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# Effects of the Attachment Video-feedback Intervention (AVI) on parents and children at risk of maltreatment during the COVID-19 pandemic

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## ARTICLE INFO

### Keywords:

COVID-19  
Child maltreatment  
Attachment intervention  
Emotional availability  
Parental reflective functioning  
Household chaos

## ABSTRACT

**Background:** The global health crisis caused by the COVID-19 pandemic has led to an increase in situations of risk of child abuse and neglect.

**Objective:** The objective of this study was to examine whether the Attachment Video-feedback Intervention (AVI) program can improve protective factors (decrease parental stress and household chaos, increase parent-child emotional availability and parental reflective functioning) that may diminish child maltreatment in a group of families at risk for child abuse and neglect during the COVID-19 pandemic.

**Participants and setting:** The sample consisted of 41 children aged between 0 and 5 years ( $M_{\text{age}} = 35.36$  months,  $SD = 14.65$ ; 85.4 % boys) and their parents ( $M_{\text{age}} = 35.44$ ,  $SD = 6.04$ ; 75.6 % mothers).

**Methods:** The study design incorporated two randomized groups (Intervention group: AVI; Control group: treatment as usual) with pre- and post-test evaluations.

**Results:** In comparison to the control group, parents and children exposed to the AVI showed increases in emotional availability. Parents in the AVI group also presented increases in certainty regarding their child's mental states and reported lower levels of household chaos compared to those of the control group.

**Conclusions:** The AVI program is a valuable intervention for increasing protective factors in families at risk of child abuse and neglect in times of crisis.

## 1. Introduction

As stated in a recent report published by the [Council of Europe \(2022\)](#), and summarized in various studies (e.g., [Herrenkohl et al., 2021](#); [Vermeulen et al., 2022](#)), the COVID-19 pandemic has led to increases in physical, psychological and sexual violence against

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<https://doi.org/10.1016/j.chiabu.2023.106121>

Received 25 October 2022; Received in revised form 9 February 2023; Accepted 19 February 2023

Available online 24 February 2023

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children. The Council of Europe's report also highlighted how the pandemic has made Child Protection systems vulnerable in this time of crisis (Council of Europe, 2022). In fact, Child Protection Services (CPS) of many countries presented significant limitations in detecting and responding swiftly to cases of child abuse and neglect (Bhatia et al., 2021; Katz et al., 2022). Therefore, during the pandemic, the use of effective interventions to support families receiving child welfare services was more than critical. The main objective of the current study was to examine whether the Attachment Video-feedback Intervention (AVI; Moss et al., 2018) helped increase protective factors in families at risk of child abuse and neglect during the COVID-19 pandemic.

### 1.1. The AVI: an attachment-based intervention for preventing risk of child maltreatment

According to the World Health Organization's INSPIRE technical package (World Health Organization, 2018), a strategic evidence-based action to tackle the risks of child abuse and neglect would be to promote intervention programs that are implemented within the family home and designed to support caregivers. Several studies have conducted comprehensive evaluations of home visiting or parenting programs and have shown their effectiveness in preventing and reducing child maltreatment and its developmental consequences (Chen & Chan, 2016; Gubbels et al., 2021 for a meta-analytic review). In particular, Gubbels et al.'s (2021) meta-analyses on the effects of home visiting programs for preventing the risk of maltreatment or reducing the number of child maltreatment cases revealed that programs improving parenting in general ( $d = 0.31$ ), targeting parental responsiveness or sensitivity ( $d = 0.24$ ), or using video-feedback techniques ( $d = 0.40$ ) yielded significantly larger effects than those without these components ( $d$ s between 0.06 and 0.12).

One of the home visiting interventions initially designed to improve parent-child interactions of families reported for child maltreatment, incorporating parental sensitivity as a target and using video-feedback techniques, is the AVI (Moss et al., 2018). The AVI is an attachment-based intervention program that targets parental behaviors, especially parental sensitivity, as a means to optimize child development, in particular child attachment security. Parental behaviors and child development are considered primary outcomes of the AVI. Prior to the COVID-19 pandemic, the AVI was administered to maltreating parents and their children between 0 and 7 years old. It has been shown to increase child attachment security, improve cognitive and motor development, and decrease internalizing and externalizing symptoms (for older children of the sample) and attachment disorganization (Dubois-Comtois et al., 2017; Moss et al., 2011). The AVI has also been shown to improve the overall quality of parent-child interaction and parental sensitivity in these families (Cyr et al., 2020; Dubois-Comtois et al., 2017; Moss et al., 2011; Van der Asdonk et al., 2020).

Despite these improvements in the parent-child interaction (as a broad construct) and parental sensitivity, there is a need to better understand the effects of the AVI on various dimensions of the parent-child relationship. The construct of emotional availability (EA; Biringer, 2008), which stems from attachment theory (Ainsworth et al., 1978) and emotional availability perspectives (Emde, 1980; Mahler et al., 1975), is a dyadic, comprehensive construct that focuses on several key dimensions of both parent and child as two partners of one dyadic emotional system. High EA is characterized by sensitive, positive structuring (i.e., the ability to properly organize the child's activities), non-hostile, and non-intrusive parental behavior, as well as by child responsiveness to the parent's proposals and willingness to engage the parent in shared activities (Biringer, 2008). Results of studies conducted with families of children under 5 years of age have found that mothers with a history of childhood abuse exhibit lower levels of emotional availability and have children who are less responsive (Fuchs et al., 2015; Kluczniok et al., 2016). Until now, no studies have tested whether the AVI can increase all dimensions of emotional availability.

Another key factor that has been associated with adaptive parenting is parental reflective functioning (Luyten et al., 2020). Parental reflective functioning refers to the caregiver's ability to reflect on their own emotions, motivations, and actions, while being able to recognize their child's mental states and understand their responses to those mental states (Slade, 2005). Parents who are curious about their child's mental states are better equipped to understand child behaviors in stressful situations and to show acceptance, empathy, and emotional availability, all of which have been associated with a secure attachment relationship (Nijssens et al., 2018). However, parents with a history of childhood trauma are less likely to show a genuine interest in their child's (under 5 years old) mental states and more likely to inadequately interpret their child's inner world and make malicious and maladaptive attributions about their child's behavior (Condon et al., 2022; Moser et al., 2019). These impaired reflective skills have been associated with lower parental sensitivity in mothers of children under 5 years of age from a community sample (Stacks et al., 2014) or exposed to interpersonal violence (Suardi et al., 2020). In these two studies, impairments in parental reflective functioning were also associated with child emotion dysregulation and attachment insecurity (Stacks et al., 2014; Suardi et al., 2020). Similarly, impairments in parental reflective functioning have been associated with lower social-emotional competence in children under 5 years of age (Nijssens et al., 2020) and more externalizing problems in sexually abused children aged 7–12 years (Ensink et al., 2016). Therefore, improving parental reflective functioning in parents is relevant, especially for those at risk of child abuse and neglect. Efficacy of mentalizing-based therapies, such as Minding the Baby® (MTB), in improving reflective capacities among high-risk mothers has been established in several studies (e.g., Slade et al., 2019), although a recent study has failed to find such results (Condon et al., 2022). Considering that MTB is a long-term home visiting program, it is not clear if a short-term, home visiting attachment intervention would also be effective in improving parental reflective functioning.

The efficacy of the AVI on parental reflective functioning has not been tested thus far, though it has been examined on other child welfare or parent variables, representing broader, secondary objectives of the AVI intervention. For example, in one study, Dubois-Comtois et al. (2017) found that the AVI had no effect on self-reports of parental stress in a sample of neglected children under the age of 5. In contrast, they found in a second study that the AVI prevented an increase in parental stress in high socioeconomic-risk foster parents compared to those in the control group (Dubois-Comtois et al., 2011). For uninvolved, neglecting parents (the first study), the AVI may have increased the demands on their parenting, thus maintaining their stress level. However, for committed high

socioeconomic-risk parents (the second study), the AVI can help them cope with burdens associated with the parental role. Two other studies have examined AVI effects on variables related to children's trajectory within Child Protection Services. The first study found fewer child placements for families who were exposed to the AVI in comparison to those who received regular child protective services (Tarabulsky et al., 2019). The second study assessed the efficacy of the AVI for reducing re-reports of maltreatment in the year following the end of intervention, but results were inconclusive (Cyr et al., 2020). In this study, families in the control group received enhanced services that may have led to a lack of results. In summary, AVI effects on variables related to parents or to children's trajectory within Child Protection Services are mixed. In particular, intervention studies with the preventative aim of increasing protective factors in diverse populations prior to alleged maltreatment, could be relevant to disentangle these mixed results.

1.2. The COVID-19 pandemic: effects on parenting

The increase in parental stress has been one of the most notable effects of the unprecedented global crisis associated with COVID-19 (Calvano et al., 2022; Giannotti et al., 2022). The measures adopted to contain the pandemic have led society to drastically modify family dynamics and support systems, both formal (i.e., school, childcare and leisure activities) and informal (i.e., extended family and social support). The emotional toll associated with the challenge of dealing with an unknown, worrisome, and highly transmissible disease was a major source of stress (Feinberg et al., 2022). Uncertainty of the future of the pandemic, the pressures of confinement, and the many imposed restrictions (need for social distancing, wearing masks, etc.) were additional challenges for families.

Decreases in parental reflective functioning were observed during the COVID-19 pandemic, which could be attributed to child-rearing difficulties and increases in parenting stress (Yatziv et al., 2022). Greater COVID-19 related stressors and high anxiety and depressive symptoms have also been associated with higher parental stress during COVID-19 (Brown et al., 2020). Results of a community-based study with data collected during the pandemic showed that greater parental exhaustion was related to parental reports of more severe and repeated instances of violent behaviors towards children during COVID-19 (Perron-Tremblay et al., 2022). This finding is in line with that of Brown et al. (2020) who showed that the burdens of COVID-19 (financial needs and parents' mental health issues) were associated with a higher potential for child abuse. In addition, greater parental stress was related to more anger towards children (Johnson et al., 2021), and greater household chaos was associated with hostile parenting and more problematic parent-child interactions during the pandemic (Cassinat et al., 2021; Daks et al., 2022; Dubois-Comtois et al., 2021). Hence, higher parental stress and household chaos are likely to have increased the risk of child abuse and neglect during the pandemic. Given that the COVID-19 pandemic has put an additional burden on families and isolated many of them, it is of utmost importance to assess the efficacy of parent-child interventions, such as the AVI, on certain parents and family factors, namely reflective functioning, parental stress and household chaos, in this specific context. Fig. 1 illustrates the factors that are directly and indirectly targeted by the AVI.

During the COVID-19 pandemic, many intervention services targeting at-risk families suffered disruptions (Council of Europe, 2022). However, a few research groups studying attachment-based intervention programs similar to the AVI were able to test their impact during the pandemic. The Attachment and Biobehavioral Catch-up (ABC) program, a well-known evidence attachment-based intervention with at-risk and maltreating parents and their children aged 6 to 48 months (e.g., Dozier & Bernard, 2017), was implemented using telehealth and hybrid (in-person and telehealth) formats during the pandemic by Schein et al. (2022). Researchers found that parents of both intervention formats showed improved parental sensitivity, although the effect sizes were low to moderate for the telehealth procedure and moderate to large for the hybrid procedure. Effect sizes for the hybrid procedure are similar to those

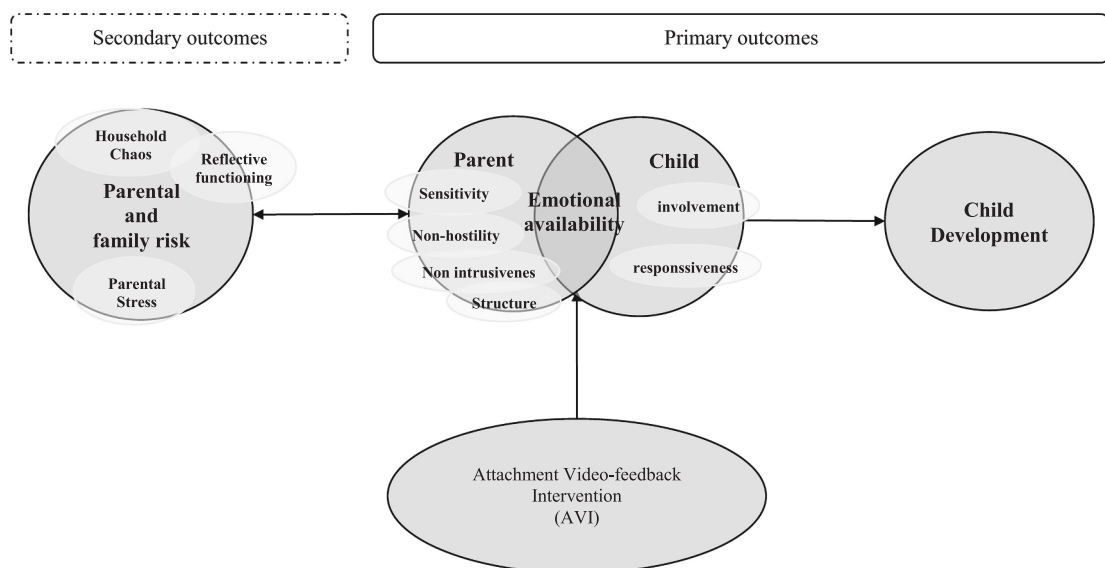


Fig. 1. Direct and indirect effects of the AVI on parental and family risk, parent-child interactions and child development.

found in studies conducted before the pandemic (Schein et al., 2022). These results are valuable because they suggest that attachment-based interventions, and the use of some in-person sessions, are useful programs for families with young children during times of crisis. However, the study by Schein et al. (2022) only reported results on parental sensitivity (following the lead, intrusiveness, positive regard). Hence, little is known about the efficacy of attachment-based interventions during the pandemic on other parental and family characteristics that are risk factors for child maltreatment.

### 1.3. Study objectives

The objective of this study is to examine if the AVI program, administered during the COVID-19 pandemic, increases parent and child emotional availability as well as parent and family protective factors, such as whether it may increase parental reflective functioning, lower parental stress, and lower levels of household chaos in families at risk for child abuse and neglect. Using a randomized control trial, we hypothesized that parents and children exposed to the AVI would show more protective factors at the end of the intervention than those in the control group, who received standard child protective services.

## 2. Method

### 2.1. Participants

The sample comprised 41 children aged between 0 and 5 years ( $M_{\text{age}} = 35.36$  months,  $SD = 14.65$ ; 85.4 % boys) and their parents as primary caregivers ( $M_{\text{age}} = 35.44$  years,  $SD = 6.04$ ; 75.6 % mothers). Nearly half (46.34 %) of the families were native Spanish, whereas 53.66 % were immigrant families (48.78 % were of Latin American origin and 4.88 % were African). All the families were at risk for child abuse and neglect as detected by the CPS of the City Council of Donostia-San Sebastián, Spain. The study inclusion criteria were child aged between 0 and 5 years and living with at least one of the biological parents, as the primary caregiver. The exclusion criteria were previous participation in a parent-child intervention program aimed at the promotion of parenting skills, and serious medical or developmental problems. Families were recruited from June 2020 to January 2022. Table 1 shows the sociodemographic characteristics of the participants. There were no significant differences between families assigned randomly to the intervention or control groups on sociodemographic variables, with the exception of family type. More single parents were found in the control group (Cramer's  $V = 0.38$ ,  $p = .01$ ).

**Table 1**  
Participants' sociodemographic characteristics.

	Total sample (N = 41)		AVI group (n = 24)		Control group (n = 17)		t-Test
	M	SD	M	SD	M	SD	
Parent age (years)	35.4	6.0	36.4	5.2	34.2	7.0	0.82
Child age (months)	35.4	14.6	37.0	13.9	33.1	15.8	1.15

	Total sample (N = 41)		AVI group (n = 24)		Control group (n = 17)		Chi-square
	n	%	n	%	n	%	
Child sex							
Boy	35	85.4	22	91.7	13	76.5	1.84
Girl	6	14.6	2	8.3	4	23.5	
Number of children							
1	17	41.5	9	37.5	8	47.1	0.38
≥2	24	58.5	15	62.5	9	52.9	
Child's sibling birth order							
1	28	68.3	16	66.7	12	70.6	0.07
≥2	13	31.7	8	33.3	5	29.4	
Type of household							
Two-parent	28	68.3	20	83.3	8	47.1	6.05*
Single parent	13	31.7	4	16.7	9	52.9	
Parents' education							
No high school diploma	6	14.6	4	16.7	2	11.8	1.06
High-school diploma	24	58.6	14	58.3	10	58.8	
Higher education	11	26.8	6	25.0	5	29.4	
Occupational status							
Employed	24	58.5	15	62.5	9	52.9	0.8
Unemployed	17	41.5	9	37.5	8	47.1	
Receiving social benefits							
Yes	19	46.3	11	45.8	8	47.1	0.01
No	22	53.7	13	54.2	9	52.9	

\*  $p = .01$ .

## 2.2. Instruments

### 2.2.1. Socio-Demographic Questionnaire at pre-test

Parents completed a questionnaire on demographic information (e.g., parental education, child age).

### 2.2.2. Parenting Stress Index-Short Form at pre-test and post-test (PSI-SF, Abidin, 1995; Spanish translation by Díaz-Herrero et al., 2010)

Parents completed the PSI-SF. It evaluates the stress experienced in the parenting role, according to three dimensions: 1) parents' characteristics, 2) children's behavioral traits, and 3) difficulties in the parent-child relationship. It consists of 36 items (e.g., "Child makes demands on me") that parents answer on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). It generates scores on three subscales (one for each dimension) and a global score of Total Stress. This last score was used in the present study. Higher scores indicate higher levels of parental stress. Scores are considered to have clinical significance when they are equal to or >80. In the study sample, the internal consistency of the Total Stress scale was  $\alpha = 0.84$ .

### 2.2.3. Confusion, Hubbub, and Order Scale at pre-test and post-test (CHAOS, Matheny et al., 1995; Spanish translation by Sánchez-Mondragón & Flores Herrera, 2019)

Parents completed the CHAOS questionnaire, which measures environmental chaos in the home, that is, the lack of family routines and weekly structure, and the high levels of noise, home disorganization and overcrowding (Matheny et al., 1995). It consists of 15 items (e.g., "The atmosphere in our home is calm"), which parents answer on a Likert-type scale ranging from 1 (very similar to my home) to 4 (nothing like my home). A total chaos score (range 15–60) is obtained by summing the scores, with higher scores representing more chaotic and less organized features of the home. In the present study, the internal consistency of the scale was  $\alpha = 0.75$ .

### 2.2.4. Parental Reflective Functioning Questionnaire at pre-test and post-test (PRFQ, Luyten et al., 2017; Spanish translation by Gordo et al., 2020)

The PRFQ assesses parents' ability to recognize their children's mental states and to explain and make sense of their behavior in terms of thoughts, wishes, and expectations. The PRFQ consists of 18 items evaluating three key dimensions of parental reflective function: Prementalization (PM), which refers to parents' inclination to use non-mentalizing states in their relationship with their children (e.g., "My child cries around strangers to embarrass me"); Certainty in Mental States (CMS), which includes items related to the parents' identification of their children's mental states (e.g., "I always know what my child wants"); Interest and Curiosity (IC), which assesses parents' genuine interest and/or curiosity about their children's mental states (e.g., "I try to see situations through the eyes of my child"). Items are rated on a Likert scale ranging from 1 = "Strongly disagree" to 7 = "Strongly agree". In the present study, the internal consistency of the PM scale was low  $\alpha = 0.36$ , so it was excluded and not examined in further analyses. Internal consistency values for the CMS ( $\alpha = 0.69$ ) and IC scales ( $\alpha = 0.75$ ) were adequate and used in the analyses.

### 2.2.5. The Emotional Availability Scales at pre-test and post-test (EA scales, Biringen, 2008)

The EA scales are an observational measure that assesses the child-caregiver relationship quality on the basis of four caregiver dimensions (sensitivity, structure, non-intrusiveness, and non-hostility), and two child dimensions (involvement and responsiveness). Behaviors for each dimension were coded on a 7-point scale (1 = low, 7 = high) from a filmed parent-child free-play situation. Dyads were provided with play material adapted to the child's age and were instructed to interact as they would normally for 15–20 min. Two members of the research team received training in the coding of the EA scales from the developer of the EA system. In this training, they achieved at least 80 % agreement with the expert on the cases that were submitted for evaluation by the trainer. For reliability on cases of the current sample, each coder independently coded half of the cases at pre-test and post-test. This procedure ensured that the scores included in the analyses at pre-test and post-test were not from the same coder. Then, because the sample is small, each coder coded independently all other cases in order to establish interrater reliability using all the study participants. The mean intraclass correlation coefficient was 0.85 for the pretest (ranging between 0.75 and 0.96) and 0.83 for the posttest (ranging between 0.74 and 0.97). Difficult to assess cases were resolved by consensus. The EA system has been widely used with families at risk of maltreatment (Fuchs et al., 2015; Stack et al., 2012).

## 2.3. Ethical considerations

The study was approved by the Research Ethics Committee on Human Beings of the University of the Basque Country (approval code: act 116/2019). Informed consent documentation was signed by the parents and the professionals who implemented the intervention.

## 2.4. Procedure

Eligible families meeting the research criteria were identified by CPS ( $n = 53$ ), who asked whether parents wished to be contacted by our research team. The research team contacted the CPS of the Donostia-San Sebastián City Council to plan the administration of the AVI with families who presented a risk of child abuse and neglect. Consent to participate was then obtained by our research team from the families who agreed. One week before starting treatment, parents completed questionnaires and participated in a free-play situation with their child (the pre-test measurements). Then, using block randomization (block size of 4), the families were either assigned to the AVI treatment group or to the waiting list control group. Block randomization is better to balance the allocation of participants to

the groups, especially in small samples (Efird, 2011). The AVI treatment was provided to families during a 3-month window ( $M = 9.17$  weeks,  $SD = 0.59$ ). Families in the control group remained on the waiting list for three months after their pre-test, during which time they received usual services provided by CPS social workers. One week after the 3-month period, parents were re-administered the study questionnaires and the observational free-play task with their child (the post-test measurements). After this post-test, families in the control group received the AVI. All the interventions were carried out during the pandemic (between June 21, 2020 and April 2022) when the state of emergency decreed by the Spanish government in March had been lifted.

Out of the 53 families who met research criteria, the research team excluded two families because they were planning to move to another town before the end of the intervention, and 10 families refused to participate. Subsequently, 41 families started the pre-test and were assigned to one of the two randomized groups (AVI group:  $n = 24$ , Standard CPS group:  $n = 17$ ). With the exception of some missing values on measures of the project, all of the 41 families who started the pre-test also completed pre-test and post-test evaluations. Fig. 2 is a flow diagram of the families' participation throughout the project.

#### 2.4.1. The Attachment Video-feedback Intervention (AVI)

The AVI was conducted in the families' homes. First, a zero session was included to explain the intervention techniques and goals to the families. During this zero session, the practitioners inquired about the parents' history, the family's needs, and the child developmental milestones, and completed a genogram. After the zero session, eight weekly sessions lasting approximately 90 min each were conducted with the parent-child dyad. All eight sessions follow a similar structure. The first part of the session begins with a 20–30-minute thematic discussion; the second part is a video recording of the parent and child interaction (10 min); the third part is a positive video-feedback to the parent on the previous filmed parent-child interaction (20–30 min); and the fourth part is a wrap-up discussion (10–15 min). The thematic discussion revolves around aspects related to child development and parenting. The videotaped interaction includes filming free or semi-structured play or caregiving situations (e.g., bottle-feeding). During the recording, the practitioner usually does not intervene with the parent-child dyad, but may encourage the parent to engage with the child if the parent seeks help or is involved in non-constructive interaction with the child. In the video-feedback phase, the practitioner intentionally stops the video during moments of positive parent-child interaction and highlights to the parent their positive and sensitive behaviors, and the child's related-positive responses or reactions. During video-feedback, parents are also encouraged to share their observations and thoughts about their behaviors and those of their child. Gradually, practitioners may also ask parents to describe and share their thoughts about less positive sequences only to relate these sequences to the parents' growing sensitive behavioral repertoire as a means to increase sensitive reparation of the relationship with the child. Therefore, in addition to enhancing sensitive parenting behavior, the AVI also aims to reduce behaviors that are inappropriate or even frightening for the child in a way that allows practitioners to remain positive with the parent and adhere to the strength-based philosophy of the intervention. Finally, in the wrap-up phase, the progress made is highlighted and caregivers are encouraged to continue similar activities throughout the week.

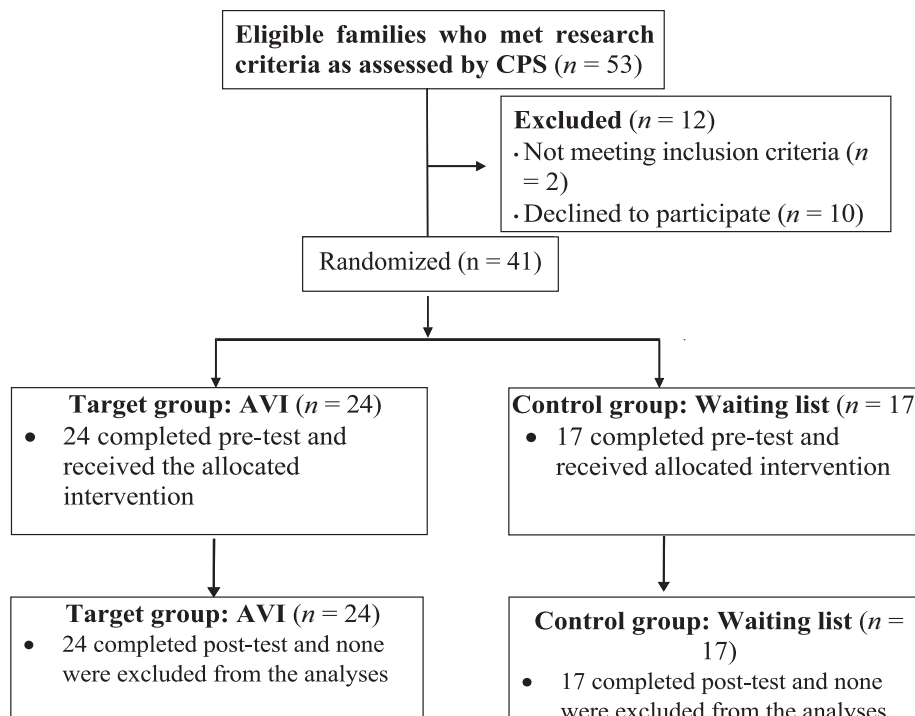


Fig. 2. Flow diagram illustrating randomization into two treatment conditions.



## 2.5. Design and data analysis

Considering the number of families receiving services by CPS of the Donostia-San Sebastián City Council, the research project was developed with the objective of recruiting 70 families (35 per group). The pandemic occurred at the very moment the research began, resulting in a drastic decrease in the number of new CPS cases. In these circumstances, it was only possible to recruit 41 families out of the 53 meeting inclusion criteria. Post-hoc power analyses using G\*Power (Faul et al., 2007) showed that with this number of participants, an alpha of 0.05 and a power of 0.80, medium effect sizes can be detected.

The experimental design incorporated two randomized groups with pre-test and post-test evaluations. First, preliminary correlation analyses were conducted to know whether sociodemographic variables at pre-test, as potential covariates, were associated with dependent variables at post-test. Second, *t*-tests on the pre-test levels of parental stress, household chaos, emotional availability and reflective functioning were conducted to examine whether the AVI and control group were similar at pre-test. Third, main analyses were conducted to test for AVI effects. To determine whether there were differences in levels of parental stress, household chaos, emotional availability, and reflective functioning between the families of the AVI and those of the control group at post-test, an analysis of covariance (ANCOVA) was carried out on each of these dependent variables with their pre-test scores as a covariate.

Due to missing data in the variables of Parental Stress, Household Chaos, Certainty in Mental States, and Interest and Curiosity in Mental States (2.51 % of the total data), multiple imputation (MI) analyses were performed to replace missing values. Data were imputed using the fully conditional specification method of SPSS 27, which relies on an iterative Markov Chain Monte Carlo (MCMC) method. A total of 100 iterations with 25 imputed data sets were specified as recommended in the literature (Enders, 2022). Relevant

**Table 2**

Pooled statistics for parental stress, household chaos, emotional availability, and parental reflective functioning at pre- and post-tests as a function of intervention/control groups.

Variables	Control group <i>n</i> = 17		AVI group <i>n</i> = 24		Effect size for comparison <i>d</i> <sup>c</sup> (CI)
	M <sup>b</sup>	(SE) <sup>b</sup>	M <sup>b</sup>	(SE) <sup>b</sup>	
Parental stress					
Pre-test	76.52	4.20	81.64	3.48	
Post-test <sup>a</sup>	72.69	4.94	71.36	4.25	0.23 (−0.40–0.85)
Household chaos					
Pre-test	29.77	1.43	32.17	1.43	
Post-test <sup>a</sup>	30.59	1.32	26.83	1.20	0.78* (0.14–1.42)
Emotional availability: parent dimensions					
Sensitivity					
Pre-test	4.35	0.23	4.27	0.13	
Post-test <sup>a</sup>	4.43	0.11	4.84	0.09	0.88* (0.23–1.53)
Structuring					
Pre-test	4.26	0.30	4.02	0.20	
Post-test <sup>a</sup>	4.34	0.09	4.71	0.08	0.94* (0.28–1.59)
Non-intrusiveness					
Pre-test	4.26	0.26	3.79	0.11	
Post-test <sup>a</sup>	4.08	0.14	4.55	0.11	0.76* (0.12–1.40)
Non-hostility					
Pre-test	5.12	0.27	4.83	0.17	
Post-test <sup>a</sup>	5.27	0.79	5.19	0.73	0.37 (−0.26–0.99)
Emotional availability: child dimensions					
Involvement					
Pre-test	4.29	0.23	4.21	0.14	
Post-test <sup>a</sup>	4.33	0.11	4.72	0.09	0.88* (0.23–1.53)
Responsiveness					
Pre-test	4.26	0.23	4.21	0.15	
Post-test <sup>a</sup>	4.30	0.10	4.73	0.09	0.98* (0.33–1.64)
Parental reflective functioning					
Certainty in mental states					
Pre-test	3.88	0.24	4.20	0.24	
Post-test <sup>a</sup>	4.13	0.23	4.90	0.22	0.83* (0.18–1.47)
Interest and curiosity					
Pre-test	5.20	0.30	5.53	0.25	
Post-test <sup>a</sup>	5.69	0.26	5.50	0.25	0.20 (−0.42–0.83)

Note. *N* = 41.

<sup>a</sup> Means at post-test are adjusted for pre-test values of the dependent variable and for their respective covariates.

<sup>b</sup> Means and SE are pooled estimates.

<sup>c</sup> Effect sizes *d* were computed from available pooled means and SE.

\* *p* < .05.

covariates were included as predictors to maximize the precision of imputed data. The grouping variable was not used as a predictor. Analyses were run on each imputed data set and results were pooled. Due to unavailable pooling methods in SPSS 27 for estimates of ANCOVAs, we averaged  $F$ s estimates across imputed results. For significance of  $F$  tests, available pooled means and standard errors to compute a  $d$  effect size and a 95 % CI were used (Lipsey & Wilson, 2001).

To test for the robustness of significant findings, analyses were repeated using the Full Information Maximum Likelihood (FIML) estimation method (MPlus, version 8.4; Muthén & Muthén, 1998–2019). In addition, Complete Case (CC) analyses were performed, which exclude participants with any missing data. Results of each scenario were then examined to see if effect sizes converged. Results of the FIML and CC analyses are presented in a supplementary file. To facilitate the comparison of effect sizes, the  $d$  statistic was computed from available estimates of each of the three methods. Overlapping CIs indicate no significant differences in effect sizes across methods.

### 3. Results

#### 3.1. Preliminary analysis

Potential sociodemographic covariates were examined in relation to the dependent variables of the study at post-test. A positive correlation was found between child's sibling birth order and household chaos ( $r = 0.36; p = .04$ ). Type of household was significantly correlated with parental sensitivity ( $r = -0.39; p = .01$ ), structure ( $r = -0.44; p = .003$ ), non-intrusiveness ( $r = -0.33; p = .03$ ), and child involvement ( $r = -0.37; p = .02$ ) and responsiveness ( $r = -0.49; p = .001$ ). A positive correlation was also found between child age and non-intrusiveness ( $r = 0.36; p = .02$ ). Occupational status was significantly correlated with parental sensitivity ( $r = -0.35; p = .03$ ), structure ( $r = -0.33; p = .003$ ) and non-intrusiveness ( $r = -0.39; p = .01$ ). A positive correlation was also found between number of children and parental structure ( $r = 0.33; p = .03$ ). Finally, parent age was significantly correlated with parental structure ( $r = 0.37; p = .02$ ) and child responsiveness ( $r = 0.35; p = .03$ ).

Furthermore, at pre-test, there were no statistically significant differences between the AVI and control groups on dependent variables: parental stress ( $t [39] = -0.922; p = .36; d = 0.29$ ); household chaos ( $t [39] = -1.163; p = .24; d = 0.37$ ); certainty in mental states ( $t [39] = -1.163; p = .35; d = 0.29$ ); interest and curiosity in mental states ( $t [39] = -0.855; p = .39; d = 0.27$ ); parental sensitivity ( $t [39] = 0.328; p = .74; d = 0.10$ ); parental structure ( $t [39] = 0.702; p = .49; d = 0.22$ ); parental non-intrusiveness ( $t [39] = -1.863; p = .07; d = 0.59$ ); parental non-hostility ( $t [39] = 0.932; p = .24; d = 0.36$ ); child involvement ( $t [39] = 0.338; p = .74; d = 0.11$ ); child responsiveness ( $t [39] = 0.218; p = .83; d = 0.37$ ).

Other analyses examined intercorrelations between dependent variables. Parental stress was significantly correlated at pre-test with household chaos ( $r = 0.54; p = .002$ ). A positive correlation was also found between certainty in mental states and interest and curiosity in mental states at pre-test ( $r = 0.40; p = .017$ ). Positive, significant correlations were also found between the dimensions of emotional availability ( $r$ s between 0.64 and 0.85).

#### 3.2. Main analyses

##### 3.2.1. AVI effects on parental stress, household chaos, parental reflective functioning, and emotional availability

Table 2 shows the means and standard errors in Parental Stress, Household Chaos, Emotional Availability, and Parental Reflective Functioning in the two groups, as well as the results of the ANCOVAs and the  $d$  effect sizes for comparisons.

Results of an ANCOVA showed no differences in parental stress between the two groups of parents at post-test ( $F[1, 38] = 0.51, d = 0.23, CI -0.4-0.85$ ). Results on household chaos indicated that parents in the AVI group reported significantly less household chaos than those in the control group at post-test ( $F[1,37] = 6.05; d = 0.78, CI 0.14, 1.42$ ). FIML and CC analyses on household chaos showed similar effect sizes with overlapping CIs (FIML:  $d = 0.84, CI 0.19-1.49$ ; CC:  $d = 0.86, CI 0.16-1.56$ ). Results on the parental reflective functioning scales showed that parents who received the AVI scored significantly higher at post-test on the certainty in mental states scale than parents in the control group ( $F[1,38] = 6.81, d = 0.83, CI 0.18-1.47$ ). FIML and CC analyses showed similar effect sizes with overlapping CIs (FIML:  $d = 0.95, CI 0.29-1.60$ ; CC:  $d = 1.01, CI 0.30-1.72$ ). No differences were observed between the AVI and the control groups on the post-test scores of the interest and curiosity scale ( $F[1,38] = 0.41, d = 0.20, CI -0.42-0.83$ ).

Results on the emotional availability scales showed that compared to parents in the control group at post-test, those in the AVI group were significantly more sensitive ( $F[1,36] = 7.74, d = 0.88, CI 0.23-1.53$ ), structuring ( $F[1,34] = 8.72, d = 0.94, CI 0.28-1.59$ ), and non-intrusive ( $F[1,36] = 5.72, d = 0.76, CI 0.12-1.40$ ). In addition, in comparison to children in the control group at post-test, those in the AVI group were significantly more likely to involve their parent in the interaction ( $F[1,37] = 7.66, d = 0.88, CI 0.23-1.53$ ), and were more responsive towards their parents ( $F[1,34] = 9.59, d = 0.98, CI 0.33-1.64$ ). No differences were observed for the non-hostility parental dimension ( $F[1,38] = 1.37; d = 0.37, CI -0.26-0.99$ ). FIML and CC analyses were not conducted given that there were no missing data on these variables.

### 4. Discussion

The aim of the present study was to examine AVI effects on dyadic emotional availability, parental stress, parental reflective functioning, and household chaos in a group of families at risk of child abuse and neglect during the COVID-19 pandemic. In comparison to the control group, parents exposed to the AVI showed increases in emotional availability and certainty regarding their child's mental states, as well as lower levels of household chaos. However, no differences in parental stress were observed. Children in



the AVI group also presented greater emotional availability in comparison to those in the control group.

The current study did not find any differences in parental stress between the AVI group and the control group at post-test. Parental distress (depressive symptoms, parental stress) increased significantly during the global crisis caused by COVID-19 pandemic (Brown et al., 2020; Feinberg et al., 2022; Giannotti et al., 2022). A possible explanation for this result is that the evolution of the pandemic has been highly disconcerting and unpredictable both for health authorities and for the population in general, and has produced a constant state of psychosocial threat that is unlikely to be neutralized with a parent-child intervention such as the AVI. However, this lack of result is in line with another AVI study conducted prior to the pandemic with families reported for child neglect, that did not find any parental stress reduction (Dubois-Comtois et al., 2017). Other interventions based on video-feedback have also been ineffective in reducing parental stress (e.g., O'Hara et al., 2019 for a systematic review). This lack of effect may be due to the fact that the primary focus of parent-child, video feedback interventions is to enhance parental sensitivity and not to target parental stress. Nevertheless, as suggested by Dubois-Comtois et al. (2017), high-risk parents may also have difficulty seeing that parenting is challenging, involving constant attention to the child's well-being, and consequently, they may be defensive and not report high levels of stress. It is also possible that parents, who are detected by CPS as being at risk of maltreatment, may not want to disclose their stress.

Parents who were exposed to the AVI reported less household chaos than those in the control group at post-test. Thus, the AVI was efficient in helping parents reduce levels of household turmoil and confusion. In light of the link that other studies have found between less household chaos and more parental sensitivity (Andeweg et al., 2021; Dubois-Comtois et al., 2021), this result indicates that in spite of the context of the pandemic, the AVI helped parents with the organization of the family environment: they were able to gain more structured routines in the family and showed less confusion and more predictability in daily activities. Thus, in the same way that the AVI has been shown to increase the organization of children's attachment system through increased parental sensitive behaviors (i. e., warm, predictable, responsive; Moss et al., 2011), the AVI was efficient in improving home organization. This result is of utmost importance given that high levels of household chaos were found to be associated with lower parental sensitivity and greater harsh-intrusive parental behavior, as well as with more child behavior problems and delays in language development (Andeweg et al., 2021; Coldwell et al., 2006; Martin et al., 2012; Mills-Koonce et al., 2016).

Similarly, in comparison to parents and children in the control group, those exposed to the AVI showed an increase in emotional availability from pre- to post-test. This means that parents in the AVI group showed more sensitive behaviors, were more effective in providing guidance and appropriate structuring, and were less intrusive when interacting with their children. Also, children in the AVI group were more involved and responsive to their parents. These results have important implications for families considering that the increased capacity of the child-caregiver dyad to share a healthy emotional relationship is a protective factor against child abuse and neglect (Fuchs et al., 2015; Kluczniok et al., 2016) and is associated with child attachment security and developmental positive outcomes (Biringen et al., 2014). These results are also in line with those of other AVI studies (Cyr et al., 2020; Dubois-Comtois et al., 2017; Moss et al., 2011), which showed increases in parental sensitivity and parent-child interaction quality. However, no group differences were found on the dimension of parental non-hostility. This lack of result may be due to parents' already relatively high scores of non-hostility at pre-test. Parents in our sample may be at greater risk of other problematic behaviors, such as emotional disengagement or withdrawal behavior, as shown in another study with young families referred to Child Protection Services because of substantiated and unsubstantiated reports of maltreatment (Yarger et al., 2020). In this latter study, in which parents showed a fair amount of withdrawal (e.g., no interaction with their child during times of distress, putting their child down too soon when in need of comfort), authors found that parents who received the ABC showed significantly less withdrawal than those in the control group. In our sample, a little more than half of the families were immigrants. It is possible that emotionally disengaged behavior more likely occurs in at-risk, immigrant families, whose migration stressors (e.g., parental distress, lack of social support, trauma history) have been associated with insecure parent-child relationships (Lecompte et al., 2018). Future intervention studies with at-risk families should consider a more thorough examination of parental emotional disengagement as well as whether migration stressors may moderate treatment effects.

As for parental reflective functioning, parents in the AVI group, in comparison to those of the control group, reported higher scores on the certainty in mental states scale at post-test, thus showing a greater ability to recognize their children's mental states. The AVI not only focuses on parents' behaviors during video-feedback, but also encourages them to see and think differently about their own and their child's behaviors and thoughts. It is important to note that despite the increase in parents' mentalization ability, the average score obtained by parents of the intervention group was not at the positive end of the scale, which could indicate a negative pattern of hypermentalization or a tendency to overinterpret mental states, something that has been associated with increased intrusive behavior (for instance, the caregiver assumes they "know" everything about their child's mental states) and greater child attachment insecurity (Luyten et al., 2017).

Contrary to expectations, no differences were found on the scale of interest and curiosity about the children's mental states. This may be due to the characteristics of the sample. For example, the study participants already showed an acceptable interest and curiosity mean score at pre-test. This initial genuine interest in the inner world of their children at pre-test may have limited improvements in parents. It may be that the AVI is more likely to increase interest and curiosity in parents with a greater risk of child maltreatment or who have more limited mentalizing skills. Still, another parent-child intervention study conducted to improve parenting in at-risk families during the COVID-19 pandemic did not find any intervention effects on the interest and curiosity variable (Condon et al., 2021). Therefore, further studies are needed to better understand the results obtained in the present study. Results of the current study suggest that the AVI could benefit from including components specifically targeting parents' interest and curiosity about their children's mental states. This is consistent with the suggestion to include specific components of parental reflective function in video-feedback interventions (Lo & Wong, 2022).

Noteworthy to our study, none of the families who started pre-test dropped out of the project. This may be due to several reasons.

The timing of the research project, at the onset of a pandemic when social contact was limited/prohibited, the fact that more than half of the sample consisted of immigrant families with no social network, and the fact that all families of the control group could receive the AVI once post-test measurements were completed, may explain the retention of families from both the AVI and control groups in our study.

#### 4.1. Strengths, limitations and prospects for future research

This study is among the first to report the effects of an attachment-based intervention administered during the pandemic to a group of families at risk of maltreatment. Moreover, having relied on a randomized control trial design and an observational measure of parent-child interactive quality are important strengths of this study.

This study has limitations. First, the small sample size reduces the statistical power and the ability to generalize the results. Therefore, the conclusions should be considered with caution. Nevertheless, according to a post-hoc power analysis, medium effect sizes can be captured with our sample size, which is consistent with effect sizes obtained in other studies using AVI (see Moss et al., 2018 for an overview). Second, it should also be noted that children who participated in the study were primarily boys (85.4 %) and that parents primarily consisted of mothers (75.6 %). Thus, the results of the study may not be generalized to girls or fathers. Third, with respect to the parental reflective functioning variable, the pre-mentalizing variable could not be used for data analysis due to poor internal consistency. Adequate internal consistency was found for this scale in multiple studies (Gordo et al., 2020; Luyten et al., 2017; Nijssens et al., 2020), although few studies from Finland and Korea have showed poor Cronbach alphas (between 0.45 and 0.51; e.g., Ahrnberg et al., 2022; Lee et al., 2021). It is possible, as stated by Lee and colleagues, that items related to parents' unwillingness to consider their child's thoughts and feelings may be more sensitive to cultural differences. Moreover, Luyten et al. (2017) found that the pre-mentalizing scale was the only one sensitive to contextual characteristics such as parents' education and social isolation. Parents who were less educated and more socially isolated showed higher levels of pre-mentalizing modes. Given that 73.17 % of parents in our sample had a high school degree or less and that 53.66 % were immigrants with no extended family available, it is possible that these contextual characteristics affected their capacity to adequately reflect on items evoking pre-mentalizing modes. For these reasons, future studies should consider using an observational measure, such as the Parent Development Interview (PDI; Slade et al., 2004), instead of a self-report measure to assess parental reflective functioning. Finally, it should be noted that the study was carried out in Spain and that the sample was heterogenous with respect to participants' origins with a little less than half of the sample being native Spanish families and more than half of the sample (53.66 %) being immigrant families (of Latin American and African origins). Because of the small sample size, analyses could not be performed to test if intervention effects were moderated by this factor. Therefore, future studies are needed to determine whether results vary according to immigration status.

#### 4.2. Conclusion

The current study shows that the Attachment Video-feedback Intervention (AVI) can increase protective factors, such as parent and child emotional availability, household functioning, and parental reflective functioning in families detected for risk of child abuse and neglect during the COVID-19 pandemic. Therefore, the AVI should be considered by Child Protection systems. This approach is in line with the Strategy for the Rights of the Child 2022–2027 put forth by the Council of Europe (2022), whose primary objective is to empower Child Protection systems to provide optimal care for children and to promote the proper resourcing of Child Protection systems to successfully address the challenges of the future.

#### Funding statement

This research was funded by a grant from the Basque Government (IT1450-22). Financial support was also given by the Canada Research Chairs program to Chantal Cyr.

#### Ethics approval statement

The study was approved by the Ethics Committee for Research on Human Beings of the University of the Basque Country (approval code: act 116/2019). Informed consent documentation was signed by the families and professionals who implemented the intervention.

#### Conflict of interest

No conflict of interest to declare.

#### Data availability

Data available on request due to privacy/ethical restrictions.

## Acknowledgements

The authors thank John Black and Michael Maudsley for their assistance with the article. We thank the participating families as well as the practitioners and the directors Pilar Ibaceta and Edurne Agirrezabala of the Child Protection Services for their valuable involvement in the project.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chiabu.2023.106121>.

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