

Improving relationship quality in group care settings: The impact of implementing the CARE model



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ABSTRACT

The current study examined the effects of implementing a new program model on the quality of relationships between direct care providers and residents in group care agencies. Children and Residential Experiences (CARE), an organization-wide program model that involves a range of structural change and staff-development activities, was implemented in 13 group care agencies in one Southeastern state. CARE implementation lasted three years and involved the application of six evidence-informed principles throughout the organization in order to create more therapeutic environments and improve the quality of care for children.

We used a stepped-wedge design in which one cohort of agencies began CARE immediately and a second cohort waited 12 months before beginning, allowing them to serve as a comparison group during the waiting period. Children in each agency were surveyed annually about the perceived quality of their relationships with staff using a new instrument developed for this study. Results of a linear mixed model indicated that after accounting for clustering at the agency and cottage levels and controlling for several important covariates, child perceptions of relationship quality increased significantly in the three years after CARE implementation began. The strength of the CARE effect was stronger for residents with several previous placements, but did not differ by age, gender, race, length of stay, DSS referral, or problem behavior. Results provide evidence that supports the effectiveness of CARE as an intervention to help group care agencies improve the quality of children's daily interactions with caregiving staff, a critical aspect of their experience while living in care. The process requires a long-term commitment and an organization-wide focus on serving the best interests of children.

1. Introduction

Nearly 50,000 young people in the United States live in group care settings (USDHHS, 2019), most of whom have experienced extreme hardship such as parental maltreatment, removal from home, and exposure to a range of adverse experiences associated with poverty (Briggs et al., 2014; Felitti et al., 1998). Many have experienced multiple out of home placements (Zinn, DeCoursey, Goerge, & Courtney, 2006), further compounding the instability in their lives and putting them at greater developmental risk (Hyde & Kammerer, 2009; Ryan & Testa, 2005). Not surprisingly, this population of children shows high rates of emotional and behavioral problems (Duppong-Hurley et al., 2009) which are difficult for agency staff to manage safely and therapeutically (Colton & Roberts, 2007; Kakuma et al., 2011; Leidy, Haugaard, Nunno, & Kwartner, 2006).

Group care agencies can play an important role in children's recovery as part of a larger continuum of services within child welfare.

With committed staff, in-house clinical services, and the capacity to provide enough structure and supervision to keep children safe, these settings offer a therapeutic alternative when less restrictive placement options are not possible (Barth, 2002; Whittaker, 2000; Whittaker et al., 2016). There is growing concern, however, that agencies providing group care are not prepared to meet the increasingly serious needs of the children they serve (Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001; Ryan, Marshall, Herz, & Hernandez, 2008). Their capacity to provide appropriate care is limited by a range of structural factors, such as low staff-to-child ratios (Bakermans-Kranenberg, van IJzendoorn, & Juffer, 2008; Dozier, Zeanah, Wallin, & Shauffer, 2012), inadequate opportunities for professional learning and reflective supervision (Bach-Mortensen, Lange, & Montgomery, 2018; Hicks, Gibbs, Weatherly, & Byford, 2009), and regulations that prevent constructive family engagement (Geurts, Boddy, Noom, & Knorth, 2012; Hess, 2003) to name a few. High staff turnover rates virtually guarantee that some staff will be inexperienced and caring for children with whom they have

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not yet established a relationship (Colton & Roberts, 2007; Connor et al., 2003; Strolin-Goltzman, Kollar, & Trinkle, 2010). These problems are exacerbated by policies and cultural norms that too often prioritize behavioral compliance, and rigid application of rules and reward structures, and do not account for children's unique developmental needs or trauma histories (Rauktis, Fusco, Cahalane, Bennett, & Reinhart, 2011; Ryan et al., 2008).

Efforts to improve group care services for this population have commonly involved implementing individual-level evidence-based treatment models originally developed and validated in clinical settings, despite lack of clear evidence of their effectiveness in group care settings (James et al., 2015). However, leading scholars have called for more research evidence on organization-level models designed specifically for group care settings that seek to improve the quality of care by enriching the overall treatment milieu (Farmer, Seifert, Wagner, Burns, & Murray, 2017; James, 2011; Whittaker et al., 2016). Such milieu-based approaches require changes throughout the organization (Bryson et al., 2017), and few program models exist to guide agencies through such a comprehensive process.

The current study helps to fill this gap in the field by examining the impact of Children and Residential Experiences (CARE), a setting-level program model that helps organizations create more therapeutic environments by purposefully designing their programs to optimally meet the developmental needs of the children in their care (Holden, 2009). CARE is based on the philosophy that enhancing the quality of relationships between children and direct-care staff across the organization and fostering more positive daily interactions contributes to children's recovery and growth, and also creates optimal conditions for the success of other individual-level programs being implemented within agencies (Trieschman, Whittaker, & Brendtro, 1969; Whittaker et al., 2016).

1.1. Rationale for focusing on relationship quality

Relational factors have become widely understood to be critical mechanisms of change in most programs and services for young people (Li & Julian, 2012; National Scientific Council on the Developing Child, 2004), and have been shown to predict treatment outcomes as well as youth engagement (Bickman, 2005; Roest, van der Helm, Strijbosch, van Brandenburg, & Stams, 2016; Shirk & Karver, 2003). Each positive relational experience with a trusted adult can strengthen the basic psychological resources that enable young people to regulate their emotions and behaviors, capacities that allow them to adapt well in the future as they encounter situations of opportunity or adversity (Feeney & Collins, 2015). Over time, relationships also shape the cognitive and neurobiological networks that support social and executive functioning (Blakemore & Choudhury, 2006), and create the foundations for longer term resilience (Raver, 2012). Notably, these processes are particularly salient during adolescence, a critical period of accelerated neural specialization (Casey, Jones, & Hare, 2008; Steinberg, 2005).

Relationship quality is particularly salient for children living in group care, who often have endured a history of unstable, unresponsive care that has impaired their relationship patterns with adults and shaped their beliefs about whether future caregiving relationships can be relied upon to meet their needs. Too often these patterns are reinforced by negative experiences with the adults they encounter while living in care (Mohr, Martin, Olson, Pumariega, & Branca, 2009; Rauktis, 2016; Soenen, D'Oosterlinck, & Broekaert, 2013), creating barriers for engagement and blocking off opportunities for connection and growth within the therapeutic milieu. Relationship patterns and belief systems, however, continue to develop throughout adolescence (Allen & Tan, 2016; Howes & Spieker, 2016), and group care settings have the opportunity to shape them by consistently fostering positive caregiver interactions with children in their day-to-day activities (Ireland, Boustead, & Ireland, 2005; Moore, Moretti, & Holland, 1998; Schuengel & van IJzendoorn, 2001; Zegers, Schuengel, IJzendoorn, &

Janssens, 2008). Moreover, research conducted in group care settings has found that children's positive relationships with caregivers predicts improved behavioral and emotional functioning, and is associated with fewer iatrogenic effects of residential placement (Duppong-Hurley, Lambert, Gross, Thompson, & Farmer, 2017; Farmer, Murray, Ballentine, Rauktis, & Burns, 2017; Southerland, Mustillo, Farmer, Stambaugh, & Murray, 2009).

1.2. Conceptualizing relationship quality

The task of assessing child-adult relationships is challenging in group care settings where children may have several caregivers working across different shifts, and with whom they may form various kinds of relationships and patterns of interaction. Research suggests that assessment of relationship quality should focus not only on the child-caregiver dyad, but also on the child's larger network of caregiving relationships (Howes & Spieker, 2016). Recent work with children in out of home care also points to the value of capturing children's subjective experience of these relationships (Farmer, Murray, Ballentine, Rauktis, & Burns, 2017; Florsheim, Shotorbani, Guest-Warnick, Barratt, & Hwang, 2010; Polvere, 2011; Soenen et al., 2013).

Thus, we conceptualize relationship quality as the extent to which children perceive that their typical daily encounters with direct-care staff include some key characteristics that are known to promote healthy social and emotional development. Our conceptualization incorporates key elements of Ainsworth's maternal sensitivity construct (Ainsworth, Blehar, Waters, & Wall, 1978), including alertness to a child's needs and attunement to his/her internal state, as well as aspects of maternal responsiveness (Bell & Ainsworth, 1972; Tamis-LeMonda, Bornstein, & Baumwell, 2001), such as being available and accessible, responding promptly to cues or overtures from the child, adapting one's helping approach as needed, and being able to effectively meet the child's felt need. It also incorporates caregivers' promotion of competence and their support for autonomy, given the predominantly adolescent sample in this study. This reflects the theory that a central attachment-related task during adolescence involves balancing children's relational needs with their growing need for autonomy and agency (Allen & Tan, 2016). Lastly, given the unique experiences of the group care population, the construct reflects key aspects of trauma informed care (Child Welfare Information Gateway, 2014; Ford & Blaustein, 2013), such as caregiver practices that avoid triggers for dysregulation, minimize the escalation of conflict, maintain routines and predictability, and help children learn to regulate strong emotions.

1.3. Outcomes reported for interventions in group care settings

Despite the importance of relationship factors to the success of child-serving programs, only a few evaluations of program models for group care settings have reported intervention effects on the quality of relationships between children and staff (Crosland et al., 2008; McCall et al., 2010; see Hermenau, Goessmann, Rygaard, Landolt, & Hecker, 2016). More commonly, research on interventions in group care have reported positive effects in areas such as coping skills, social environment variables (Rivard, Bloom, McCorkle, & Abramowitz, 2005), post-traumatic stress symptoms (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013), school achievement (Ringle, Ingram, & Thompson, 2010), illegal behavior (Kirigin, Braukmann, Atwater, & Wolf, 1982), behavioral incidents (Duppong-Hurley et al., 2006), and favorable discharge and placement outcomes (Lee & Thompson, 2008). Furthermore, although some evaluations have involved implementation at multiple agencies (Farmer, Seifert, Wagner, Burns, & Murray, 2017; Jones & Timbers, 2003; Lee & Thompson, 2008), most have involved only a single agency, limiting the extent to which findings can be generalized.

In a previous quasi-experimental study of CARE involving 11 agencies (all of which were included in the current study), Izzo et al.

(2016) used interrupted time series analysis to show that CARE implementation led to significant reductions in behavioral incidents (e.g., aggression towards staff, running away). Using a similar approach at a separate agency, Nunno, Smith, Martin, and Butcher (2017) found that CARE significantly reduced the use of physical restraints.

1.4. Research questions

The current study of the CARE model extends previous research by examining the following research questions based on a multi-year study involving implementation of CARE in 13 agencies:

- 1) Does CARE implementation lead to improvements at the agency level in perceived relationship quality compared to before implementation?
- 2) Are the effects of CARE implementation on agencies' relationship quality scores moderated by key factors likely to influence relationships between children and adults.

Moderators examined included child age, gender, length of stay, placement instability, social-emotional functioning, involvement with the child welfare system, and organizational climate and culture. We made no a priori hypotheses about how each moderator might affect the changes in relationship quality observed in agencies during program implementation, but instead approached these as exploratory analyses.

2. Method

2.1. Study design

To test whether this organization-level intervention led to improvements in relationship quality, we used a stepped-wedge design (Handley, Lyles, McCulloch, & Cattamanchi, 2018; Highfield et al., 2015) in which agencies were non-randomly assigned to two cohorts. Cohort 1 received a baseline assessment in 2010 and began CARE immediately. Cohort 2 was assessed in 2010 (pre-baseline) and again in 2011 after a 1-year waiting period (baseline) before crossing over into the intervention condition (see Fig. 1). Annual assessments in each agency allowed us to assess whether relationship quality (at the agency level) changed over the three-year course of CARE implementation. Given that most children were discharged within one year of placement, longitudinal assessment of children over time was not possible. Change was assessed by comparing mean scores of agencies during the Pre-CARE period with mean scores in Years 1, 2, and 3.

The stepped-wedge is a quasi-experimental design commonly used to evaluate organization-wide interventions in which program implementation is to be rolled out over time across multiple sites and more than one baseline assessment can be obtained for sites in the later cohorts (see example in Highfield et al., 2015). It strengthens the evidence for making causal attributions by addressing key threats to

internal validity (see Shadish, Cook, & Campbell, 2002). Specifically, in the current study, the design allowed us to examine the stability of scores in Cohort 2 in the 12 months before implementation, helping rule out the possibility that observed changes were simply due to statistical regression or the continuation of a pre-existing trend. It also helped to rule out historical factors as an alternative explanation by allowing us to compare the changes in Cohorts 1 and 2 during the period from 2010 to 2011 (i.e., if increases were observed in Cohort 1 but not in Cohort 2, they were less likely to be caused solely by historical events). Finally, establishing equivalence across cohorts in 2010 helped to eliminate selection bias as a concern, as did the fact that CARE was implemented and assessed at multiple agencies across the state.

2.2. The CARE model

CARE is an organizational intervention that provides ongoing consultation, training and technical assistance to help group care agencies create a more therapeutic environment through improvements to their policies and agency-wide practices. It was developed by the Residential Child Care Project at Cornell University and has been described in detail elsewhere (Holden, 2009; Holden, Anglin, Nunno, & Izzo, 2014; Holden & Sellers, 2019). The model is rooted in the core idea that a critical pathway for healing and growth to occur among children in group care is through experiencing a consistent pattern of positive, reciprocal interactions with supportive adults that, over time, promote connection and trust (Bronfenbrenner & Morris, 2006; Li & Julian, 2012; Schuengel & van IJzendoorn, 2001). CARE helps agencies accomplish this goal by engaging leadership, management and staff throughout the organization in a systematic effort to learn and apply a set of scientifically grounded principles to guide their ongoing practices and programming decisions. The six principles support programming and policies that are (1) relationship-based (i.e., helps youth form healthy models of adult-child relationships and builds their capacity for healthier relationships in the future), (2) trauma-informed (i.e., sensitive to youth's trauma history), (3) developmentally-focused (i.e., provides more opportunity for normative developmental experiences and adapts expectations to meet the unique needs of youth), (4) family-involved (i.e., seeks to understand and adapt to families' cultural norms and to promote active family involvement), (5) competence-centered (i.e., creates opportunities for building self-efficacy and competence for dealing with life circumstances), and (6) ecologically-oriented (i.e., enriches the physical and social environment to create a therapeutic setting).

As shown in the theory of change (see Fig. 2), these efforts aim to improve staff's understanding of the unique developmental needs of the children in their care, and to build their motivation and capacity to adopt management and childcare practices that are aligned with the CARE principles. A key mechanism of change involves helping agencies to maximize positive relational experiences for children throughout the day (Trieschman et al., 1969) and to minimize dynamics such as punishment and fear that can exacerbate trauma symptoms (Mohr, Martin,

		Year				
		2010	2011	2012	2013	2014
Cohort 1 7 sites	Pre-CARE Baseline n = 90	CARE Year 1 n = 83	CARE Year 2 n = 86	CARE Year 3 n = 81	X	
	Pre-CARE Pre-Baseline n = 106	Pre-CARE Baseline n = 75	CARE Year 1 n = 80	CARE Year 2 n = 57		
Cohort 2 6 sites					CARE Year 3 n = 75	

Fig. 1. The study design involved four variables: Cohort, Year, CARE status (Pre-CARE vs. CARE), and Stage (Pre-Baseline, Baseline, Year 1, Year 2, Year 3), resulting in 9 categories. Two cohorts of sites began the study in 2010 and participated for 3 or 4 years, respectively. As shown in the white squares, Cohort 1 provided one Pre-CARE assessment, while Cohort 2 provided two. The degree of shading in the CARE squares corresponds to the number of years of CARE implementation at the time of assessment. Sample sizes refer to the number of children who provided valid Youth Perceptions of Relationship Quality scores.

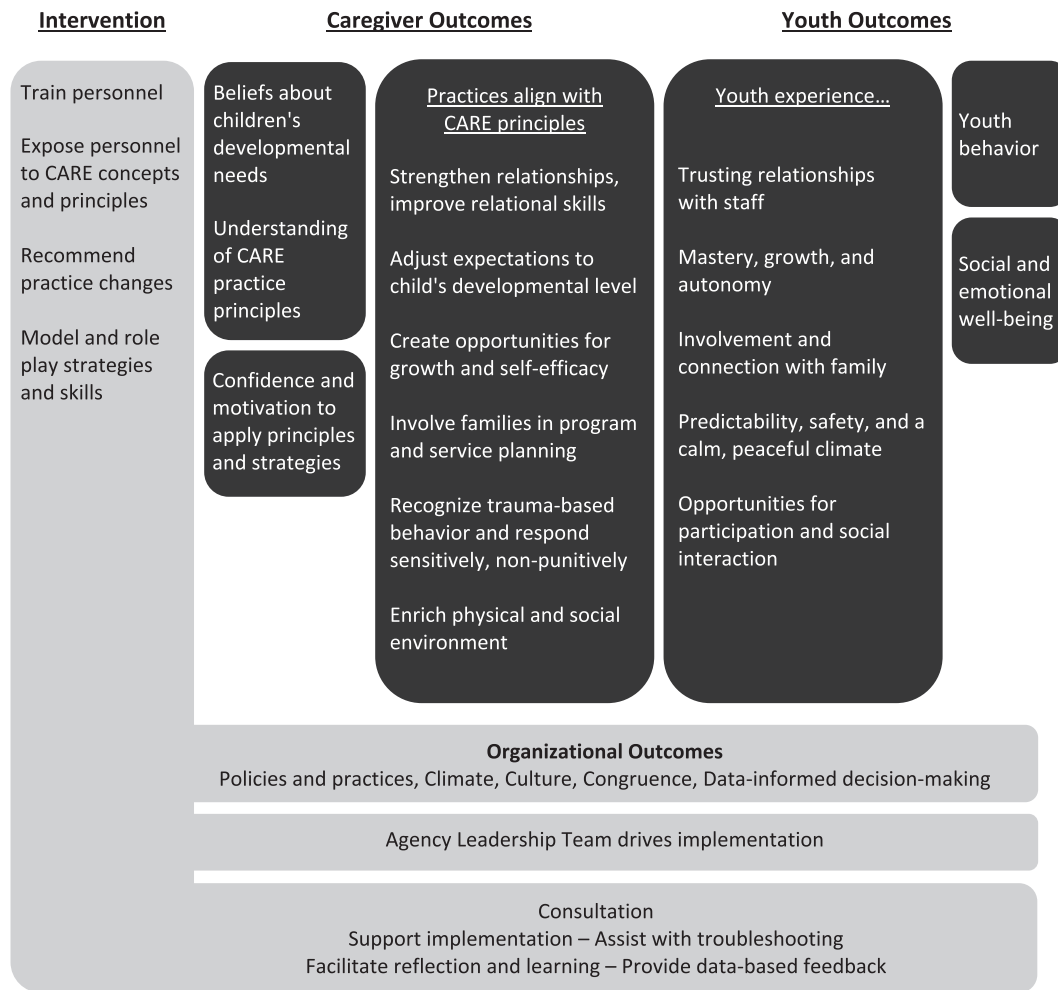


Fig. 2. The theory of change for CARE implementation.

Olson, Pumariega, & Branca, 2009; Perry, Griffin, Davis, Perry, & Perry, 2018) and impede healthy development (Patterson, 2016). By helping to meet some of the children's basic social and developmental needs such as connection, mastery, and autonomy, these changes are expected to build the essential conditions for the development of self-regulation and social-emotional well-being (Allen & Tan, 2016; Maccoby, 2015; Pianta, Hamre, & Allen, 2012; Ryan & Deci, 2000).

Ultimately, CARE implementation is an intensive and complex organizational process that calls for substantive changes in role expectations, theoretical perspective, organizational priorities and norms. For example, priorities are expected to shift from an emphasis on behavioral control through punishments and rewards to creating peaceful, trauma sensitive environments enriched with developmental opportunities and positive relationships. Structural changes are often required, including changes to job roles and responsibilities, hiring criteria, daily routines, and creating regular opportunities for reflective practice. Accomplishing these changes requires a multi-year effort by administration and leadership to support and sustain the process and building an agency culture that is oriented completely around serving the best interests of children (Anglin, 2002). The challenges of implementing these changes, and factors related to their success have been described by Holden et al. (2014).

2.3. CARE Implementation

The three-year implementation process at each agency began with the development of a CARE Implementation Team including two university-based CARE consultants, agency leadership, supervisors and key

training and clinical staff. Its purpose was to create an implementation plan that was individualized to fit the unique circumstances of the agency. Team member roles involved realigning agency policies and procedures to better reflect the CARE principles, establishing staff training schedules and selection of agency-based CARE trainers, creating processes to facilitate the daily application of CARE principles and promoting their integration into the agency culture, identifying and addressing barriers to CARE implementation, and providing mentorship and support to staff regarding the application of CARE principles.

After conducting the core 5-day CARE training with the implementation team, CARE consultants provided coaching and support to a cadre of local agency trainers who delivered the core training to all remaining agency staff. Quarterly technical assistance (TA) visits continued for the entire implementation period, including activities such as observation and feedback, training and coaching of supervisors, developing routines for reflective practice, and planning for sustainability after the 3-year implementation period. Consultants also reviewed administrative data and survey results with the implementation team to facilitate reflection on current agency policies and practices and to inform problem-solving around implementation.

2.4. Participating agencies

Agency Recruitment. Recruitment was limited to two Southeastern states as a requirement set by the funder. Agencies were recruited in several ways, including presentations to a statewide association of group care agencies, letters sent directly to eligible agencies, and through word of mouth. Criteria for participation included being

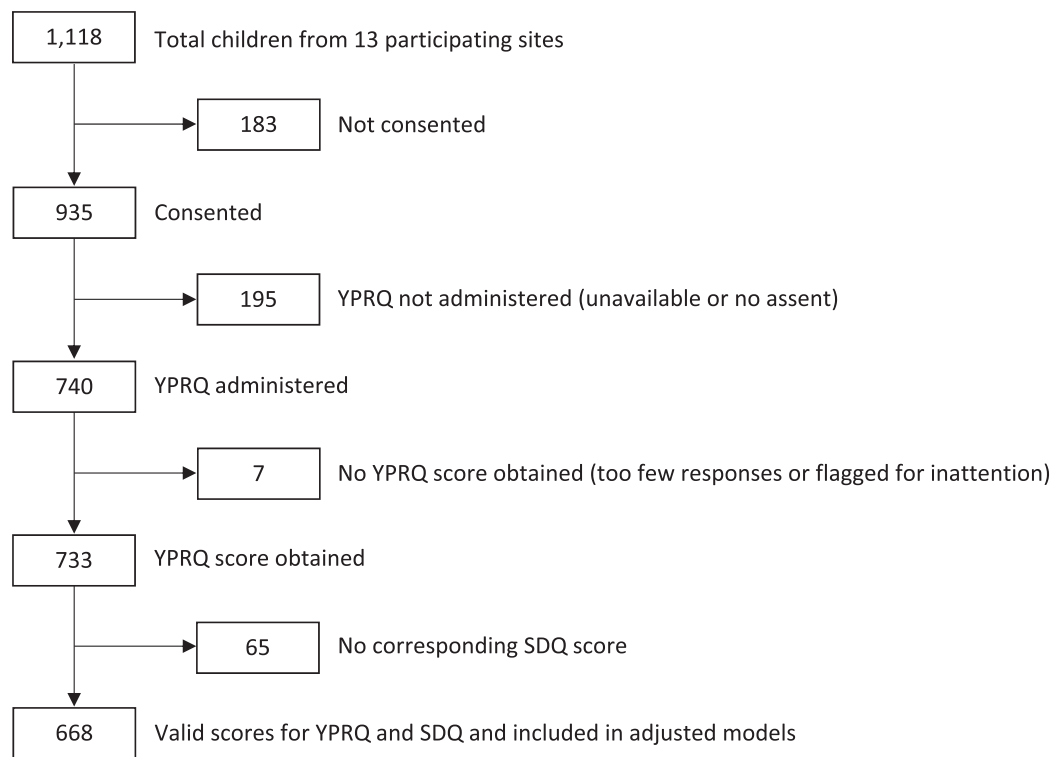


Fig. 3. Flow diagram illustrating the disposition of all children from the 13 participating sites over the course of the study. Eligible children may not have been included in the analysis for four reasons: (1) the guardian may not have provided consent; (2) the child survey could not be administered because the child was no longer at the site, was unavailable, or did not assent; (3) a YPRQ score could not be computed; or (4) there was no Total Difficulties score for the Strengths and Difficulties Questionnaire (SDQ), which was one of the covariates in the statistical model.

licensed by a state agency, having not already been exposed to CARE, willingness to be placed on a 12 month wait-list if needed, and serving primarily children from the child welfare and mental health systems. At initial contact, agencies were informed that they might be assigned to begin CARE in either the first or second year of the study and that they were expected to provide ongoing logistical assistance for data collection activities.

Assignment to Cohort. Five of the first six agencies recruited were placed in Cohort 1 due to slow initial recruitment and the need to begin implementation in early 2010. Although the next seven agencies recruited were part of a larger parent organization, they participated as separate entities, each with its own leadership structure and implementation team. Of these, three were assigned to Cohort 1 and four to Cohort 2, based partly on logistical considerations (i.e., agencies that were in close proximity or who had close working relationships were kept in the same cohort). The last three agencies were assigned to Cohort 2.

Given the potential for contamination across cohorts, we took steps to monitor and prevent sharing of CARE-related information. Reading materials were initially shared with directors of Cohort 2 agencies for brief perusal but retained by the research team until after baseline data collection was complete. Directors of each campus were asked to refrain from exchanging CARE materials with other campuses. We determined through interviews with agency directors that there were no network-wide gatherings where staff from agencies in Cohorts 1 and 2 had substantive discussion about CARE implementation.

Three agencies discontinued their participation in the study, one due to agency closure, one due to a change in service population, and one due to a change in leadership priorities. The remaining 13 agencies, all from the same state, were included in this study.

Description of Participating Agencies. Each agency included two to six residential units and had a monthly census ranging from 7 to 77 residents (mean = 25), or 217 to 2,305 days in care. At the start of CARE,

the average number of direct-care staff and supervisors at these agencies was 17 (min = 5; max = 45), and the average number of youth was 27 (min = 11; max = 46), resulting in an average youth to staff ratio of 1.87 (min = 0.46; max = 3.83). All but one agency served both males and females, typically from 7 to 18 years of age. One agency served only males and followed a wilderness camp model maintaining up to four outdoor campsites year-round. For most agencies direct-care staff lived full-time in the home for 1-2 week shifts. In most agencies senior leadership remained stable for the duration of the study, although three agencies experienced a change in Director during this period.

Before beginning the study, all agencies operated with homegrown systems of rules and consequences and an assortment of enrichment activities (e.g., recreation, life-skills training). Except for the wilderness camp, none operated under a coherent model that guided day-to-day childcare and management matters. No agency had received systematic training with a specific, agency-wide, evidence-based program model.

2.5. Data collection

For all children under age 18, parents or legal guardians provided written consent, and children aged 18 or older provided their own written consent. One month prior to each annual survey, agency administrative staff provided a list of all current, consented children age 8 or older including a unique id number, gender, race, date of birth, intake date, number of past residential placements, referral from DSS, as well as discharge dates of participants from prior years.

Child surveys occurred annually from the beginning of the study until the end of Year 3 implementation. A member of the research team visited each agency annually to invite consented children to participate and administer surveys to those providing their assent. Typically, research staff administered the survey by reading the items to groups of about 5–8 children, but for various reasons, 5% of respondents

completed the survey privately online. Children were informed that the purpose of the survey was to *learn about young people's opinions about living at the agency and about their relationships with staff*, and that the information they shared would be stored securely at the university. This was essential because one could reasonably expect concern from some children that staff might otherwise learn their true opinions, and that doubts about confidentiality could affect how they answer.

For each child, agencies also included the names of two direct-care workers (one from each shift) who could accurately complete a rating form on child social-emotional adjustment. Within about 2 weeks of the child survey, supervisors distributed rating forms to selected staff and mailed them back to the research office when complete. When a child's direct-care worker was not available, ratings were made by a substitute rater familiar with his/her daily functioning.

As summarized in Fig. 3, parent/guardian consent was sought for 1,118 children over the entire study period and, of these, complete child surveys were obtained for 733 children (65.6%). The remaining 385 (34.4%) were missed due to non-consent, being unavailable or unwilling to participate, or incomplete survey records. An additional 65 were excluded from the study due to missing staff-reported data on child social-emotional adjustment. Most children were only at the agency long enough to complete one survey. For those who completed it more than once, only the first survey was included in analyses.

Staff surveys about organizational culture and climate were administered anonymously to all agency personnel 2–4 weeks prior to the agency's first training session. Most surveys were administered on paper by research staff at agency-wide meetings, but 15% were self-administered online or mailed in for those not present on survey day. Respondents were informed that their survey data would not be linked to their identity and that no agency personnel would ever see them. Survey questions asked about demographics and their perceptions about organizational climate and culture.

All assessment procedures were approved by the Cornell University Institutional Review Board.

2.6. Relationship Quality Measures

Two measures were used to assess children's perceptions about the quality of their relationships with direct care staff at their agency over the previous month. Respondents answered using a 5-point scale (1 = never to 5 = always) and were asked to think about all direct care staff who worked at their cottage over the past month, which included about 4 to 12 staff depending on agency staffing patterns.

The *Youth Perceptions of Relationship Quality (YPRQ)* was our primary measure of relationship quality, as it was designed to be salient to the unique conditions of children living in group care settings. Developed for the current study, the YPRQ included 33 items that were generated based on a review of the scientific literature and focus groups with children from non-study agencies. Items reflect child-adult interaction patterns associated with healthy social-emotional functioning, and that are uniquely salient for engaging effectively with children in group care settings (Ainsworth, Blehar, Waters, & Wall, 1978; Allen & Tan, 2016; Anglin, 2002; Feeney & Collins, 2015; Moore, Moretti, & Holland, 1998; Pianta, Hamre, & Allen, 2012; Ryan & Deci, 2000; Schuengel & van IJzendoorn, 2001). Although no factors were identified empirically, the measure was designed to reflect the following constructs pertaining to children's relational experiences with staff:

- Sensitivity to the child's experience and needs (e.g., “They notice when I'm upset”; “They listen to understand why I acted that way”).
- Availability/Responsiveness (e.g., “They were available to talk with me”; “They tried to make me feel better”).
- Autonomy support (e.g., “They let me make some of my own choices”).
- Growth promotion (e.g., “They showed me ways to calm down or feel better”).

- Punitive/Non-punitive practice (“They gave me consequences that seemed too strict”; “They let up on the rules to give me a break”).
- Family involvement (“They talk with me about my family or loved ones”).
- Trauma sensitivity was reflected in all survey items (Perry et al., 2018), although a subset of items were included specifically to reflect this construct (e.g., “If we had an argument they were willing to back off and let me calm down”; “They made sure I knew what was going to happen each day so there were no big surprises.”).

The YPRQ was designed such that most items asked respondents to report on their experience within the context of specific scenarios that are commonly experienced in residential settings (e.g., during group activities with other children, when you are feeling very sad or angry, after you misbehaved or did not meet expectations), rather than relying on generalized reports of “typical” experiences. This reflects research showing that people naturally rely on contextual information when evaluating questions and making judgements (Schwartz, 2012), and suggesting that contextual information may help respondents understand and respond more accurately.

The *Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987)* was included as a secondary measure of relationship quality, as well as a source of construct validity for the YPRQ. It is a well-established and widely used measure, originally designed to assess the quality of relationships between adolescents and parents (McElheney, Allen, Stephenson, & Hare, 2009; Wilson & Wilkinson, 2012). Modifications included replacing “parents” with “staff,” simplifying wording to accommodate children with limited verbal skills, eliminating items less relevant to the group care situation, and changing response choices from a 5-point agree/disagree scale to a 5-point never/always scale asking how often the respondent felt this way about residential staff members at their cottage. The IPPA was included on the final pages of the survey, after all YPRQ items. It was sometimes skipped when the survey administrator judged that a child or group of children would have difficulty sustaining their attention or become fatigued by the survey process.

2.7. Child characteristics

As supported by prior research, a range of child characteristics that may influence youth-adult relationships were assessed for this study, including youth gender and age (Gullone & Robinson, 2005; Heller, Robinson, Henry, & Plunkett, 2008), social-emotional functioning (Landsman, Groza, Tyler, & Malone, 2001), involvement with the child welfare system (Wulczyn, Barth, Yuan, Harden, & Landsverk, 2005), placement instability (Rauktis, Andrade, Doucette, McDonough, & Reinhart, 2005), and agency-length of stay (Baker, Wulczyn, & Dale, 2005). Our measures of these characteristics are described below.

Social-Emotional Adjustment. The *Strengths and Difficulties Questionnaire (SDQ, Goodman, 2001)* is an established measure of social-emotional adjustment that has been used with a diverse range of populations, including children living in residential and foster care (Goodman, Ford, Corbin, & Meltzer, 2004). Each year, staff rated the extent to which 30 behaviors were present for each child in the past month using a 3-point scale (1 = not true, 2 = somewhat true, 3 = certainly true). The SDQ includes five domains of adjustment including emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial skills. In the current study, ratings from the first four domains were combined into a total difficulties score, and scores from two raters were averaged into one combined score for each child.

Demographic Characteristics. Agency administrative staff provided the gender, age, and race of each child in care.

Service History. Agency administrative data provided characteristics of each child's service history, including whether the referral was from DSS, the number of previous placements, and the length of stay at the

Table 1
Baseline Descriptive Statistics and Tests for Cohort and Year Differences.

Site Level Covariates						
Variable	Overall	Cohort 1	Cohort 2			
Number of Sites	13	7	6			
Sites with Positive OSC Profiles in 2010	5	4	1			
Sites belonging to a Parent Organization	6	3	3			
Child Level Covariates						
Variable	Overall Baseline	Cohort 1 Baseline	Cohort 2 Baseline	Cohort Difference	Year Difference	Cohort × Year
Age (years)	14.8 (2.2)	14.5 (2.2)	15.2 (2.1)	F(1, 45) = 10.92 <i>p</i> = .002	F(4, 45) = 0.49 <i>p</i> = .743	F(3, 45) = 0.23 <i>p</i> = .876
Male	55.8%	41.1%	73.3%	F(1, 183) = 5.72 <i>p</i> = .018	F(4, 184) = 0.47 <i>p</i> = .761	F(3, 183) = 0.25 <i>p</i> = .864
Non-White	27.9%	18.9%	38.7%	F(1, 178) = 14.49 <i>p</i> < .001	F(4, 174) = 1.32 <i>p</i> = .264	F(3, 178) = 0.12 <i>p</i> = .950
SDQ Total Difficulties	14.5 (6.7)	14.2 (6.2)	14.8 (7.3)	F(1, 41) = 0.12 <i>p</i> = .727	F(4, 40) = 0.23 <i>p</i> = .919	F(3, 41) = 0.28 <i>p</i> = .841
DSS Custody	40.0%	30.0%	52.0%	F(1, 183) = 14.53 <i>p</i> < .001	F(4, 185) = 0.97 <i>p</i> = .424	F(3, 182) = 0.81 <i>p</i> = .489
Length of Stay (months)	7.8 (11.6)	8.8 (13.3)	6.5 (8.9)	F(1, 45) = 0.61 <i>p</i> = .439	F(4, 45) = 1.01 <i>p</i> = .413	F(3, 45) = 0.63 <i>p</i> = .599
Previous Placements				F(3, 287) = 5.94 <i>p</i> = .001	F(12, 302) = 1.72 <i>p</i> = .063	F(9, 289) = 2.47 <i>p</i> = .010
None	35.2%	35.6%	34.7%			
One	26.1%	24.4%	28.0%			
Two or More	23.0%	21.1%	25.3%			
Unknown	15.8%	18.9%	12.0%			

Note. Data from 13 sites were included in the analyses. Counts or percentages for categorical variables; means and standard deviations for continuous variables. Generalized linear mixed models used for the statistical tests, using the normal, binomial, or multinomial distribution, as appropriate. For Length of Stay, tests were run using the natural log of days. Sample size for Overall Baseline was 165 (90 for Cohort 1 and 75 for Cohort 2), but was 153 for the Strengths and Difficulties Questionnaire (SDQ). DSS = Department of Social Services; OSC = Organizational Social Context; SDQ = Strengths and Difficulties Questionnaire.

time of the survey.

2.8. Agency characteristics

Two agency-level characteristics were measured: Agencies that were members of a parent organization were coded 1, and those that were not were coded 0.

Organizational climate and culture, as measured by Organizational Social Context (OSC), was included because of research showing its impact on the success of programmatic interventions in children's service settings (Aarons & Sawitzky, 2006). Annual staff surveys included the OSC, which is designed to assess culture and climate in child service systems (Glisson & Hemmelgarn, 1998). Three agency culture subscales reflect the extent to which the values and norms at the agency are characterized by Proficiency, Resistance, and Rigidity. Three agency climate subscales reflect employees' affective responses to their work environment in terms of Stress, Engagement and Functionality. Using a national sample of 100 child mental health clinics, Glisson, Hemmelgarn, Green, and Williams (2013) derived three profiles (1 = negative, 2 = average, 3 = positive), with positive profiles reflecting higher scores on engagement, functionality, and proficiency and lower scores on stress, resistance, and rigidity. Negative profiles reflected the opposite pattern of subscale scores. Average profiles had moderate scores on the six subscales.

In collaboration with the instrument developer, we assigned each agency in the current study to one of these three profile classes based on probability estimates from the national sample. Due to the low number of agencies in the "negative" category, we combined them with "average" agencies, resulting in a two-level variable: "Positive" vs. "Negative/Average".

2.9. Data analysis strategy

For each relationship quality measure (YPRQ and IPPA), we constructed a linear mixed model with fixed and random effects. Random

effects were necessary to account for the clustering of children within the data set. Within each year of data collection, children lived together in cottages and cottages were situated within agencies. Two random effects were added to the model to reflect this nested structure: cottage*agency*time and agency*time.

The model also included fixed effects. The three elements of the research design (agency cohort, study year, and stage of CARE implementation) were included as a single, 9-category variable, (see Fig. 1). In addition, nine covariates were included in the model, given their potential to influence the outcome variables or program implementation. Two of these covariates were at the agency level: an indicator for agencies with a positive OSC profile at the start of the study and an indicator for agencies that shared the same parent organization. The remaining seven covariates were at the child level: gender, race, age, referral to agency by Department of Social Services (DSS), number of previous placements, the natural log of length of stay in days, and the SDQ Total Difficulties score.

Using the model, we conducted six planned contrasts, three to assess the equivalence of relationship quality scores during the Pre-CARE period and three to estimate the effects of CARE on relationship quality over the course of implementation. To determine their equivalence before CARE implementation began, relationship quality scores in Cohorts 1 and 2 were compared at the start of the study in 2010 and at baseline, just prior to the start of CARE. Stability of relationship quality prior to CARE was assessed within Cohort 2 because these agencies provided Pre-CARE measurements at both pre-baseline and baseline. The three planned contrasts testing for change over time in relationship quality within agencies were estimated by comparing Pre-CARE relationship quality scores to the corresponding scores at Year 1, Year 2 and Year 3. When results indicated stability at baseline and equivalence between cohorts at study inception and at their respective baseline periods, finding of significant change in agencies' YPRQ or IPPA scores was interpreted as evidence of a program effect.

In addition to the main effects model, we ran a model for each of the nine covariates to investigate whether levels of the covariates

moderated the size of the CARE effect. For these moderation models, a single fixed-effect term for the interaction between the moderator and CARE implementation was added to the main effects model. To reduce the number of significance tests conducted, we assessed moderation of the Year 3 CARE effect only and we limited tests for moderation to the Year 3 CARE effect for YPRQ. We did not assess moderation for IPPA.

3. Results

3.1. Sample characteristics

Table 1 shows the characteristics of children included in the sample at baseline (i.e., Cohort 1 in 2010 and Cohort 2 in 2011) and summarizes differences in the composition of the sample between cohorts and across the 5-year study period. At baseline, the sample included slightly more males than females, and the average age was about 15. The average length of stay for the current placement was about 8 months, and among children with a known number of previous placements, about 58% had one or more placements prior to their current one. Forty percent of all children were referred by DSS. The average SDQ total difficulties score was 14.5 which is comparable to similar populations reported in the literature (Mason, Chmelka, & Thompson, 2012), and corresponds to the 89th percentile in a national sample of non-institutionalized children in the United States (<http://www.sdqinfo.com/norms/USNorm.html>).

As shown in Table 1, results suggest that the two cohorts were equivalent at baseline with regard to SDQ and length of stay. However, compared to Cohort 1, children in Cohort 2 were more likely to be older, male, non-white, and referred through DSS. At the site level, Cohort 2 had a lower proportion of agencies with positive OSC profiles (16.7%) than Cohort 1 (57.1%). Over the five-year study period, the composition of the sample remained consistent with regard to age, gender, race, SDQ score, referral source, and length of stay. Only number of previous placements reached statistical significance and an interaction between cohort and year was found. Post-hoc analyses (not shown) indicated that the proportion of children in Cohort 1 with 2 or more placements steadily decreased over time, while in Cohort 2, the proportion in each placement category varied over time but did not follow a consistent pattern. To account for these baseline differences across cohort and time period, our statistical model included all variables as fixed effects covariates, regardless of statistical significance.

3.2. Relationship quality

We report more thorough results for the YPRQ, our primary measure of relationship quality. Unless otherwise stated, the results of the IPPA were comparable with those of the YPRQ.

YPRQ. The distribution of YPRQ scores possessed excellent statistical properties. Across the full sample of 733 surveys, the unadjusted YPRQ mean and median were both 3.3, indicating a symmetric distribution located at the center of the 5-point Likert scale. The standard deviation and interquartile range were 0.7 and 1.1, respectively. The 33 items comprising the YPRQ score were highly reliable (Cronbach's $\alpha = 0.93$). The YPRQ score was highly correlated with the modified IPPA score ($r = 0.84$, $p < .0001$), providing a good indicator of construct validity.

Examination of YPRQ scores aggregated at the site-level showed that although Pre-CARE scores for most agencies ranged from 2.5 to 3.5, one agency had an average score of 4.1 (see Fig. 4). In the boxplot, Site A is shown to be an outlier; its distance from the third quartile is 2.6 times the width of the interquartile range, which is well beyond the standard of 1.5 (IBM Corporation, 2016). Results from a univariate analysis of variance indicated a significant effect of Site, $F(12, 258) = 7.33$, $p < .0001$. Pairwise comparisons, using the Sidak adjustment for multiple tests, showed that the Site A mean was significantly different from 9 of the 12 remaining agencies. None of the

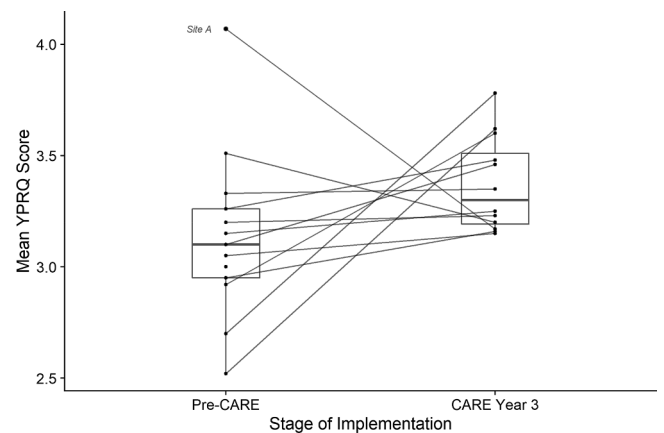


Fig. 4. Unadjusted means for Youth Perceptions of Relationship Quality (YPRQ) scores for each site during the Pre-CARE period and at the end of the third year of CARE implementation. Boxplots indicate the quartile ranges. Data from 13 sites are shown, but for one site, YPRQ data could not be collected in CARE Year 3. Site A is over 1.5 times the interquartile range beyond the third quartile, and is therefore considered an outlier at Pre-CARE relative to the other sites.

other sites differed from each other. A closer review of Site A revealed that it was the only agency that served only boys, and for which all of the direct care staff were male, had a bachelor's degree, and had worked at the agency for less than 2 years. It was also the only agency with an intact practice model in place when it entered the study, a wilderness therapy program that had been in operation for over 20 years. These quantitative and qualitative comparisons indicated that Site A differed substantially from other agencies in the study. Consequently, we chose to exclude Site A from analyses pertaining to sample equivalence and estimation of the CARE effect. Following presentation of these results below, we report sensitivity analyses in Section 3.3 showing the influence of Site A on estimates of the CARE effect.

Least squares means for the YPRQ score, adjusted for covariates in the statistical model, are presented in Table 2. The adjusted mean YPRQ score for the entire sample was 3.2, corresponding to an average rating between "sometimes" and "usually" on survey items. Random effects estimates indicated measurable variation at each level of the mixed model. Intraclass correlations, computed with intercept-only models, were 0.32 at the cottage level and 0.05 at the site level.

Three of the ten fixed-effects covariates, Age, SDQ, and Design Group, showed a statistical association with the YPRQ score. Older children and children with higher SDQ Total Difficulties scores had lower YPRQ scores, on average. YPRQ estimates at each year of CARE implementation, derived from the Design Group variable, showed that the mean YPRQ score was 3.0 during the Pre-CARE period and during CARE implementation, scores ranged from 3.25 to 3.40 (see Fig. 5).

Three planned contrasts within the statistical model were conducted to look for Pre-CARE differences in YPRQ scores. As shown in Table 2, the results do not suggest any cohort or time differences during the Pre-CARE period. The test of cohort equivalence at the start of the study in 2010 was not statistically significant, nor was the test of baseline equivalence between Cohort 1 in 2010 and Cohort 2 in 2011. Within Cohort 2, which had two Pre-CARE assessments, YPRQ scores remained stable during the 12-month period before CARE implementation began.

Three planned contrasts were constructed to estimate the size of the CARE effect at the end of each year of CARE implementation. Results from these tests, presented in Table 2, suggest that YPRQ scores increased from the Pre-CARE period to the CARE implementation period. The increase peaked at 0.40 at the end of the first year and decreased slightly in subsequent years. Despite the dip, the difference from baseline was greater than zero for all three years. Effect sizes, calculated as Cohen's d , ranged from 0.21 to 0.35.

Interaction contrasts with the Year 3 CARE effect were tested to

Table 2
Least squares means for YPRQ scores in the adjusted linear mixed model.

		Mean	SE	95% CI	Test of Fixed Effects
Fixed Effects					
YPRQ Score at Centered Covariates ^a					
Parent Organization	No	3.22	0.06	[3.10, 3.33]	F(1, 52.45) = 0.002, p = .967
	Yes	3.22	0.08	[3.06, 3.37]	
OSC Profile in 2010	Positive	3.09	0.11	[2.87, 3.31]	F(1, 45.08) = 3.99, p = .052
	Negative/Average	3.35	0.06	[3.23, 3.46]	
Gender	Girl	3.18	0.07	[3.05, 3.31]	F(1, 293.30) = 1.26, p = .263
	Boy	3.26	0.07	[3.12, 3.39]	
Race	White Only	3.23	0.06	[3.10, 3.35]	F(1, 540.37) = 0.07, p = .799
	Non-White/Other	3.21	0.07	[3.07, 3.35]	
Age	at 12 years	3.30	0.07	[3.16, 3.44]	F(1, 569.45) = 4.14, p = .042
	at 18 years	3.14	0.07	[3.00, 3.27]	
DSS Custody	No	3.28	0.08	[3.13, 3.43]	F(1, 523.90) = 2.59, p = .108
	Yes	3.16	0.06	[3.03, 3.28]	
Previous Placements	None	3.27	0.07	[3.14, 3.41]	F(3, 274.58) = 0.85, p = .470
	One	3.16	0.08	[3.01, 3.30]	
	Two or more	3.19	0.08	[3.04, 3.34]	
	Unknown	3.26	0.10	[3.05, 3.46]	
ln(Length of Stay)	at 3 months	3.24	0.06	[3.13, 3.36]	F(1, 550.34) = 1.61, p = .206
	at 12 months	3.20	0.06	[3.07, 3.32]	
SDQ Total Difficulties	at SDQ = 8	3.33	0.06	[3.20, 3.46]	F(1, 556.97) = 20.00, p < .001
	at SDQ = 20	3.11	0.06	[2.98, 3.23]	
Cohort	Cohort 1	3.30	0.06	[3.17, 3.42]	F(1, 42.1) = 1.46, p = .233
	Cohort 2	3.16	0.09	[2.97, 3.34]	
Planned Contrasts					
Test of Difference in Means					
Cohort Equivalence	Cohort 1 in 2010	3.21	0.12	[2.96, 3.45]	-0.24 [-0.61, 0.14], p = .206
	Cohort 2 in 2010	2.97	0.13	[2.70, 3.24]	
Baseline Equivalence	Cohort 1 in 2010	3.21	0.12	[2.96, 3.45]	-0.37 [-0.77, 0.04], p = .074
	Cohort 2 in 2011	2.84	0.15	[2.54, 3.14]	
Cohort 2 Stability	Cohort 2 in 2010	2.97	0.13	[2.70, 3.24]	-0.13 [-0.49, 0.23], p = .474
	Cohort 2 in 2011	2.84	0.15	[2.54, 3.14]	
CARE Effects	Pre-CARE Overall	3.00	0.08	[2.84, 3.17]	0.40 [0.17, 0.63], p = .001 0.24 [0.01, 0.48], p = .044 0.32 [0.07, 0.57], p = .013
	CARE Year 1	3.40	0.09	[3.21, 3.59]	
	CARE Year 2	3.25	0.10	[3.05, 3.44]	
	CARE Year 3	3.33	0.11	[3.11, 3.54]	
Random Effects					
Site*Time		0.012	0.020	[0.000, 0.338]	
Site*Time*Cottage		0.123	0.032	[0.074, 0.207]	
Residual		0.346	0.024	[0.302, 0.396]	

Note. Data from 12 sites were included in the analysis. CI = confidence interval; DSS = Department of Social Services; ln = natural log; OSC = Organizational Social Context; SDQ = Strengths and Difficulties Questionnaire; SE = standard error; YPRQ = Youth Perceptions of Relationship Quality.

^a The overall YPRQ score is estimated at the centered values of Age (15 years), Length of Stay (6 months), and SDQ Total Difficulties (Score = 14).

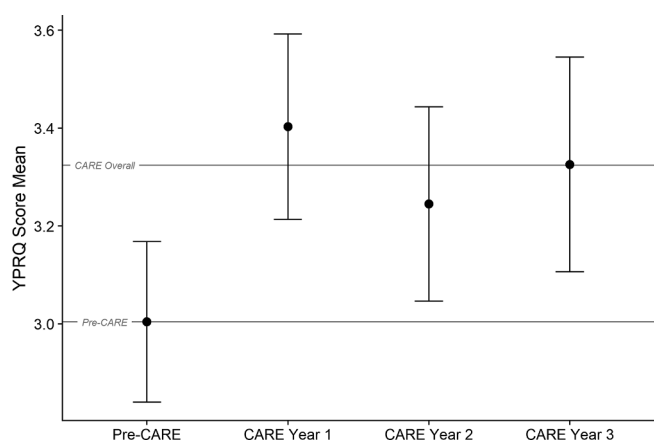


Fig. 5. Model-adjusted least squares means and 95% confidence intervals for Youth Perceptions of Relationship Quality (YPRQ) scores by stage of CARE implementation. The horizontal CARE Overall line indicates the model-adjusted average across the three years of implementation. Data from 12 sites were included in the analysis (n = 592).

assess how model covariates moderated the strength of the effect. The only statistically significant interaction was with number of previous placements, $F(3, 322.74) = 2.93, p = .034$. The CARE effect was stronger among children with 2 or more previous placements (0.83, 95% CI [0.40, 1.28]) than for those with one or fewer placements or for whom number of previous placements was unknown (0.11, 95% CI [-0.27, 0.48]; 0.23, 95% CI [-0.16, 0.61]; and 0.45, 95% CI [-0.05, 0.95], respectively). We were unable to test for moderation with OSC because there were too few Cohort 2 agencies with positive OSC profiles at the start of the study.

IPPA. For the analysis of the modified IPPA, we applied the identical main effects model used for the YPRQ. The adjusted mean IPPA score was 3.1, corresponding to a rating of “sometimes” on the survey scale. The 95% CI for IPPA ranged from 2.97 to 3.26, which overlaps the confidence interval of the YPRQ.

The pattern of effects for the covariates differed somewhat from that observed for the YPRQ; however, the results of the six planned contrasts were similar to what we found with the YPRQ, though not as strong. For the three pre-CARE contrasts, the Cohort Equivalence and Cohort 2 Stability tests were not statistically significant, as expected, while the Baseline Equivalence test was statistically significant (mean difference = -0.53, 95% CI [-1.04, -0.01], $p = .045$). For the three planned contrasts testing the CARE effects, Years 1 and 2 were not statistically

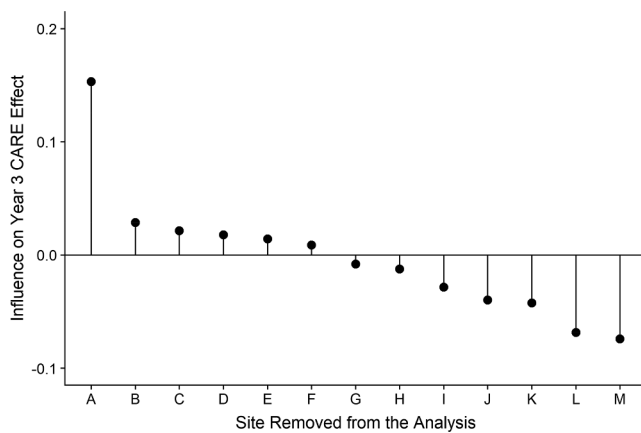


Fig. 6. Influence of individual sites on the size of the CARE effect in Year 3. Influence is the CARE effect when a site has been removed from the analysis minus the CARE effect when all 13 sites are included. Positive values indicate an increase in the size of the CARE effect if the site is removed, while negative values indicate a decrease. Site A corresponds to Site A referenced in Fig. 4.

significant, while Year 3 was statistically significant (mean difference = 0.34, 95% CI [0.02, 0.66], $p = .038$)

3.3. Sensitivity analysis of the CARE effect

Given the removal of Site A due to concerns that it was unrepresentative and may disproportionately influence the results, we conducted follow-up analyses to examine this site's statistical influence on the estimate of the CARE effect relative to other sites in the sample. Using the full main effects model for each site, we computed the difference between the Year 3 CARE effect using data from all 13 sites and the Year 3 effect when each site was removed. Positive influence values measure how much the CARE effect increased with the removal of each site, while negative values measure how much it decreased. As can be seen in Fig. 6, Site A had a positive influence score of 0.15; that is, when Site A was removed the estimate of the Year 3 CARE effect increased from 0.17 to 0.32. The second most influential agency, Site M, had a negative score of -0.07 . Thus, the influence of Site A on the estimate of the CARE effect was more than twice as strong as that of every other site in the study.

Tests of the CARE effect with Site A included in the analysis indicate that, based on null hypothesis testing at $\alpha = 0.05$, the CARE effect at Year 1 was different from zero, but the CARE effects at Years 2 and 3 were not. For Year 1, $t(39.5) = 2.26$, $p = 0.030$, 95% CI [0.03, 0.56]; for Year 2, $t(40.1) = 1.13$, $p = 0.265$, 95% CI [-0.12, 0.43]; for Year 3, $t(38.5) = 1.19$, $p = 0.243$, 95% CI [-0.12, 0.46].

These findings demonstrate the disproportionate influence of Site A on estimates of the CARE effect, which is large enough to affect interpretation of the results. Together with its extreme baseline score and qualitative differences from other sites in the study, these sensitivity analyses support the exclusion of Site A from the analytic sample (Aguinis, Gottfredson, & Joo, 2013).

4. Discussion

4.1. Summary of findings

This quasi-experimental study examined the effects of implementing CARE on the quality of relationships between children and direct care staff in 13 residential care agencies. With regard to the first research question, results indicated that, after controlling for several important variables, the perceived quality of child-adult relationships within agencies increased significantly after CARE implementation began, with improvements observed at the end of each year of CARE

implementation. Importantly, several aspects of the methodology allow for greater confidence that the improvements in relationship quality scores within agencies can be attributed in part to the implementation of CARE. Specifically, the stepped-wedge design allowed us to demonstrate that observed changes were not likely due to a secular trend affecting agencies throughout the region (i.e., scores in Cohort 2 agencies remained stable during the Pre-CARE period). Any lack of equivalence across years or between cohorts was accounted for statistically. Furthermore, concerns about selection bias were reduced by implementing the program model independently across 13 distinct agencies.

With regard to the second research question, the increase in YPRQ was consistent across most child-level factors we tested, including age, gender, race, length of stay, DSS referral, and problem behavior. Only number of past placements significantly moderated this effect. The finding of a greater increase among those with more previous placements is consistent with some research suggesting that program impacts tend to be greater among higher risk participants (Eckenrode, Izzo, & Campa-Muller, 2005). Given that placement disruption can influence children's relationships with care providers (Rauktis et al., 2005), this finding may suggest that these children's history of disrupted relationships with past caregivers made them particularly responsive to the enhancements made by agencies as they put the CARE principles into practice. It is also possible that CARE may have helped staff become more capable and purposeful about meeting the unique relational needs of these children.

4.2. Contribution to the literature

This study adds to the relatively sparse literature on organization-level interventions to improve service quality and positive outcomes for children in group care settings (James et al., 2015). It is one of the few evaluations of a residential program model including more than one or two agencies (Farmer, Murray, Ballentine, Rauktis, & Burns, 2017; Lee & Thompson, 2008). Most other empirically-supported models are based on studies at a single agency (Elwyn, Esaki, and Smith, 2015; Hodgdon et al., 2013; McCall et al., 2010; McCurdy & McIntyre, 2004; Morral, McCaffrey, & Ridgeway, 2004; Rivard, Bloom, McCorkle, & Abramovitz, 2005), making it difficult to know the extent to which findings were influenced by unique conditions at those locations. It is also one of the few intervention studies focusing on the child-adult relationship in institutional settings, as research with this population has tended to focus on behavioral and developmental outcomes (Bakermans-Kranenberg et al., 2008; Hermenau et al., 2016). This demonstration of the model's ability to improve relationship quality is especially salient in light of concerns that group care offers limited opportunities for enriching youth-adult relationships (Annie E. Casey Foundation, 2010; Barth, 2002).

The current findings add to a growing body of evidence suggesting that implementation of CARE in group care agencies leads to measurable improvements in outcomes considered essential to their success. Based on evaluation studies showing reductions in behavioral incidents and physical restraint (Izzo et al., 2016; Nunno, Smith, Martin, & Butcher, 2017), CARE currently has a scientific rating of 3 (promising research evidence) in the California Evidence-Based Clearinghouse (<https://www.cebc4cw.org>) where it is listed under both the Higher Levels of Placement and the Alternatives to Long-Term Residential Programs topics. The methodological strengths of this research are acknowledged in research reviews of organization-wide, trauma-informed intervention models (Bailey et al., 2018; Purtle, 2018). Promising findings were also described in a qualitative study conducted by Anglin (2011) based on interviews and observations across 7 experienced CARE agencies in a different state that were actively working to sustain CARE after 4 years of implementation. Staff reported that their agencies' participation in CARE led to fewer confrontations and power struggles with children, more peaceful environments in the homes, less

fear among staff and children, and greater confidence and job satisfaction. Because the current study is based on direct reports from children, it provides an important complement to the existing studies which rely on administrative data and staff report.

The results also lend empirical support regarding a critical pathway within the CARE Theory of Change. Implementation by CARE consultants focused largely on supporting the efforts of managers and leadership to help direct-care staff apply the CARE principles in their daily work. Although our study did not examine these implementation processes directly, the improved relationship quality scores we observed may suggest that their efforts succeeded in changing how staff approached their work with children, reflecting more trauma sensitive responses, greater autonomy support and flexibility, competence-building, and prioritizing relationship quality over punishment and power struggles. Future research is needed to examine key mechanisms of change such as these. In particular, targeted research is needed to determine the extent to which improved relationships between children and staff may contribute to CARE's positive impact on behavioral incident and restraint rates, as reported in prior studies (Izzo et al., 2016; Nunno et al., 2017).

Lastly, this study adds to the literature by reporting a new measure of relationship quality for group care settings, the YPRQ. It was designed to capture key aspects of relationships between children and caregivers that are associated with engagement, growth, and well-being. It showed high internal reliability and its validity was demonstrated by its high correlations with established measures of social and emotional functioning and relationship quality.

4.3. Limitations

Several methodological limitations should be considered when interpreting this study's findings. The stepped-wedge design enabled us to compare outcomes after one year of implementation versus none; however, this study lacked a true no-treatment comparison group (i.e., in which comparison agencies receive no CARE implementation for the three-year implementation period). Also, the strength of the evidence from this design was limited by including only two cohorts of agencies. Future studies of CARE need to include additional cohorts or "steps" to improve the scientific rigor of the design. Furthermore, although differences between cohorts were accounted for statistically, those agencies may have differed on other variables that were not measured. These factors limit the strength of the causal conclusions that can be drawn from the changes observed in YPRQ scores.

The number of agencies included in this study and their method of selection limit the generalizability of the findings. A larger sample of agencies would provide greater variability on important agency-level characteristics, improve statistical power to detect effects, and reduce the influence of any given outlying agency on the study results.

In evaluating an organization-level intervention such as CARE, it is important to account for other agency-level factors that may relate to program outcomes or implementation. Our assessment of these factors was limited. The OSC, although validated in some child service settings, has not been validated in group care settings like the ones represented in this study. It is unclear whether it assesses dimensions of organizational functioning that are most salient for these agencies. Future studies need to address other organization-level factors such as size, funding, staff turnover, and commitment of leadership. Ultimately, studies involving randomized assignment of agencies across intervention conditions are needed to ensure equivalence between groups on a host of potentially important variables that can be neither measured nor included in statistical models.

Our results say little about the mechanism of change responsible for the improvements in relational quality. A more detailed assessment is needed of how organization-level and staff-level practices changed over the course of implementation to account for the outcomes we observed. Although the CARE implementation model provided a standard

progression of activities, implementation unfolded in unique ways at each agency, and many developed their own innovative strategies to apply the CARE principles. Future studies need to incorporate measures of implementation fidelity and a detailed qualitative assessment to elucidate the change process and to better understand the connection between implementation and outcomes.

Lastly, although most agencies showed improvement over time, some agencies did not, and one agency (Site A) showed a substantial decline in relationship quality between baseline and Year 3. It seems likely that the change in Site A was partially due to a statistical regression effect, given that it started so high at baseline. Leadership changes at the agency may have contributed as well. However, we must also consider the possibility that the decline was related to difficulties transitioning to CARE from their pre-existing program model. It is typical to find that agencies face many challenges when adjusting their policies and practices to adapt to a new philosophy of service. The change may have been more troublesome, however, when shifting from a longstanding program model, especially if aspects of the new model were perceived as incompatible, generated resistance or conflict among staff, or if the process did not result in a coherent milieu across the agency. We have no evidence about how this transition may have occurred in our agencies, however. Future research on milieu-based models must examine this important aspect of the implementation process.

4.4. Concluding remarks

Efforts to promote the well-being of children in group care need to look beyond individual-level treatment protocols (James, Thompson, & Ringle, 2017). A major determinant of program effectiveness throughout the youth service field is the degree of professional learning and support provided to staff (Bach-Mortensen et al., 2018; National Research Council (NRC), 2015). This need is especially acute in group care settings. In order to improve care quality and reduce the risk for their children and staff, agencies must insure that staff are well-supported and prepared to deal with the serious behavioral problems and complex trauma often prevalent within this population (Colton & Roberts, 2007; Kakuma et al., 2011). Perhaps equally important, agencies must also focus on creating rich relational environments that stimulate positive social interaction among children and adults and foster a sense of belonging, factors that are essential for healthy growth and thriving in any child service setting (Allen & Tan, 2016; Baumeister & Leary, 1995; Feeney & Collins, 2015; Holt-Lunstad, Robles, & Sbarra, 2017; Pianta, Hamre, & Allen, 2012; National Scientific Council on the Developing Child, 2004). Use of a coherent program model such as CARE helps to accomplish this challenging goal by offering a sound philosophy that creates congruence across the entire agency, and aligns everyone's efforts around creating a consistent, coherent experience for children (Anglin, 2002).

The current study of the CARE model reinforces the conclusions of a growing literature showing that organizational-level approaches that promote relational competencies and reflective practice can improve important outcomes for children. As highlighted by Anglin (2011) and others (Bryson et al., 2017; Whittaker et al., 2016), achieving this goal requires sustained commitment, agency-wide education, and critical reflection about existing beliefs and norms, all within the context of a coherent program model centered around the best interests of children. CARE represents a promising approach for elevating the quality of group care and thus strengthening the continuum of care within child welfare.

Declaration of Competing Interests

Holden is Director of the Residential Child Care Project (RCCP) and developer of the CARE program model. At the time of the study, Izzo, Smith, Nunno, and Sellers were employed by RCCP as members of the

research team to evaluate the efficacy of CARE and improve its implementation. No author received direct revenue from CARE implementation, although acceptance and dissemination of the CARE program may produce opportunities for funded research and program development.

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