

USING THE RESPONSIBILITY TRANSFER TEACHING MODEL TO TRAIN PRIMARY CAREGIVERS OF CHILDREN AGED 0-2 WITH SUSPECTED AUTISM TO IMPLEMENT NATURAL CONTEXT TEACHING STRATEGIES

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ABSTRACT:

This study investigated the efficacy of the Responsibility Transfer Teaching Model in training primary caregivers of toddlers (aged 0–2) suspected of autism to implement natural context teaching strategies at a family support center. Findings revealed that all three caregivers effectively applied these strategies during snack time but showed limited success in parent-child activities and free play. Home visits indicated that only one caregiver (Case 1) generalized skills to the home, while the others, facing socioeconomic or health challenges (e.g., schizophrenia, spatial constraints), used strategies sparingly. Post-intervention, two toddlers exhibited significant improvements in spontaneous language communication, including increased frequency, pragmatic functions (e.g., describing), and forms (e.g., words with gestures). A three-month follow-up showed only one family sustained gains, underscoring the need for tailored interventions. Future research should refine strategies for diverse family contexts and explore home-based models.

Keywords: Autism Intervention, Caregiver Training, Early Childhood Development, Natural Context Teaching, Responsibility Transfer Teaching Model

1| INTRODUCTION:

Children aged 0–2 suspected of autism often exhibit early signs such as delayed language development, limited social reciprocity, and atypical behaviors like hand-pulling instead of pointing [1]. Early intervention is crucial, yet primary caregivers—typically parents—face significant barriers in applying complex strategies in natural settings [2]. Traditional models like Problem-Based Learning (PBL) can overwhelm caregivers lacking foundational skills, leading to frustration [3]. The Responsibility Transfer Teaching Model (RTTM), or Gradual Release of Responsibility (GROR; Pearson & Gallagher, 1983) [30], offers a scaffolded alternative, progressing from guided support to independence [4]. Research shows parents easily master responsive teaching (attuning to cues) and direct teaching (structured lessons), but struggle with natural context teaching (integrating learning into daily life) [5]. This study explores RTTM’s application, framing it as a three-tier framework: responsive teaching, natural context teaching, and direct teaching, guiding caregivers from observation to autonomy (see Figure 1).

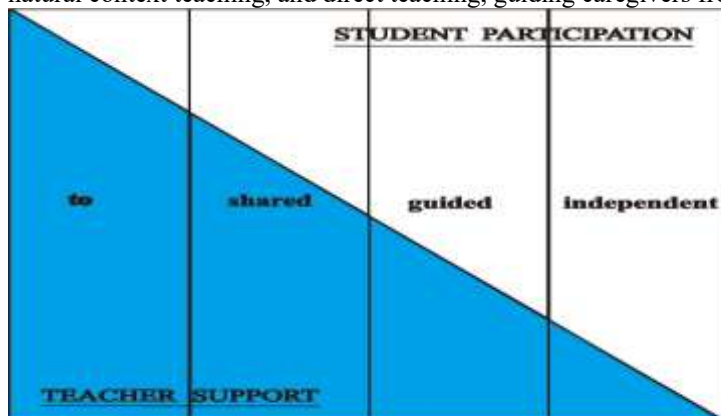


Figure 1: Natural Context Teaching :Illustrates GROR stages: “Watch Me,” “Help Me,” “Try It,” “Go Solo,” showing teacher support decreasing as caregiver independence increases.)

2] LITERATURE REVIEW:

Since 2000, autism intervention research has prioritized parental involvement to enhance responsiveness [6]. Mahoney and Perales (2003) found Responsive Teaching improved maternal skills and toddlers' social-emotional development [26]. Their 2005 study showed autistic children outpaced developmentally delayed peers in cognitive, communicative, and social gains, linked to maternal responsiveness and pivotal behaviors [27]. Kasari et al. (2010) reported an 8-week "Enhanced Naturalistic Teaching" program boosted joint engagement in autistic toddlers (21–36 months), with sustained gains after a year [18]. Wong and Kwon (2010) in Hong Kong's "A-1-2-3" program enhanced language and social behaviors while reducing caregiver stress [37]. Girolametto et al. (2006) found More Than Words (MTW) increased maternal responsiveness and toddler vocabulary [16]. Carter et al. (2011) noted mixed MTW outcomes, with object interest impacting effectiveness [14]. Dawson et al. (2010) demonstrated two years of Early Start Denver Model (ESDM) training improved cognitive and adaptive skills [14], but Rogers et al. (2012) found no gains with a 12-week ESDM, contrasting Dawson's intensive 2,000-hour approach [31]. These studies highlight training potential but emphasize variability in approach, intensity, and individual factors [7].

3] METHODOLOGY:

A. Research Design

This study employed a mixed-methods approach, using a single-subject, multiple-baseline-across-settings design across free play, parent-child activities, and snack time, supplemented by qualitative observations and interviews [8]. The aim was to assess caregiver and toddler changes, and challenges, under RTTM [9]. Caregivers learned natural context strategies (create, wait, prompt, feedback) starting in one setting, expanding to all three [10].

B. Independent Variable: RTTM (GROR) with four stages:

1. Watch Me: Researchers demonstrate, caregivers observe.
2. Help Me: Researchers lead, caregivers assist.
3. Try It: Caregivers lead, researchers support.
4. Go Solo: Caregivers operate independently, researchers observe [30].

Dependent Variable: Frequency of natural context strategy use, tracking successes and attempts across baseline, intervention, and follow-up [11].

C. Data Collection:

1. Recruitment (Feb–Apr 2022): Partnered with Taoyuan's Early Intervention Center; screened 5 cases, confirmed 4 (1 withdrew due to pandemic) [12].
 2. Staff Training: Two professionals trained in 17 sessions on natural context strategies (Feb 7–Apr 1, 2022) [13].
 3. Baseline Phase: Filmed 15-min free play, 15-min parent-child activities, 10-min snack time; assessed with MBRS, CBRS, CSBS-DP Behavior Sampling (20–30 min), MCDI-T, and CCDI [14, 24, 25, 36].
 4. Intervention Phase: 10 weekly 40-min sessions (15-min free play, 15-min parent-child, 10-min snack), plus 30-min discussions; mid-term home visit filmed 10-min snack, 15-min play [15].
 5. Follow-Up Phase: Post-test mirrored baseline; final home visit filmed 10-min snack, 15-min play, 30-min interviews; 60-min focus group with caregivers; 3-month follow-up filmed 15-min free play, 30-min report [16].
- D. Qualitative data from in-depth interviews and focused groups, led by psychologist Tsai Hsiu-Ling (familiar with families from 2018–2020), enriched insights [23, 33].

4] CASE PRESENTATION:

Case 1: A 2-year-2-month-old boy, only child in a nuclear family, full-term natural birth, no complications; mother as primary caregiver. Diagnosed with mild autism spectrum disorder on December 17, 2021 [17].

Case 2: A 3-year-old girl, only child with mother post-separation, premature (33 weeks, C-section), with heart septal defect, kidney malformation, and imperforate anus; mother as primary caregiver. Suspected ADHD and autism since August 2021 [18].

5] RESULT

Figure 2 presents an analysis of data pertaining to the primary caregiver of Case 1 across 15 time points, encompassing baseline, intervention, and follow-up phases, utilizing the Responsibility Transfer Teaching Model. As illustrated in Figure 2, the baseline usage (time points 1–3) was characterized by low but intermittent occurrences during snack time and parent-child activities, suggesting that the caregiver possessed a limited prior knowledge of the strategies. By the intervention phase and post-test (time point 14), there was a notable increase in usage across all three settings compared to the baseline, indicating the caregiver's capacity to independently and effectively implement natural context teaching strategies by the conclusion of the study. However, during the three-month follow-up (time point 15), no strategy use was recorded in the free play context, with classroom observation notes documenting the underlying reasons, which will be further discussed in the qualitative analysis section. Graphical trends indicated a covariance effect: following the second snack-time lesson (time point 5),

there was an observable increase in free play usage, as this setting was filmed first that day, reflecting the positive impact of the initial snack-time demonstration from the first lesson. By the third lesson (time point 6), the caregiver independently applied strategies in free play prior to practicing in snack time, achieving a peak in baseline for that setting. In contrast, parent-child activities exhibited minimal engagement during the baseline phase and remained unaffected by these changes, suggesting that this context posed greater challenges. According to the study design, parent-child activities were scheduled for caregiver practice by the seventh lesson (time point 10), at which point independence had been attained in the other settings; however, no successful or attempted use was recorded until the eighth lesson (time point 11), when usage surged by 10 points, reaching an immediate peak in that setting.

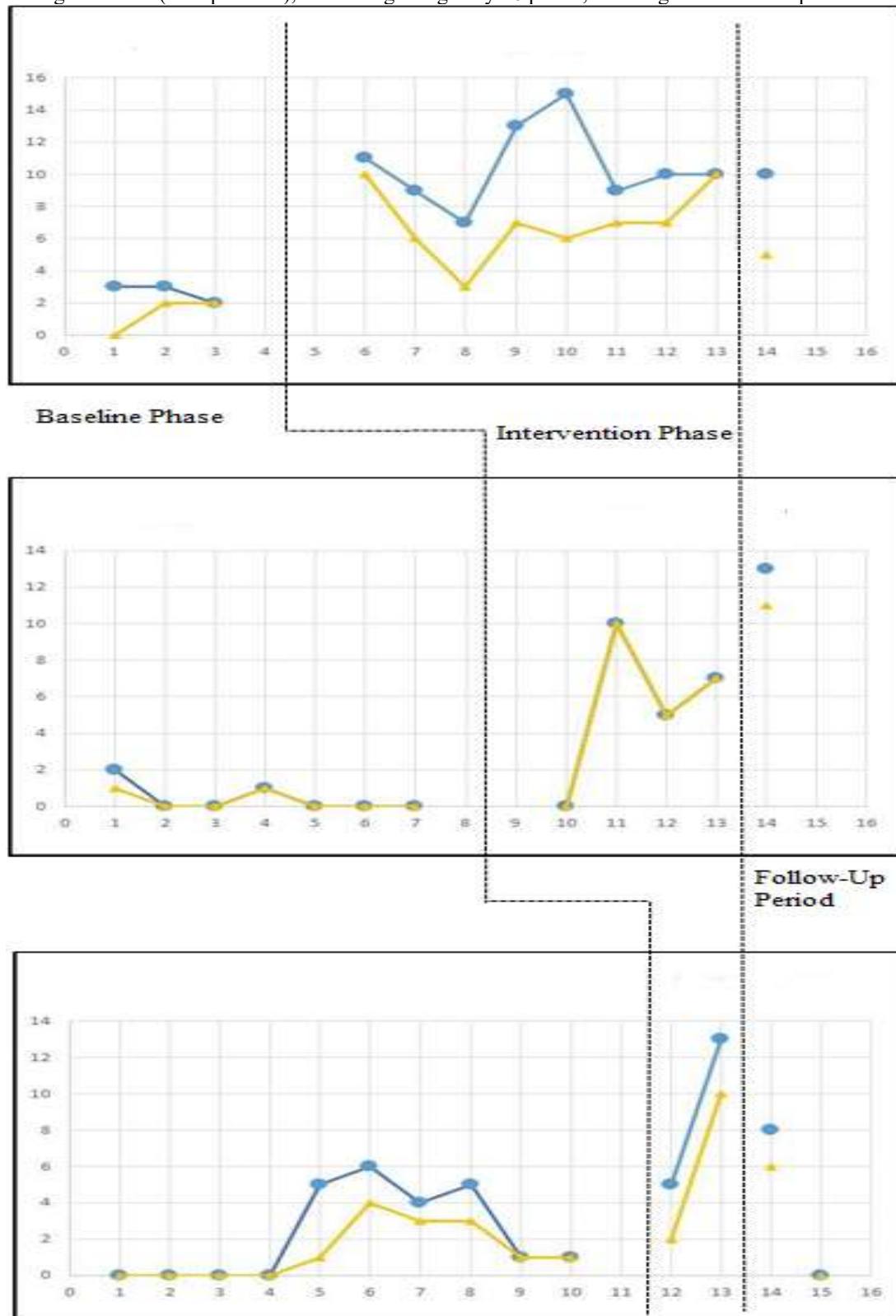


Figure 2: Frequency of Caregiver Use of Natural Context Teaching Strategies for Case 1 Across Snack Time, Parent-Child Activities, and Free Play

This figure 3 illustrates how the primary caregiver for Case 1 applied natural context teaching strategies—creating opportunities, waiting, prompting, and giving feedback—across three settings: snack time, parent-child activities, and free play. The data points analyzed to evaluate how primary caregivers implemented natural context teaching strategies during snack time, free play, and parent-child activities at the center across 15 time points, utilizing the Responsibility Transfer Teaching Model. The dependent variable—frequency of strategy use (successful completions of creating, waiting, prompting, and providing feedback, along with attempts)—demonstrated minimal baseline usage (one instance in free play), with significant increases observed in snack time and free play by the follow-up (time point 14), yet no usage was recorded in parent-child activities, indicating challenges in mastery within that context. Free play usage increased following the third snack-time lesson (time point 6) due to prior demonstrations, peaking early, while parent-child activities did not show improvement until time point 7. In snack time, the initial use of picture cards enhanced frequency but declined by the sixth lesson (time point 9); however, the removal of cards at time point 10 resulted in a spike in usage to 13 by time point 11, with success rates reflecting total usage, except in parent-child activities, where difficulties persisted, underscoring the model's effectiveness in certain settings but not in others.

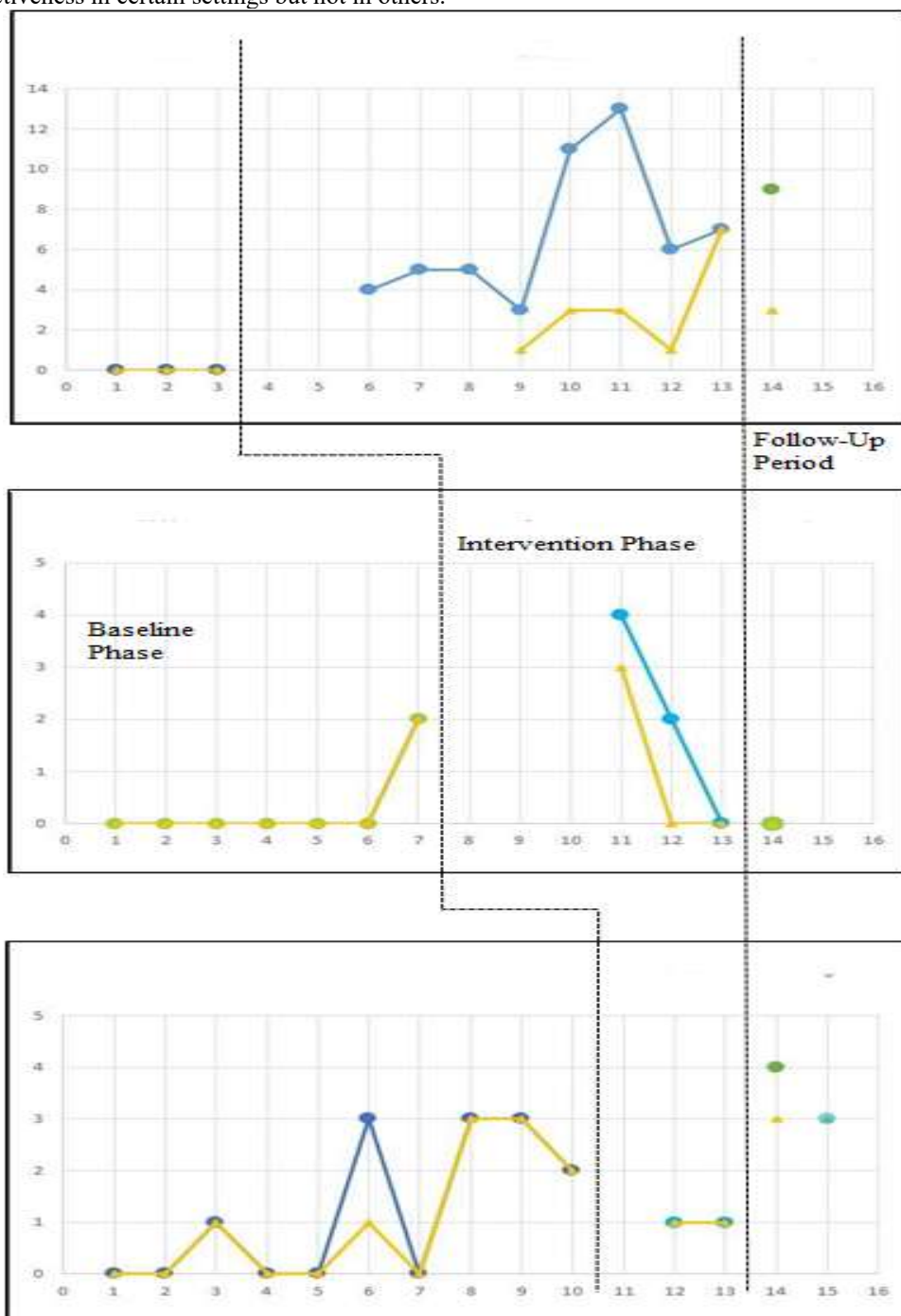


Figure 3: Frequency of Caregiver Use of Natural Context Teaching Strategies for Case 1 Across Snack Time, Parent-Child Activities, and Free Play.

Collectively, the findings of this study provide compelling evidence for the efficacy of the Responsibility Transfer Teaching Model in equipping primary caregivers with the skills necessary to independently apply natural context teaching strategies. In Case 1, caregivers demonstrated proficiency in these strategies across three distinct center-based environments—snack time, free play, and parent-child interactions—and were able to generalize their application to the home setting. However, they encountered challenges related to optimizing communication opportunities and adapting to the child's pronounced imitative behaviors, which led to increased caregiver directiveness and heightened achievement expectations. In Case 2, caregivers performed well during snack time and free play but faced difficulties in parent-child activities, resulting in limited generalization at home due to spatial limitations and challenges in identifying the child's motivational drivers. Both cases exhibited notable improvements in spontaneous language communication following the intervention: Case 1 experienced an increase in frequency, transitioning from the use of habitual questions to more direct statements, with verbal expressions increasingly accompanied by eye contact and gestures. Similarly, Case 2 showed an increase in frequency, with an expansion of pragmatic functions such as "describing" and the emergence of more complex forms, including additional gestures, actions, and two-word phrases. These results underscore the model's effectiveness while highlighting the necessity for customized adaptations to address specific individual and environmental challenges.

6| CONCLUSION

The Responsibility Transfer Teaching Model effectively trained caregivers to use natural context strategies during snack time, with mixed results in parent-child activities and free play. Only Case 1 generalized skills home, while Case 2's challenges (e.g., schizophrenia, poverty) limited application. Two toddlers improved language communication significantly, but a three-month follow-up showed only one family (economically disadvantaged) sustained gains, adapting despite constraints, as others scaled back due to maturing child skills or concerns like "reverse mimicry." These findings emphasize tailored interventions for family diversity. Future research should adapt strategies for high-functioning autistic children, explore home-based models (addressing spatial barriers), refine cross-setting designs, and provide interdisciplinary support for caregivers with complex needs [29].

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9| Miscellaneous:

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10| Data Availability: The data that support the findings of this study are available from the corresponding author.

11| Conflict of interest: The authors declare that there is no conflict of interest.

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