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# Art at the Start: A controlled trial and close observation of parent-infant art therapy intervention

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## Abstract

This two-part study seeks to evidence art therapy intervention for parent-infant attachment relationships, looking at improvements to wellbeing and relationships. Study one was a controlled trial with 105 participating parent/caregivers and their infants (0–3-years), identified due to concerns about their relationship. They were quasi-randomized to attend a 12-week art therapy group or treatment as usual. Measures focused on parents' wellbeing and their perceptions of their relationship with their infant. In study 2 we analyzed video footage from the first and penultimate sessions of a sample of 37 dyads, looking for observable changes in the different channels of communication upon which attachments are predicated. The controlled trial showed intervention participants had significantly improved parental wellbeing, significant increases in attachment warmth and significant decreases in intrusion. This contrasted with the control sample who showed a significant decrease in wellbeing, stable warmth, and significant increases in intrusion. The observation study showed that there was a significant increase in the communicative behaviors from the parents to the infant which would support attachments between the first and penultimate sessions. We conclude that these results make a robust case for the inclusion of art therapy within the range of interventions available for at risk early relationships

## KEYWORDS

attachment, art therapy, controlled trial, intervention, observation, parent-infant relationships

## 1 | INTRODUCTION

This two-part study aims to rigorously evidence a model of art therapy intervention to support parent-infant relationships in the early years. Our group-based art therapy intervention supports primary caregivers and their 0 to 3-year-old infants to engage in playful art making together. The “Art at the Start” model of art therapy groups (see [Supplementary material](#) for model protocol) facilitates positive

interactions, whilst giving therapeutic support to parental wellbeing and encouraging attuned responsive parenting. Innovatively, our art therapy groups were embedded within an arts center, a public building with visible creativity, and a social community space. This paper focuses on providing a robust evidence base for group-based parent-infant art therapy by offering the first controlled trial of this approach, at a much larger scale than in any previous published research in the field (Armstrong & Ross,

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2020). In part one of this study, we use standardized measures of psychological change to statistically and clinically compare wellbeing and relationship outcomes at the beginning and end of a 12-week parent-infant art therapy group, as compared to treatment as normal. In part two of the study, we focus on capturing the infant's experience of changes in their relationship through the art therapy process, using a novel observation tool with video footage from the beginning and end of the art therapy process.

## 2 | CONTEXT

Underpinned by attachment theory, there is a strong evidence base for the psychological importance of positive early years relationships (Britto et al., 2016; Moullin et al., 2014). There is also a strong economic case to be made for early intervention, which leads to accumulated savings by preventing other intervention services being required later in the child's life and improving the families' participation in the economy (Parent Infant Foundation, 2021). However, though there is an emphasis on infant mental health in national (Scottish Government, 2021; Public Health Agency, 2016) and international (World Association for Infant Mental Health, 2016) policy, more evidence is needed concerning how to address mental health most effectively and efficiently in the early years (Axford et al., 2015; Love & McFadyen, 2020; Lumsden, 2017). Moreover, despite creative art offering a developmentally appropriate vehicle for mental health interventions which aim to directly target infant mental health, parallel policy pushes to recognize the health benefits of community-based arts participation (All Party Parliamentary Group on Arts, 2017) have tended to focus on older children and adults. A recent review of psychoanalytic and psychodynamic interventions did not include any art therapy approaches (Sleed et al., 2022). We provide evidence to suggest that these perspectives might be usefully brought together to provide an efficacious model of infant mental health intervention.

### 2.1 | Early relationships

Infants who experience warm reciprocal interactions with the adults who are caring for them, develop secure relationships and come to expect positive responses from others (Benoit, 2004). Within these interpersonal relationships they experience well-timed, synchronous "conversations" (Feldman, 2007a; Isabella & Belsky, 1991; Stern, 2000) which teach them that their feelings can be understood and regulated. Infants can communicate their states and emotions through non-verbal, gestural signifiers such

### KEY FINDINGS

- Parental wellbeing increased significantly following a 12-week dyadic art therapy group intervention for infants and caregivers together.
- Following the intervention, the parents' perception of their infant as intrusive decreased significantly and their perception of their infant's warmth toward them increased significantly.
- Infant's experiences within their primary relationship quantifiably changed over the course of the intervention, with them experiencing significantly more time in channels of positive communication, supportive of attachment relationships, by the end of the art therapy intervention.

as the qualities of a movement or a rhythm (Reddy, 2019; Stern, 2000; Trevarthen & Aitken, 2001). Good quality early attachment relationships lay the foundation for cognitive and behavioral development, emotional and social wellbeing, whilst mitigating against the impacts of other adversities (Belsky, 2001; Mikulincer et al., 2005; Sroufe, 2005; Weich et al., 2009). The World Health Organisation (2020) states that all infants should receive responsive care during their first 3 years of life and advises that parents should be supported to provide this.

There is increasing recognition that parental mental health is one of the key risk factors for poor attachments (Badovinac et al., 2018; Barlow et al., 2016; Murray et al., 2010) with researchers highlighting the negative impact on interactions (Granat et al., 2017). It is thought that one in five women will develop a mental health condition while pregnant, or in the first year of their baby's life (Bauer et al., 2014; Logsdon et al., 2006), as will one in ten new fathers (Paulson et al., 2020; Williams, 2020). In addition, there is the impact of pre-existing mental health conditions (O'Hara & Wisner, 2014) and a parent's own experiences of attachments (Steele et al., 1996). Social deprivation has also been shown to be a risk factor in developing perinatal mental illness (Ban et al., 2012). Acquarone (2004) points out the urgency of intervening early where relationships are not optimal, and fortunately, early relationships have been shown to be open to change. Interventions to help improve parental sensitivity and the quality of attachment relationships can have a mitigating effect on the impact of poor post-natal mental health (Bergman et al., 2010; van IJzendoorn et al., 1995; van IJzendoorn et al., 2022).

## 2.2 | Supporting early relationships

The World Association for Infant Mental Health state how the crucial nature of sensitive relationships mean we have a responsibility for giving “attention to unique ways that infants express themselves and educating mothers, fathers, caregivers, and professionals in their recognition of relationship-based attachment behaviors” (p4, World Association for Infant Mental Health, 2016). Echoing this, Newton et al. (2020) found that common approaches behind successful attachment interventions included facilitating positive interactions and helping caregivers to see things from the baby’s perspective. Interventions may try to develop parents’ insight into their infants’ inner states (Camoirano, 2017; Suchman et al., 2011) or use psychoeducation with parents to help them recognize their infant’s cues (Tedder, 2008). Some interventions focus on observing and thinking about the baby (Barlow et al., 2010) or on following infant-initiated interactions (Cohen et al., 1999). A review of intervention outcomes for parent-child interactions supports this active behavioral approach (Bakermans-Kranenburg et al., 2003).

Art therapists working dyadically with parents and infants may draw on similar techniques to encourage caregivers to recognize and respond to babies’ communications. However, the tactile and visual nature of art making may bring additional benefits for the relationship, especially given that early interactions are founded in the visual and physical signals of non-verbal communication. Art therapy intervention uses the potential of the art-making process in being able to draw parents and infants into playful, sensory interactions alongside the safety created by a facilitator who, as a qualified art therapist, has an in-depth understanding of mental health and attachments, and who is trained to create a safe space and to offer support and containment. Case studies of dyadic art therapy with parents and infants outline the promise of the approach to support sensitive and responsive interactions (Armstrong & Howatson, 2015; Bruce, 2020; Hall, 2008; Hosea, 2011; Meyerowitz-Katz, 2017; Parashak, 2008; Proulx, 2002). Studies using standardized outcome measures have found improvements in parental wellbeing and in the parents’ perception of the relationship (Armstrong et al., 2019; Arroyo & Fowler, 2013; Lavey-khan & Reddick, 2020) and our pilot study in preparation for this trial also found improvements in observable attachment behaviors (Armstrong et al., 2019). These studies discuss mechanisms of change in the therapeutic approach – the kind of space created, the benefits of group membership, the accepting and containing qualities the therapist brings, and the direct support for relationships – alongside mechanisms unique to the art-making process – the qualities of materi-

als, the process of shared creativity, and the final art works themselves.

These studies have shown the potential of art therapy to add to the range of intervention available to vulnerable parent-infant dyads, providing a rich picture of the process and the therapeutic mechanisms for supporting relationships and mental wellbeing. There remains considerable stigma around perinatal mental health difficulties and the use of Infant Mental Health services (Sambrook Smith et al., 2019), and so the potential of arts therapies to help reduce barriers to accessing support could also be valuable. However, the scale of research so far has been small ( $n = 4-11$ ), and no studies have included a control group, meaning that it is not clear that the intervention is the cause of relational change (Armstrong & Ross, 2020). It is essential that art therapists find a way to evidence and sustain their practice within the public health funding model, without compromising their interpretative stance. Hence this study, with the first controlled trial in parent-infant art therapy, offers a valuable contribution. Our research seeks to evaluate whether an art therapy intervention is associated with change in wellbeing and relationships for vulnerable parent-infant dyads. In part 1 of this study, we hypothesized that parent-infant dyads receiving an art therapy group intervention would see more improvement to parental wellbeing and the relationship than dyads receiving treatment as usual. In part 2 we hypothesized that among infants participating in art therapy we would observe more of their time being spent experiencing positive interactions at the end of the intervention than at the beginning. Conversely, we expected to see the overall time spent experiencing negative or absent behaviors which do not support relationships to decrease. These hypotheses are based on the positive results reported in previous small  $n$  studies, and a developmental understanding of the behavioral building blocks of secure attachment relationships.

## 3 | PART ONE: CONTROLLED TRIAL

### 3.1 | Methods

#### 3.1.1 | Recruitment

This study had ethical approval from the University of Dundee (SREC – PhD/033). Our study took place in an urban locality in Scotland where many families face multiple deprivations, with more than a third of the areas among the most deprived in the country (SIMD (Scottish Index of Multiple Deprivation), 2020). Difficulties which may impact our participants include a higher percentage

of first-time mothers under 19 than the national average and more parents living with long-term physical or mental health issues. An estimated 30.1% of children in our locality live in households that experience both low income and material deprivation (Dundee City Council, 2019). The research methodology centered around comparing attendance at an art therapy group with treatment as usual for parent-infant dyads where there were concerns about their attachments. Our pilot results (Armstrong et al., 2019) found a large effect size for all measures, however given the small sample size of 10 dyads this may have been an inflation, so we powered for a medium effect size. Based on G\*Power (Faul et al., 2007) analysis for 90% power to detect a medium effect size we would need a total sample size of 88 participants. We had initially hoped to fully randomize the sample but found that our pattern of referrals did not give us sufficient numbers of participants at one time point in order to divide them successfully. Instead, we adopted a quasi-randomized approach where the first set of referrals from an area were allocated to the art therapy group and the next to the control group, and vice versa in a different area. The areas were determined by each health team's served population, with approximately 3500 infants within our age range divided between three teams within the city, and an additional two teams in the wider area serving smaller more rural population of approximately several hundred infants. There was no selection of intervention or control group made by either the researchers, the referrers or the participants and we have checked the matching between the groups as described below. We offered a follow-up with families allocated to the control condition after they had completed their participation in the form of art therapy sessions in the home alongside a gift of art materials to use together.

Our participating parent-infant dyads were recruited from a variety of routes. We explained the project and the service offered to local health visiting teams, family nurse teams, early years workers, social workers, and third sector organizations, including a charity working with families facing multiple deprivations, an organization women's support organization, and a charity working with refugees and asylum seekers. These professionals were then able to share information with parents when they or the parent had concerns about their relationship and get consent from parents to pass on their contact details if they were interested in being contacted by us to join. The key criteria for suggesting the project were concerns about the parent-infant relationship whatever the reason for those concerns – for example parental mental health difficulties such as post-natal depression or anxiety, previous histories of mental health or trauma, social isolation or lack of support, external stressors such as domestic abuse or high deprivation. The other necessary criteria were that the infant had

to be between zero and three and the parent had to consent to their contact details being passed on to us to get in touch. We are using the term parent, to include parents of either gender as well as other primary caregivers such as kinship or foster carers. We followed up with all potential participants passed on to us.

Once we received a parent's contact details, we phoned to explain more about the project and, if they were happy, to arrange a home visit. At the home visit, we explained the group or control condition, answered any questions, explained the research process, and gained informed consent. We work with both parent and infant and, even though only the parent was able to consent formally at the home visit, it was important to ensure the infant was also giving their "assent" to taking part in the art therapy. We introduced ourselves and explained to infants what to expect even if they couldn't respond, and we checked that they were comfortable in the space and with the different experiences, remaining tuned into their non-verbal communication. This is a natural part of the art therapy process where a primary focus is on recognizing the infant's cues and responding appropriately. At the home visits we also filled in the initial measures. Parents and infants in the intervention group then joined 12 weeks of art therapy sessions after which they repeated the measures. Parents and infants in the control condition were revisited 12 weeks later where we repeated the measures and then they were offered a home-based art therapy session.

### 3.1.2 | Model of parent-infant art therapy group intervention

The Art at the Start model of parent-infant art therapy intervention was developed through a service evaluation (Armstrong & Howatson, 2015) and then two pilot groups trialing the methods to be used in this larger study (Armstrong et al., 2019). The parent-infant art therapy groups have around eight parent-infant dyads and for this study we ran six groups in total. The groups run in a private space within an arts center or in a community space to reach areas geographically too far away. At request from two of the 3rd sector organizations we ran a group in their venues to increase accessibility for their families (after the art therapy group ended, we brought them into the gallery to connect them to that public gallery space for the future). The spaces are all safe for infants and set up with plastic on the floor and comfortable mats, so everyone is working down at baby level, an area with a play mat and toys for infants to take a break from art making, a table with snacks, and an area with changing facilities and bathtubs.

The group is run by a qualified art therapist together with a co-facilitator. Sessions last an hour and a half, with

a loose structure with an emphasis on following the needs of the infants. Parents and infants arrive and settle in with snacks, and the art therapist informally checks in with them as they arrive. The group then come together in the room for the art therapist to introduce the session, highlight the art materials available and reflect on the previous week before the art making time begins. Art materials are all taste safe and graspable for very young children, for example, giant egg-shaped chinks or non-toxic water-based paints, or paints made from fruits and other foodstuffs. The art making is a joint endeavor for parent and infant together. The art process is central to the therapeutic goals, with the joint making helping to draw the dyads together into interactions with a shared focus of engagement.

The art therapist is focused on supporting their shared engagement and using the new art experiences as a vehicle to build their communication and the parent's attunement and responsiveness. Exploring new materials together gives opportunities to draw parents attention to cues from babies and encourage parents to reflect back how their infant may be feeling and offer responses. The therapist provides containment, both in practical terms by holding the boundaries of the sessions and in psychological terms by helping to manage difficult emotions that arise. The art therapist may need to scaffold interactions for an infant if a parent is not managing at that time, while redirecting toward positive dyadic interactions. The art therapist will help to highlight moments of nice interaction in the relationships.

Dyads come to an end of the making in their own time and then infants are offered baths and towels. Once all the dyads are complete the group are encouraged to reflect on the art works made, how the session has been for the infants, and share any ideas for the next week. The ending of the group in week twelve is also something worked toward and planned for with groups choosing their own ways to mark this.

### 3.1.3 | Measures

The study collected standardized self-report measures of wellbeing and attachment alongside a range of demographic controls. Parental wellbeing was measured using the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS, Tennant et al., 2007). The WEMWBS has been validated for use with adults and shown to have high content validity and internal reliability (Cronbach's alpha .89–.91) (Tennant et al., 2007). This measure uses a 14-item questionnaire scaled with 5 response categories from "all of the time" to "none of the time." Statements are all framed positively and cover the functional aspects of wellbeing, "I've been thinking clearly" and the emotional

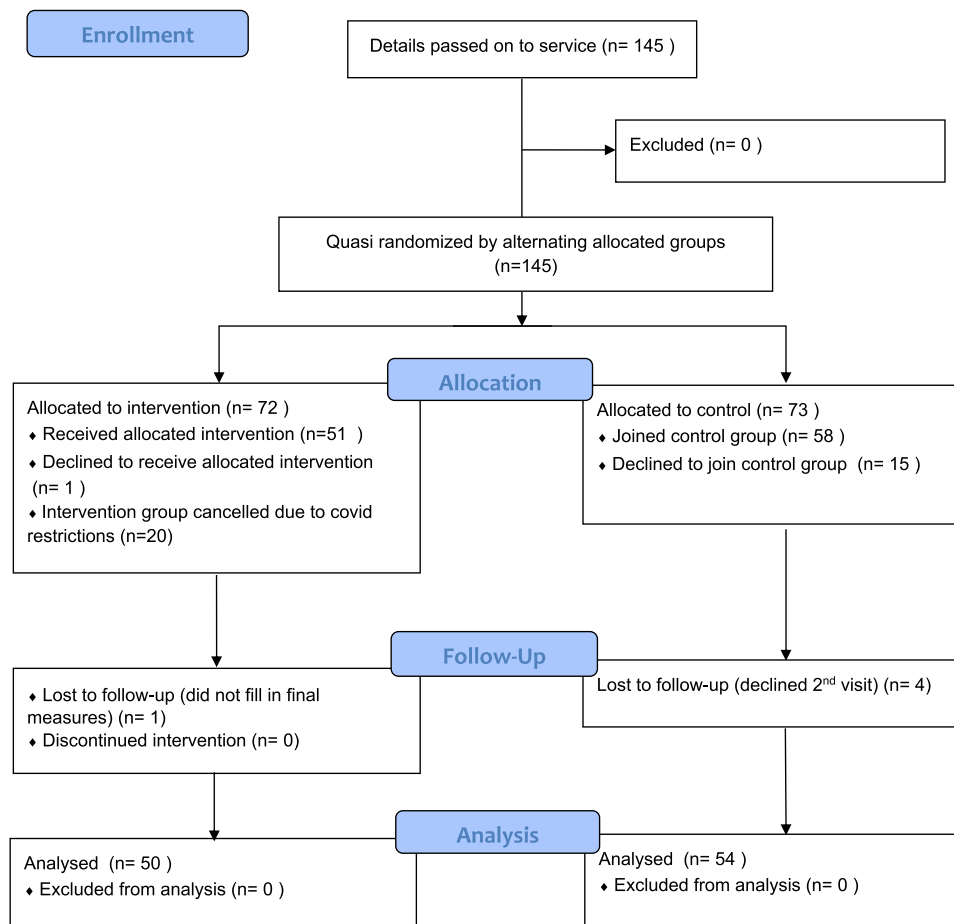
aspect of wellbeing, "I've been feeling loved." Total scores can range from 14 to 70 with higher scores being more positive. Forty is recommended as a cut-off for clinical concern.

The Mother Object Relations Scale, short form (MORS-SF, Oates et al., 2018) is used as a measure of how the parent perceives their attachment relationship by capturing the mental representation that the parent has of their child's feelings for them. It has been validated as a measure of mothers' internal working models of their infants with several alternative scales and across different cultural populations and has high internal reliability (Cronbach's alpha .73–.79 for warmth, .71–.81 for intrusion) (Oates et al., 2018; Simkiss et al., 2013). There are 14 statements for parents to scale in six categories from "Never" to "Always." The statements in MORS-SF are framed as seven positive statements, "my baby likes me," and seven negative statements, "my baby dominates me." The positive statements are calculated together to give a measure of "warmth" and the negative statements give a measure of "intrusion" to capture both aspects within the relationship. Scores in each can range from 0 to 35. A score below 22 for warmth may indicate concern while a score above 12 for intrusion may indicate concern. MORS-SF is recommended by the Royal College of Psychiatrists as a routine outcome measure in perinatal psychiatry, and by the Increased Access to Psychological Therapies Under-Fives (IAPT-U5s) programme. The authors suggest that it reduces inaccuracy caused by social desirability effects as the focus of questions is on the infant rather than the parent.

Demographics collected were parents age in years and infants age in months, the birth order of the infant, and the families' deprivation level, calculated using their post-code in the Scottish Index of Multiple Deprivations (SIMD, 2020). We also used an Infant Toddler Temperament Tool (IT3, Centre for Early Childhood Mental Health Consultation, n.d.) which measures the "goodness of fit" between parent and infant. There are 9 categories of temperament, such as approachability and persistence, and the parent rates themselves and their infant as high or low in each of these. They can score from 0 to 9, where 9 indicates they were matched on all aspects of temperament. This was used to check the demographic match between the groups.

### 3.1.4 | Sample

Data were collected between January 2019 and March 2020 (see Figure 1 for flow diagram of process). Of 52 dyads allocated to the intervention condition, 1 declined to take part. There was no dropout during the intervention, but one parent did not complete the final measures, so her data has been excluded. This left 50 dyads with art therapy intervention. Of 73 dyads allocated to the control condition, 15



**FIGURE 1** CONSORT flow diagram showing the progress of all participants through the trial (CONSORT, 2010, <http://www.consort-statement.org/>).

declined to take part and 4 dropped out before we collected post measures leaving 55 control dyads. (n.b. There is a higher number of allocations to the control condition due to two intervention groups, due to commence, needing to be cancelled with the onset of covid restrictions).

Of the 105 dyads in the project, all the parents were mothers, with three who were not the birth mother (kinship carer, foster carer, and adoptive parent). In the intervention sample, 18 referrals came from health (36%), 29 from the 3rd sector (58%), and 3 were self-referred (6%). In the control sample 32 came from health (58%), 21 from the 3rd sector (38%) and 2 were self-referrals (4%). The mothers had a mean age of 30.87 years (SD 7.37) and the infants ages ranged from 3 to 36 months with a mean age of 16.71 months (SD 9.57).

### 3.2 | Results for match between samples

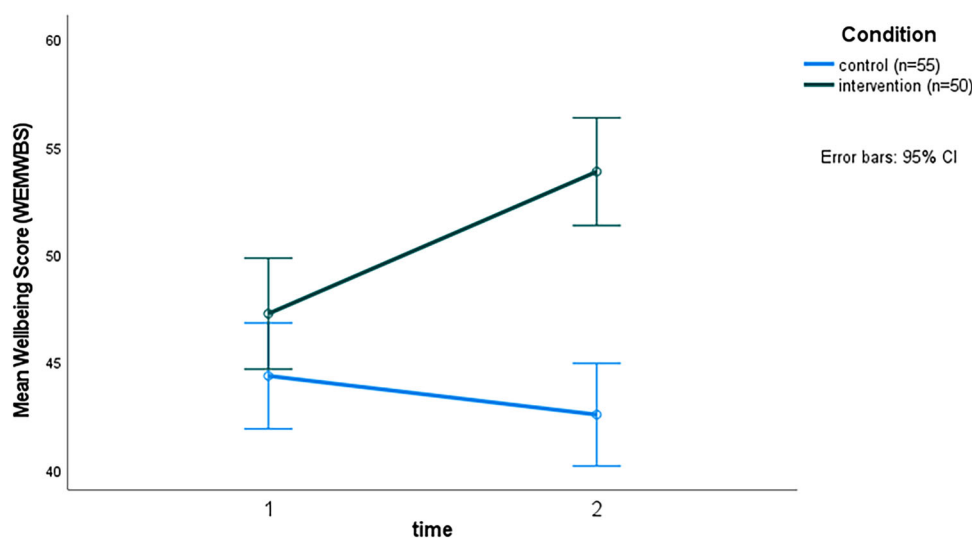
A multivariate ANOVA was conducted to check that the two samples were matched on a range of control mea-

asures – parent age, infants age, similarity of temperament between parent and infant (IT3, Centre for Early Childhood Mental Health Consultation, n.d.) and deprivation level (using postcode data to link to the Scottish Index of Multiple Deprivations, SIMD, 2020). A Kruskal–Wallis test was used to check the samples were matched on infant birth order and a Chi-square test to check they were matched on infant gender. The descriptive statistics and results for each variable are shown in Table 1. As shown in Table 1, the two groups were also matched on their scores for our time 1 measures, with multivariate analysis confirming no significant baseline differences between the samples for wellbeing, warmth, or intrusion. The only demographic variable showing significant variance between groups was parent age; this is likely traceable to the intervention group containing three non-birth parents who were aged between 50 and 55 years. Given this difference, the main analyses were repeated without these parents (see [Supplementary materials](#)). There was no change in the overall pattern of results when excluding these parents, and so whole group results are reported here.

**TABLE 1** Statistical comparison of intervention and control groups on baseline demographic and evaluation measures.

Demographic	Mean (SD) or distribution		Statistical comparison
	Control	Intervention	
Parent age (years)	29.04(5.97)	32.84 (8.24)	$F(1.104) = 7.35, p = .008^*$
Infant age (months)	16.22 (7.48)	17.24 (11.50)	$F(1.104) = .29, p = .591$
Temperament match	5.79 (1.67)	5.14 (2.10)	$F(1.104) = .17, p = .681$
SIMD	4.57 (3.14)	4.46 (2.93)	$F(1.104) = .37, p = .849$
Birth order	35 1st, 15 2nd, 5 3rd	29 1st, 17 2nd, 2 3rd, 2 4th	$\chi^2(3) = 3.71, p = .295$
Infant gender	28 m, 27 f	25 m, 25 f	$\chi^2(1) = .09, p = .926$
Evaluation			
Wellbeing at time 1	44.33 (9.24)	47.22 (9.15)	$F(1.104) = 2.59, p = .111$
Warmth at time 1	25.36 (5.63)	25.40 (7.50)	$F(1.104) = .38, p = .541$
Intrusion at time 1	14.40 (4.33)	14.98 (5.36)	$F(1.104) = .001, p = .978$

\* $p < .05$ .

**FIGURE 2** Mean scores for Wellbeing for control and intervention group at time 1 and time 2 (from a maximum score of 70).

### 3.3 | Main results

Mixed level ANOVAs were conducted with pre- and post-test scores for each of the three variables (wellbeing, warmth, and intrusion) as within subject variables, and groups (control vs. intervention) as a between subject factor.

#### 3.3.1 | Wellbeing

There was a significant main effect for time on wellbeing scores,  $F(1.104) = 36.12, p < .001, \eta_p^2 = .26$ , as well as a significant interaction between intervention group and time,  $F(1.104) = 110.61, p < .001, \eta_p^2 = .52$ . Figure 2 shows that

wellbeing increased for parents in the intervention condition over time, whereas wellbeing decreased for parents in the control condition.

Simple main effects comparisons on wellbeing over time 1 and time 2 confirmed that these changes were significant for both groups. The control group had a significant decrease in scores, with a moderate effect size –  $F(1.54) = 17.79, p < .001, \eta_p^2 = .25$ , and the intervention group had a significant increase in scores with a large effect size –  $F(1.49) = 90.44, p < .001, \eta_p^2 = .65$ .

#### 3.3.2 | Warmth

There was a significant main effect for time on warmth scores,  $F(1.104) = 24.07, p < .001, \eta_p^2 = .19$ , as well as a



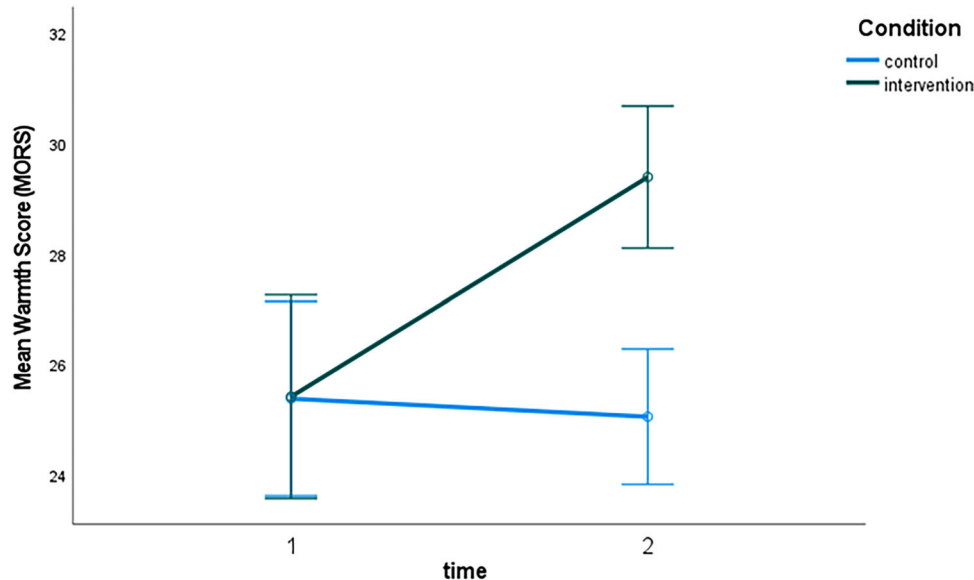


FIGURE 3 Mean scores for Warmth for control and intervention group at time 1 and time 2 (from a maximum score of 35)

significant interaction effect between intervention group and time,  $F(1.104) = 33.48$ ,  $p < .001$ ,  $\eta_p^2 = .25$ .

Comparisons for the simple main effects on warmth over time 1 and time 2 showed that the control group had no significant change in warmth ( $p = .25$ ), while the intervention group had a significant increase in warmth scores with a large effect size –  $F(1.49) = 30.73$ ,  $p < .001$ ,  $\eta_p^2 = .38$  (Figure 3).

### 3.3.3 | Intrusion

There was a significant main effect for time on intrusion scores,  $F(1.104) = 9.79$ ,  $p = .002$ ,  $\eta_p^2 = .09$ , as well as a significant interaction effect between intervention group and time,  $F(1.104) = 62.24$ ,  $p < .001$ ,  $\eta_p^2 = .38$ .

Comparisons for the simple main effects on intrusion over time 1 and time 2 showed that the control group had significant increase in intrusion scores with a moderate effect size –  $F(1.54) = 22.11$ ,  $p < .001$ ,  $\eta_p^2 = .29$  – while the intervention group had a significant decrease in intrusion scores with a large effect size –  $F(1.49) = 38.40$ ,  $p < .001$ ,  $\eta_p^2 = .43$  (Figure 4).

## 3.4 | Part one discussion

In this controlled trial the participants across the two conditions were well matched on the baseline for our standardized measures as well as several demographic controls. We found that there were no initial differences in wellbeing between conditions but there was statisti-

cally significant change between the start and end of 12-week period for both groups. For the intervention group there was a statistically significant increase in wellbeing, whereas for the control group there was a statistically significant drop. This meant that there was a significant difference in the wellbeing of the 2 groups at the 12-week follow-up. We are also able to consider whether this change is clinically relevant as the WEMWBS has a cut-off score of 40 to indicate clinically low wellbeing. In the intervention condition 12 parents (24% of the sample) had notably low wellbeing before the intervention and only 2 (4%) afterwards. In the control condition 17 parents (30.91% of the sample) were below the cut-off before the intervention, increasing to 25 (45.45%) afterwards. This shows that without support, it is not just that wellbeing does not improve, we actually see a concerning increase in those experiencing clinically low wellbeing. This is likely to impact on the infant forming a secure relationship, as well as the obvious negative impact to the mental health of the parent.

In terms of the parents' perception of attachment warmth, there were again no baseline differences between conditions at the start of the intervention, but for the art therapy participants there had been a statistically significant increase in perceived attachment warmth by the end of the intervention. The control condition saw no change, meaning that the attachment warmth of the intervention group was significantly higher than that of the control group at follow-up. If we use a cut-off where level of warmth is considered to be clinically troubling (22) we can see that in practice this translates to 15 parents in each condition who had concerning low attachment warmth at the outset (30% of the intervention sample and 27.27% of the

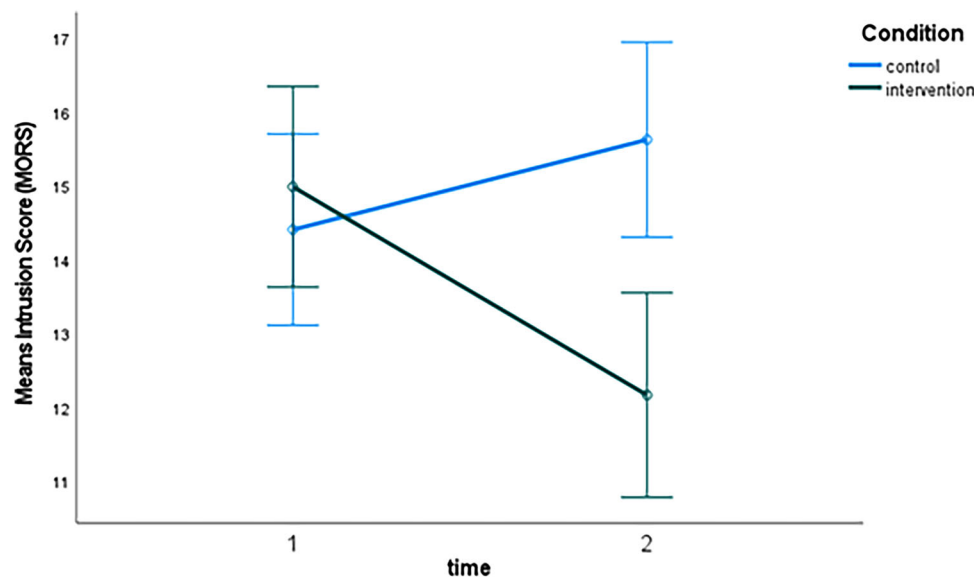


FIGURE 4 Mean scores for Intrusion for control and intervention group at time 1 and time 2 (from a maximum score of 35)

control sample). However, by the end of the 12 weeks, only one parent (2%) in the art therapy condition scored below the clinical cut-off for attachment warmth, whereas there was no change with the parents in the control condition and 15 (27.27%) remained of clinical concern.

Similarly, there were no initial differences between the groups on how intrusive their perception of their infant was. However, there was a significant decrease in intrusion levels for parents in the intervention condition, and a significant increase for the control condition, meaning that by 12 week follow-up the level of intrusion was significantly different between the groups. As you might expect given our inclusion criteria, there were relatively high baseline rates of intrusion, with 35 parents (70% of the sample) in the art therapy condition and 38 parents (69.09%) in the control condition reporting negative perceptions of their infant's behavior which would be considered clinically troubling (a score higher than 12). At the end of 12 weeks this had dropped to 21 parents (42%) in the art therapy condition with concerning high intrusion, and increased to 45 parents (81.82%) in the control condition. Given that the control and art therapy groups were matched on a number of factors – parent's age, infant's age, temperament similarity, and deprivation levels – the changes we see over time likely arise from the intervention rather than from any impact from a demographic factor such as the infant's increasing age.

The standardized measures in part 1 of this study capture the parent's perspective and illustrate significant improvement. However, it is important that we include the infant as an equal participant and capture their experiences as we develop potential interventions. Therefore, part two of our

study is focused on capturing the infant's voice and measuring changes that they experienced in their interactions during the art therapy intervention.

## 4 | PART TWO: OBSERVATION TO CAPTURE INFANT EXPERIENCE

### 4.1 | Methods

#### 4.1.1 | Participants

Study two had the same ethical approval from the University of Dundee (SREC – PhD/033). Participants in the observation study were the parent-infant dyads allocated to the art therapy group condition. At the home visit, we explained the filming and parents gave informed consent. They were able to take part in the group but not be part of the filming, although they had to be made aware that they may be in the background of video footage for other dyads. The camera was fixed in the room, and we made parents aware of where this was, so they were also able to physically opt out by positioning themselves out of view and some chose to do this. A total of 37 dyads had footage of sufficient quality for us to include in the observation analysis, this is 74% of the total 50 dyads who took part in the art therapy groups. All 37 dyads were female. 18 had been referred through health (49%), 16 through the 3rd sector (43%), and 3 self-referrals (8%). The mean age was 34.65 with a range from 16 to 55 (a kinship carer and foster carer resulting in this higher top end of ages than expected). 10 parents lived in areas in the highest quintile in the

country for deprivation, with the mean rating for SIMD being 5. Infants ages ranged from 2 to 36 months with a mean age of 16.11 months.

#### 4.1.2 | Measure

Given that the infant is non-verbal, capturing change in their experiences is best done through close observation. As we know that attachment is built upon observable behaviors between parent and infant, video footage can be used to analyze how the infant experiences the interactions within their main attachment relationship and any changes over the course of the art therapy intervention. In our piloting of this approach (Armstrong et al., 2019) we considered pre-existing observation tools, but wanted to avoid using a screening tool which could be seen as making judgments, and risk alienating the parents we were seeking to support. Instead, we sought to focus on measuring the volume of specific behaviors being observed to get a high level of concrete detail. We also needed to teach our tool to research assistants for this stage of the project, so the high paywall for many tools was restrictive. Looking to the developmental psychology research we know that there are recognized communicative behaviors and reciprocal exchanges on which the quality of parent-infant attachment is premised (Bigelow et al., 2010; Feldman, 2007b; Isabella & Belsky, 1991; Rutter & Durkin, 1987). Our tool looks for these building blocks of attachment in the different behavioral channels of synchronous communication and connection being offered by the parent to the infant – Touch, Proximity, Shared Goals, Emotional Presentation, Connection, Language, Responsiveness, and Boundaries. For each channel we considered three kinds of experiences: positive experiences for the infant of warm, empathetic, and playful interactions; experiences of flat or absent behaviors, where opportunities for communication and connection were missed; and experiences of negative behaviors, where the infant was rejected or treated harshly (see Table 2). We used Open-source Behavioral Observation Research Interactive Software (BORIS, Friard & Gamba, 2016) which allowed us to analyze each clip, coding each channel of communication frame by frame. We used video footage made during the art therapy sessions described in study one.

#### 4.1.3 | Coding

Ten-minute clips of each dyad were used from a session at the beginning and a session at the end of the intervention (we used week 11 as week 12 was atypical given the endings

taking place) giving 74 clips in total. We used a 10-min section of footage during the art making time and, as much as was possible, where the parent and infant were interacting independently as opposed to being guided by the art therapist. The BORIS software was used to go through the clip taking each channel of communication one at a time, rating whether that channel was happening in a positive dimension, whether it was flat or absent, or whether it was happening in a negative dimension. This gave us the amount of time infants were spending in the different dimensions across each channel during their interactions. Coders could also record if they were not able to see/hear to code. We adjusted the final timings pro-rata to exclude any time when they were unable to code it.

Clips were analyzed by five research assistants who had been taught the coding system and worked through practice clips. Coders were blinded to the order of the clips to avoid any bias inherent in being aware of the hypothesis. There were difficulties with aspects of some clips, especially language as the sound quality made it difficult to hear and English was not always the first language of the coders.

#### 4.1.4 | Reliability

We conducted inter-rater reliability on 74 clips which were each coded by two coders from our selection of 5. This dictated that we use a two-way random-effects model (Koo & Li, 2016), and we tested for consistency. ICC values of less than .5, between .5 and .75, between .75 and .9, and greater than .90 are indicative of poor, moderate, good, and excellent reliability, respectively.

As can be seen in Table 3 the results for reliability were generally strong with good or excellent interpretations of the ICC. There were two channels of communication which were problematic. The first was language where the negative category was not reliable. Although the other categories were reliable, we had also had difficulty with coders struggling to hear the tapes and so this channel was excluded from the final analysis. The boundaries channel receiving only a moderate score in the positive category. This is likely to be due to the very low volume of time coded in the boundaries channel, given the safe and relaxed setting of the groups. It also connects to the difficulty with language as often boundaries were given verbally. Consideration was given to removing boundaries as a channel however, though not important in every dyad's interaction, when it was absent or when risk was being created it was an identifiable concern therefore important to capture. Caution can be used in interpreting those results given these concerns about how reliable the measure was for boundaries.

TABLE 2 Descriptors of categories for observational coding.

Positive experiences	Flat or absent experiences	Negative experiences
<b>Touch</b>		
Pleasurable	Flat	Unpleasant
Soothing, cuddling, comfortable, comforting	Passive, flat, touching but not engaged	Rough, not welcomed, inhibiting
<b>Proximity</b>		
Seeks	Flat	Rejecting/Intrusive
Moving closer to other or staying in close contact	Passive, not moving closer, remain far apart	Approaches in threatening manner or actively moves further away
<b>Goals</b>		
Joint	Solitary	Intrusive/Inhibiting
Shared goal, or infant's goal recognized and supported	Pursuing own goals in isolation	Parents goal overrides infants or prevents infant from pursuing goal
<b>Emotional presentation</b>		
Positive	Flat	Negative
Happy, excited, interested	Little affect shown, blank expression	Angry, fearful, disgusted, upset
<b>Connection</b>		
Seeks	Absent	Rejecting/Intrusive
Speaks to, listens, makes eye contact, shows joint attention	Not focused on other	Looks or turns away, won't make eye contact, or speaks over, forces eye contact
<b>Language</b>		
Positive	Absent	Negative
Verbal affection, praise, warmth, validation, or giving the infant verbal support	Praise or talking missing where needed or talking to baby but flat, not engaged	Critical/mocking language, hostile, abrupt, verbally abusive. Or talking negatively about infant to others
<b>Responsiveness</b>		
Attuned	Unattuned	Unresponsive/Rejecting
Recognizes & regulates infant's emotional need. Or recognizes & engages with positive emotion	Doesn't recognize there is a need or misinterprets it	Rejects others emotional need, does the opposite, teases
<b>Boundaries</b>		
Appropriate	Not offered	Inappropriate
Recognizes social/safety problem and attempts to regulate behavior or keep safe	Doesn't recognize problem or no boundaries are put in place	Dangerous, creates/escalates problem. Or boundary is given as punitive or punishing

## 4.2 | Observation results

Figure 5 shows the average duration of positive, flat absent and negative behaviors experienced at time 1, on their first week of the intervention, and time 2, on week eleven of the intervention, collapsed across communication channels. Repeated measures ANOVA was conducted to look at the effect of time for each behavior category. There was a large main effect for time on duration of positive behaviors,  $F(1.36) = 192.88$ ,  $p < .001$ ,  $\eta_p^2 = .84$ , which increased across time 1 to 2. There was also a moderate significant main effect for time on the duration of flat or absent behaviors,  $F(1.36) = 110.97$ ,  $p < .001$ ,  $\eta_p^2 = .76$ , which decreased across times 1 and 2. Finally, there a small significant main effect for time on duration of negative behaviors,  $F(1.36) =$

$22.75$ ,  $p < .001$ ,  $\eta_p^2 = .39$ , which decreased across times 1 and 2.

We can look at the breakdown of behaviors within the 7 channels at T1 and T2. These results are shown in Figure 6. For all channels the duration of time in the positive dimension increased, and the time spent in flat/absent or negative dimensions decreased, though not all of these results when broken down into channel are significant. Figure 6 highlights the direction of change for each channel and significant channels are indicated. Given multiple comparisons, Benjamini-Hochberg corrections were used to correct false discovery rate. All but the changes reported for negative and flat responsiveness remained significant.

It is also possible to look at the predominant mode of behavior which infants were experiencing at each time

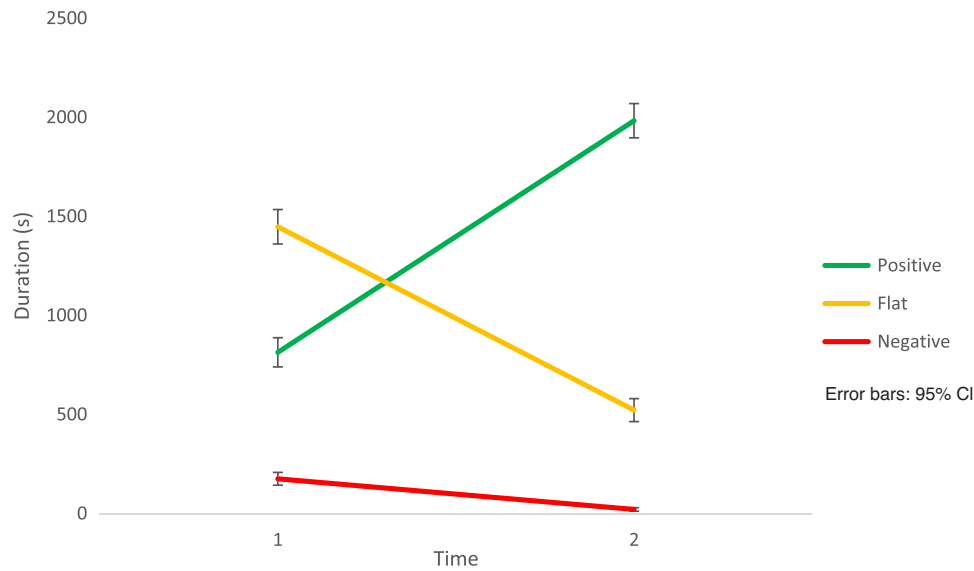


FIGURE 5 Mean duration of time spent in positive, flat, and negatively rated behaviors at T1 and T2

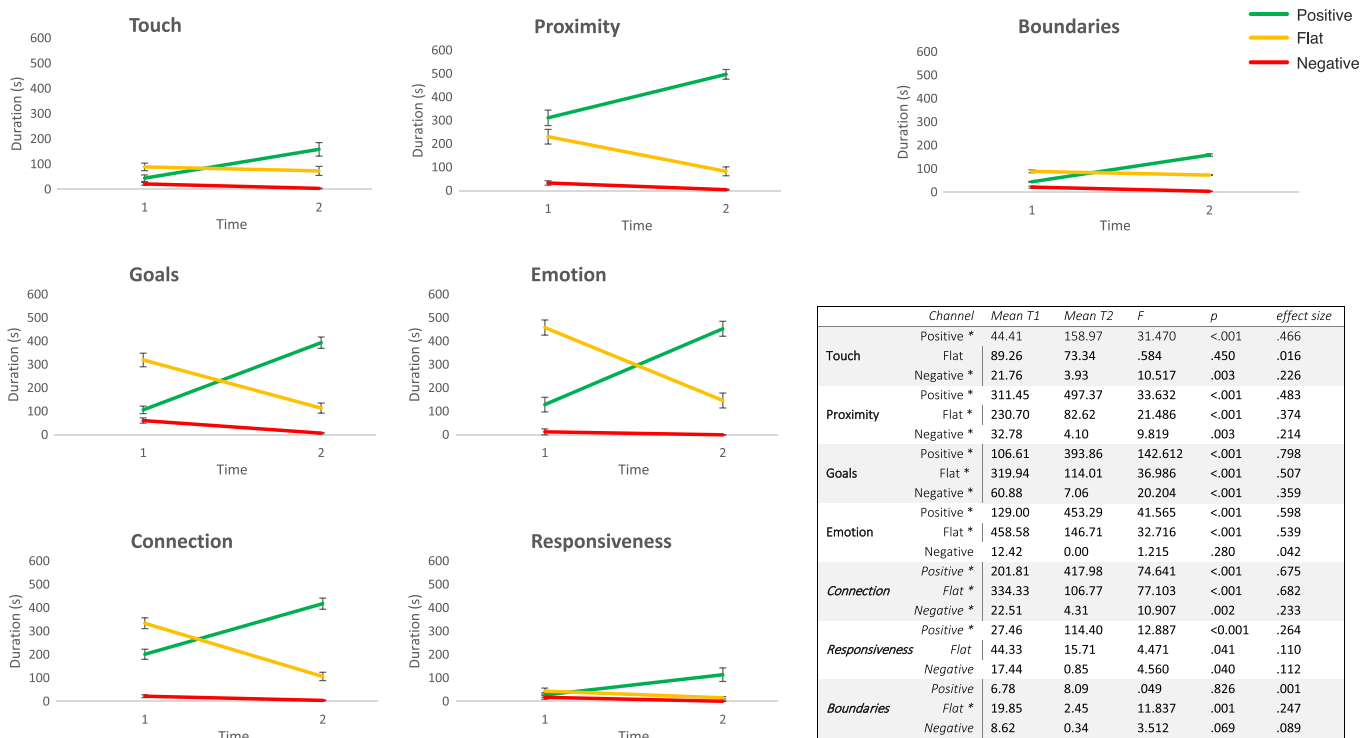


FIGURE 6 Results for observation measures of each channel of behavior (\* significant results)

point. Table 4 highlights the predominant behavior that the infant was experiencing in each channel at T1 and T2. At the start of the intervention, we see that infants were spending the longest duration of their time experiencing “flat” parenting, where behaviors may be absent, passive, or solitary so that there was little opportunity for

them to become involved in positive synchronous interactions. Only proximity was most predominant in its positive dimension which may suggest that while parents were physically present, they were emotionally less available, as represented by the other remaining channels. The predominant behavior at T2, shows that the infants experiences

**TABLE 3** Results for inter-rater reliability on a sample of 74 clips.

	ICC (95% confidence interval)	F	p	Rating
<b>Touch</b>				
Positive	.986 (.977–.991)	69.03	<.0001	Excellent
Flat	.811 (.700–.881)	5.30	<.001	Good
Negative	.912 (.860–.944)	11.31	<.0001	Good
<b>Proximity</b>				
Positive	.911 (.858–.944)	11.22	<.0001	Excellent
Flat	.916 (.867–.947)	11.97	<.0001	Excellent
Negative	.926 (.882–.953)	13.45	<.0001	Excellent
<b>Goals</b>				
Positive	.962 (.940–.976)	26.35	<.0001	Excellent
Flat	.949 (.918–.968)	19.44	<.0001	Excellent
Negative	.940 (.904–.962)	16.54	<.0001	Excellent
<b>Emotion</b>				
Positive	.971 (.952–.983)	34.82	<.0001	Excellent
Flat	.971 (.951–.983)	34.14	<.0001	Excellent
Negative	.958 (.929–.975)	23.60	<.0001	Excellent
<b>Connect</b>				
Positive	.921 (.875–.950)	12.70	<.0001	Excellent
Flat	.920 (.872–.949)	12.44	<.0001	Excellent
Negative	.772 (.638–.857)	4.39	<.001	Good
<b>Language</b>				
Positive	.834 (.609–.930)	6.03	<.001	Good
Flat	.832 (.604–.929)	5.96	<.001	Good
Negative	.278 (–.703 to .694)	1.39	.226	Poor
<b>Responsiveness</b>				
Positive	.841 (.747–.900)	6.28	<.001	Good
Flat	.852 (.765–.907)	6.76	<.001	Good
Negative	.762 (.622–.850)	4.21	<.001	Good
<b>Boundaries</b>				
Positive	.540 (.270–.710)	2.18	<.001	Moderate
Flat	.727 (.566–.828)	3.66	<.001	Good
Negative	.936 (.898–.960)	15.56	<.0001	Good

were fundamentally different at the end of the intervention. Across all the channels of communication infants spent the majority of their time experiencing positive behaviors from their parent. Repeated measures ANOVA confirmed that the total duration spent in each category of behavior varied significantly, such that flat behaviors were dominant at time 1  $F(2, 72) = 61.30, p < .001, \eta_p^2 = .63$ , and positive behaviors were dominant at time 2,  $F(2, 72) = 217.28, p < .001, \eta_p^2 = .86$  (for means and standard error refer to Figure 6). All paired comparisons were  $p < .001$ .

### 4.3 | Part two discussion

The second part of our study captured changes in the infant's experience of their parent from the beginning of the art therapy intervention to the end. We were able to trial our observation tool with sufficient inter-rater reliability to find meaningful results. Results show that the infants' experiences of their caregivers were significantly different by the end of the art therapy intervention. Overall positive behaviors had significantly increased, flat/absent behaviors had significantly decreased. The volume of overtly negative behavior in the safe and public space of the groups was low at the outset, but nonetheless significantly decreased across the course of the intervention. This increase in infants experiencing positive interactions was observable to some extent across all of our modes of communication with positive behaviors becoming the most dominant by the end of the intervention. The result for boundaries needs read with some caution though as this channel did not prove reliable in the positive category due to the low volume of occurrences.

As this observation measure did not have a control sample it is possible that some of the effect comes from changes in parenting style as the infants increase in age. However, our measure was designed to include different ways that the channels of communicative behaviors may be expressed at different stages – for example responsiveness to the younger baby may include more regulation whereas in an older baby may include increasing amounts of responding to displays of positive emotion, and the tool captures both of these. Therefore, the impact of the babies increasing age should have a minimal impact on the results.

We would argue that we are seeing an increase in the behavioral building blocks of positive attachment for these infants following the art therapy intervention. If infants are experiencing their caregiver as engaged and responsive, whilst receiving positive communication such as gentle touch then they will have more opportunities to develop into synchronous interactions and these “conversations” allow them to experience themselves as a valuable playmate.

### 4.4 | Overall discussion

Measures for both parts of our study saw significant improvements for the parent-infant dyads attending art therapy. The standardized measures from part one showed that there was significant improvement to the parent's wellbeing and relationship perception associated with the

TABLE 4 Predominant behaviors (highlighted) at T1 and T2.

Predominant behavior at T1			Predominant behavior at T2		
Touch			Touch		
Pleasurable	Flat	Unpleasant	Pleasurable	Flat	Unpleasant
Proximity			Proximity		
Seeks	Flat	Rejecting/Intrusive	Seeks	Flat	Rejecting/Intrusive
Goals			Goals		
Joint	Solitary	Intrusive/Inhibiting	Joint	Solitary	Intrusive/Inhibiting
Emotional presentation			Emotional presentation		
Positive	Flat	Negative	Positive	Flat	Negative
Connection			Connection		
Seeks	Absent	Rejecting/Intrusive	Seeks	Absent	Rejecting/Intrusive
Responsiveness			Responsiveness		
Attuned	Unattuned	Unresponsive/Rejecting	Attuned	Unattuned	Unresponsive/Rejecting
Boundaries			Boundaries		
Appropriate	Not offered	Inappropriate	Appropriate	Not offered	Inappropriate

art therapy intervention condition. Conversely, parents in the control condition showed significant decreases in wellbeing, no change to their warmth, and a significant increase in their feelings of intrusion. These findings indicate that without support being put in place parental wellbeing and relationship to their infant may become more concerning – relationships in our sample did not improve over time alone without help, and in some measures we saw a decline. MORS measurements of warmth for the control group did not change over time (though many remained concerningly low) but the levels of intrusion increased significantly. This may suggest that while the dimension of warmth is one which is maintained at its existing level despite adversity whereas, as stressors increase over time, the parent finds that their infant is increasingly making demands upon them that they find difficult to meet, and they are experienced as intrusive. All three of these measures highlight concerning risks to early attachment relationships, so it is promising to see that all three showed significant improvement after parents were supported with art therapy. This is likely to improve outcomes for parent and child as we know that parental mental health (Atkinson et al., 2000) and how they view their infant (Ammaniti, 1991; Meins et al., 2001) are strongly linked to the attachment outcomes for the infant.

In part two of our study, the development and reliability testing of our observation tool, showed it to be reliable across all categories except language (which could potentially also be reliable if more of the sound was functional). Using this novel observational tool to look in more detail at behavioral changes during the art therapy intervention, we found that infants in the art therapy group experienced

an increase in positive behaviors across all channels of communication. These significant increases in the time which they spent receiving positive communication from their caregiver were accompanied by significant decreases in the time they spent where the channels of communication were flat or absent, and a decrease in the time they experienced they experienced negative communication. This implies that infants' experiences of interactions within their primary attachment relationship changed for the better over the course of the intervention.

As this is a novel tool it may be useful to think about what potential our observation measure has for future use. The fact that all categories showed the same pattern of change across time prompts the possibility that it could be simplified down to a smaller number of categories which are signifiers of the whole and would save time in coding. As positive behaviors increase where other behaviors decrease, we could also explore whether the tool would work as a measure of change using only the positive dimensions. As well as simplifying the process of coding, this may also make the tool feel more acceptable to parents and take another step away from it feeling critical. A measure of increasing time spent in positive relational behaviors could be a useful addition. We are also aware that this tool was only possible because we had the luxury of time and research assistants, as well as parents who generously allowed us to record them. For art therapists (or others working with parents and infants to offer support) this would not be practical to use for evaluation. For those reasons, the next step is to develop this tool into one which is simple to apply as a practitioner to help capture change for infants and keep their voice central within service evaluation and development.

It was a strength of this study that an adequate sample size was achieved, despite the pandemic reducing the number of groups that could be run. The study had the largest numbers within the field so far and was the first to have a control group. It was a limitation that randomization was not possible in our context, but there was an excellent balance between the groups achieved, suggesting major residual confounding is unlikely. Though the groups were open to recruitment of caregivers of all genders, it was all mothers who participated and so it may require additional investigation with a gender balanced sample, although this would be challenging to achieve given the balance of primary caregivers. It is a potential limitation that there are multiple aspects to the intervention which may be beneficial, for example, it was group-based therapy so the positive effects may be due to the group setting and interaction with other caregivers as well as to the dyads own process. However, this aspect is inherent within the model of art therapy intervention being proposed. As with any psychotherapy intervention there may be multiple mechanisms of change, such as the materials themselves, the impetus to go out, the group process and the relationship to the therapist. These mechanisms could benefit from qualitative exploration, which we have undertaken in subsequent phases of the research (Armstrong & Ross, 2023).

Without follow-up beyond the art therapy group to look at quality of attachment we can't say that this has had a long-lasting effect, but if we can expect that changes observed over the duration of the therapy are continued then the opportunity to build secure attachments is there. In further research with this same sample of parents and infants, we are taking a qualitative approach and following up with parents to learn more about their participation in the group and what they have noticed since. It is this kind of exploration which is needed to help explain these positive results. Currently, we can draw on the literature from art therapy to help us explain this positive change. The art therapy group may have offered dyads a safe space in which they could experiment with different ways of relating together (Arroyo & Fowler, 2013) while the materials facilitate play and communication (Hall, 2008) and can be presented to draw dyads into engagement (Armstrong & Howatson, 2015; Proulx, 2002). Research has highlighted the importance of early play for development (Ginsburg, 2007; Walker et al., 2022) and how synchronous playful interactions are associated with secure attachments (Bureau et al., 2014). The materials in themselves are tactile, but they also necessitate tactile physical contact between parent and infant. Art therapists have highlighted the importance of this touch (Bruce, 2020), and we saw the large increase in positive touch in our own results. The art

process may also support attuned responses as caregivers notice their babies interests or as they learn to respond within the art itself (Armstrong & Ross, 2022; Hosea, 2017; Lavey-khan & Reddick, 2020). Improvements to parent's wellbeing may be facilitated by the support offered by the art therapist (Hosea, 2006) but also from social support of the other group members (Arroyo & Fowler, 2013).

Art therapy may also be more acceptable to parents than some other forms of intervention. Goodman's research (2009) into the barriers to accessing support, found caregivers reporting a preference for treatment in a non-mental health setting so basing this art therapy intervention in the gallery may have helped to make sessions feel more accessible, something we heard anecdotally from parents. There is also evidence of this in our demographics looking at the Scottish Index of Multiple Deprivations, where we see that 42 of our 105 participants (40%) were living in the most deprived 20% of the country showing the interventions success in reaching those who sometimes struggle to access services. The introduction to art making with their child, as well as to the arts venue where sessions took place, may have a lasting impact to the families' access to arts more generally. We could think of this form of intervention as one which has "transferable skills" such as an increased confidence with art, activity ideas to use again together, as well as a sense of ownership of the gallery as a public space. Given that we know art making and access to cultural spaces can have positive effects on wellbeing across the lifespan (Fancourt & Finn, 2019; Jensen & Bonde, 2018; Mak & Fancourt, 2019) this would be interesting to explore further in future studies. In undertaking an art therapy intervention within a gallery space, we have been able to bring together the fields of infant mental health and in arts and health to offer a successful intervention with the potential to impact upon the attachments and wellbeing of vulnerable parents and infants. Importantly, we provide the first robust evidence to confirm that group-based art therapy is clinically and statistically effective in supporting early infant-caregiver relationships.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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