

Confident mothers, easier children: A quasi-experimental manipulation of mothers' self-efficacy

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Abstract

This randomized micro-trial aims at testing the relationship between mothers' self-efficacy and children's behavior in a quasi-experimental design. It assesses if mothers' self-efficacy can be improved using the social learning theory processes of social comparison and positive feedback on parenting experience. In this theory-based experiment, mothers' self-efficacy was manipulated in a convenience sample of 42 mothers and their 4-5 year-old preschoolers. Mothers' and children's behaviors were assessed during a 45-minute mother-child interaction session with free-play, frustration and problem-solving tasks. Both observational and self-report measures were used. Results show that mothers who received a positive feedback to reinforce their self-efficacy had more positive parenting behaviors with their children than non-reinforced mothers in the control group. Children whose mothers had been reinforced in their self-efficacy were more positive with their mothers. This quasi-experimental micro-trial contributes to discuss the quite complex causal nature of the relation between parents' self-efficacy, parenting and child behavior. First, its results confirm that mothers' self-efficacy could be improved using the social learning theory processes of social comparison and positive feedback. Second, this study documents the positive impact of a positive feedback to mothers, on both mothers and children, contributing in this way to parenting research and intervention design.

Keywords: Parenting, preschoolers, mother, self-efficacy, experimental manipulation

Introduction

Studies relating parenting to child behavior are numerous. However, existing studies are rarely experimental, mostly correlative, and therefore unable to test causality between parenting variables and child behavior (van Ijzendoorn & Bakermans-Kranenburg, 2012). When manipulation is used to improve parenting, the purpose is usually to evaluate interventions and demonstrate the positive effects of parenting intervention programs (Dretzke et al., 2009). Such an approach does not make it possible to identify which parenting variables have the most effect on children's behavior, since several variables are manipulated together and simultaneously.

In contrast to such studies, micro-trials using experimental or quasi-experimental designs can bring a real added-value. Micro-trials are defined as “randomized experiments testing the effects of relatively brief and focused environmental manipulations designed to suppress specific risk mechanisms or enhance specific protective mechanisms, but not to bring about full treatment or prevention effects in distal outcomes” (Howe, Beach, & Brody, 2010). Such a focused manipulation offers the opportunity to isolate a variable and disentangle its impact from that of covariates.

Among the various parenting variables that could be isolated, the cognition of parental Self-Efficacy Beliefs (SEBs) has been defined as parents' self-perceived competence in their role (Coleman & Karraker, 2003). It covers the beliefs, thoughts, values and expectations which are activated when one is in charge of a child's upbringing (Coleman & Karraker, 2003; Meunier & Roskam, 2007).

SEBs is an adequate variable to study among other parenting variables for three main reasons. First, it plays a key role in explaining parents' and children's behavior, second because a strong theoretical background provides effective ways to manipulate it and third because the experimental manipulation of this variable has been scarce so far. In the following section, we will describe those reasons more elaborately.

First, with regard to the key role of SEBs in parenting behavior, Social Learning Theory (Bandura, 1977) suggests that self-efficacy is a key concept to understand the transaction between an individual and his environment. It relates to the concept of human agency, defined as an intentional behavior reflecting one's general feeling to be able to influence his environment. As such, self-efficacy contributes to predict behavior and persistence in case of adversity (Bandura, 1989), “the stronger the perceived self-efficacy, the more active the efforts” (Bandura, 1997, p. 194). This is of particular interest in the field of parenting where parents may encounter difficulty with their child. For parents, it is an indicator of parental engagement in parenting tasks and of satisfaction and adjustment (Meunier & Roskam, 2009a).

Several empirical studies have confirmed Bandura's hypotheses in the field of parenting showing a positive association between SEBs and parental behavior. For instance, Teti and Gelfand (1991) reported a positive association between maternal SEBs and parenting competence. In their meta-analysis based on 47 studies, Jones and Prinz (2005) confirmed this link as well as Meunier and Roskam (2009a) documenting that a high level of SEBs was correlated with positive support practices, higher parental satisfaction, and lower parental stress and depression. More recently, Dekovic, Asscher, Hermmans, Reitz and Prinzie (2010) concluded that self-efficacy is a powerful determinant of parenting practices in a recent quasi-experiment on parental sense of competence in the Head Start parenting program.

Parents' SEBs are also associated with children's outcomes, in terms of social competence, self-regulation, self-esteem (Jones & Prinz, 2005) and academic achievement (Ardelt & Eccles, 2001). Coleman and Karraker (2003) also observed a significant link between SEBs in specific parenting fields (physical care, emotions, discipline) and child outcomes (development outcomes measured by the Bailey test, as well as enthusiasm and affection towards the mother).

This link is also observed when the relationship between parent and child is not easy. Parents tend to feel less confident about their ability to raise their children when they have a difficult child (Hill & Bush, 2001; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; M. R. Sanders & Woolley, 2005; Sequerra, 2011; Slagt, Deković, de Haan, van den Akker, & Prinzie, 2012), both in terms of temperament (i.e. highly active, negative or emotionally reactive) or behavior (i.e. agitated, aggressive, oppositional). It is likely that difficult child behavior does not directly impair parental childrearing practices, but operates through a mediating role, by undermining parents' perception of their competence (Coleman & Karraker, 2003; Day, Factor, & Szkiba-Day, 1994). A lack of confidence in their parenting skills may increase frustration and irritation in parents, which contributes to negative parenting behaviors such as criticism, negative teasing and physical punishment. Such negative parenting has been shown to be related to difficult behavior in children (Gershoff et al., 2010; Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012) .

Furthermore, recent research explores a possible mediation link between parental SEB, parental practices and child outcome. In a longitudinal study on adolescents, Dekovic and colleagues (2012) concluded that "changes in parental sense of competence predicted changes in positive discipline, which in turn predicted a decrease in adolescent externalizing problems" (p.574).

Second, with regard to the manipulation of parental SEBs, Social Learning Theory (Bandura, 1977; Bandura, 2012) assumes that self-efficacy should be considered not as a personality trait but rather as a context-

dependent concept, which means that it can be manipulated, as shown in social psychology and sport studies (Coffee & Rees, 2011). Bandura's theory states that psychological procedures, whatever their form, alter the level and strength of self-efficacy (Bandura, 1977). Social Learning Theory holds that SEBs are rooted in individual factors (e.g. personal history of accomplishment, emotional arousal and its physiological impact) as well as in contextual factors (e.g. verbal feedback from others, social comparisons) (Bandura, 1989). Performance accomplishments are the strongest source of self-efficacy, followed by vicarious experience (evaluation process based on seeing others of widely differing characteristics perform), verbal persuasion and emotional arousal (Bandura, 1977). In parenting, SEBs are therefore expected to depend on parents' past and actual experience with their children (successes and failures) and on emotional arousal this experience may induce. Feedback from others (in particular comments from relatives, teachers, doctors, friends, etc.) and social comparison with other parents are also major contributors to self-efficacy. Particularly, in the case of verbal persuasion, research shows that raising outcome expectations ("You will perform well") is less efficient than raising self-efficacy ("You possess the capabilities to master difficult situations") (Bandura, 1977). Several of these factors can be considered as theoretically good candidates for a joint use in an experimental manipulation of parental SEBs, in which parents are compared to others through a positive feedback that valorizes their parental experience.

Finally, experimental manipulation of SEB has been scarce so far. Experimentation in the parenting field is generally limited by necessary ethical requirements. For obvious reasons, one cannot manipulate child's or parent's behavior or cognitions without precautions. This makes designs based on comparison between experimental and control groups and pretest-posttest measures common for evaluation studies of mid to long-term parenting intervention but less usual for focused micro-trials.

This study is an attempt to innovate in this area, bearing in mind inherent limitations due to its innovative character. In line with the theoretical framework of Social Learning Theory, this study seeks to address the gaps in the literature by testing experimentally the impact of improving mothers' SEBs on mothers' and children's behaviors. A study like the one presented in this paper is original as no evaluation of the manipulation of parental SEB has been done so far in intervention research. Furthermore, this study innovatively used a quasi-experimental randomized controlled trial design that can be considered as a micro-trial. In this specific study, SEBs are focused mainly on beliefs or efficacy expectations rather than outcome expectations, as the manipulation procedure will further illustrate. Given that parental SEBs and child outcomes are correlated (Coleman & Karraker, 2003; Jones & Prinz, 2005), it was expected that reinforcing mothers' SEBs through

positive feedback on their parenting experience and social comparison would enhance both the mothers' positive parenting behaviors towards their children and positive behavior by the children.

Method

Participants

This sample is part of the longitudinal H2M (Hard-T(w)o-Manage) research program conducted at the Psychological Sciences Research Institute of the University of Louvain-la-Neuve (Belgium). Data were collected from a self-selected convenience sample of 42 mothers and their 4-5 year-old preschoolers. Our sample was selected to be a relatively well-functioning, non-clinical community sample and not considered to be at risk in terms of children's behavior (in particular when looking at mother's income and education level). Mothers also volunteered to take part in such an experiment. Therefore, we expected mothers to have, in average, good parenting skills at baseline.

22 dyads were randomly assigned to the experimental group, and the other 20 to the control group, on a signing-up order basis. Mothers were informed about the research project, which had been approved by the Ethical Committee of the University of Louvain-la-Neuve, through leaflets and posters distributed in surrounding schools, as well as on a website and Facebook page created for this study. Participants received small rewards for their participation (i.e. entry tickets to museums, small toys or shopping vouchers provided by sponsors). Fifty-five parents expressed an interest in participating in the study. Forty-six actually came to the lab, four of whom had to be withdrawn from the sample (one father, two video recordings missing for technical reasons, and one outlier for child externalizing behavior). There were no missing data on parents. The socio-demographic characteristics of the sample are presented in Table 1.

Table 1 (Descriptive statistics on socio-demographic characteristics for experimental and control groups) should be placed around here.

Procedure

The experimental procedure was structured in four steps. A standardized manual was used and the same experimenter was in contact with the entire sample. First, a few days before coming to the University lab, mothers completed an online set of questionnaires about their self-efficacy, their parenting practices and their child's behavior. Note that the data from the questionnaires were not used during the manipulation procedure, neither for group allocation nor for the preparation of mothers' feedback. The experimenter was blind to this

information. Questionnaires were encoded and analyzed after the fourth step of this experimental procedure. They were used to test the comparability between experimental and control groups and as baseline control measures in the main analysis testing the effect of the experimental manipulation.

In a second step, mothers came to the lab with their child for an hour and were randomly allocated to the experimental or control group (simple randomization based on the lab signing-up order). Participants were unaware of condition assignment. Those allocated to the experimental group received individual positive feedback concerning both their child and their parenting skills by mentioning the questionnaires filled in at home. Those in the control group received no feedback but they were also taken aside without their child to receive instructions about the experiment. Mothers in the experimental group were socially compared to a virtual representative group of mothers by means of a false graph on which they occupied a very high position. The experimenter introduced herself as a university researcher specializing in parenting in order to be perceived by the participants as an expert whose comments were research-based. The positive feedback highlighted their high parenting 'performance' compared to other parents and their child's positive development. By presenting it this way, we intended to use different components of self-efficacy: an acknowledged performance attainment, a positive social comparison and a verbal persuasion. Since SEBs are based both on an auto-evaluation that parents make about their skills and also their perception of their ability to positively influence their children (Coleman & Karraker, 2003; Jones & Prinz, 2005), we talked about their child's positive development. Mothers were told the exact same thing, word for word: *"On the basis of the questionnaire filled in at home, we see that the way you behave with your child is particularly interesting for our research. Two points grabbed our attention. First, your child: he or she shows all the signs of a healthy child, at school and at home, in general, apart from any minor worries. Second, the way you parent your child. We have noticed in earlier research we carried out that some childrearing practices, like yours, seem to be more effective in daily life. Maybe you have already experienced this yourself: some ways seem to work better in the long run. Based on an average calculated in earlier research with similar families in Belgium (same number of children, same age, same number of boys and girls), we conclude that you are among the 20% of parents who seem to be the most effective with their children in three fields in particular: limit setting, emotion regulation and warmth."*

There are various elements that make the context in which positive comments are provided quite specific. It takes place in a university laboratory; it is given by a child development researcher; it is part of an experiment, which the mother is aware of and volunteers to participate to. It should not be assumed that SEB may change everyday, depending on any comment that the mother may hear about her parenting. But it was thought that

Bandura's SEB theoretical framework used here could give way to SEB modification through the four main sources that influence SEB, on which this experiment is built.

After this positive feedback and social comparison (or absence of it in the case of the control group but with some time shared with the experimenter), mothers played with their child following a standardized procedure including free play and several semi-structured tasks. In the fourth and final step, the experimenter gave a debriefing to every mother without her child, explaining the goal of the study and the manipulation procedure.

Measures

Three self-reported measures on mothers' SEBs, mothers' parenting behavior, and children's behavior, were collected at baseline in the first step of the experimental procedure. The set of questionnaires was completed at home by mothers who intended to come to the lab. The experimenter was not blind to the condition during the experiment, since he had to manipulate SEB in one condition and not in the other. But he was blind to parenting questionnaires that mothers fill in at home prior to the lab, therefore blind to how the mother described her child and her parenting skills. Coders who coded video-taped mother-child interaction tasks were blind to condition.

Mothers' self-efficacy beliefs (SEBs) were assessed with the Global Parental Self-Efficacy Scale of Meunier and Roskam (EGSCP, 2009a). Based on Bandura's Social Learning Theory (1977) and on subsequent parenting research (Coleman & Karraker, 1998), this is a 25-item scale related to five domain-specific SEB factors: Discipline, Nurturance, Playing, Instrumental Care, and Teaching. Bandura (1977) suggests that the most valid approach for determining domain-level SEBs regarding a multidimensional construct—such as parenting—is achieved by combining several behaviorally specific assessments. In that sense, self-efficacy beliefs in parenting can be evaluated as a quantitative construct by asking parents their beliefs in specific parenting activities, such as teaching, playing, providing instrumental care, nurturing or disciplining their child.

Items are in the form of affirmatives, for example: "*I am able to sense when my child is starting to become distressed*" for the Nurturance subscale. The measure has been validated on 705 French-speaking parents and displays good psychometric properties, according to Meunier and Roskam (five-factor solution explaining 53.1% of the variance, α ranging from .60 to .84, 2009a). In order to limit the number of predictors in the analyses, a main SEB score was computed. Moderate to high correlations were observed between the five domain-specific measures in the validation article and this study ($r = .40$ to $.71$), suggesting that they may be combined in a higher-order domain-general parental SEB measure (α of .91). This procedure, used in the current

study, is in line with Bandura's formulation (1977), which suggested that the most valid approach for determining domain-level SEBs regarding a multidimensional construct—such as parenting—is achieved by combining the efficacy information conveyed by several behaviorally specific assessments.

Mothers' parenting behavior was assessed with the Preschool Parent Form of the Evaluation of Parental Practices of Meunier and Roskam (EPEP, (2009b). The EPEP-PPSF is a 40-item instrument yielding nine factors: Positive Parenting, Monitoring, Rules, Discipline, Inconsistent Discipline, Harsh Punishment, Ignoring, Material Rewarding, and Autonomy. A five-point Likert-type scale is provided for each item, ranging from “never” to “always”. This instrument has been validated on 565 French-speaking mothers and fathers and shows good psychometric properties (nine-factor solution explaining 61.36% of the variance, α ranging from .59 to .90). Confirmatory factor analyses in the validation study showed that two second-order factors covering the supportive and controlling dimensions of parenting emerged from the initial factor solution (CFI = 0.94, RMR = 0.03, and RMSEA = 0.05). The supportive factor was composed of Positive Parenting, Autonomy, and Rules, and included items such as “*When my child seems to have a problem, I discuss with him/her what is wrong*”. The controlling factor was composed of Discipline, Harsh Punishment, and Ignoring, and included items such as “*When my child does something that is not allowed, I only talk to him/her again when he/she behaves better*”. In order to limit the number of predictors in the analyses, the second-order factors of support and control were used in the current research.

Child behavior was measured using the preschool version of the Child Behavior Check-List or CBCL (Achenbach & Edelbrock, 1981). The CBCL provides three-point Likert scales: not at all present, moderately present, or often present. Its psychometric properties are good (α ranging from .63 to .86 for the different scales and .85 for test-retest reliability). For the current study, the data collection was limited to two first-order scales, i.e. the “attention problems” and “aggressive behavior” scales, enabling us to calculate an externalizing behavior total score building the second-order “externalizing behavior” scale.

Mothers' and children's behaviors were observed using the Crowell Mother-Child Interaction Task (MCIT) procedure. This method of observing caregiver-child interactions in a semi-structured play session has been widely used (Coleman & Karraker, 2003; Crowell & Feldman, 1988, 1989; Crowell, O'Connor, Wollmers, Sprafkin, & Rao, 1991). It involves a series of episodes designed to elicit behaviors showing how comfortable and familiar the dyad members are with each other, how they negotiate transitions, their ability to solve problems together, and their use of shared positive or negative affect. This setting is unstructured enough to allow for “real-life” or spontaneous interactions. It takes 45 to 60 minutes to complete and consists of five episodes: free

play, frustration task and three increasingly difficult problem-solving tasks (puzzles).

Mothers' behavior was coded using the Crowell MCIT parent scales and scored on a seven-point Likert scale for emotional responsiveness (creating a positive emotional context through encouragement and praise), behavioral responsiveness (providing instrumental support adapted to the child's developmental level through well-timed cues), positive affect (smiling and laughing), irritability (frustration with the child), withdrawal/indifference (disinterest in the child) and aggression towards the child. Coding was done by two independent trained coders, one of whom was certified by the University of Tulane (USA), with an intercoder reliability of .92 calculated with the weighted Kappa coefficient on 25% of the sample.

Children's behavior during the interaction with the mother was measured using the Crowell MCIT child scales. Positive affect (smiling and laughing), withdrawal/indifference (disinterest in the relationship due to sadness or depression), irritability (fighting, withdrawn behavior with anger, sulking), non-compliance (not listening to the mother's suggestions or requests) and aggression (verbal or physical) towards the mother, as well as persistence and enthusiasm towards the task, were coded on a seven-point Likert-type scale. Coding was done by trained coders, with an intercoders' reliability of .94 for these scales, calculated with the weighted Kappa coefficient on 25% of the sample.

In order to limit the number of variables under consideration in the current study, a Principal Component Analysis based on regression and without rotation was computed on the four relevant scales for mothers, i.e. emotional and behavioral responsiveness, positive affect and irritability. The mothers' aggression scale had no variance, with very low scores as expected for a community sample. The withdrawal/indifference scales for both mothers and children had also limited variance and they did not correlate significantly with other parenting and children measures (i.e. CBCL or parenting practices). Therefore, these scales were not included in our analyses. A main factor of Positive Parenting was extracted explaining 62.03% of the variance. Reliability was high with $\alpha = .78$. All four scales loaded on the Positive Parenting factor .88, .87, -.71 and .66 for positive affect, emotional responsiveness, irritability, and behavioral responsiveness, respectively. Another Principal Component Analysis was computed on the six relevant scales for children, i.e. enthusiasm, positive affect, persistence, non-compliance, irritability and aggression. A main factor of Positive Child Behavior was extracted explaining 70.81% of the variance. Reliability was high with $\alpha = .90$. All six scales loaded on the Positive Child Behavior factor -.90, .87, .85, .84, -.82, -.75 for non-compliance, enthusiasm, positive affect, persistence, irritability and aggression, respectively. These two factors of Positive Parenting and Child Positive Behavior were used as variables for subsequent analyses.

Data analysis

A first preliminary analysis consisted of checking the comparability of the experimental and control groups on baseline measures, through t-tests. A second preliminary analysis checked the consistency of observed and self-report measures with one another through correlations.

The main analysis of the current study consisted of testing the relationship between the manipulated mothers' SEBs on the one hand and mothers' and children's behaviors on the other hand. The manipulation check was based on a highly controlled laboratory setting, enabling most variables to be controlled for. The only difference remaining between the two groups on the outcomes measured with t-tests and Cohen's d for effect's size, can be considered as the self-efficacy manipulation. A pretest-posttest evaluation of self-efficacy seemed inadequate because of a possible test-retest effect of this cognitive measurement carried out within an hour-time through a 25-item questionnaire.

Results

The comparison between the baseline measures of the experimental and control groups revealed no difference. Mothers in both groups had similar age, income and education level. Their children lived in similar families in terms of family composition (number of siblings, rank in the family, raised by single mothers) and had the same age and gender.

But most importantly, the two groups had similar parenting practices, felt similarly confident as mothers in each of the five domains (discipline, nurturance, instrumental care, play and teaching) and globally. Mothers' SEBs were comparable to norms established for mothers of 3-7 year old preschoolers (Meunier & Roskam, 2009a) in both groups, ranging in the average level of SEBs. They had children with similar levels of externalizing behavior at baseline, allowing us to test the main analysis. Descriptive statistics and results of t-tests are presented in Table 2.

Insert Table 2 (Descriptive statistics of the baseline measures for the experimental and the control groups) about here.

Table 3 shows the correlation coefficients used to assess the relations between baseline measures (i.e. mothers' SEBs, parenting practices, and children's behavior), with mothers' and children's scores from the MCIT Crowell procedure. The results reveal coherent patterns of relations, supporting the validity of our sample's measures. For example, what children and mothers did in the lab was consistent with what mothers reported by questionnaire at home about their parenting practices and their children's behavior. Children with

low levels of positive behavior observed in the lab were described by their mother in the CBCL as also externalized at home. As expected on the basis of previous studies on SEBs (Coleman & Karraker, 2003; Meunier & Roskam, 2009a), mothers who were low in positive parenting (for instance, showing irritability or low positive affect with their child) had lower SEBs at baseline and used more negative controlling practices. Negative controlling practices and low SEBs were correlated with children's observed low levels of positive behavior (for instance, higher irritability or non-compliance and less persistence and enthusiasm towards the task). Only the support scale of self-reported parenting practices did not correlate with observed behaviors of mothers and children. This scale measures autonomy, positive parenting and limit setting, which are not directly related to the scales of the observed interaction, with the exception of positive parenting. But it was positively correlated to mothers' SEBs ($r(42) = 0.36, p < .05$). It remains that correlations between these various parenting constructs could have been found, as it has been for the control scale. Although these self-reported measures of parenting practices play a controlling role, they are not the main variables of interest in this experiment. Last, the way mothers and children behaved in the lab was also very similar to one another, showing congruent behaviors. Finally, these preliminary correlational analyses confirmed the link between mothers' SEBs and children's and mothers' behaviors for the entire sample, as expected.

Insert Table 3 (Correlations between baseline measures of mothers' and children's MCIT Crowell scores) about here.

With regard to the main analysis of the current study, the results confirmed that the experimental manipulation made a difference in the outcomes. T-tests comparing control and experimental groups on outcomes showed that giving a positive feedback to mothers in view of enhancing their SEBs had a positive effect on both Positive Parenting and Positive Child Behavior, with effect sizes of 0.63 and 0.64, respectively. Descriptive statistics, results of t-tests and effect sizes are displayed in Table 4.

Concretely, during the observed interaction, mothers in the experimental group showed more positive parenting behavior than mothers in the control group. Furthermore, children in the experimental group displayed more positive behavior; they expressed more positive affect towards their mother, smiled and laughed more than the ones whose mothers did not receive any feedback. Their enthusiasm towards the task was also higher.

Insert Table 4 (Descriptive statistics of the measures after the experimental manipulation for the experimental and control groups, t-tests and effect sizes) about here.

Discussion

The aim of this quasi-experimental study was to clarify one of the processes involved in parent-child interactions. By investigating in the lab the link between mothers' self-efficacy and both parenting and child's behavior, this controlled randomized micro-trial brings an insight to the relationship between parenting and children's behavior. In such a complex field, where many variables interact with one another, experimental manipulations of this kind are innovative, providing probably one of the closest ways, although imperfect, to clarify a potential causal relationship between one specific parenting variable and child behavior in particular. For obvious ethical reasons, manipulations of either parents or children are limited to outcomes' improvement. Longitudinal studies can provide a complementary way to determine directionality but with the limitation that time precedence does not necessarily indicates causality, as illustrated by recent genetic studies that show that some genetic effects manifest only at certain ages (Avinun & Knafo, 2014).

As on the issue of understanding to what extent parenting influences children, results of this study show that an attempt to modify one single specific parenting variable, here the cognition of self-efficacy beliefs, may have an immediate effect on both mothers' and children's behaviors. The positive comments on the way they raise their children may have reinforced mothers' evaluation of a positive experience of parenting, contributing to a possible enhancement of their self-efficacy beliefs. This had a positive impact on their observed behavior with their child. Being told by an expert that they are among the top parents using the most effective parenting practices contributes to an increase in Positive Parenting of mothers even when asked to do difficult and frustrating tasks. Enhanced SEBs seem to play a protective role against the effect of children's frustration. The experimental manipulation, which allows an immediate effect of improved parenting to be observed, leads to positive changes in the child as well. For children, manipulation makes also a significant difference in their behavior, which is particularly interesting, considering that nothing has been said or done to them directly. Results show that children show more positive behavior directly after their mother has received positive feedback, for instance expressing more positive affect, less irritability, more enthusiasm and persistence towards the task. In line with their mother's changes, children modify their affect and behavior almost immediately. This complements previous studies stressing the impact of improved positive parenting on children's positive affect, rather than a reduction of harsh or negative parenting (Gardner, Hutchings, Bywater, & Whitaker, 2010). This immediate effect has been rarely observed in parenting intervention studies because most of them evaluate effects on a more diluted time. It could be hypothesized that if they were observed immediately after the sessions, an immediate effect could be found. The sleeper effect (i.e. effects not visible immediately after an

intervention but later on) described in several studies measuring behavioral change (Mitchell, Broeren, Newall, & Hudson, 2013), was not salient for Child Positive Behavior here.

Clinical implications

Micro-trial designs like this one make it easier to translate knowledge into prevention and intervention research because of their focused and theory-based approach (Howe et al., 2010). Hagan et al. (2012) recently underlined the added value of prevention trials founded on well-specified and theory-based models of developmental processes. They “provide experimental tests of whether changing these processes accounts for reductions in problem outcomes and increases in competencies, which in turn should lead to the design of more effective and efficient intervention” (p.2). In a complementary way to trials, Sanders (2013) proposed a model detailing change processes based on Social Learning Theory, that are used in parenting intervention.

The results of this study could contribute to show that parenting interventions can build on positive feedbacks related to parental SEB to improve mother-child interaction and to the reduction of difficult behavior by children (Deković et al., 2012; Sofronoff & Farbotko, 2002). However, SEBs could be targeted and specifically improved in parenting interventions, and should not be considered solely as a positive side-effect of intervention. Self-efficacy beliefs could be considered as a possible empowerment tool for parents which strengthens positive parenting and contributes to improving children’s behavior (Deković et al., 2010).

SEB-based interventions could use the processes of verbal persuasion when it targets parents’ actual parenting experience and compare it to other parents, with a limited number of sessions. This confirms the study by Bakermans-Kranenburg and colleagues showing that such short-term interventions are more effective (2003). This study showed that providing a positive feedback to mothers (through a short and straightforward experimental manipulation) makes a difference in behaviors of both mother and child. Medium size effects were already visible after a single feedback session.

Limitations and further research

While results of this study are promising, it has several limitations and replication could be recommended in future research. First, the size of its sample is relatively small, though adequate for a micro-trial design (Brown et al., 2012; Brown & Liao, 1999; Howe et al., 2010). Second, the measurement of mothers’ SEBs, as a form of cognition, is based exclusively on self-report without being combined with behavioral or multi-informant measures. The way mothers are allocated to a group could have been done in a more

randomized way, such as flipping a coin instead of allocating them on the basis of their signing-up order.

Because of these evaluation limitations and the fact that this concept may seem close to other cognitions such as self-esteem or influenced by mood, three methodological precautions were thoroughly prepared. First, to ensure that the only difference between the control and experimental groups was the positive feedback provided, most of what could be controlled for has been checked, both groups are comparable in terms of parents' and children's characteristics.

Second, this study is based on a control-experimental group comparison, which is not the ideal pretest-posttest design for a full experimental manipulation. Given that even mothers in the control group were invited to discuss experiment guidelines with the experimenter, without their child, in the same room where mothers from the experimental group received their feedback, one may assume that time and interest dedicated to each participating mother before the interaction time was somehow comparable. In theory, the best manipulation check would have been a pretest-posttest evaluation of self-efficacy beliefs. But it seemed inadequate because of a possible test-retest effect of this type of cognition measurement carried out within an hour-time and through a 25-item questionnaire. The possibility that mothers in the experimental group may have been more efficient before the intervention cannot be completely ruled out. In future similar micro-trials on SEBs, a pretest-posttest comparison could be tested.

Third, the positive feedback was theory-based using Bandura's Social Learning Theory, which stipulates that self-efficacy is enhanced by personal experience, comparison with others, feedback and emotional states (Bandura, 2012). This experiment specifically used several of these resources to improve mothers' SEBs by explicitly acknowledging their high parenting performance and the positive development of her child.

Another limitation relates to the probable short-lived effect of the manipulation. Evidence is provided on mothers' self-efficacy enhancement and its impact on both mothers' and children's behaviors and affect but without any indication of its effect on the longer run. Longer-term effects could be explored if this type of manipulation induces mainly short-lived effects or not.

This study also focuses on a relatively well-functioning, non-clinical convenience sample not considered to be at risk in terms of children's behavior, in particular when looking at mother's income and education level. Further analyses could compare the impact of such SEB manipulation on different populations such as a clinical sample of externalizing children, or socio-economically at-risk dyads. Mothers with a lower level of education could need an intervention not based solely on language as the one used in this study.

Studying a possible mediation relation between mother SEB, mother behavior and child behavior would be an interesting point to explore. In our study design, since mothers are never alone and in constant interaction with their child, there is no possibility to identify a possible mediation link. Unfortunately here, mothers and children's behaviors are measured at the same time and both measures are necessary because of this interaction setting.

A similar micro-trial studying the impact of fathers' SEB reinforcement could also bring a different perspective (Kwok, Ling, Leung, & Li, 2013; Seigny & Loutzenhiser, 2010). Studies tend to show that the association between SEBs and parenting behaviors is stronger for mothers than fathers (Slagt et al., 2012) and that fathers' SEBs may be more influenced by their child's temperament than mothers' (Seigny & Loutzenhiser, 2010).

Taking into account the temperament of children and mothers could also shed additional light on these results (Pluess & Belsky, 2010; Prinzie, van der Sluis, de Haan, & Deković, 2010; Van Den Akker, Deković, Prinzie, & Asscher, 2010). Children with a difficult temperament may be more sensitive to changes in their mother's SEBs. Checking for a differential susceptibility hypothesis based on temperament measures (Gilissen, Bakermans-Kranenburg, van Ijzendoorn, & van der Veer, 2008) could contribute to the identification of which intervention is most beneficial to which type of parents and children (Belsky & Pluess, 2009). This could widen the understanding of these results notably by reflecting temperamental influences, which remains a research field yet to be explored further. In a recent meta-analysis, Avinun and Knafo (2014) provide empirical evidence for the role of children's genotype in affecting parenting, stressing the importance of viewing children as active agents in the family environment and calling for a deeper understanding of the family not only as a social but also biological system.

In spite of these shortcomings, this micro-trial study contributes to the field of parenting research, as it contributes to prove a direct relationship between mothers' manipulation based on a positive feedback aiming at improving their self-efficacy beliefs and their behavior, in particular positive parenting, when other variables have been controlled for thanks to the experimental nature of this study. Mothers' self-efficacy's enhancement could be considered also as a possible predictor of children's positive behavior including in challenging tasks. Thus this study identifies self-efficacy beliefs as a relevant parenting variable to be targeted and manipulated in parenting interventions using theory-based change processes as a therapeutic leverage, and not just as a secondary effect used to evaluate programmes or as a baseline predictor of programmes' effectiveness.

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