizing Behaviours, and Externalizing Behaviours). We focus on these summary scales, which were strongly correlated with the specific scales, in

order to minimize the number of comparisons. Scores on all scales are normed (Achenbach, 1991), so that values indicate whether the child falls into the normal (below the 93rd percentile), borderline (93rd to 97th percentile), or clinical range (above the 98th percentile), compared to children of the same age and gender.

Analysis

First, we performed a descriptive analysis of the sample—demographic characteristics, characteristics of the centres, and extent of mental health problems—noting city differences in these variables. Second, we considered relationships between children's mental health and various predictors, starting with a battery of demographic measures to assess whether expected relations between SES and mental health problems occurred in the current sample. Then, we turned to Hierarchical Linear Regression analyses (Raudenbush & Bryk, 2002) to assess the relative importance of the various predictors (SES, centre characteristics, and cities), while taking into account clustering within centres and cities. Hours spent in care (measured as a continuous variable) was included as a potential predictor.

Finally, our observations of the early childhood coalitions completed between January 2006 to October 2007 are reported in the next section. These observations, rather than being transformed into variables to be used in the quantitative analysis, will guide the interpretation of our findings.

Results

Social capital of the study communities

By establishing contact with the local coalitions for early child development, which functioned as hubs for childcare centres, we hoped to simplify the recruitment process. This

expectation was only met in Vernon, the resilient community, where the local coalition was distinctively organized and coordinated, and worked along side us during the recruitment of childcare centres. Many members of the coalition were early childhood educators themselves and kept in frequent contact with other members of the coalition who also worked at or managed childcare centres. Information about our study travelled very quickly within the community, and childcare providers demonstrated enthusiasm and commitment. It was clear that childcare providers were invested in the study as much as we were because we shared a common end: the wellbeing of children. This centralized and capillary support allowed us to work very efficiently in the resilient community.

The same could not be said for the other two communities, but for two very different reasons. In Kamloops, where children did as well as expected given their better off socio-demographics, the coalition of early childhood educators worked in a more fragmented way. In fact, we soon realized that trying to obtain endorsement from the coalition almost turned into a "bureaucratic" endeavour, where it was unclear who the gatekeeper was and what levels of approval we needed to secure in order to proceed. In the end, because the coalition did not *have to* formally approve the study for us to be able to proceed, we decided to contact each centre individually. Not surprisingly, unlike the resilient community, the recruitment process in Kamloops was lengthy and difficult. Merritt presented yet different challenges. Merritt is by all standards a depressed and remote community. Not only is it the smallest of the three, but it is also the one with the worst socioeconomic conditions and the least access to health and educational services. The coalition of early childhood educators is very small, representing the only 5 childcare centres in town. In that sense, the coalition is a tight cohesive group. As in the

resilient community, we felt that each childcare centre was connected to the other. Unlike the resilient community, however, in Merritt there was a great sense of abandonment and isolation, which the educators talked about extensively during our visits. The sense of abandonment (and resentment) was felt in light of the struggles experienced by many children in areas of speech and language pathology and motor development for which specialized care was needed, but which the regional health authorities failed to deliver because of disputes about jurisdiction.

The accounts of vulnerability in Merritt that emerged from our interactions with childcare providers and coalition members were consistent with the demographic characteristics of our sample, as described in the next section.

Demographic variables: Descriptive findings

Marital status ($N = 242$) Marital status did not differ significantly across cities, $\eta2 = .00$. Most children (85%) were living in two-parent families (married or common-law). Only 8% had parents who were separated or divorced; 6% had parents who had never married. Only two children had a parent who was widowed.

Income ($N = 217$) Consistent with its designation as a worse-off community, families in Merritt reported lower incomes (mean = $53,300) than those in Kamloop (mean = $67,000) or Vernon (mean = $56,600), univariate $F(2,206) = 5.17$, $p < .01$, $\eta2 = .05$. (Median values were $55,000 in Merritt and Vernon, vs. $85,000 in Kamloops).

As expected, two-parent families reported much higher levels of income than single-parent families, $65,600 vs. $28,300, $t(215) = 9.01$, $p < .001$, $r\mathrm{pb}^2 = .27$. However, two-parent families in this sample earned significantly less than other two-parent families in British Columbia ($78,600 in 2005; Statistics Canada, 2007; one-sample $t(216) = -7.99$, $p < .001$, $r\mathrm{pb}^2$

= .23). The bottom quartile of our sample, which included both single parent and two-parent families, reported incomes ranging from $5,000 to $35,000, suggesting that they were experiencing economic hardship.

Education (*N* = 236) At least some post-secondary education was reported by 86% of the sample, with 29% earning a diploma, 25% a BA, and 8% a professional or post-graduate degree. Only six individuals (2.5%) reported less than a high school degree. Consistent with their higher income, families in Kamloops reported marginally higher levels of education, univariate $F(2,206) = 2.84$, $p = .06$, $\eta2 = .03$.

Gender (*N* = 608) The sample was evenly divided between girls (50.2%) and boys (49.8%). Although there were slightly fewer girls (49%) in the non-SES group (*N* = 372) than in the group for which we had SES data (51% of 236 families), this difference was small and statistically non-significant (Cramer`s V = .02), as were city differences ($\eta2 = .01$).

Age (*N* = 599). Children averaged 3.8 years of age, SD = .7, with children in Kamloops slightly older (mean = 3.9) and those in Vernon slightly younger (mean = 3.7; $F(2, 596) = 4.37$, $p < .05$, $\eta2 = .01$. Almost all children (99%) were between the ages of 3 and 5, inclusive.

Childcare Quality

As indicated by Table 1, centers in this sample were consistently rated high on structure, interaction, and personal care (means > 6 out of 7 possible). In contrast, activities were more variable, with some centers offering fewer opportunities to children.

Insert Table 1 about here

Three specific center characteristics - the individual items for discipline, free play, and health practices - are of particular interest because they showed replicated relations with children's mental health, as we will describe below. Most centers received ratings of 7 on these items (75%, 83%, and 87%, respectively), and supplementary analyses confirmed that the relations shown below in Table 5 reflected a contrast between centers with scores of 7 and those with scores of 6 - that is, between centers that were very good and centers that were excellent.

Consistent with its status as a resilient community, childcare programs in Vernon were rated significantly higher on program quality, compared to programs in the other two cities, multivariate $F(8,14) = 3.45$, $p < .05$, for the planned comparison across all eight summary scales. As shown in Table 1, centers in Vernon were rated higher on personal care, $F(1,21) = 12.10$, $p < .01$, $\eta2 = .37$, and higher overall, $F(1,21) = 3.98$, $p < .05$, $\eta2 = .16$. Differences for Activities ($\eta2 = .10$) and Space and Furnishing ($\eta2 = .09$), although moderate in size, were only marginally significant ($ps < .10$), due to our small sample size (24 centers). Values in this paragraph are for one-tailed tests, given our theoretical expectations that the resilient community would be favoured, and because of concerns about Type II Error arising from our small sample size.

Child mental health

Teacher reports As expected in a community sample, most children were in the normal range. For Total Problems, 72% of children in the SES group ($N = 212$) had *T*-scores of 50 or less (mean = 43.1; SD = 10.7), while only 3% had scores in the clinical range (65 or greater). Values for the non-SES group ($N = 336$) were similar (71% and 4%, respectively; mean = 45.7, SD = 10.3). Thus both groups were less troubled than the general population, given that a T-score of 50 represents the 50th percentile; one-sample $t(211) = -9.40$, $p < .001$, $r$pb² = .29 and

one-sample $t(346) = -7.74$, $p < .001$, $r$pb² $= .15$, respectively.

As shown in Table 3, there were small but consistent city differences in teacher-reported child mental health. As expected, children in Vernon had fewer problems, as indexed by all three measures, compared to children in Kamloops and Merritt. All three planned comparisons between Vernon and the other two cities were highly significant (ps $< .001$), with η2 values ranging from .03 to .04. In supplementary chi-square analyses, children were divided into two groups based on their T-scores (50 and below; greater than 50). Consistent with the η2 values just reported, Vernon had significantly greater proportions of children scoring low (76% to 77% across measures). Merritt had the lowest proportions (54% to 65%), as expected, and Kamloops was intermediate (64% to 68%). Across comparisons, p-values ranged from less than .05 to less than .005.

Parent reports Children also appeared less troubled from the point of view of their parents. Based on their reports, 72% of the children in the SES group ($N = 211$) had T-scores of 50 or less for Total Problems (mean = 45.1; SD = 10.0), while only 4% had scores in the clinical range (65 or greater). Thus parents also described children in this sample as less troubled than the general population, one-sample $t(210) = -7.11$, $p < .0001$, $r$pb² $= .19$.

Despite the agreement between parents and teachers about the general level of mental health problems in the SES group as a whole, there was no agreement about the behavior of particular children. As shown in Table 2, the median correlation between parent and teacher measures was only .12.

Insert Table 2 about here

Because of this low level of agreement, parent and teacher scores were aggregated using three Principal Components Analyses, one for each pair of teacher and parent measures (Total Problems, Internalizing, and Externalizing). This technique draws out what is shared by disparate sources. In the two analyses for Total Problems and Internalizing scores, the respective latent variables each summarized 56% of the variance in teacher and parent measures, with factor loadings = .75. The latent variable for Externalizing scores summarized 59% of the variance in teacher and parent measures, factor loadings = .76.

City differences for parent-reported child mental health problems were less consistent than those for teacher-reported problems. Although two of three univariate tests for parent reports were significant at .05, the overall multivariate test was not significant, $F(6,470) = 1.69$, $p > .10$). Moreover, the pattern of city differences for parent-reported problems differed from the pattern for teacher-reported problems. *Post hoc* comparisons indicated that parents in Kamloops, consistent with their higher socio-economic status, reported fewer behavior problems than parents in the other two cities, multivariate $F(3,235) = 3.10$, $p < .05$, with two of three *post hoc* comparisons significant, $ps < .05$, with η2 values of .02 (Internalizing) and .03 (Total problems).

Given these inconsistencies and differences with teacher-reported problems, it was not surprising that city differences were not found for factor scores aggregating parent and teacher-reported behavior problems, multivariate F(6,466) = 1.25, p > .10.

Insert Table 3 about here

Demographic variables and child mental health

Education, income and marital status showed small, consistent relations with children's mental health, as shown in Table 4. Teachers reported more problems for children from single-parent families and from families with lower income. Parents with lower levels of education reported more problems in their children. Latent variables aggregating teacher and parent reports were related to all three demographic measures.

Insert Table 4 about here

Demographic variables, centre characteristics, cities, and children's mental health

Because children are nested within centres and centres within cities, we examined relations across these levels using Hierarchical Linear Modeling (Raudenbush & Bryk, 2002). With child mental health problems as outcomes (Internalizing, Externalizing, and Total problems were analyzed separately), we sought models that replicated across groups (SES, non-SES) and sources (teacher ratings and parent-teacher factor scores in the SES group) for our level-2 predictors (childcare characteristics). Necessarily, Level-1 predictors (demographic measures) could only be required to replicate across sources.

We began by constructing 3-Level models (children within centres within cities) to assess possible city differences. However, consistent with the small city differences in child mental health reported in Table 3, the analysis of variance component of HLM found non-significant city variance for all 3-Level models after partitioning variance between children, centres, and cities (for the nine models - 3 data sets (SES, non-SES, parent-teacher factor scores) x 3 problem

behaviours – all ps > .30).

Given that city differences were small and non-significant, we next tested 2-Level models (children within centres). With child mental health as outcomes, Level-1 variables included demographic variables (SES measures were considered first, when present, then individual hours in care). Level-2 variables included program characteristics and interaction terms (characteristics x city) structured to contrast Vernon with the other two cities in our sample (Preacher, Curran, & Bauer, 2006).

As will be seen below, no Level-1 variables predicted children's mental health once Level-2 variables entered the models, indicating that demographic variables were unimportant for children's mental health when compared to immediate situational variables in the childcare. Among these situational variables, a small set of centre characteristics emerged as consistent predictors of children's mental health, across groups and sources. Interaction terms did not enter these models, indicating that cities were not moderating child outcomes: childcare characteristics had similar effects regardless of the differing contexts provided by the three cities in our sample. Finally, we note that in the absence of Level-1 predictors, level-2 models are predicting mean scores across childcares. Very similar models emerged when we conducted OLS regressions using individual scores. We now consider each mental health problems in detail.

Total Behavior Problems As shown in Table 5, more mental health problems were found in centers with a more restricted range of activities, lower levels of discipline, and, especially, more opportunities for free play. These three centre characteristics predicted teacher-reported Total Behavior Problems across groups (SES and non-SES) and across sources (SES group and Parent-Teacher factor scores), accounting for a third to two-thirds of the variability across

childcares.

Insert Table 5 about here

Internalizing Problems The pattern of replicating results just described for Total

Problems also emerged for Internalizing Problems.

Externalizing Problems In addition to a more restricted range of activities, lower levels of

discipline, and greater free play, Externalizing Problems were also predicted by less-structured

routines for heath practices (such as hand washing). On average, over two-thirds of the

variability in children's behavior across childcares could be explained by these four program

characteristics.

Discussion

With this study we set out to investigate the mental health of preschoolers in three

communities with the expectation that, collectively, children from the off-diagonal resilient

community would have better mental health than children from the two comparison

communities. We also expected that the advantage observed in the children from the resilient

community could be explained by better childcare practices. Our expectations were partially met.

First, we replicated the findings of the EDI Mapping Project and showed that, in a younger

cohort of children, teachers from the resilient community reported fewer mental health problems

than those reported by teachers in the two comparison communities. However this finding was

not replicated when parental reports were used. Second, we found that childcare centres from the

resilient community scored higher on measures of program and structure quality than the two

comparison communities. The difference between cities in childcare quality, however, was lost

in the hierarchical linear regressions, indicating that differences between communities in mental

health problems could be completely attributed to community differences in childcare quality.

Combined, these findings suggest that the differences between cities in children's mental health

were mediated by childcare characteristics. In other words, cities indirectly influenced the mental

health of children through the effects of childcare characteristics. These findings raise a key

question: how can we explain the high quality of the childcare in the resilient community?

To answer this question we turn to our observations, which suggest that social capital

plays an important role in our resilient community. Perhaps the most important aspect that

differentiated the resilient community from the comparison communities was the level of activity

and engagement demonstrated by the local coalition. As previously indicated, local coalitions for

early child development are provincially mandated in British Columbia, yet coalitions' specific

mandates can be slightly different. We also found that the efficiency of each coalition (i.e., the

degree to which coalitions are able to work towards their goals) can vary significantly. From our

observations, it became clear that the commitment to research stated in the mandate of the

resilient community was a key pillar of that coalition. The coalition also functioned very

efficiently, perhaps also in part thanks to the facts that there were enough local services and

community resources that allowed the coalition to be successful in its efforts to provide families

and children with the services they needed.

On the other hand, in the better off community, the coalition offered piecemeal services

and lacked leadership and direction, despite having access to adequate resources; and in the

worse off community the absence of community resources impaired the small (informal)

coalition in their effort to promote healthy child development, despite their good intentions. It is of course not trivial to comment that geography may also have much to do with the observed differences. The resilient community is more "compact" and adjacent to Kelowna, the city that controls delivery of health resources and services in the region. The worse-off community, on the other hand, is more isolated and rarely receives specialized service for children. Finally, the better-off community has access to some specialized services for children, but not to the same extent as the resilient community.

Consistent with Small's (2009) concept of childcare centres as producers of social capital, we argue that in the resilient community the combination of high quality childcare and the efficiency of the local coalition lead to a greater production of social capital than in the comparison communities. Small (2009) would argue that children do better than expected because their mothers are directly benefitting from greater access to resources and social networks that are promoted both by the childcare centres and the local coalition that connects the centres. In other words, a more functional coalition increases the production of social capital that is typical of childcare centres, leading to greater maternal wellbeing, which in turn leads to better children's mental health. This intriguing hypothesis will guide our future research endeavors.

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Figure 1. Changes in the proportion of vulnerable children in one or more scales of the EDI in

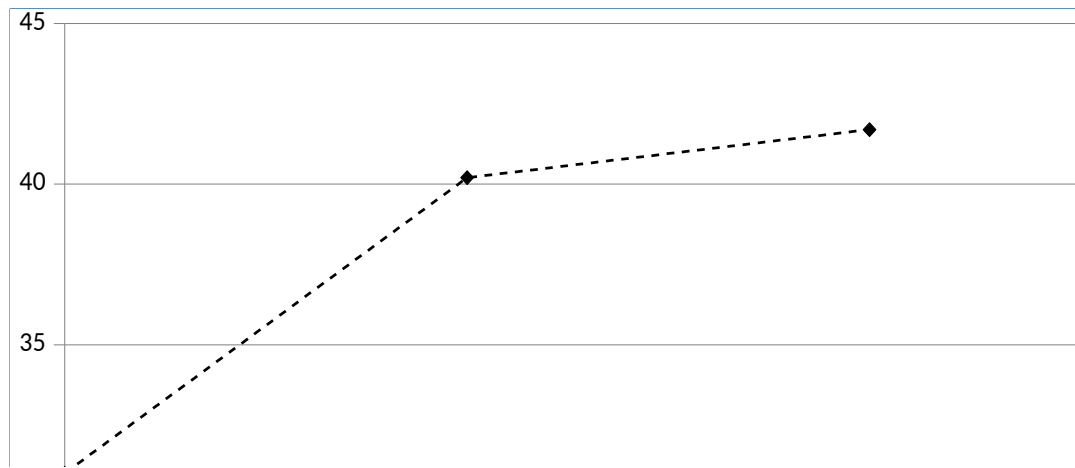the study communities between 2000 and 2009

Table 1

Program characteristics, by city: Means and (Standard Deviations) for ECERS summary variables and selected individual scales

Variable	All Centres	Kamloops	Vernon	Merritt	η^2
ECERS-R Subscales	($N = 24$)	($N = 13$)	($N = 9$)	($N = 2$)	
Total	5.7 (.4)	5.6 (.4)	5.8 (.3)	5.2 (.6)	0.16+
Space and Furnishing	5.7 (.4)	5.6 (.4)	5.9 (.3)	5.5 (.7)	.09+
Personal Care Routines	6.1 (.6)	5.9 (.5)	6.5 (.5)	5.2 (.4)	.37**
Language-Reasoning	5.8 (.7)	5.7 (.7)	5.9 (.6)	5.6 (.9)	.02
Activities	5.0 (.7)	5.0 (.7)	5.2 (.6)	4.2 (1.4)	.10+
Interaction	6.5 (.5)	6.4 (.7)	6.6 (.2)	6.7 (.1)	.00
Program Structure	6.5 (.5)	6.6 (.4)	6.4 (.5)	6.5 (.7)	.02
Parents and Staff	5.2 (.8)	5.2 (.8)	5.2 (1.0)	4.8 (.3)	.01
Health Practices	6.7 (.9)	6.4 (1.1)	7.0 (.0)	7.0 (.0)	.02
Discipline	6.6 (.9)	6.6 (.5)	6.8 (.9)	7.0 (.0)	.03
Free Play	6.9 (.3)	7.0 (.2)	6.7 (.4)	7.0 (.0)	.05

Notes.

+$p < .10$; ** $p < .01$. Tests are one-tailed.

Effect sizes and significance levels are from the planned comparison between Vernon and the two "on-diagonal" cities.

Table 2

City differences in children's mental health problems: Means and (standard deviations)

Children's Mental Health	Kamloops	Vernon	Merritt	η^2
Teacher reports ($N = 587$)	($N = 289$)	($N = 250$)	($N = 48$)	
Internalizing	46.0 (9.0)	43.6 (9.9)	49.6 (10.0)	.03***
Externalizing	47.8 (9.4)	44.2 (8.8)	48.5 (10.2)	.04***
Total Problems	46.2 (9.9)	42.1 (10.6)	48.0 (10.3)	.04***
Parent reports ($N = 240$)	($N = 101$)	($N = 114$)	($N = 25$)	
Internalizing	45.2 (9.3)	48.2 (10.0)	49.0 (11.2)	.03*
Externalizing	43.6 (9.3)	45.8 (10.4)	45.5 (9.8)	.01
Total Problems	43.2 (9.0)	46.6 (10.3)	47.6 (11.5)	.03*
Factor scores ($N = 238$)	($N = 99$)	($N = 114$)	($N = 25$)	
Internalizing	-.07 (.96)	-.04 (.99)	.47 (1.09)	.02
Externalizing	.01 (1.00)	-.07 (.99)	.24 (1.06)	.01
Total Problems	-.02 (.96)	-.06 (1.00)	.39 (1.10)	.03*

*$p < .05$; ** $p < .01$; *** $p < .001$. All tests are two-tailed. Values for Teacher and Parent reports are *T*-scores.

Table 3

Mental health problems: Teacher and parent reports, $N = 238$

Variables	1	2	3	4	5	6
Teacher reports						
1. Internalizing	1.00	.---	.---	.---	.---	.---
2. Externalizing	.68***[a]	1.00	.---	.---	.---	.---
3. Total Problems	.89***[b]	.89***[c]	1.00	.---	.---	.---
Parent reports						
4. Internalizing	0.11	.03	.08	1.00	.---	.---
5. Externalizing	.08	.17**	.15*	.64***	1.00	.---
6. Total Problems	.10	.10	0.12	.88***	.83***	1

Cohen's omnibus test that all correlations are zero: $P^2(15) = 2{,}061.99$, $p < .0001$.

a. for the non-SES group, $r(351) = .60$***

b. for the non-SES group, $r(351) = .86$***

c. for the non-SES group, $r(351) = .88$***

* $p < .05$; ** $p < .01$; *** $p < .001$. All tests are two-tailed.

Table 4

Demographic variables and mental health problems: Correlations for the SES group

Variables	1	2	3	4	5
Demographic					
1. child age	1.00				
2. gender	.10	1.00	.---	.---	.---
3. education	-.06	.06	1.00	.---	.---
4. income	.02	.07	.30***	1.00	.---
5. marital status	.04	.04	.04	.52***	1.00
Teacher reports					
6. Internalizing	0.08[a]	-0.01[b]	-0.02	-.21**	-.20**
7. Externalizing	-0.04	0.05	-.06	-.23***	-.23***
8. Total Problems	.02	.04[c]	-.06	-.22**	-.21**
Parent reports					
9. Internalizing	.05	-.04	-.13*	-.08	.02
10. Externalizing	-.08	-.10	-.20**	-.11	-.06
11. Total Problems	-.03	-.09	-.22***	-.15*	-.06
Teacher/ Parent factors					
12. Internalizing	.08	-.04	-.10	-.19**	-.12
13. Externalizing	-.08	-.04	-.18**	-.21**	-.18**
14. Total Problems	-.01	-.04	-.20**	-.25***	-.17**

*N*s varied from 210 to 242.

For SES variables, the binomial probability of observing 17 or more significant tests ($p < .05$) in a set of 36 is $< .0001$.

Gender: 1 = girls, 0 = boys

Marital status: 1 = married, common-law; 0 = divorced, separated, single

Education: 1 = less than Grade 12; 9 = postgraduate degree

a. For the non-SES group, correlations between child age and teacher-rated mental health problems ranged from -.07 to .03, all $df = 343$.

b. For the non-SES group, correlations between gender and teacher-rated mental health problems ranged from -.02 to .02, all $df = 351$.

* $p < .05$; ** $p < .01$; *** $p < .001$. All tests are two-tailed.

Table 5

Childcare predictors of mental health problems: Summary of HLM models

Behavioural Problem	Between Groups	R^2 Between	Intercept	Level 2 Coefficients, Childcare Program Characteristics			
				Activities	Health Practices	Discipline	Free play
Total Problems							
SES Group	.48***	.60	46.29***	-4.57**	--	-4.80**	10.88**
Non-SES	.30***	.36	46.16***	-2.76+	--	-3.29*	8.43*
Group Parent– Teacher	.29***	.72	.18+	-.41**	--	-.39**	.67*
Externalizing							
SES Group	.39***	.60	48.00***	-3.55*	-2.93*	-2.52+	6.90*
Non-SES	.17***	.70	47.45***	-2.31*	-1.77*	-2.41*	5.37*
Group Parent– Teacher	.23***	.83	.16	-.30*	-.35**	-.25*	0.39
Internalizing							
SES Group	.41***	0.69	46.82***	-4.09**	--	-4.36**	9.05**
Non-SES	.26***	.28	46.00***	-2.69+	--	-2.24+	6.72+
Group Parent– Teacher	.24***	0.86	0.17*	-.41***	--	-.37**	.51*

No Level-1 variables reached statistical significance.

Health Practices only entered the model for Externalizing Behaviours.

For the SES Group, $N = 240$; for SES Group Parent–Teacher Factor Scores, $N = 235$; both across 22 childcares.

For the non-SES group, $N = 347$, across 24 childcares.

Between Groups = proportion of total variance that can be attributed to differences between

childcares (variance between groups (childcares) / total variance).

R2 Between = Proportion of between-groups variance accounted for by childcare characteristics.

+ $p < .10$; * $p < .05$; ** $p < .010$; *** $p < .001$. All tests are two-tailed.