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Gadgets as a Second Caregiver: Parental Functional Dependence, Technoference, and Early Childhood Development in Dual-Career Families

Munisa[1*], Rika Widya[2], Asmidar Parapat[3]

[1,2,3]Faculty of Islamic Studies and Humanities, Universitas Pembangunan Panca Budi, Medan, Indonesia
Author's Email: [1*]munisa@pancabudi.ac.id, [2]rikawidya@dosen.pancabudi.ac.id,
[3]asmidarparapat@dosen.pancabudi.ac.id

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ABSTRACT

Research on young children's screen use has focused on how long children use devices, while far less is known about which caregiving functions parents delegate to them. This study introduced and examined parental functional dependence, the repeated reliance on gadgets to perform caregiving functions, in dual-career families. An exploratory qualitative case study was conducted with two dual-career Muslim families of children aged five to six years attending an Islamic preschool in Kuala Lumpur, Malaysia. Data from parent interviews, classroom observation, and psychologist assessment were analysed thematically. Children used gadgets for one to three hours daily, mainly on workdays with minimal co-use. Parents cited limited time, emotional exhaustion, perceived educational value, and immediate calming, and one family cited guilt. Concentration and emotion regulation were the most affected domains, whereas visual-symbolic recognition was adequate. The study proposed five caregiving functions of gadgets, an aid–complement–substitute spectrum, a reinforcement cycle, five testable propositions, and candidate indicators for measurement. The findings indicated that digital parenting interventions should target the work–family conditions and caregiving functions behind device use, not screen duration alone.

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Corresponding Author:

Munisa,
Faculty of Islamic Studies and Humanities, Universitas Pembangunan Panca Budi
Jl. Jenderal Gatot Subroto Km. 4.5, Medan, Indonesia
Email: munisa@pancabudi.ac.id

1. INTRODUCTION

Smartphones and tablets have become part of the daily routine of families with young children, present at the dining table, in the car, and in bedrooms. These devices offer real opportunities, from educational songs to video calls with distant relatives, yet unmanaged use raises concerns about parent–child interaction and development during the most formative period of life. Meta-analytic evidence shows that only a minority of preschoolers meet screen time guidelines (Madigan et al., 2020), and greater screen time has been associated with poorer performance on developmental screening (Madigan et al., 2019) and with fewer adult words, child vocalisations, and conversational turns at home (Brushe et al., 2024).

Increasingly, the question is not only how much children use screens but why parents provide them. Parents report giving mobile devices to calm upset children (Radesky et al., 2016), and this practice has been termed *parental digital emotion regulation* or *media emotion regulation*. Longitudinal studies indicate that using devices to calm preschoolers predicts greater emotional reactivity and weaker effortful control one year later (Radesky et al., 2023; Konok et al., 2024), although associations with other emotional competencies are mixed (Coyne et al., 2023). The process appears bidirectional: children with weaker executive functioning or

greater anger are more likely to be given devices (Danet et al., 2022; Konok et al., 2024). Parental distress and low parenting efficacy also predict media-related coping and more child screen exposure (Chen et al., 2020; Jusienė et al., 2025). In parallel, parents' own device use interrupts face-to-face interaction, a phenomenon termed *technoference*, which a recent meta-analysis of 53 studies associated with children's problematic media use (Zhang et al., 2025; McDaniel & Radesky, 2018).

These pressures are concentrated in *dual-career* families, in which both parents work. In Indonesia, the February 2023 National Labour Force Survey recorded 52.74 million women in formal work, about 38.98 percent of all formal workers (Badan Pusat Statistik, 2023), and comparable trends exist across urban Southeast Asia. Work–family conflict reduces the time and energy available for children (Greenhaus & Beutell, 1985; Powell et al., 2019), and working mothers describe devices as a "square au pair" that buys time while threatening their identity as good mothers (McAuley, 2025). Parents experience cognitive dissonance: they know the risks yet continue to provide devices because of perceived behavioural control and situational demands (Mallawaarachchi et al., 2022).

Three gaps remain. First, existing measures capture how often parents use devices for calming or discipline (Lunkenheimer et al., 2023; Konok et al., 2024) but not the full range of caregiving functions that devices take over, nor the degree to which they substitute for parental presence. Second, research on child media effects and research on the work–family interface have developed largely in isolation; scholars have called for studies that account for the context and purpose of parental device use rather than stigmatising parents (McDaniel et al., 2024). Third, evidence comes predominantly from Western and Chinese samples, while religious and collectivistic Southeast Asian Muslim families, in which parents are expected to be the primary educators of character and *adab*, remain underrepresented. Studies from Indonesia and Malaysia have documented parents' awareness and management of screen time (Fahrizal et al., 2024; Lestari & Rahmadani, 2024; Yahya & Singh, 2026) but have not theorised parents' reliance itself.

This study addressed these gaps by shifting the analytic focus from the child as a screen user to the parent who depends on the gadget. It asked: (RQ1) How intensively, and in which situations, do dual-career parents use gadgets as an additional caregiver? (RQ2) Why do they rely on gadgets? (RQ3) Which developmental consequences are observed in their children, and how can the pattern be conceptualised? The study makes three contributions. Conceptually, it defines *parental functional dependence* (PFD) and distinguishes it from technoference, parental digital emotion regulation, problematic media use, and parental mediation. Theoretically, it integrates work–family conflict, coping, and reinforcement perspectives into a model of why device delegation persists, expressed as five testable propositions. Practically and methodologically, it identifies five caregiving functions, a function-based spectrum, and candidate indicators that can guide intervention and scale development.

2. LITERATURE REVIEW

2.1. Work–Family Conflict and Coping in Dual-Career Families

Dual-career families are those in which both partners pursue developing or established careers (Powell et al., 2019); here, dual career and dual earner are used interchangeably for families in which both parents work full time. Greenhaus and Beutell (1985) identified *time-based*, *strain-based*, and *behaviour-based* work–family conflict. A parent who has just finished a tense meeting may be physically present yet emotionally unavailable. Work–family balance, the capacity to meet both domains' demands without significant interference (Frone, 2003), is difficult to attain when work extends into the home; dual-earner households working from home, including in Malaysia, had to invent new family strategies to manage the blurred boundary (Beigi et al., 2024). Coping theory (Lazarus & Folkman, 1984) frames handing a child a device as an emotion- and situation-focused coping strategy: effective for immediate relief, but fragile when it becomes the only option.

2.2. Devices as Regulators of Children's Emotion and Behaviour

A growing body of work treats parental use of screens to manage children as a parenting practice in its own right. Radesky et al. (2016) documented the use of mobile technology to calm upset toddlers, and subsequent longitudinal studies linked this practice to later emotional reactivity and weaker executive functioning or effortful control (Radesky et al., 2023; Konok et al., 2024). Coyne et al. (2023) found that media emotion regulation was cross-sectionally associated with higher reactivity and lower emotion knowledge and empathy, but predicted higher empathy one year later, underscoring that effects depend on how and why devices are used. Parents under distress are more likely to use media to cope with children's behaviour (Jusienė et al., 2025), and parents with low efficacy provide more television and tablet exposure, prompting the question of whether devices soothe children or soothe parents (Chen et al., 2020). Lunkenheimer et al. (2023) showed that parental device use for child care, discipline, and self-regulation, unlike limit-setting and involvement, was related to more parent and child problems.

2.3. Technoference and Responsive Interaction

Technoference refers to interruptions of parent–child interaction by technology (McDaniel & Radesky, 2018). Reviews show that parental smartphone absorption reduces sensitivity and responsiveness in early childhood (Braune-Krickau et al., 2021; Kildare & Middlemiss, 2017; McDaniel, 2019), and parenting stress is associated with perceiving one's phone use as cutting into family time (McDaniel et al., 2025). Parental phubbing predicts preschool behaviour problems via parent–child conflict and screen time (Gu & Zhao, 2025). For language, reduced gaze following, joint attention, and responsiveness are proposed mechanisms (Morris et al., 2022), consistent with evidence that conversational turns rather than words heard relate to language-related brain function (Romeo et al., 2018). In Indonesia, toddlers with intensive, passive gadget use showed more limited vocabulary and responsiveness than limited users (Al Baqi & Afiah, 2025).

2.4. Digital Parenting: From Regulating Children to Understanding Parents

Guidelines recommend avoiding digital media other than video chatting before 18 months and limiting children aged two to five to about one hour per day of high-quality, co-viewed content (American Academy of Pediatrics [AAP], 2016; World Health Organization [WHO], 2019). Digital parenting research has emphasised restrictive, active, and co-use mediation (Nikken & Jansz, 2014). These strategies regulate children's use but rarely address why parents need devices in the first place. Qualitative studies have begun to illuminate parents' motives and ambivalence (Mallawaarachchi et al., 2022; McAuley, 2025), yet they do not specify what caregiving work devices perform or how reliance becomes self-sustaining. This study therefore drew on four sensitising perspectives: the ecological *techno-subsystem*, in which technology becomes part of the child's microsystem (Bronfenbrenner, 1979; Johnson & Puplampu, 2008); scaffolding, in which adult accompaniment turns exposure into learning (Vygotsky, 1978); attachment, in which security grows from caregiver availability and responsiveness (Bowlby, 1969); and operant reinforcement, in which the removal of an aversive stimulus strengthens the behaviour that removed it.

3. RESEARCH METHOD

3.1. Design and Setting

An exploratory, theory-building qualitative case study design was adopted, as the aim was to understand in depth how gadgets were used in everyday caregiving, in natural settings and from the parents' perspectives, and to generate concepts and propositions for later testing. The approach drew on the ethnographic attention to what people do, know, and use (Spradley, 1980). The study was conducted at an Islamic preschool in Kuala Lumpur, Malaysia, from December 2025 to January 2026, with support from the preschool's teachers.

3.2. Participants

Two families were selected purposively as information-rich cases representing the phenomenon under study: both parents worked full time, gadgets were used routinely for both work and caregiving, and the child used a gadget as an additional caregiver at home. In both families the children were aged five to six years and attended the preschool. Parents took part voluntarily after the purpose of the study had been explained, and the identities of the families and children were anonymised.

3.3. Data Collection and Analysis

Three data sources were combined (Table 1). The analysis followed reflexive thematic analysis (Braun & Clarke, 2006, 2022) with an abductive orientation: codes were generated inductively from parents' accounts and then examined against the sensitising perspectives described above. Findings from interviews, observation, and psychological assessment were compared to strengthen credibility through source triangulation. Because only two families were involved, frequencies are reported as numbers of families alongside percentages, and the findings are treated as analytic rather than statistical generalisations.

Table 1. Data sources, analytic focus, and contribution to the research questions

Data source	Analytic focus	Research question
In-depth conversations with parents (open-ended guide)	Work schedules, patterns of use, reasons and feelings, knowledge, rules, support	RQ1, RQ2
Observation of children's daily activities at preschool	Behaviour in non-digital activities, peer interaction, reactions to transitions	RQ3
Psychologist's behavioural assessment (observation sheet)	Social-emotional, language, concentration, emotion regulation, visual cognition	RQ3

4. RESULTS AND DISCUSSION

4.1. Intensity and Situations of Gadget Use (RQ1)

In both families the father and mother worked full time and used gadgets intensively for professional and domestic activities. Table 2 summarises the children's gadget use.

Table 2. Pattern of gadget use as an additional caregiver

Aspect observed	Main finding
Duration of use	1–3 hours per day
Dominant time of use	Workdays
Situation in which the gadget was given	Parents working or attending online meetings
Type of content	Educational videos, animation, simple games, YouTube
Parental accompaniment	Inconsistent or minimal

Gadgets were a routine part of the children's day, used consistently as an additional caregiver on workdays. One to three hours per day exceeds the approximately one hour recommended for this age (AAP, 2016; WHO, 2019), consistent with the international pattern of guideline non-adherence (Madigan et al., 2020) and with Indonesian findings among full-time working parents (Lestari & Rahmadani, 2024). The decisive feature, however, was not duration alone but timing and function: use clustered in the hours when work demands peaked and was largely unaccompanied, signalling that the gadget was filling a caregiving gap rather than serving a planned educational purpose.

4.2. Why Parents Relied on Gadgets (RQ2)

Five themes emerged from the parents' accounts (Table 3).

Table 3. Reasons for gadget use among dual-career parents

Theme	Description	Frequency
Limited time	Parents lacked time to accompany the child	Both families (100%)
Emotional exhaustion	Stress and fatigue after work	Both families (100%)
Perceived educational value	Gadgets were seen as supporting the child's learning	Both families (100%)
Instant effectiveness	The child became calm and stopped fussing	Both families (100%)
Parental guilt	Gadgets as emotional compensation	One of two families (50%)

Limited time and emotional exhaustion map directly onto time-based and strain-based conflict (Greenhaus & Beutell, 1985). The gadget functioned as a *buffer* that relieved short-term pressure without resolving its source (Frone, 2003), an emotion-focused coping strategy (Lazarus & Folkman, 1984). This reading aligns with evidence that parental distress drives media-related coping (Jusienė et al., 2025) and that devices may soothe parents as much as children (Chen et al., 2020). Perceived educational value supplied justification, echoing Malaysian parents who believe that gadgets build vocabulary while overlooking the difference between active and passive engagement (Yahya & Singh, 2026). Guilt in one family resonates with working mothers' struggle against intensive mothering ideals (McAuley, 2025). Notably, the parents understood the risks, yet knowledge had not translated into consistent behaviour, mirroring the cognitive dissonance reported in Australia (Mallawaarachchi et al., 2022) and Indonesia (Fahrizal et al., 2024). The convergence of these motives across very different settings suggests that the drivers are structural rather than idiosyncratic, a point developed in the propositions below.

4.3. Developmental Consequences (RQ3)

Observation and the psychologist's assessment indicated effects on several domains (Table 4).

Table 4. Observed developmental consequences of gadget use

Developmental domain	Finding	Intensity
Social-emotional	Easily frustrated; tantrums when the gadget was taken away	Moderate–high
Language	Imitated vocabulary; limited two-way communication	Moderate
Concentration	Short attention span in non-digital activities	High
Emotion regulation	Relied on the gadget to calm down	High
Visual cognition	Adequate recognition of symbols and pictures	Moderate

The most affected domains were concentration and emotion regulation, capacities tied to executive functioning and self-soothing that develop through co-regulation with adults. This pattern converges with

longitudinal evidence that device calming predicts emotional reactivity and weaker effortful control (Radesky et al., 2023; Konok et al., 2024). Tantrums when the gadget was removed suggest that the device had become the child's main regulatory resource. Because young children naturally have short attention spans, the "high" rating for concentration should be read as more pronounced than typical for the age and requires confirmation with comparison groups.

The language profile, adequate imitation but limited two-way communication, is consistent with technoference operating from both sides: the child looked at one screen while the parent, still working, looked at another. Reduced parental responsiveness and joint attention are plausible mechanisms (Braune-Krickau et al., 2021; Morris et al., 2022), and screen time has been shown to displace conversational turns at home (Brushe et al., 2024; Romeo et al., 2018). Adequate visual-symbolic recognition shows that not all effects were negative, but this benefit did not offset the costs in emotional and social domains. The key issue therefore lay in duration, substitutive function, and lack of accompaniment rather than in the device itself (AAP, 2016).

4.4. Parental Functional Dependence: Definition and Conceptual Boundaries

The findings show that structural constraints and the gadget's immediate efficacy combine into a pattern that is poorly described by the labels "gadget-addicted child" or "negligent parent". We define *parental functional dependence* (PFD) as a condition in which parents repeatedly and consistently rely on gadgets to perform particular caregiving functions—soothing, distracting, minding, accompanying, or teaching—such that without the gadget they find it difficult to perform those functions in the same situations. PFD is graded rather than binary, and it is not a clinical addiction: dependent parents need not overuse devices themselves. Its defining feature is the *role* assigned to the gadget in caregiving. Table 5 positions PFD relative to adjacent constructs.

Table 5. Parental functional dependence compared with adjacent constructs

Construct	Core focus	What PFD adds
Technoference (McDaniel & Radesky, 2018)	Interruption of interaction by the parent's own device use	Focuses on the child's device as a delegated caregiver; the two co-occur in dual-career homes
Parental digital or media emotion regulation (Coyne et al., 2023; Konok et al., 2024)	Frequency of using devices to calm the child	Extends from one function (soothing) to five, and to the degree of substitution
Parental device use for child care and discipline (Lunkenheimer et al., 2023)	Parental regulation of device use across domains	Specifies work–family drivers and the reinforcement loop that sustains reliance
Problematic media use (Zhang et al., 2025)	Child's dysregulated or compulsive use	Locates dependence in the parent–device caregiving relationship, not the child alone
Parental mediation (Nikken & Jansz, 2014)	Strategies to regulate the child's use	Explains why mediation fails under structural pressure despite parental knowledge

4.5. Five Caregiving Functions and the Spectrum of Substitution

Drawing on the literature and the case findings, five functions taken over by gadgets were identified (Table 6).

Table 6. Five functions of the gadget as a second caregiver

Function	Description	Example situation
Soother	Relieves the child's whining or crying	Child fusses when parents return from work
Distractor	Keeps the child from interrupting parental activities	Child is given a video during the mother's online meeting
Minder	Keeps the child in a safe place without full supervision	Child watches while parents cook or work
Playmate	Provides entertainment in place of shared play	Child plays a simple game while parents rest
Teacher	Perceived as a source of learning	Child watches songs and educational videos

Each function solves a real problem, which explains the gadget's appeal. The soother and minder functions lie closest to the core of caregiving—providing security and helping the child manage emotions—and are therefore where substitution is most consequential. The teacher function warrants critical scrutiny, because perceiving content as educational does not mean the child learns from it without scaffolding. To distinguish problematic from benign use, we propose a function-based spectrum (Table 7).

Table 7. Spectrum of the gadget's role in caregiving

Role	Main characteristic	Parental accompaniment	Expected impact
Aid	Limited use, clear purpose, selected content	Parent accompanies and discusses	Supports rather than displaces interaction
Complement	Routine use at set times, with rules	Partial accompaniment	Neutral to slightly risky if duration grows
Substitute	Replaces parental presence and soothing	Minimal or none	Risks to emotion regulation, attention, and social interaction

4.6. The Reinforcement Cycle

Why does PFD persist and even grow? Figure 1 depicts a five-stage reinforcement cycle.

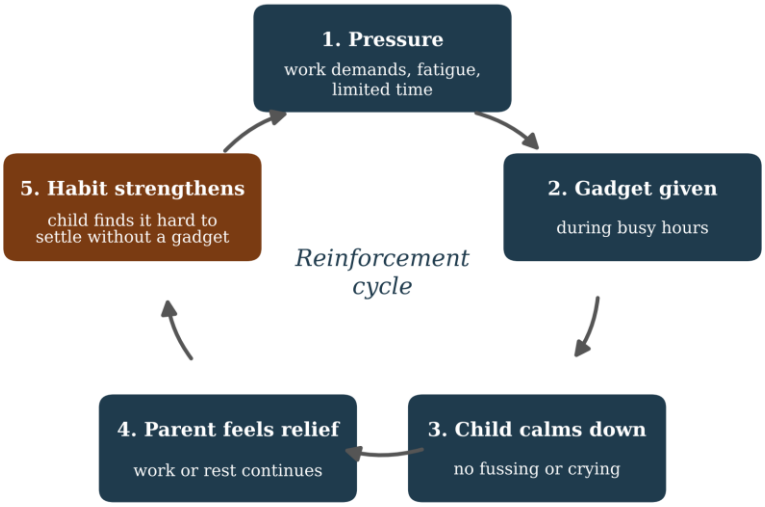


Figure 1. Reinforcement cycle of parental functional dependence on gadgets

The cycle begins with *pressure* from work demands, fatigue, and limited time. Pressure prompts parents to *give the gadget*; the child *calms down*, and the parent experiences *relief* because work or rest can continue. The removal of an aversive stimulus (the child's distress) following a behaviour (giving the gadget) negatively reinforces that behaviour. A parallel process unfolds for the child, who has fewer opportunities to practise self-soothing and protests more strongly when the gadget is removed, making parents more reluctant to remove it. Guilt motivates compensation, perceived educational value supplies justification, and the lack of easy alternatives closes the loop. The bidirectional associations reported in longitudinal studies (Danet et al., 2022; Konok et al., 2024) are consistent with this cycle, which explains why advice to "reduce screen time" alone tends to fail.

4.7. Testable Propositions

To facilitate cumulative research, the framework is expressed as five propositions (Table 8) that can be tested with longitudinal, dyadic, or experience-sampling designs.

Table 8. Propositions derived from the parental functional dependence framework

No.	Proposition
P1	Time-based and strain-based work–family conflict are positively associated with PFD, and this association is mediated by parental fatigue and stress.
P2	PFD, particularly the soother and minder functions, predicts children's emotion-regulation and attention difficulties over and above total screen time.
P3	The association between PFD and child outcomes is weaker when use is accompanied and positioned as an aid rather than a substitute.
P4	PFD and children's emotional reactivity reinforce each other over time, such that child reactivity predicts later PFD and PFD predicts later reactivity.
P5	Parental guilt and perceived educational value strengthen, whereas partner sharing, extended-family support, and workplace flexibility weaken, the link between work–family conflict and PFD.

Table 9 translates the case evidence into candidate indicators that can seed the development and validation of a PFD scale.

Table 9. Candidate dimensions and indicators of parental functional dependence

Dimension	Indicator
Primacy	The gadget is almost always the first response when the child fusses or is bored
Routinisation	The gadget is given routinely during the parent's busy hours, especially on workdays
Perceived indispensability	The parent feels anxious or unable to manage the child without the gadget
Low accompaniment	Co-viewing and discussion of content are minimal or inconsistent
Child withdrawal reactivity	The child shows strong frustration when the gadget is stopped
Knowledge–action gap	The parent recognises the risks but feels unable to change the habit

4.8. Theoretical and Practical Implications

Theoretically, PFD bridges the work–family literature and the child media literature by specifying a mechanism, functional delegation sustained by negative reinforcement, through which exosystem pressures enter the child's microsystem as a techno-subsystem (Johnson & Puplampu, 2008). It shifts the unit of analysis from minutes of screen exposure to the caregiving role the device plays, answering calls to consider the context and purpose of device use (McDaniel et al., 2024), and it extends single-function constructs such as media emotion regulation to a multi-function, graded model.

Practically, interventions should target points in the cycle rather than duration alone. Families can audit one week of use, noting the situation, function, duration, and accompaniment; agree on a family digital plan covering time, gadget-free zones, content, co-viewing, and rules for adults; provide an alternative for every function (hugs, naming feelings, and a quiet corner for soothing; an activity box for distraction; alternating schedules between partners for minding; fifteen minutes of device-free "special time" for play; co-viewing with discussion for learning); reduce technoference through device-free routines after work and at meals; and manage transitions with advance warnings and gradual reduction. Because the roots are structural, responsibility should be shared by partners, extended families, and employers through family-friendly policies such as flexible hours and parental leave (Powell et al., 2019). For Muslim families, caregiving as a trust (*amanah*) can motivate change provided it does not become paralysing guilt, and shared prayer, bedtime supplications, storytelling, and practising *adab* offer meaningful alternatives. Preschools, as part of the mesosystem, can offer brief, non-judgemental parenting and digital literacy programmes suited to working parents, balance screen exposure with play-based activities, and refer families when difficulties are severe, while interpreting behavioural changes cautiously.

4.9. Limitations and Future Research

The study involved only two families from one preschool; the developmental observations were descriptive and lacked a comparison group; and the framework has not yet been tested quantitatively. These limitations define a research agenda: developing and validating a PFD scale from the indicators in Table 9; testing P1–P5 in larger, more diverse samples using longitudinal and dyadic designs that include both mothers and fathers; using experience-sampling methods to capture the moment-to-moment reinforcement cycle; comparing PFD across cultural and religious contexts; and evaluating interventions that address both parents' work–family conditions and children's use.

5. CONCLUSION

This study shows that in dual-career families, gadgets can function as a second caregiver. Children aged five to six years used gadgets for one to three hours per day, mainly on workdays and with minimal accompaniment. Parents relied on gadgets because of limited time, emotional exhaustion, perceived educational value, and instant effectiveness, and in one family because of guilt, indicating that the practice arises from structural work–family pressures rather than negligence. Concentration and emotion regulation were the most affected domains. The study contributes the construct of parental functional dependence, distinguished from adjacent constructs; five caregiving functions; an aid–complement–substitute spectrum; a reinforcement cycle; five testable propositions; and candidate indicators for measurement. Digital parenting efforts should move beyond regulating children's screen time toward strengthening parents' reflective awareness, providing alternatives for each function, and building supportive ecosystems that involve partners, extended families, preschools, and workplaces.

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