

# Randomized Control Trial of Video-Feedback Intervention to Promote Positive Parenting in Lima, Peru: A Pilot Study\*

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This randomized pilot study explored the viability and effectiveness of the Video-feedback Intervention to Promote Positive Parenting and Sensitive Discipline (VIPPSD) for improving sensitivity in a group of 14 mothers of lower and upper socioeconomic status in Lima, Peru. Maternal sensitivity was assessed using the Maternal Behaviour Q-Set 3.1, based on the observation of one hour of free interactions at home. The effectiveness of the intervention was calculated on the basis of the difference between pre- and post-intervention sensitivity scores. Overall, we found no significant differences between the intervention group and the control group; however, when participants were sorted based on their pre-intervention sensitivity levels, low-sensitivity mothers who participated in the VIPPSD program showed a significant improve in global sensitivity and in the *Sensitive vs. Insensitive* and *Disengaged* profiles, compared to low-sensitivity mothers in the control group. These findings are an initial contribution to establishing the viability and effectiveness of the VIPPSD for the improvement of maternal sensitivity, especially for groups of low-sensitivity mothers in situations of greater psychosocial vulnerability.

*Keywords:* maternal sensitivity, video-feedback intervention to promote positive parenting, randomized control trial, intervention program

Bowlby proposed that a children's secure attachment bond to their caregivers facilitates the exploration and management of the environment (Grossmann, Grossmann, Kindler, & Zimmermann, 2008) and is the key foundation of a person's development (Bowlby, 1988).

Similarly, attachment theory posits that attachment security is determined in large measure by the caregiver's sensitivity—this is to say, by the caregiver's ability to detect, interpret, and respond promptly and adequately to the child's physical and emotional needs (Ainsworth, 1969; 1989; Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1976; 1980; 1988; Waters & Cummings, 2000).

The association between attachment security and caregiver's sensitivity has been abundantly confirmed by research in a variety of contexts, including Peru (Atkinson, Niccols, Paglia, Coolbear, Parker, Poulton, Guger,

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\* **Acknowledgments:** The authors thank the Centre for Child and Family Studies, Leiden University, especially Claudia Werner and Marinus Van IJzendoorn for their support with the VIPPSD training process. The authors also acknowledge the financial support received from Pontificia Universidad Católica del Perú. We also thank the families for their participation.

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& Sitarenios, 2000; Behrens, Parker, & Haltigan, 2011; De Wolff & Van IJzendoorn, 1997; Nóblega, Bárrig, Conde, Nuñez del Prado, Carbonell, Altmann ... Bauer, 2016; Nievar & Becker, 2008; Posada, Carbonell, Alzate, & Plata, 2004; Posada, Jacobs, Carbonell, Alzate, Bustamante, & Arenas, 1999; Posada, Jacobs, Richmond, Carbonell, Alzate, Bustamante, & Quiceno, 2002; Posada, Trumbell, Nóblega, Plata, Peña, & Carbonell, 2016; Ravala, Goldberga, Atkinson, Benoit, Myhala, Poultonc, & Zwiersa, 2001; Sroufe, 2005; Tarabulsky, Bernier, Provost, Maranda, Larose, Moss, Larose, & Tessier, 2005).

In turn, caregiver's sensitivity is associated with positive results in other areas, such as a child's social-emotional development, awareness, and language development, as well as with the amelioration or absence of behavioural problems (Deater-Deckard, 2000; De Wolff & Van IJzendoorn, 1997; Kochanska, 2002; Tamis-LeMonda, Bornstein, & Baumwell 2001; Van Zeijl, Mesman, Stolk, Alink, Van IJzendoorn, Bakermans-Kranenburg, Juffer, & Koot, 2006).

These studies identified a caregivers' sensitivity as an important locus of intervention for the improvement of many aspects of child development (Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2003). This is why in recent years a line of research have been devoted to the design and assessment of intervention programs based on attachment theory (Berlin, Ziv, Amaya-Jackson, & Greenberg, 2005).

The evidence from these studies has shown interventions with focalized and short-term objectives to be more effective (Bakermans-Kranenburg et al., 2003; Juffer, Struis, Werner, & Bakermans-Kranenburg, 2017). Programs that focus on caregivers' behaviour have similarly been found to produce better results (Bakermans-Kranenburg, Juffer, & Van IJzendoorn, 1995; Fukkink, 2008; Juffer et al., 2017; Kalinauskiene, Cekuoliene, Van IJzendoorn, Bakermans-Kranenburg, Juffer, & Kusakovskaja, 2009; Klein, Bakermans-Kranenburg, Juffer, & Van IJzendoorn, 2006), as have interventions using video-based feedback techniques (Bakermans-Kranenburg et al., 2003; Kalinauskiene et al., 2009; Klein et al., 2006).

The Video-feedback Intervention to Promote Positive Parenting and Sensitive Discipline (VIPP-SD) features the three characteristics mentioned above (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2008). The program has been applied in a variety of contexts, such as The Netherlands, Italy, Portugal, Turkey, and Lithuania (Alsankac-Akbulut, Sahin-Acar, & Sumer, 2017; Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2014; Juffer et al., 2017; Nazzari, Casonato, & Frigeiro, 2017; Negrao, Pereira, Soares, & Mesman, 2014; Yagmur, Mesman, Malda, Bakermans-Kranenburg, & Ekmekci, 2014). Its results include, among others, the enhancement of parental sensitivity and sensitive discipline (Van Zeijl et al., 2006; Yagmur et al., 2014) as well as a lessening of intrusiveness (Alsankac-Akbulut et al., 2017), maternal inflexibility and lassitude (Nazzari et al., 2017), and externalizing problems in children (Bakermans-Kranenburg, Van IJzendoorn, Mesman, Alink, & Juffer, 2008).

For those reasons, and given that this intervention is yet to be applied, and its effectiveness assessed, in the Latin American and Peruvian contexts, our study is intended to explore the VIPP-SD's viability and effectiveness for the improvement of sensitivity in a group of mothers of lower and upper socioeconomic status in Lima, Peru. Based on existing research, VIPP-SD is expected to have a high impact on the participants' sensitivity.

## **Method**

### **Participants**

Participants were contacted through their child's school as well as by reference from earlier contacts. Twenty-one mothers started the process and were randomly assigned to the intervention group or to the control

group. Of this initial group, seven left mid-study (four from the intervention group, three from the control group) and 14 completed their participation (seven in each group).

We found no significant differences either in terms of the mother's age ( $p = 0.31$ ) or the children's age ( $p = 0.60$ ) between those who chose to complete the study and those who deserted. Similarly, we found no significant differences in initial maternal sensitivity ( $p = 0.22$ ) or in the child's internalizing or externalizing behaviours ( $p = 0.63$  and  $p = 0.68$ , respectively) between the two groups.

The mean age of the 14 remaining participants was 32.36 years ( $SD = 7.06$ ;  $Min = 23$ ;  $Max = 42$ ). In average, they had 14.29 years of schooling ( $SD = 2.73$ ;  $Min = 9$ ;  $Max = 18$ ). In terms of their job situation, three were homemakers. In terms of their marriage status, 11 were married or were in a domestic partnership, and three were single, separated, or divorced. Participants had between one and four children.

The children of the 14 participants were 8 boys and 6 girls, aged between 17 and 30 months ( $M = 23.07$ ;  $SD = 4.36$ ). Twelve participants described themselves as their child's primary caregivers; three of them reported receiving no child-rearing support from others.

Finally, 14.3% of participants reported not having encountered any stress-producing situations during the month prior to the intervention; 71.4% reported one or two stress-producing situations; and only two mothers reported between three and six stress-producing situations.

There were no significant age differences between the intervention and control groups, either for the mothers or the children ( $p = 0.80$  and  $p = 0.28$ , respectively). Similarly, we found no differences in the mothers' global sensitivity scores prior to the intervention ( $p = .25$ ) or in the children internalizing ( $p = 0.56$ ) or externalizing ( $p = 0.61$ ) behaviours.<sup>1</sup>

The Research Ethics Committee of the university to which the study is affiliated approved this research project. Every participant mother was provided with and signed an informed consent form explaining the research objectives, the voluntary nature of their participation, and the conditions of confidentiality. Mothers in the control group were given the VIPP-SD intervention after their participation in the study was completed.

### **Procedure**

In accordance with the research objectives, participants were randomly assigned to the intervention and control groups while we sought to maintain a balanced distribution of lower and upper socioeconomic status mothers in each group.

The intervention group was given the VIPP-SD (Juffer et al., 2008). The control group received six phone calls in which they responded to standardized questionnaires about their children's development, behaviour, and problems with regards to play, feeding, and sleep, among other areas. In this group, mothers' concerns were addressed in general terms, and participants were informed that the conversation would continue later, when they underwent the VIPP-SD intervention.

### **Measurements**

We used the Maternal Behaviour Q-Set 3.1 (MBQS; Pederson & Moran, 1995; Pederson, Moran, & Bento, 1999) to assess maternal sensitivity. The MBQS 3.1 assesses 90 behaviours classified in nine groups, ranging from "most characteristic" to "least characteristic" (Pederson & Moran, 1995; Pederson et al., 1999). The

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<sup>1</sup> Behaviour problems were assessed using Achenbach and Rescorla's (2000) *Child Behavior Checklist* (CBCL). Internal consistency reliability results for the internalizing problem and externalizing problem scales were 0.73 and 0.89, respectively.

placement of the behaviour in each group determines the score to be assigned, from one to nine. To determine a final score, the scores in the 90 behaviours are correlated to a sensitivity criterion; an individual score is thus reached on a range from -1 to 1, reflecting the degree of similarity between the observed behaviours and the sensitive mother criterion.

Along with the maternal sensitivity score, some of the behaviours give shape to three profiles (Bailey, Moran, Pederson, & Bento, 2007): *Sensitive vs. Insensitive, Disengaged, and Nonsynchronous*. The *Sensitive* profile refers to mothers whose interactions are characterized by sensitivity, responsiveness, and acceptance of the child, as well as by the absence of punitive, vindictive, or irritable behaviours. The *Disengaged* profile refers to mothers characterized by a lack of attention to their child's signals. The *Nonsynchronous* profile refers to mothers who are unable to adjust the pace and intensity of their interactions in response to the child's signals. These profiles are established by correlating the scores for the items in each profile with the criterion scores proposed by Bailey et al. (2007).

For this study, we recorded mothers in free interaction with their children for 60 minutes before and after the intervention or phone calls. Once this procedure was completed, an evaluator outside the intervention team coded the video recordings. To ensure the reliability of the coding, 46% of the observations were randomly selected for additional coding, also by an independent evaluator. Mean interobserver reliability was 0.81 ( $SD = 0.18$ ,  $Min = 0.40$ , and  $Max = 0.94$ ).

### Data Analysis

In accordance to the main research objective, we first calculated the difference between pre-intervention and post-intervention sensitivity for each participant mother, and then applied the same analysis for her scores in the *Sensitive vs. Insensitive, Disengaged, and Nonsynchronous* profiles. Due to the sample size, we used medians for the statistical comparison of the intervention and control groups (Mann Whitney  $U$  test).

Additionally, we grouped mothers into two segments, low sensitivity and high sensitivity, on the basis of the whole sample's median pre-intervention sensitivity score. Afterwards, we compared the median differences between pre- and post-intervention scores for both the low sensitivity and high sensitivity segments of the intervention and control groups. The Mann Whitney  $U$  test was also used for this analysis.

## Results

Table 1 presents the pre- and post-intervention maternal sensitivity scores for each of the participants in the intervention group, as well as the difference between those two scores. A positive value indicates an improvement in sensitivity after participation in the intervention program, while a negative one indicates a decrease in sensitivity.

Table 1  
*Pre- and Post-intervention Global Sensitivity Scores and Difference Between the Two Scores for Each Mother in the Intervention Group*

	M1	M2	M3	M4	M5	M6	M7
Pre-intervention global sensitivity	0.82	-0.53	-0.57	0.70	0.80	0.81	0.78
Post-intervention global sensitivity	0.78	0.78	0.41	0.45	0.73	0.77	0.72
Difference in global sensitivity	-0.04	1.31	0.98	-0.25	-0.08	-0.04	-0.06

*Note.* Positive difference indicates that mother increased her sensitivity after intervention.

To analyse the effectiveness of the intervention, the first step was to compare the intervention group's median difference to the control group's. Table 2 shows that no significant variations in global sensitivity or in any of the three profiles were found.

Then, mothers were assigned to a high sensitivity segment and a low sensitivity segment based on the whole group's median pre-intervention sensitivity score ( $Mdn = 0.69$ ). For each segment (high and low sensitivity), we followed the procedure described above, comparing the intervention group's median difference in pre- and post-intervention scores to the same measurement in the control group.

Table 2

*Comparison of the Median Difference in Pre- and Post-intervention Sensitivity Scores, Intervention Group vs. Control Group*

	Intervention Group ( $n = 7$ )			Control Group ( $n = 7$ )			$U$	$p$
	$Mdn$	$M$	$SD$	$Mdn$	$M$	$SD$		
Difference between global sensitivity medians	-0.04	0.26	0.62	0.08	0.01	0.58	22.00	0.403
Difference between <i>Sensitive vs. Insensitive</i> profile medians	0.00	0.38	0.76	0.04	-0.02	0.73	21.00	0.355
Difference between <i>Disengaged</i> profile medians	0.02	-0.26	0.55	-0.09	-0.06	0.56	22.00	0.403
Difference between <i>Nonsynchronous</i> profile medians	0.08	-0.15	0.50	-0.13	-0.10	0.56	17.00	0.192

As Table 3 shows, mothers in the low sensitivity segment intervened with VIPP-SD (two mothers) saw—unlike the control group, comprised of five mothers—a significant increase in global sensitivity and in specific sensitive characteristics (*Sensitive vs. Insensitive* profile), as well as a decrease in their disconnection from the child's signals (*Disengaged* profile). Meanwhile, mothers in the high sensitivity segment intervened with VIPP-SD (five mothers) saw a post-intervention increase in their lack of synchronicity (*Nonsynchronous* profile) when compared to the control group (two mothers).

Table 3

*Comparison of the Median Difference in Pre- and Post-intervention Sensitivity Scores, Intervention Group vs. Control Group, Segmented According to Initial Sensitivity Level*

Initial sensitivity level	Intervention Group ( $n = 7$ )			Control Group ( $n = 7$ )			$U$	$p$	$r$	
	$Mdn$	$M$	$SD$	$Mdn$	$M$	$SD$				
Low	Difference in Global Sensitivity	1.14	1.14	0.24	0.09	0.03	0.70	0.00	0.048	0.73
	Difference in <i>Sensitive vs. Insensitive</i> profile	1.45	1.48	0.16	0.04	0.01	0.89	0.00	0.048	0.73
	Difference in <i>Disengaged</i> profile	-1.05	-1.05	0.29	-0.18	-0.08	0.68	0.00	0.048	0.73
	Difference in <i>Nonsynchronous</i> profile	-0.82	-0.82	0.47	-0.22	-0.13	0.69	2.00	0.191	--
High	Difference in Global Sensitivity	-0.06	-0.09	0.09	-0.03	-0.03	0.17	4.00	0.429	--
	Difference in <i>Sensitive vs. Insensitive</i> profile	-0.04	-0.06	0.10	-0.08	-0.08	0.18	4.00	0.429	--
	Difference in <i>Disengaged</i> profile	0.02	0.06	0.06	-0.01	-0.01	0.11	4.00	0.429	--
	Difference in <i>Nonsynchronous</i> profile	0.08	0.11	0.08	-0.02	-0.02	0.01	0.00	0.048	0.73

## Discussion

The main goal of this pilot study was to explore the viability and the effects of the VIPP-SD program on a group of mothers of upper and lower socioeconomic status in Lima, Peru. This project is among the first randomized studies evaluating VIPP-SD in non-clinical mothers in the Latin American context, which makes its results significant despite the limitations that arise from the small size of the sample.

Overall, the results suggest that the VIPP-SD might not raise sensitivity scores (in the global score or the *Sensitive vs. Insensitive*, *Disengaged*, and *Nonsynchronous* profiles). This finding can be explained by a possible ceiling effect among the participants in the intervention group, as well as an unexpected impact of the phone calls on the control group.

In terms of the ceiling effect (Bakermans-Kranenburg et al., 2003), a detailed analysis of the data reveals that 71% of the mothers in the intervention group came into the study with a high global sensitivity score (between 0.70 and 0.82). These sensitivity values are particularly high in the Peruvian context, compared to previous studies (Nóblega et al., 2016; Posada et al., 2016).

On the other hand, the absence of differences between the intervention and control groups could also be explained by an unforeseen impact of the parallel work carried out with the participants. It is possible that the phone conversations made the control group mothers' more attuned to their children's behaviour or functioned as spaces where mothers connected with their children's needs and demands. These hypothetical effects of our work with the control group could have had a positive impact on maternal sensitivity. It must be noted that no such effects have been previously reported in research; the hypothesis needs to be probed by future studies in contexts such as Peru, marked by a dearth of child-rearing support.

Further analysis of the results from the VIPP-SD intervention revealed two cases of positive impact, one case where results (a post-intervention decrease in sensitivity) contradicted expectations, and four cases where pre- and post-intervention maternal sensitivity scores were similar. The two mothers for whom we observed a significant increase in sensitivity had also shown strikingly low levels of sensitivity before the intervention (negative scores in the global scale, the lowest scores in the *Sensitive vs. Insensitive* profile, and high scores in the *Disengaged* and *Nonsynchronous* profiles).

This prompted us to segment both the intervention group and the control group into low sensitivity and high sensitivity subgroups. Our analysis of these subgroups revealed that the two mothers with low initial sensitivity scores saw their sensitive behaviours enhanced, while their disconnection from their children's signals decreased to a greater degree than among mothers in the control group. We found, however, no evidence of a decrease on non-synchronicity in interactions with their children.

We also found that these two mothers shared, along with a low sensitivity score, a number of socio-demographic characteristics that set them apart from others in the intervention group: They had the lowest levels of schooling (nine and 11 years) and were the only participants occupied exclusively as homemakers. Their children had the highest scores in externalizing and internalizing behaviours, and they were the only mothers receiving no child-rearing support. Lastly, they reported the greatest numbers of stressors during the month prior to the intervention, including in connection to romantic relationships. This combination of factors indicates that, prior to intervention, these participants were at greater psychosocial risk than the rest of the intervention group. It is possible then to posit a significant impact of the VIPP-SD on the sensitivity of mothers with low initial sensitivity scores, children with more behaviour problems, and greater psychosocial vulnerability. This tendency needs to be validated by future research.

Kalinauskiene et al. (2009) showed that a VIPP intervention without the sensitive discipline component had greater impact on low-sensitivity mothers compared to other groups (Juffer et al., 2017; Juffer et al., 2014). Also, the size of the effect was similar to that in Kalinauskiene et al. (2009). Our pilot study's main contributions are, first, to confirm similar results for VIPP-SD; second, to have been carried out in a different context; and, third, to have sampled mothers with children older than 10 months. A further contribution is to

present evidence of the VIPP-SD's immediate impact on maternal sensitivity, unlike studies where the effect has been found to occur some time after the intervention (Bakermans-Kranenburg et al., 2003), or studies that find no change in sensitivity (Nazzari et al., 2017; Negrão et al., 2014).

In terms of the effect of the program on mothers of children with externalizing behaviours, one previous study showed changes in positive discipline but not on maternal sensitivity (Mesman, Stolk, Van Zeijl, Alink, Juffer, Bakermans-Kranenburg, Van IJzendoorn, & Koot, 2008), and another reported changes in maternal attitudes towards sensitivity (Van Zeijl et al., 2006). The results of our study suggest an effect on sensitivity as such, to be validated by further research.

Lastly, the results of our pilot study are in agreement with previous research findings showing that the VIPP-SD program's impact is greater on mothers under more risk factors, such as stress and lack of support (Mesman et al., 2008).

One mother in the intervention group showed a significant reduction in sensitivity after her participation in the program, but we have not identified any characteristic setting her apart from the rest of the sample. There appears to be no plausible explanation for this outlier other than the possibility of unreported external circumstances impacting the participant's sensitivity around the time of assessment. Given the small size of the sample, this result nevertheless has a significant impact on our overall findings.

The findings about the effectiveness of the VIPP-SD on maternal sensitivity in this pilot study are valuable. The viability and effectiveness of a program to enhance maternal sensitivity in the Peruvian context begin to emerge here; such a program could be used to improve attachment security among children, given the high correlation between sensitivity and security in Peru (Nóblega et al., 2016; Posada et al., 2016).

As we have mentioned, the small number of participants significantly limit the results of this study. Our initial design was indeed for a pilot study with a small sample, but the group was decimated by a high desertion rate (33%). Although such a rate of desertion is within the standards reported in other studies (Bakermans-Kranenburg et al., 2003), it appears imperative to devise strategies to lessen participant desertion.

The main consequence of the small number of participants is the lack of statistical power to reveal differences between the groups or to bring forth a moderate effect of the intervention; thus, our results cannot be generalized and are only sufficient to outline foci for further research into the effectiveness of the VIPP-SD in the Latin American and Peruvian contexts.

A further constraint on our study, compared to previous research, is the consideration of a single measurement in its results. It is possible that the inclusion of other measurements, such as attitudinal ones, will shed greater light on the effectiveness of the VIPP-SD.

In spite of these limiting factors, the results of this randomized pilot study provide initial evidence of the viability and efficacy of the VIPP-SD program in Latin America and Peru, and they support findings from other contexts (Alsankac-Akbulut et al., 2017; Juffer et al., 2008; Juffer et al., 2014; Juffer et al., 2017; Mesman et al., 2008; Nazzari et al., 2017; Negrão et al., 2014; Van Zeijl et al., 2006; Yagmur et al., 2014).

Our findings also suggest that the VIPP-SD could be a particularly well-suited source of sensitivity improvement for at-risk mothers. This is of special importance in Peru and other Latin American countries, where large segments of the population live in such conditions.

One strength of our study's design is that despite the reduced number of participants, the initial process of randomization achieved a balanced distribution between the intervention and control groups, both in terms of socio-demographic characteristics and in terms of maternal sensibility and children behaviour. Further strengths

are our assessment of sensitivity based on somewhat more extended observation sessions, compared to previously published research, and the independence of the team assessing the participants sensitivity levels, which contributed to the avoidance of biased results.

Since the main constraint on this study is the size of our sample, applying the intervention and replicating the study with larger groups is of particular importance. We strongly recommend that such research is carried out among population segments of lower socioeconomic status and sampling specific groups, such as single mothers, adolescent mothers, mothers of children with behavioural problems, and others.

In conclusion, our study suggests that VIPP-SD can be a relatively brief and cost-effective program for the enhancement of sensitive maternal behaviours among mothers for whom sensitivity is an issue, and who live in situations of greater vulnerability.

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