



# Implementation of system-wide change in child welfare and behavioral health: The role of capacity, collaboration, and readiness for change



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## ABSTRACT

Children who enter out-of-home care are at risk for trauma and behavioral problems, however the child welfare and behavioral health systems do not effectively communicate to provide evidenced-based treatment. This case study describes the implementation of [name blinded for peer review] to address these concerns. The project was driven by shared recognition in child welfare, behavioral health and their stakeholders that the system was not adequately identifying and responding to the behavioral health needs of children in out-of-home care. Utilizing survey research, we present findings from four cohorts of child welfare and behavioral health staff as they began implementation of the intervention (N = 1370). Guided by the implementation stages framework, this five-year project was required to examine capacity, collaboration, and readiness in the needs assessment phase, and chose to identify these constructs as outcomes in themselves. As such, we were able to trend data in our implementation teams and other periodic dissemination efforts to show progress and support recommendations for course correction as needed. This study revealed statistically significant differences in the perceptions of workers from each system in capacity for trauma-informed knowledge, collaboration (in the interaction between cohort and provider type), and organizational readiness for change. While our study found differences between cohorts and providers in the perception of these factors, it is certain that implementation in real world child welfare and behavioral health settings present a vast array of contextual factors that may influence them, both related to and totally external to the project being implemented. Leadership and policy change can facilitate growth in these implementation drivers throughout stages to full implementation and ultimately sustainability.

## 1. Introduction

Children entering out-of-home care are at a greater risk for significant trauma and resultant behavioral health challenges (Casaneuva, Ringeisen, Wilson, Smith, & Dolan, 2011). However, child welfare and behavioral health service delivery systems can be fragmented and do not effectively collaborate to provide appropriate evidence-based treatment (Cooper & Vick, 2009). Federal Child and Family Service Reviews have demonstrated that the vast majority of states do not provide adequate services to meet the physical and behavioral health needs of children and families (McCarthy, Marshall, Irvine, & Jay, 2004). The U.S. Department of Health and Human Services, Administration for Children and Families has recognized these concerns (2012), funding a series of discretionary grants to test approaches to better serve these children and youth through data-driven processes. This case study describes one such grant that was implemented in a Southeastern state. The project was driven by shared recognition in child welfare, behavioral health and their stakeholders that the system was not adequately identifying and responding to the behavioral health needs of children in out-of-home care.

Prior to this project, children were not screened for trauma and behavioral health needs, and there was no standardized tool used for

functional assessment and monitoring treatment progress. The project implemented universal, standardized screening for trauma and behavioral health needs by child welfare workers upon entry into out-of-home care, standardized functional assessment and periodic measurement of progress by behavioral health providers, use of data from screening and assessment to inform treatment selection, and use of aggregate data on the organizational level for capacity building and service array reconfiguration. The project began with one cohort in a small region of the state, and over the course of four years, expanded to include the entire state. This represented major interorganizational and frontline practice change. In order to implement these interventions, the project focused on building interagency capacity, collaboration, and readiness for change. The measurement of these implementation drivers across the five-year statewide implementation of this initiative is the focus of this paper.

### 1.1. Capacity, collaboration, and readiness for change

The literature provides definitions of the concepts of capacity, collaboration, and readiness for change. The capacity of an organization to successfully implement an evidenced-based intervention can be defined as increasing staff awareness of the intervention, increasing staff

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knowledge and skills of the intervention, building self-efficacy related to delivering the intervention, and establishing a sense of motivation to adopt a new practice (Leeman et al., 2015). To that end, there are multiple ways to operationalize the construct of capacity. However, most measure capacity at least to some degree through knowledge and skills provided to staff who deliver the intervention (Akin, Dunderley, Brook, & Bruns, 2019; Fraser et al., 2014). Moreover, providing ongoing training and evaluation of an agency's capacity to successfully implement an evidenced-based intervention is recommended (Akin et al., 2019; Fraser et al., 2014).

Fundamental to the concept of collaboration is communication and responsiveness. Mason, DuMont, Paterson, and Hyman (2018) explored the experiences of child protection workers in collaborating with adult mental health providers and found mistrust between child welfare and mental health providers, and a lack of knowledge from both on their roles and responsibilities. While mistrust and lack of knowledge on roles and responsibilities may act as inhibitors to collaborative efforts, other studies have found that providers are open to collaboration. Kerns et al. (2014) explored facilitators and barriers to connecting children and youths in out-of-home care with effective mental health treatment qualitatively, and found that overall, child welfare and mental health-based staff shared a desire for collaboration in treatment planning and service delivery. Participants expressed that information sharing and care collaboration was valuable to treatment. Responsiveness and communication were two themes that emerged as critical. Similar to our study, He, Lim, Lecklitner, Olson, and Traube (2015) explored interagency collaboration in identifying mental health needs in child welfare involved youth and found a substantial increase in collaborative efforts through introduction of a uniform agency mental health screening tool.

Weiner's theory on readiness for change (2009) posited change occurs when members of the organization feel committed to organizational change and confident in the ability of organizational members to implement such change. This concept has been explored in healthcare settings (Holt, Helfrich, Hall, & Weiner, 2010; Shea, Jacobs, Esserman, Bruce, & Weiner, 2014; Williams, 2011) to determine whether organizations, units, and their members are able to adapt to a changing landscape and what factors may influence their ability to implement this change (Sharma et al., 2018). Commitment to change is an important factor related to readiness and can be associated with the concept of staff buy-in. Lang et al. (2017) reported on a five-state implementation of a trauma screening in child welfare and found that limited buy-in from staff was a barrier. Similarly, a qualitative study by Akin et al. (2019) explored the ways in which organizational drivers impact implementation of a statewide intervention to implement trauma screening as perceived by child welfare supervisors and administrators and found staff buy-in to be a critical aspect of sustainability. Moreover, a tiered approach to buy-in emerged with administrators and supervisors being trained in the intervention first to show their support of the intervention.

### 1.2. Implementing with science

This project utilized the implementation stages framework due to its practical fit and consistency with the design of the demonstration project. The implementation stages framework is one of five frameworks in the Active Implementation Frameworks (Metz & Bartley, 2012). There are four distinct and dynamic implementation stages involved in implementing a quality practice or intervention: Exploration, Installation, Initial Implementation, and Full Implementation. Although not linear, each stage is necessary for successful sustained implementation. Another construct important to implementation is the use of drivers, or infrastructure components identified through examination of successfully implemented programs which support the needed change. These drivers include competency drivers (staff selection, training, coaching, and fidelity assessment), leadership drivers

(technical and adaptive), and organization drivers (systems intervention, facilitative administration, and decision support data systems) (Metz & Bartley, 2012; National Implementation Research Network, 2017).

In the planning year, the Children's Bureau required this project to conduct a readiness and fit assessment, examining constructs associated with interagency relationships, capacity to support trauma-informed care, and readiness for change. Based on the data collected in this exploration phase, the project took an intentional approach to the use of implementation drivers in a number of ways which are summarized throughout this section of the paper. Capacity, collaboration, and readiness for change were assessed using survey research throughout the five years to monitor progress and address areas in need of attention to support implementation.

*Capacity* to implement a trauma-informed approach to service delivery was promoted primarily through agency-specific training of frontline staff and supervisors, and consultation by intervention purveyors. In terms of the facilitative administration driver, practice protocols, policies, and compliance and fidelity tracking were created with a goal of workload neutrality. Regional and state level leadership was engaged to support the removal of policy and procedural barriers to the intervention, and positive messaging regarding the interventions to the frontline. Interim data results were communicated to build buy-in, and identify areas needing improvement. Regional champions were identified and trained to support implementation and promote buy-in. Behavioral health agency concerns regarding Medicaid reimbursement for the interventions were addressed through negotiation of recommended billing codes and processes.

In order to promote improved *collaboration*, a series of cross-system implementation teams were established on the regional and state levels. These teams met at least quarterly from installation through full implementation with representatives from both child welfare and behavioral health agencies participating. Technological strategies were employed to facilitate information-sharing between the two systems, including embedding the screening process into the child welfare MIS system, building a web-based system for entry of functional assessment results and treatment selection, and establishing an interface between the two, operationalizing the decision support data system driver (Collins-Camargo, Strolin-Goltzman, & Akin, 2019).

Many of these capacity-focused strategies served a dual purpose of promoting *organizational readiness for change*. Using a staged cohort approach, implementation was rolled out in different regions over a four-year time period, enabling project staff to help each region prepare for implementation. Regional champions from cohort one were enlisted to train and support subsequent cohorts on a limited basis. Due to delays in initial implementation of the first cohort, some momentum was lost in subsequent cohorts. Efforts to make up for lost time led to shortened installation and planning. When it was discovered that these compressed efforts were insufficient, a more extensive and structured process was instituted to bring new cohorts on board.

### 1.3. The present paper

This case study describes the process whereby changes in perspectives of child welfare and behavioral health providers related to capacity, collaboration, and readiness for change informed the implementation of [name blinded for peer review]. Specifically, the paper focuses on the providers' capacity to engage in implementing an intervention, their ability and willingness to collaborate between these two systems, and their organization's commitment and capacity to change. Utilizing survey research, we present findings from four cohorts of staff as they began implementation as an exemplar of how such data may be used to support and adjust implementation. Practice and research implications are discussed.

## 2. Method

### 2.1. Research design and sample

To evaluate factors and strategies associated with successful adoption, installation, and implementation, including capacity, collaboration, and readiness for change, survey research was utilized through a cohort design to examine child welfare and behavioral health clinicians' perceptions of implementation study constructs as the interventions were rolled out to each region of the state. Clinicians were classified based on the type of provider by which they were employed; child welfare clinicians were employed by the public agency, while behavioral health clinicians worked in community mental health centers, private therapeutic foster care or residential treatment agency.

The project timeline was a total of five years with the first year used for planning. A purposive sampling approach was utilized with a new cohort established annually, over the course of the remaining four years. Each cohort is composed of all staff trained in a given year. Paper surveys were administered to participants upon completion of the training. All child welfare front line staff employed at the time of regional implementation or hired thereafter were mandated to attend the training. Behavioral health staff were required to send at least one representative from each agency to the training, and in many cases multiple workers per agency were sent to training. Behavioral health providers included all private therapeutic foster care and residential treatment centers within the state. In all a total of 1720 child welfare staff, and 893 behavioral health providers completed the training. This represents close to 100% of the child welfare frontline workforce. High turnover rates impeded estimation of the percentage of behavioral health providers trained.

Of these 2613 trainees, demographic information was captured for 1370 participants: 871 child welfare workers, for a response rate of 51%; and 499 behavioral health providers, for a response rate of 56%, suggesting no significant differences in the response rate by group. In order to maximize survey responses, participants were entered into a drawing to receive a \$25 gift card if they completed the survey. There was a variation in survey completion for each construct: capacity ( $n = 1138$ ), collaboration ( $n = 1081$ ), and readiness for change ( $n = 1134$ ). Only those with complete data for the constructs under analysis were included. Analysis was conducted to assess for demographic differences between respondents with completed surveys compared with those who did not have completed surveys; however, no statistically significant differences were found, suggesting the sample of survey respondents was representative of the larger demographic.

### 2.2. Measures

#### 2.2.1. Dependent variables

Capacity was assessed using the Trauma Informed Systems Worker Self-Assessment (TISWSA) scale. The scale was developed by the University of Wisconsin in 2014 as part of the Behavioral Health Training Partnership and NEW Partnership for Children and Families. The stated purpose of the scale is for child welfare and behavioral health providers to assess their understanding of how trauma may impact consumers. There is no published reliability/validity data on the scale. The TISWSA is a 10-item scale with responses ranging from 1 = 'none of the time' to 5 = 'all of the time'. Higher scores indicate a greater knowledge of how trauma may impact consumers. Scores for this study range from 22 to 50. Examples of scale items include: 'I understand the impact of trauma on a child and adult's behavior', 'I understand the impact of trauma on a child's development', and 'I understand the impact of trauma on a child and adult's relationships'. This scale has good internal consistency with a Cronbach alpha of 0.91 for this study sample.

Collaboration was assessed using the Wilder Collaboration Factor Inventory (Mattessich, Murray-Close, & Monsey, 2001). The inventory

is a 40-item instrument, measuring 20 collaboration factors grouped into the six categories: environment, membership, process and structure, communication, purpose, and resources. Townsend and Shelley (2008) conducted an exploratory factor analysis to determine if any underlying structures existed. Criteria including an a priori hypothesis that the measure was unidimensional, and the interpretability of the factor solution was used to determine the number of factors to rotate. Their study revealed a statistically significant theoretical structure of the instrument that grouped the 40 items into four components that explained 55.5% of the total variance. The Wilder Collaboration Factor Inventory has three factors in which reliability cannot be assessed because each factor includes only one item. The six categories can be measured separately, as well as a total score can be calculated. For this study a total score was utilized to assess collaboration. Responses are measured on a 5-point scale from 'Strongly Disagree' to 'Strongly Agree'. Scores for this study sample range from 20 to 200 with higher scores suggesting a greater degree of collaboration. This scale has good internal consistency with a Cronbach Alpha of 0.97 for this study sample.

Readiness for change was measured using two scales. The first was the Organizational Readiness for Implementing Change scale (ORIC). This scale is a multilevel construct (Holt et al., 2010) with a focus on change commitment and change efficacy (Shea et al., 2014; Weiner, 2009; Weiner, Lewis, & Linnan, 2009). There are 12 items on a 5-point Likert-type scale ranging from 'Disagree' to 'Agree'. Scores for this study sample range from 12 to 60 with higher scores suggesting a greater sense of change commitment and change efficacy. Shea et al. (2014) conducted an exploratory factor analysis and a confirmatory factor analysis to determine if change commitment and change efficacy represented interrelated facets of organizational readiness and were correlated. Their study found all five items intended to measure change commitment exhibited factor loadings greater than 0.6, however for change efficacy only five of the seven items exhibited factor loadings greater than 0.6. Shea and colleagues then dropped the two items that did not load greater than 0.6 and ran a confirmatory factor analysis. Results from the confirmatory factor analysis revealed the two-factor structure (change commitment and change efficacy) converged and demonstrated a strong correlation between them. In our study, we used the 12-item scale with a reliability Cronbach's alpha of 0.98 indicating strong internal consistency. The second scale used to measure readiness for change was the Organizational Learning Conditions and Support Sub-Scale of the Training Transfer Inventory (Coetsee, 1998). This sub-scale assesses the degree to which the organization supports or maintains an environment of learning. The construct validity of the sub-scale was tested using structural equation modeling with items emerging as a single factor (Coetsee, 1998). The sub-scale contains 17 items to which subjects respond on five-point Likert scales, ranging from 'Strongly Disagree' to 'Strongly Agree'. Scores for this study sample range from 17 to 85. This sub-scale has strong internal consistency reliability, with a Cronbach alpha of 0.96 for this study sample. This sub-scale has been used in other studies assessing the child welfare workforce with similar internal consistency (Antle, Barbee, & van Zyl, 2008; Sullivan, Antle, Barbee, & Egbert, 2009).

#### 2.2.2. Independent variables

There were two primary independent variables of interest. The first measured change across cohorts in which the surveys (dependent variables) were administered to four cohorts collected over the course of the multi-year project. As has been stated, cohorts were comprised of participants in different regions of the state within a year as they completed training. The second independent variable was provider type. Provider type measured the differences between child welfare and behavioral health providers as it relates to capacity, collaboration, and readiness for change.

### 2.3. Analysis strategy

This study employed chi-square, t tests, and ANOVA's to assess similarities and differences between the characteristics of the providers and cohorts. Because one measure was utilized to assess the constructs of capacity and collaboration, an ANOVA was employed. Multiple measures were used to assess the construct of readiness for change, thus a MANOVA was employed. The study was approved by the [name blinded for peer review] Human Subjects Institutional Review Board.

## 3. Results

### 3.1. Similarities and differences between cohorts and providers

The sample was examined to assess for similarities and differences across cohorts and provider type using key demographic and training variables including age, gender, race, years of experience, years at current agency, and two questions exploring whether the participant received prior training in an evidenced-based practice or on trauma-informed care. There were no statistically significant differences between cohorts when examining gender, and whether participants received prior training in an evidence-based practice, or prior training in trauma-informed care. There were, however, statistically significant differences when examining age, race, years of experience, and years at current agency. There was a statistically significant difference between cohorts in age ( $F(532.55) = 5.55, p < .001$ ) with the mean age for cohort 3 higher ( $M = 37.81$ ) compared to all other cohorts. There was a statistically significant difference in race by cohort, with cohort 2 having more African American participants ( $\chi^2(6) = 45.74, p < .001$ ) compared with all other cohorts. This may be explained by the urban setting of regions trained in cohort 2 compared to the predominantly rural, Caucasian workforce in the other cohorts. There was a statistically significant difference between cohorts in years of experience ( $F(209.19) = 3.49, p < .01$ ) with cohort 3 ( $M = 9.12$ ) having more years of experience, compared with all other cohorts. There was also a statistically significant difference between cohorts in years at current agency ( $F(300.90) = 6.11, p < .001$ ) with cohort 3 ( $M = 7.47$ ) having more years at their current agency, compared with all other cohorts.

There were no statistically significant differences between providers when examining age, gender, race, and years of experience. There were statistically significant differences when examining years at current agency, and whether participants received prior training in an evidence-based practice, or prior training in trauma-informed care. There were statistically significant differences between child welfare and behavioral health providers with regard to number of years at their current agency ( $t(1309) = 6.89, p < .001$ ) with providers in child welfare ( $M = 7.47, SD = 7.66$ ) having more years of employment at their current agency compared with behavioral health providers ( $M = 4.71, SD = 5.60$ ). There were also statistically significant differences between providers when exploring prior training in an evidence-based practice ( $\chi^2(1) = 32.04, p < .001$ ) with 95% of behavioral health providers having received prior training compared with 85% of child welfare workers. The same held for prior training in trauma-informed care ( $\chi^2(1) = 18.47, p < .001$ ) with over 93% of behavioral health providers having received prior training compared with 86% of child welfare workers.

### 3.2. Capacity

A total of 1138 participants completed the Trauma Informed Systems Worker Self-Assessment (TISWA) Scale. The mean TISWSA scale scores for participants employed by child welfare remained virtually the same between cohort one ( $M = 40.25, SD = 6.34$ ) and cohort four ( $M = 40.91, SD = 5.29$ ). Mean scores for child welfare providers between cohort one and cohort two ( $M = 39.54, SD = 5.97$ ) dropped

**Table 1**

Analysis of variance assessing capacity.

Variable	Sum of squares	df	Square	Mean	F	$\eta^2$
Change across cohorts	256.35	3	85.45	2.94*	0.01	
Provider type	910.31	1	910.31	31.26***	0.03	
Change across cohorts (x) Provider type	129.45	3	43.15	1.48	0.004	
Error	32902.31	1130	29.12			

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

n = 1138.

less than one point, then increased in cohort three ( $M = 40.74, SD = 5.29$ ) and held constant for cohort four. Mean TISWSA scale scores for participants employed in a behavioral health setting increased more than two points between cohort one ( $M = 41.10, SD = 4.85$ ) and cohort four ( $M = 43.34, SD = 4.97$ ). Mean TISWSA scores for behavioral health providers consistently increased between cohort one and cohort two ( $M = 42.66, SD = 4.82$ ) of the study, held constant in cohort three ( $M = 42.68, SD = 4.82$ ), and slightly increased in cohort four. Throughout the study, behavioral health providers scored higher on the TISWSA scale than did child welfare providers suggesting a greater knowledge of how trauma may impact consumers.

Table 1 provides results from the ANOVA analysis assessing capacity. The overall model had a small effect with an  $R^2$  of 0.06. Among the sample, there was a statistically significant change over time difference in mean TISWSA scale scores across cohorts ( $F(256.351) = 2.94, p < 0.03$ ). A statistically significant difference ( $F(910.31) = 31.26, p < .001$ ) in mean TISWSA scale scores was found between those participants employed in a behavioral health setting ( $M = 42.71, SD = 5.06$ ) compared with participants employed in child welfare ( $M = 40.62, SD = 5.61$ ). There was, however, not a statistically significant difference in mean scores when exploring the interaction between cohort and provider type ( $F(129.45) = 1.48, p < 0.22$ ). The effect size for change across cohorts ( $\eta^2 = 0.01$ ), provider type ( $\eta^2 = 0.03$ ), and the interaction between cohort and provider ( $\eta^2 = 0.004$ ) was small. To further explore mean differences in TISWSA scale scores across study cohorts a Bonferroni post hoc analysis was conducted, however there were no statistically significant mean differences found.

### 3.3. Collaboration

There were 1081 participants who completed the Wilder Collaboration Factor Inventory. The mean Wilder Collaboration Factor Inventory scores for participants employed by child welfare increased over 11 points between cohort one ( $M = 130.08, SD = 33.20$ ) and cohort four ( $M = 141.63, SD = 25.11$ ). Interestingly, mean scores for child welfare providers between cohort one and cohort two ( $M = 123.57, SD = 28.57$ ) dropped over six points, then significantly increased in cohort three ( $M = 134.50, SD = 26.87$ ). Mean Wilder Collaboration Factor Inventory scores for participants employed in a behavioral health setting increased more than seven points between cohort one ( $M = 128.02, SD = 34.59$ ) and cohort four ( $M = 135.47, SD = 23.95$ ). While scores rose consistently between cohort one and cohort three, scores in cohort four dropped over four points. Even though Wilder Collaboration Factor Inventory scores increased for both providers between cohort one and four, at the end of the study period behavioral health providers had a lower confidence of collaboration compared with providers in child welfare.

Table 2 provides results from the ANOVA analysis assessing collaboration. The overall model had a small effect with an  $R^2$  of 0.05. Among the sample, there was a statistically significant difference in mean Wilder Collaboration Factor Inventory scores between cohorts ( $F$

**Table 2**  
Analysis of variance assessing collaboration.

Variable	Sum of squares	df	Square	Mean	F	$\eta^2$
Change across cohorts	14304.63	3		4768.21	6.93***	0.02
Provider type	1354.77	1		1354.77	1.97	0.002
Change across cohorts (x) Provider type	12097.68	3		4032.56	5.86***	0.02
Error	737999.42	1073		687.79		

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .  
n = 1081.

(4768.21) = 6.93,  $p < 0.001$ ). There was not, however, a statistically significant difference ( $F(1354.77) = 1.97$ ,  $p < .16$ ) in mean scores between those participants employed in a behavioral health setting ( $M = 136.0$ ,  $SD = 24.55$ ) compared with participants employed in child welfare ( $M = 135.85$ ,  $SD = 27.86$ ). There was a statistically significant difference in mean Wilder Collaboration Factor Inventory scores when exploring the interaction between cohort and provider type ( $F(4032.56) = 5.86$ ,  $p < 0.001$ ). The effect size for change across cohorts ( $\eta^2 = 0.02$ ), provider type ( $\eta^2 = 0.002$ ), and the interaction between cohort and provider ( $\eta^2 = 0.02$ ) was small. To further explore mean differences in Wilder Collaboration Factor Inventory scores across study cohorts a Bonferroni post hoc analysis was conducted. Statistically significant mean differences were found between cohort one and cohort three ( $M = 7.20$ ,  $SE = 2.55$ ,  $p < .02$ ), and cohort one and cohort four of the study ( $M = 10.37$ ,  $SE = 2.47$ ,  $p < .001$ ). There were also statistically significant mean differences found between cohort two and cohort four of the study ( $M = 9.71$ ,  $SE = 2.53$ ,  $p < .001$ ).

### 3.4. Readiness for change

A total of 1134 participants completed the Organizational Learning Conditions and Support (OLCS) Sub-Scale of the Training Transfer, and Organizational Readiness to Implement Change Scale. The mean OLCS scale scores for participants employed by child welfare decreased slightly between cohort one ( $M = 62.10$ ,  $SD = 12.12$ ) and cohort four ( $M = 61.18$ ,  $SD = 12.38$ ). Mean scores for child welfare providers between cohort one and cohort two ( $M = 54.83$ ,  $SD = 12.65$ ) dropped over seven points, then increased in cohort three ( $M = 60.68$ ,  $SD = 11.45$ ) and marginally increased again in cohort four. Mean OCS scale scores for participants employed in a behavioral health setting, however, increased more than four points between cohort one ( $M = 62.16$ ,  $SD = 3.17$ ) and cohort four ( $M = 66.84$ ,  $SD = 10.23$ ). Though child welfare and behavioral health providers began the study with a similar sense of how their organization supports or maintains an environment of learning, over the course of the study behavioral health providers showed an increase in confidence in their organizations support, whereas child welfare providers had a reduced sense of confidence in their organization's support of a learning environment.

By comparison, the mean Organizational Readiness to Implement Change Scale scores for participants employed by child welfare increased over two points between cohort one ( $M = 43.97$ ,  $SD = 10.16$ ) and cohort four ( $M = 46.31$ ,  $SD = 10.22$ ). Mean scores for child welfare providers between cohort one ( $M = 43.97$ ,  $SD = 10.16$ ) and cohort two ( $M = 39.83$ ,  $SD = 9.64$ ) dropped over four points, then increased in cohort three ( $M = 45.15$ ,  $SD = 9.90$ ) and increased again in cohort four ( $M = 46.31$ ,  $SD = 10.22$ ). Mean Organizational Readiness to Implement Change Scale scores for participants employed in a behavioral health setting increased more than three points between cohort one ( $M = 3.20$ ,  $SD = 7.88$ ) and cohort four ( $M = 46.76$ ,  $SD = 8.76$ ). Organizational Readiness to Implement Change Scale scores for behavioral health providers consistently increased between cohort one ( $M = 43.20$ ,  $SD = 7.88$ ) and cohort three ( $M = 47.39$ ,  $SD = 8.43$ ) of the study, with a slight decrease in scores in cohort four ( $M = 46.76$ ,  $SD = 8.76$ ). In tandem with the Training Transfer

**Table 3**  
Multiple analysis of variance assessing readiness for change.

Variable	Wilks' $\Lambda$	F	df	$\eta^2$
Change across cohorts	0.97	5.92***	2250.00	0.02
Provider type	97	18.84*	1125.00	0.03
Change across cohorts (x) Provider type	0.99	2.61*	2250.00	0.01

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Wilks' Lambda statistic reported.

n = 1134.

Inventory Scale, scores from the Organizational Readiness to Implement Change Scale suggest child welfare and behavioral health providers began the study with a sense of readiness for change. While both providers showed an increase in readiness for change throughout the years of the study, behavioral health providers showed a greater increase in confidence related to readiness for change when compared with child welfare providers.

Table 3 provides results from the MANOVA analysis. The overall model had a small effect with an  $R^2$  of 0.08. MANOVA revealed a significant multivariate main effect between cohorts with a Wilks'  $\Lambda$  statistic of 0.97 ( $F(2250.0) = 5.92$ ,  $p < .001$ ). There was also a statistically significant main effect among participants employed in a behavioral health setting compared with participants employed in child welfare with a Wilks'  $\Lambda$  statistic of 0.97 ( $F(1125.00) = 18.84$ ,  $p < .001$ ). The main effect for the interaction between cohort and provider type was also statistically significant with a Wilks'  $\Lambda$  of 0.99 ( $F(2250.00) = 2.61$ ,  $p < .02$ ). The effect size for change across cohorts ( $\eta^2 = 0.02$ ), provider type ( $\eta^2 = 0.03$ ), and the interaction between cohort and provider ( $\eta^2 = 0.01$ ) was small. To further explore mean differences in scores on the Training Transfer Inventory Scale and the Organizational Readiness to Implement Change Scale across study cohorts a Bonferroni post hoc analysis was conducted. For the Training Transfer Inventory Scale statistically significant mean differences were found between cohort two and cohort three ( $M = 4.37$ ,  $SE = 1.16$ ,  $p < .001$ ), and cohort two and cohort four of the study ( $M = 4.54$ ,  $SE = 1.12$ ,  $p < .001$ ). Bonferroni post hoc analysis for the Organizational Readiness to Implement Change Scale found statistically significant mean differences between cohort one and cohort four ( $M = 2.76$ ,  $SE = 0.87$ ,  $p < .01$ ), and statistically significant mean differences between cohort two and cohort three ( $M = 3.73$ ,  $SE = 0.94$ ,  $p < .01$ ), and cohort two and cohort four ( $M = 4.21$ ,  $SE = 0.91$ ,  $p < .001$ ).

## 4. Discussion

As attention to implementation science has grown, research has demonstrated the need to consider the outer and inner context when attempting to embed innovative practices into organizations, and employ strategies designed to benefit from and respond to challenges that may impede the practice within those contexts (Aarons, Hurlburt, & Horwitz, 2011; Palinkas et al., 2008). Successful implementation is recognized to require systems change at multiple levels (Mullen, Bledsoe, & Bellamy, 2008). This paper presents a case study in which periodic measures of factors associated with successful implementation (Metz & Bartley, 2012) revealed change across cohorts. Such change, of course, is no doubt influenced by factors unrelated to the interventions, but with that limitation acknowledged does provide a tool to support implementation. For examples regarding how this can be useful, we will turn to examining possible explanations for the patterns of change revealed, and in the process demonstrate how use of such measurement can both help to assess implementation progress and tell its story within process evaluation and sustainability efforts.

First, however, limitations of this study must be acknowledged. The focus of this paper is one state's implementation of an intervention

study, so the results associated with change in capacity, collaboration, and readiness are not in any way generalizable beyond this one jurisdiction. It should be noted, though, that they are not intended to be. However, if these constructs were measured across multiple studies, it could contribute to our understanding of how these factors influence implementation in similar contexts. The change across cohorts observed in constructs such as this will be directly related to the characteristics of the local context and the approach taken to implementation in any specific case, in addition to other factors including the characteristics of the individuals responding to the surveys in each cohort, their regional context, and the influence of other initiatives that may impact these constructs. They do provide some evidence that measuring these constructs over time can demonstrate change, and, in turn, help to assess implementation progress. As these measures were collected using a cohort design, the ever-changing workforce and other contextual factors external to the project itself undoubtedly impact the composition of each cohort and their perceptions of the constructs of interest. This should be considered when interpreting the contribution of this paper.

We were unable to track the perceptions of the same individuals over time, so our results represent estimations of a cohort of frontline worker perceptions at each point in time. In other words, the authors acknowledge selection and response bias as a potential limitation. In terms of how the constructs were measured, there was one scale with no known published psychometrics (i.e. the Trauma Informed Systems Worker Self-Assessment scale), which is a limitation. However, in terms of the implementation drivers under review for this study, there is value in assessing these constructs at regular intervals which have been suggested to be important to successful implementation of practice and system change: capacity (e.g. Lang, Campbell, Shanley, Crusto, & Connell, 2016; Leeman et al., 2015); collaboration (e.g. Akin et al., 2019; Bai, Well, & Hillemeier, 2009; Bungler, Doogan, & Cao, 2014); and organizational readiness for change (e.g. Damian, Gallo, & Mendleson, 2018; Kerns et al., 2014; Garcia, Circo, DeNard, & Hernandez, 2015).

#### *4.1. How the results of this study compares with the extant literature on building perceptions of capacity, collaboration, and readiness for change*

As one of twenty states implementing one of the Children's Bureau-funded grants to promote a trauma-responsive service delivery system for children in out-of-home care, our results were similar to others reporting increases in capacity, collaboration, and readiness for this cross-system change. In a three-state examination of lessons learned associated with exploration and initial implementation of initiatives such as these, both challenges and successes in these three factors were identified (Akin, Strolin-Goltzman, & Collins-Camargo, 2017). Lang et al. (2017) summarized lessons learned across a five-state initiative to embed trauma screening in child welfare, and described efforts such as implementation teams, leadership support, workforce development with ongoing coaching, and data systems targeting these same implementation drivers. Other child welfare-related initiatives have discussed their use of implementation drivers to support their work (e.g. Kaye, DePanfilis, Bright, & Fisher, 2012). Hence, there is growing support for the importance of these factors.

This paper, however, demonstrates the usage of such measurement on an ongoing basis from exploration through sustainability. While these particular projects were required to examine capacity, collaboration, and readiness in the needs assessment phase, we chose to deem these constructs as worthy of ongoing measurement in themselves as a part of the process evaluation. They represent organizational and interorganizational movement in perceptions as implementation of a set of interventions designed to promote change at a systems level as well as a practice level. As such, we were able to use trend data in our implementation teams and other periodic dissemination efforts to show progress and support recommendations for course correction as needed (Bertram, Blase, & Fixsen, 2014). The instruments selected

demonstrated strong reliability and represent good options for employment of this strategy in future initiatives. With use of the same instrumentation, comparison of progress across initiatives may facilitate discussion of the possible impact of differing implementation strategies and contextual factors.

#### *4.2. Possible explanations for the pattern identified in capacity, collaboration, and readiness to exemplify use in implementation evaluation*

Across all reported measures, a common finding was the dip in cohort two scores for child welfare agencies. This observation highlights the importance of carefully administered and sustained installation and initial implementation. Cohort one included regions that volunteered to participate in this project, whereas subsequent cohorts were mandated to do so. The intent was for cohort one to serve as champions for statewide implementation and assist other cohorts in adopting the new interventions. Implementation of the interventions between cohort one and cohort two was also delayed for a variety of reasons such as technology development, a graduated roll-out plan in one region, and other factors. This delay may have contributed to buy-in and a slowing in intervention momentum.

The lower levels of behavioral health provider compliance in completing their functional assessments may have influenced child welfare perceptions of collaboration, which were substantially lower than those of behavioral health in cohorts two and three. In addition, other unrelated contextual factors impacting the entire state may have played a role, including upper level leadership change resulting in uncertain project support for a period of time, passage of Family First legislation, and the initial planning which took time and attention from leadership. The impact of competing priorities on implementing initiatives such as this is frequently discussed (Lang et al., 2016, 2017). Initiative fatigue has been identified as a significant challenge to implementing this type of system change in child welfare, which influences both readiness and capacity (Lang et al., 2016). Administrators have suggested specific strategies are needed to protect and support the innovation being implemented at the system level (Akin et al., 2019). For our project, consideration of the factors that may have contributed to the patterns observed enabled the team to shift our approach and account for factors that may be influencing our intervention outcomes.

The project observed statistically significant differences in the perceptions of workers from each system in capacity for trauma-informed practice, collaboration (in the interaction between cohort and provider type), and organizational readiness for change. Behavioral health clinicians reported a greater capacity to deliver trauma-informed care throughout the study period, including pre-implementation, suggesting more exposure to, organizational capacity for, and training to perform trauma-informed practice in the behavioral health agencies unrelated to this project. The importance of systems interventions, which often involve interagency interactions is clear in the implementation science literature (Aarons & Palinkas, 2007; Chamberlain, 2017). The role of interagency collaboration in promoting improved behavioral health response for children in out-of-home care has been discussed extensively and is associated with positive outcomes, including implementation of behavioral health screening to identify need for referral (He et al., 2015), service use (Chuang & Wells, 2010) and improved mental health (Bai et al., 2009).

While both provider settings saw an overall improvement across cohorts, perceptions of collaboration in behavioral health settings actually dropped for cohort four. This may have been due in part to a change in study procedures in which monthly calls between providers were eliminated. Another factor that may have influenced these results is that between cohort one and cohort two the provider pool for Medicaid reimbursed behavioral health services was expanded beyond community mental health centers, allowing independent providers to participate. Since that time, in regions where child welfare staff reported dissatisfaction with the former, referrals have increasingly

shifted away from the traditional providers to independent providers. These independent providers were not included in the project and were not trained to complete the functional assessment until after the study period, while those community mental health centers remained in the study population and may have been disgruntled from the drop in referral volume.

While many studies focus on the perspective of either child welfare or behavioral health (e.g., Darlington, Feeney, & Rixon, 2005; Garcia et al., 2015; Johnson, Zorn, Tam, LaMontagne, & Johnson, 2003; Kerns et al., 2014), our study intentionally collected data from both systems. The literature provides some insight into the complexity of these interagency dynamics. Bunker et al. (2014) found that even in the context of substantial new funding, such as from a grant, agencies tend to refer to agencies they trust, and partnership ties developed during the influx of resources may not result in actual changes in referral patterns. Another study related to information sharing between child welfare and behavioral health systems found that variations in information accessibility, clarity in roles and protocols and attitudes toward collaboration are critical factors (Hwang, Mollen, Kellom, Dougherty, & Noonan, 2017). Additional research revealed that while workers engaged in interagency contact, the level of agency support for it was insufficient, and interagency processes needed to be established based on realistic expectations (Darlington et al., 2005). This project attempted to intentionally influence these factors to some degree. While other trauma-informed care initiative publications suggested cross-system training and learning collaboratives may have improved perceptions of collaboration as well as fidelity to the intervention (Lang et al., 2017), our project did not have the capacity to employ this strategy, which might have improved our results.

In terms of organizational readiness for change, behavioral health scores outpaced child welfare for the majority of the time, although in the former there was a slight drop in cohort four. This too could be related to changes in leadership, shifts in priorities and other contextual factors including significant increase in the number of children in out-of-home care. There was a steady increase in the number of children entering out-of-home care in the state over the course of the study. Prior research suggests that high levels of job stress may impede readiness for change; as workloads increase, attention shifts from adopting innovative practices to simply completing mandated tasks and responsibilities (McCrae, Scannapieco, Leake, Potter, & Menefee, 2014). It is possible that the workforce demands associated with a burgeoning OOH population over the course of the study played a factor in the declining perceptions of organizational readiness for change. Or perhaps it is reflective of initiative fatigue, the time and attention consumed by Family First legislation, and the frustration of child welfare providers with information exchange with behavioral health providers. While admittedly many factors may have influenced these patterns of change, we were able to use these data to promote discussion with agency leaders and stakeholders and identification of strategies to address those factors over which we have some control.

#### 4.3. Implications for practice and policy

We have suggested in this paper that measurement of factors aligned with key organizational and inter-organizational implementation drivers can be sensitive to change over time and can be useful both prospectively and retrospectively. First, they provide a general estimate of where perceptions in the child welfare and behavioral health agencies stand on these key factors (collaboration, capacity and readiness for change) as projects move forward. With the exception of community mental health centers which have regional service areas, staff from the public child welfare agency and all of the private therapeutic foster care and residential treatment centers were included in each cohort. We were subsequently able to use interviews and focus groups to help us understand the trends observed and design strategies to adjust. Second, they help to tell the implementation story. When paired with

qualitative data not reported here because of the scope of this paper, they may help identify implementation issues needing attention, and to explain overall project success and lessons learned.

While it is clear that perception of these factors did change across cohorts throughout the course of the project, it is certain that implementation in real world child welfare and behavioral health settings present a vast array of contextual factors that may influence them, both related to and totally external to the project being implemented. Akin et al. (2019) reported supervisor and administrator perceptions demonstrating how implementation drivers in the systems intervention, facilitative administration and decision support data systems categories can facilitate or inhibit implementation. We have described the systems intervention, facilitative administration, and decision support data systems strategies this particular project employed in the Introduction section of this paper. The intentional measurement of collaboration, capacity and readiness as a part of the process evaluation can be important to understanding how trends revealed in the data may relate to the use of these strategies and whether further action is needed. In this section, we will describe a number of examples of implementation strategies designed to promote capacity, collaboration and readiness, and how periodic measurement may be a useful endeavor to support practice change initiatives.

In this project, a number of lessons were learned about implementation that no doubt influenced these results. For example, our intervention purveyors had very limited time for coaching and clinician consultation originally planned due to the intensive burden of training a workforce that was constantly turning over. Also, the importance of substantial effort during the installation phase was clearly recognized after poor implementation in a few regions was observed in cohort two and suggested by the dip in staff perceptions. Maintaining buy-in and momentum despite inevitable challenges is critical (Crea, Crampton, Abramson-Madden, & Usher, 2008; McCrae et al., 2014; Willging et al., 2018), which was reflected between cohort two and cohort four. While survey data does not tell the whole story, it provides an indicator that exploration is needed to identify additional steps needing to be taken.

Leadership and policy change can facilitate growth in these implementation drivers throughout each stage of implementation and, ultimately, sustainability. An example of this relates to decision support data systems. Proctor et al. (2011) found that data system accessibility and technology supports can facilitate intervention fidelity by helping workers believe it to be acceptable, appropriate and feasible. The decision to embed the trauma screener in the state child welfare MIS system may have positively supported implementation of the screening function by making it easier for the frontline worker to complete, and determine if a behavioral health referral was necessary. This presumably enhanced capacity. Making the necessary investment of resources and organizational commitment to build an interface between the web-based system used by behavioral health providers and the child welfare MIS system, so that data and information was pushed back and forth to facilitate information exchange practitioners in each system certainly supported our practice change. Moreover, this interface likely impacted perceptions of cross-system collaboration, thereby functioning as a systems intervention driver as well. These uses of technology to support clinical practice required tremendous effort both technically but also practically to overcome confidentiality and other barriers. Our methodology did not enable us to measure if this data system interface caused the increase in perceptions of collaboration and capacity, of course, but it did demonstrate a positive trend which could support project momentum.

Another important example relates to the decisions made to promote practice change that fall in the category of facilitative administration. The literature is filled with discussion of workload concerns in child welfare agencies (e.g. Juby & Scannapieco, 2007; McFadden, Mallett, & Leiter, 2018; Weaver, Chang, Clark, & Rhee, 2007). We were able to change policy to replace another instrument which had been used for establishing the child's level of care with the screening and

functional assessment instruments. Other examples of facilitative administration strategies employed included collaborative implementation team structures, engagement of top administrators in the steering committee, use of data to identify and correct issues, and establishment of a liaison in each region to facilitate and track referrals from child welfare to behavioral health, and the subsequent receipt of functional assessments and reports. Periodic measurement of capacity and readiness for change helped the project know if such strategies may be supporting practice change.

The professional literature suggests that training is insufficient and must be supported through ongoing consultation and supervision (e.g. Beidas & Kendall, 2010). Within the category of competency drivers, after the decision was made to sustain the screening intervention beyond the study period, agency preservice training was revised, and efforts were made to institutionalize consultation and coaching through maintaining two purveyor positions on the state level and engagement of existing regional clinical staff within the child welfare agency to further build capacity.

#### 4.4. Implications for future research

Future research efforts should explore factors associated with perceptions of collaboration such as provider meetings, and communication efforts such as distribution of data reports. Since our study found statistically significant change across the four cohorts related to collaboration, a better understanding of factors that promote these differences is needed. Future research should also explore how to support the transition from piloting a project such as this to statewide implementation. The use of qualitative research would be helpful to deconstruct the factors that went well and those that were missing, or needed, or were problematic to the project. There is also a need to evaluate change over time at the individual worker and provider level as the unit of analysis versus a cohort approach. Analysis at the individual worker level would also allow better understanding of how characteristics such as years of experience and education/training may influence the longitudinal trajectories of capacity, collaboration, and readiness for change. Finally, if these constructs were measured across multiple studies, findings across these could contribute to the evidence base regarding the dynamics of how collaboration, capacity and readiness influence implementation of system change interventions. Similarly, future research could focus on the possible influence of implementation of other drivers, such as coaching and supervision, and even the relative impact of various levels intensity of coaching or other drivers, upon which this project did not have the resources to focus.

## 5. Conclusion

In summary, this study underscores that systematic measurement of the capacity to implement an evidenced-based practice, collaboration between systems, and an organizational readiness for change may document gains and challenges common in real world implementation. Moreover, differences in how child welfare and behavioral health providers perceived capacity, collaboration, and readiness for change provide a window into the agency's ability to implement change over time. Successful implementation requires investment locally and systemically with the goal of long-term sustainability in the adoption of new practices. As the field of implementation science continues to influence child welfare practices, informed changes can occur which ultimately impact policy, procedures, and benefit the youth they serve. This case study demonstrates the prospective and retrospective uses of implementation driver measurement in these processes.

### Ethical approval

All procedures performed in studies involving human participants were in accordance with ethical standards of the institutional and/or

national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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### Declaration of Competing Interest

The authors declared that there is no conflict of interest.

### Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.childyouth.2019.104580>.

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