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Effects of social pressure and child failure on parents' use of control: An experimental investigation

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ABSTRACT

Because research has shown that controlling parenting is related to general and school-related maladjustment in children, there is a need to examine antecedents of controlling parenting. In this study, we addressed the role of two sources of pressure (i.e., social pressure eliciting ego-involvement and child failure) on parents' situational use of control. 124 parents worked with their 5th or 6th grade children on a puzzle task. The two sources of pressure were induced experimentally in a 2 × 2 design, with parents receiving instructions eliciting either ego-involvement or task-involvement and with children either failing or succeeding in the task. Following the task, there was a free choice period in which dyads could choose whether or not to make additional puzzles. In both phases of the experiment, we coded parents' controlling interaction style, dyadic reciprocity, performance, and parents' and children's engagement. Additionally, in the free-choice period the dyads' degree of persistence was registered. While induced child failure was related positively to parents' controlling style during the initial puzzle activity, induced social pressure was related to parents' controlling style in the free-choice period. In turn, a controlling style was related negatively to performance, reciprocity, and engagement. The findings confirm that parents' use of a controlling style is a multi-determined phenomenon affected by different sources of pressure and undermining children's performance and engagement.

1. Introduction

There is increasing consensus that controlling parenting, when defined as parenting that is domineering and pressuring in nature, undermines children's well-being and performance (Grolnick, Deci, & Ryan, 1997; Joussemet, Landry, & Koestner, 2008). As such, there is a need to identify antecedents of a controlling parental style. Pressure on parents has been identified as the main reason why parents interact with their children in a more controlling way (Grolnick, 2003). Pressure would deplete parents' energy and psychological availability, thereby increasing the probability that parents interact with children in a controlling fashion. Theory and research (Belsky, 1984; Grolnick, 2003) suggest that pressure on parents can arise from three different sources, that is, parents' social environment, parents' own characteristics and experiences, and the child's behavior and performance. Most researchers have focused on the role of parents' own functioning, have assessed stable inter-individual differences in parenting, and have relied on correlational designs.

In the present study, we aimed to contribute to the literature (a) by focusing on the two other sources of pressure, (b) by examining parental style in a specific situation with high relevance in middle childhood, and (c) by relying on an experimental design, which allows for an examination of causal effects. We also examined effects of the two sources of pressure on parents' emotional experiences and on the dyads' performance and engagement. The identification of sources of a controlling parenting style has much applied value because this information can be used in interventions targeting parents' style of interacting with children in an academic context. That is, by minimizing the pressures to which parents are exposed, parents may be less likely to transfer the pressure placed upon them to their children. In turn, parents' reduced reliance on controlling strategies is important for children to maintain their motivation and task engagement.

1.1. Antecedents and consequences of parents' use of control

Parents differ in the style they use to interact with their children in general and in the context of their child's learning and school work in particular (e.g., Katz, Kaplan, & Buzukashvily, 2011; Pomerantz, Moorman, & Litwack, 2007). According to Self-Determination Theory (SDT; Deci & Ryan, 2000), parental behavior differs in the degree to

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which it obstructs or facilitates the satisfaction of children's psychological needs for autonomy, competence, and relatedness. The more parents engage in controlling parenting, the more they are likely to thwart the child's needs, thereby increasing the risk for maladjustment. In contrast, more frequent engagement in autonomy-supportive practices would foster need satisfaction, thereby contributing to well-being, performance, and social adjustment (Grolnick & Pomerantz, 2009; Joussemet et al., 2008; Soenens & Vansteenkiste, 2010). Controlling parenting involves a tendency for parents to impose their own standards and to engage in various behaviors that pressure a child to think, feel, or act in certain ways. A controlling style involves the use of controlling language (e.g., 'must', 'have to'), solving the child's problems, and taking the lead in interactions (Grolnick, Ryan, & Deci, 1991). A more autonomy-supportive style entails working from the child's perspective, offering choice, encouraging children to try and solve problems themselves, and respecting the child's rhythm (Deci, Eghrari, Patrick, & Leone, 1994; Grolnick et al., 1997).

Accumulating cross-sectional and longitudinal evidence shows negative associations between controlling (relative to autonomy-supportive) parenting and children's adjustment in general (e.g., Soenens & Vansteenkiste, 2010) and in the learning domain in particular, as indicated by children's school achievement (e.g., Aunola & Nurmi, 2004; Su, Doerr, Spinath, Johnson, & Shi, 2014), academic competence (e.g., Ahmad, Vansteenkiste, & Soenens, 2013; Gray & Steinberg, 1999; Marbell & Grolnick, 2013), autonomous motivation (e.g., Katz et al., 2011) and academic drop-out (Ricard & Pelletier, 2016). Given the systematic relations between a controlling parental style and children's general and achievement-related maladjustment, it is important to gain more insight in its origins. An examination of the origins of parents' controlling involvement in children's learning is particularly important during middle childhood. In this developmental period, learning and acquiring new skills represent key developmental challenges for children (Erikson, 1968). Also, research shows that the quality of parents' involvement in learning plays an important role in children's motivation, experiences, and performance at this age (Pomerantz et al., 2007).

According to Grolnick (2003), pressure (i.e., feelings of obligation resulting from internal or external expectations to meet certain standards) can undermine parents' ability to support their children's needs. Pressure would narrow parents' perspective and would lead parents to focus rigidly on outcomes. Thus, pressure may lead parents to turn towards the most straightforward and efficient way to achieve desired outcomes. A controlling approach is likely to be perceived as such a fast and efficient way of reaching parents' goals. In contrast, taking the child's perspective and allowing children to solve problems independently and at their own pace (i.e., an autonomy-supportive approach) is likely perceived to require more time and patience, resources that are restricted under pressure. We hasten to add that parents' reliance on a controlling approach is in many cases not a deliberate decision, but often occurs automatically in response to perceived pressures (i.e., without full conscious awareness). Indeed, pressures experienced by parents may elicit stress (Campbell et al., in press), which may then immediately prompt a more controlling approach.

According to Grolnick (2003), pressure on parents can stem from three sources, that is, parents' social environment, the child's behavior, and the parents' own characteristics and experiences. The distinction between these three sources of pressure closely parallels Belsky's (1984) distinction between three antecedents of parenting: social-contextual influences, child characteristics, and parent characteristics. Correlational research has begun to demonstrate associations between variables related to each of these sources of influence and controlling parenting, with most research focusing on parent characteristics. Indeed, there is systematic evidence that relatively stable parental characteristics, such as their general personality traits (e.g., the Big Five traits; Prinzie, Stams, Dekovic, Reijntjes, & Belsky, 2009) and more specific dimensions of personality vulnerability (e.g., perfectionism and dependency; Soenens, Vansteenkiste, & Luyten, 2010) are related to parents' use of a controlling style towards their children. Because there is increasing evidence that parental behavior also varies on a day-to-day basis, with day-to-day variation in controlling parenting being predictive of children's daily well-being and ill-being (Aunola, Tolvanen, Viljaranta, & Nurmi, 2013; Van der Kaap-Deeder, Vansteenkiste, Soenens, & Mabbe, 2017), research has begun to examine also the role of more fleeting and variable parenting characteristics in controlling parenting. For instance, it has been shown that parents' daily negative emotions (e.g., Aunola, Viljaranta, & Tolvanen, 2017) and parents' daily experiences of psychological need frustration (e.g., Mabbe, Soenens, Vansteenkiste, van der Kaap-Deeder, & Mouratidis, in press) are related to stronger parental engagement in controlling practices during the day.

As regards the social context, correlational studies have shown for instance that a family's low socio-economic status (including financial problems) predicts more observed parental engagement in controlling practices (e.g., Conger, Ge, Elder, Lorenz, & Simons, 1994). In addition to objective features of a family's social context, parents' subjective appraisal of the social environment as threatening also was found to relate positively to controlling parenting (Gurland & Grolnick, 2005). In addition to the social context, certain child characteristics also have been found to elicit more controlling parenting. For instance, cross-sectional and longitudinal studies have shown that difficult temperament (Bates, Pettit, Dodge, & Ridge, 1998; Laukkanen, Ojansuu, Tolvanen, Alatupa, & Aunola, 2014; Lee, Zhou, Eisenberg, & Wang, 2013) and problem behaviors (externalizing problems in particular; e.g., De Haan, Soenens, Prinzie, & Dekovic, 2013; Pettit, Laird, Dodge, Bates, & Criss, 2001) are related to more parental reliance on controlling practices.

In sum, researchers have identified relevant predictors from each of the sources of influence postulated by Belsky (1984) and Grolnick (2003). In the current study we aimed to contribute to this literature in a number of ways. Most past research on antecedents of controlling parenting focused on relatively stable individual differences in parenting style. Parents or children were asked to rate how parents typically behave. Because research increasingly shows that parental behavior can vary on a short-term (e.g., daily) basis (e.g., Aunola et al., 2013) and even from situation to situation (Holden & Miller, 1999), it is important to gain insight in determinants of parental behavior in specific situations with high relevance to children at a given age. In the current study, we examined antecedents of parents' engagement in a controlling style in a homework-like situation (with parents and children working together to solve a challenging puzzle), which is a rather common and important situation in middle childhood. Second, we aimed to contribute to the literature by focusing on the two sources of influence that received comparatively less attention (i.e., social context and child characteristics) and by relying on an experimental design to determine the causal role of these antecedents in controlling parenting.

1.2. Social pressure and child performance in the context of children's achievement

According to Grolnick and Seal (2008), some parents experience social pressure to be a successful parent. They feel an obligation to raise happy and high-performing children. Such pressure can be conveyed through different social agents, including the media, school, one's partner, and one's own parents. As a consequence of experiencing such social pressure, parents would become more likely to develop an ego-involved orientation towards the child's performance. That is, parents would focus on enhancing and protecting their own self-worth through their child's performance. This ego-involved orientation can be contrasted with a more task-involved orientation, where parents focus primarily on the child's learning process and get involved in their child's learning out of interest (Grolnick & Seal, 2008). Consistent with these claims, correlational research has begun to show that perceived social pressure to be a successful parent is related to more controlling

parenting (Wuyts, Chen, Vansteenkiste, & Soenens, 2015). Wuyts, Vansteenkiste, Soenens, and Assor (2015) further reported that this association is mediated by parents' tendency to invest their self-worth in the child's achievement. Such an orientation of child-invested contingent self-esteem, which reflects parental ego-involvement, is a strong predictor of controlling parenting (Ng, Pomerantz, & Deng, 2014; Wuyts, Vansteenkiste, et al., 2015).

In addition to social pressure (resulting in feelings of parental ego-involvement), children's failure to perform well in achievement settings can also pressure parents to use a more controlling style. Indeed, some correlational studies have shown that parents' perception of their child's competence in school (e.g., Ng et al., 2014; Wuyts, Vansteenkiste, et al., 2015) and their children's objective performance (i.e., their grades; Grolnick, Gurland, DeCourcey, & Jacob, 2002; Pomerantz & Eaton, 2001) relate to parents' controlling parenting behavior. Other studies, however, failed to confirm these associations (e.g., Ng, Kenney-Benson, & Pomerantz, 2004).

1.3. Moving beyond correlational data

Because most studies on the antecedents of controlling parenting are correlational in nature, causality in effects of the sources of pressure could not be demonstrated. Two prior experimental studies addressed this limitation. Grolnick, Gurland, DeCoucey, and Jacob (2002) examined the effects of experimentally induced social pressure on mothers' autonomy support and control, as observed while mothers were working on a map or poem task with their child. Mothers in the high pressure condition were told that they were responsible for their child's performance and that the child would be tested later on. Mothers in the low pressure condition were simply invited to help their child without mentioning a test. Effects of children's grades were also examined. The induction of social pressure had a direct effect on observed autonomy-suppressing maternal language in the poem task only. In the other task (i.e., the map task), the induction of social pressure elicited more non-verbal controlling maternal behavior when mothers were rated by their children (prior to the experiment) as being generally more controlling. Lower grades also predicted more controlling and less autonomy-supportive maternal behavior. Thus, Grolnick et al. (2002) found some effects of induced social pressure on autonomy-suppressing maternal behavior. Although this study also yielded some evidence for the role of child characteristics (i.e., grades), these characteristics were not manipulated experimentally, leaving the direction of effects unclear.

Grolnick, Price, Beiswenger, and Sauck (2007) examined the role of pressure on mothers' behavior in a different context, that is, children's social adjustment. Mothers were told that their child would interact with other children. Social pressure was manipulated experimentally by telling mothers in the high pressure condition that their child would be rated by the other children in terms of social acceptance. In the low pressure condition these ratings were not mentioned. In terms of child characteristics, both mothers and children also rated aspects of the child's social adjustment (social anxiety and social competence). Mothers in the high social pressure condition were observed to be more controlling on one out of four indicators. The child characteristics were generally unrelated to mothers' behavior.

These two studies by Grolnick and colleagues yielded important findings. In our study we aimed to build on these two studies in two ways. First, in both studies by Grolnick and colleagues, the manipulation of social pressure primarily referred to an evaluation of the child's performance. In our study we aimed to strengthen the manipulation of social pressure by adding that the child's performance reflects his or her intelligence. This type of reference to a fixed and highly desirable trait such as intelligence has been shown to elicit feelings of ego-involvement in research with undergraduate students (Ryan, 1982). In addition, we explicitly held mothers accountable for the child's performance (which was also done in Grolnick et al., 2002). Second, although the Grolnick et al. studies included measures of child characteristics, these characteristics were not manipulated experimentally. In our study we performed an experimental manipulation of the child's failure (versus success). The inclusion of an experimental manipulation of both social pressure and child failure also provides us with an opportunity to examine, in an explorative fashion, interactions between both sources of pressure. Possibly, the simultaneous presence of two sources of pressure results in an additional effect on controlling parenting, with controlling parenting being particularly elevated when parents are confronted both with social pressure and child failure. This combination of pressures may be particularly worrisome and threatening to parents, thus resulting in the highest levels of controlling parenting.

1.4. Broadening the scope of outcomes of pressure on parents

In the present study we also aimed to add to the literature by expanding the breadth of outcomes associated with pressures on parents, focusing not only on parenting behavior but also on parental experiences and on the quality of dyadic interaction. As regards parental experiences, we expect that under pressuring conditions, parents will experience elevated levels of tension and concern with the child's failure. Although this hypothesis may seem self-evident at first sight, Grolnick et al. (2002) did not find an effect of experimentally induced pressure on parents' feelings of tension. Possibly, parents immediately transfer the pressure into controlling behavior and thus do not experience tension directly. Another possibility, which will be addressed in this study, is that several sources of pressure need to be present simultaneously for parents to experience tension.

Further, we also included a number of dyadic outcomes, including parents' and children's joint performance during the puzzle activity. There is some initial evidence for the impact of experimentally induced autonomy versus pressure on the performance of student dyads (Weinstein, Hodgins, & Ryan, 2010) and parent-child dyads (Grolnick et al., 2002). Complementing the measure of performance, which is a rather quantitative indicator of the dyad's interaction, we included qualitative outcomes of dyadic interaction, such as parents' and children's task engagement and the dyad's reciprocity, which both have been found to yield important learning and well-being benefits (e.g., Weinstein et al., 2010). Consistent with past work (e.g., Sansone, Weir, Harpster, & Morgan, 1992), we reasoned that parents and children are less likely to be fully engaged in the task under pressuring conditions. Further, the sources of pressure may also negatively affect dyadic reciprocity, an important indicator of quality of interactions that manifests in behavioral attunement (e.g., leaning towards each other, joint laughter, and behavioral synchronicity; Weinstein et al., 2010). Finally, we investigated the effects of pressure on parents' and children's persistence, thereby making use of the standard free-choice paradigm (Deci, 1972). Using this paradigm, persistence was operationalized as the dyad's continued participation in the task during a free-choice period after the termination of the experimental phase, with participants being unaware that their behavior is recorded.

1.5. The present study

In this study, we examined effects of two sources of pressure on (a) parents' situation-specific use of a controlling style, (b) parents' experiences, and (c) several features of parent-child dyadic interaction. We experimentally manipulated social pressure (by inducing parental ego-involvement versus task-involvement) and the child's failure (versus success) on a puzzle task. We hypothesized that both sources of pressure would relate to more tension and concern with the child's failure, to more use of a controlling style, and to decreased quantity and quality of dyadic interaction (as indicated by reciprocity, engagement, performance, and persistence). We also explored interactions between both sources of pressure.

In an attempt to summarize the hypothesized effects of different sources of pressure, we aimed to test an integrated model in which the

two sources of pressure were modeled as predictors of parents' observed controlling parenting practices which, in turn, would relate to the dyadic outcomes. Specifically, we expected a controlling style to play an intervening role, with the sources of pressure relating to lower dyadic reciprocity, engagement, and decreased task-performance via their effects on the parents' controlling style. Two such integrated models were examined; one for the experimental phase and one for the free-choice phase.

2. Method

2.1. Participants

124 Belgian parents and their 5th and 6th grade elementary school children participated in the study. Belgium is a small Western European country. All parent-child dyads were recruited from the Flemish, Dutch-speaking region of the country. All participants had the Belgian nationality and were Caucasian. On average, children were 11.19 years old (SD = 0.65; *range* 9–13; 53% boys). For 119 out of the 124 participating children we obtained children's official exam results from their teachers. Teachers provided a list of exam results from the past examination period for Dutch (i.e., the children's mother tongue) and Mathematics, the two most important subjects. An aggregate measure for actual achievement was computed by taking the mean across the two subjects (M = 80.59, SD = 9.84). From the 124 parents, 104 were mothers (84%) and 20 were fathers (16%). On average, parents were 41.05 years old (SD = 3.77; *range* 32–51). Parents were relatively highly educated, as 79% had obtained a college or university degree, which is higher compared to nation-based data for this age-group of parents. Seventy-one percent of the parents reported to be married or living together with the other biological parent of the child.

2.2. Recruitment and procedure

The procedures of the study were approved by the Ethical Committee at the host university. Dyads were recruited by contacting three rural (36%) and three urban (64%) elementary schools in Belgium. Children were informed about the experimental phase in class. The study was introduced as focusing on 'how parents and children work together on schoolwork'. All children received an invitation letter for their parents. The invitation letter described the project to parents and invited them to participate in the study with their child. Thirty-two percent of all invited parents responded with interest in participating by returning the permission slips with their children. Participants were contacted and an appointment was scheduled. The response rate of 32% is comparable with similar experimental studies in which a parent together with his/her child participated (e.g., Grolnick et al., 2007). A graphical overview of the different phases of the experiment and the different measures obtained throughout the experiment is provided in Fig. 1.

2.2.1. Experimental phase

The experiment took place after school hours in the child's regular classroom. Upon arrival parents and children were informed that they would work together on a puzzle task. The puzzle task was a mind game (i.e., GoGetter Prince & Dragon) in which participants needed to lay the puzzle pieces in a prescribed way to connect two or more fantasy figures. Yet, there were also built-in restrictions regarding the exact route the participants could follow (Peeters, 1999). Pilot testing had shown that children found this task to be highly interesting. Parent-child dyads were informed that they would be videotaped while working together on the puzzles and that the experimenter would leave the room so they would not be disturbed. After the parent had signed the informed consent, the child was asked to leave the classroom because the rules of the game would be explained to the parent in private. Parents were then explained the rules of the puzzle activity in detail and were allowed to practice one puzzle themselves to ensure that they understood the rules. Any remaining questions were addressed.

Directly following the explanation of the puzzle activity, parents were given condition-consistent instructions. Four conditions were created by combining two manipulated variables, that is, (a) social pressure (with parents receiving instructions that elicit either ego-involvement versus task-involvement) and (b) the child's performance (with children either succeeding or failing to meet prescribed standards). There were 30 participants in the condition combining task-involvement with success, 32 in the condition combining task-involvement with failure, 29 in the condition combining ego-involvement with success, and 33 in the condition combining ego-involvement with failure.

To activate ego-involvement, the instructions (a) aimed to make parents feel accountable for the child's performance during the puzzling task (Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982), (b) contained controlling language, and (c) presented the puzzle task as being reflective of the child's logical intelligence. The literal instructions in the ego-involvement condition were as follows: *"I just explained to you the rules of the puzzle activity you are about to begin with your child. These puzzles are reflective of your child's intelligence. More specifically, they assess your child's ability to think in a logical way. We expect children who perform high on logical thinking to finish all of the given puzzles. They probably also manage to do some extra puzzles. Your role is to guide your child while working on the puzzles. You must make sure that your child learns to solve the puzzles in order to perform well."* In contrast, in the task-involvement condition the puzzles were presented to parents as an interesting challenge. Parents were informed that there exist inter-individual differences in the number of puzzles children solve and the parents' attention was oriented towards helping the child in solving the puzzle activity and having fun when working together on the puzzles, thereby making use of inviting and informational language. The literal

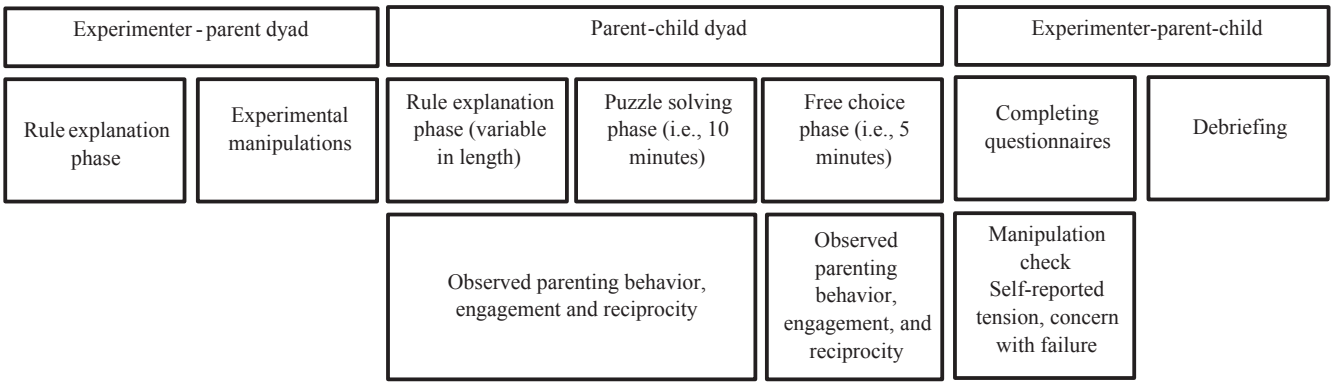

Fig. 1. Schematic overview of the different phases of the experimental procedure together with the obtained rated and self-reported measures.

instructions in the task-involvement condition were as follows: *"I just explained to you the rules of the puzzle activity you are about to begin with your child. These puzzle tasks can inform us about how children manage to solve problems in different ways. We understand that children, due to their previous experiences with such tasks and depending on how tired they are, differ in how many tasks they solve. Your role is to guide your child while working on the puzzles. You can help your child with the puzzles. In doing so your child can learn something while experiencing pleasure when working on the puzzles with you."*

Children's failure (versus success) was manipulated experimentally by providing parents different information regarding the average number of puzzles to solve. Parents in the failure and success condition were informed that a child could on average solve, respectively, 3 and 8 puzzles. All parents were informed that the indicated number of puzzles reflected the average performance of a child of that age. So, parents in both conditions assumed that they received standards for an average performance. As such, the perceived expectations or standards for parents were the same in the two conditions. However, based on pilot testing (N = 17, 5th and 6th grade children), we (as experimenters) knew that children in the condition with three puzzles would succeed, while children in the condition with eight puzzles would fail. Indeed, the pilot study had indicated that children on average could solve 4.5 puzzles (*range* = 3–6) within the allotted period of ten minutes.

Specifically, we instructed parents in the failure/success condition as follows: "Based on previous research, we know that children from 5th and 6th grade typically finish 8 (in the failure condition)/3 (in the success condition) puzzles within a period of ten minutes. This means that a child needs about 1 min (in the failure condition)/3 min (in the success condition) to solve each puzzle." It is important to mention that parents were simply told how many puzzles their child was expected to make (either 8 or 3). They were not informed about the real degree of difficulty to achieve these standards nor about the fact that they were in a condition where standards were high or low. All parents were told that the standards were achievable for an average child this age. As such, parents in the failure and success conditions entered the experiment with similar expectations about the level of difficulty and feasibility of the task. Parents only found out about the child's failure (versus success) to meet the standards during the task. Because parents were unaware about the differential levels of difficulty at the onset of the task, this manipulation was not meant to be an induction of social or external pressure. Instead, it was designed as a manipulation of pressure arising from the child's failure (versus success) to meet prescribed standards.

Following these manipulated instructions, parents were asked to explain the rules of the puzzle activity to the child. Before inviting the child to reenter the room, the experimenter activated the camera so that the interaction could be videotaped. Upon arrival of the child, the experimenter left the room and the parent explained the overall purpose and specific rules of the puzzle activity and informed the child that they had ten minutes time to work on the puzzles. Then, the parent started a timer, which was set to ring after ten minutes and the child began to solve the first puzzle. Every parent-child dyad was given the same set of puzzles. To reinforce the child's performance manipulation, parents were given a booklet containing the descriptions of either 8 (i.e., failure condition) or 3 (i.e., success condition) puzzle tasks and were all provided with 4 additional puzzles that could be solved in case they would have time left. Parent-child dyads worked uninterruptedly at the activity until the clock indicated that the allotted ten minutes had passed.

2.2.2. Free-choice phase

After these ten minutes the experimenter re-entered the room and pretended to switch off the camera. The experimenter also gave condition-congruent feedback on the performance to the mother and the child. This feedback indicated either the success or failure of the child and again included language inducing either ego-involvement or task-involvement. For instance, dyads in the ego-involvement/failure condition received the following feedback: "I see that you did not manage to finish all puzzles. You are not so good at thinking logically because this task meant to measure this capacity in children your age." Next, the experimenter removed the puzzles the dyad had been working on as to avoid the occurrence of the Zeigarnik-effect (i.e., working further on the puzzles of the experimental phase out of motivation to reengage unfinished, interrupted activities; Reeve, Cole, & Olson, 1986). At that point, the experimenter excused herself for a couple of minutes, pretending that she had received an urgent phone call concerning an administrative problem. Consistent with the free-choice paradigm often used in experimental motivational work (Deci, Koestner, & Ryan, 1999), the parent-child dyad was left alone for exactly 5 min with (a) two new and highly challenging puzzles, and (b) some popular magazines for adults and some comics for children. Before leaving the room, the experimenter told the dyads that they could do whatever they wanted to, that is, they could work on the puzzles or read some magazines or comics. Although the experimenter had pretended to have switched off the camera, this was not the case, thus ensuring the registration of dyads' continued engagement with the puzzles during this 5-min free-choice phase. Unfortunately, for two dyads this procedure failed, resulting in only 122 parent-child dyads being videotaped during this free-choice period.

After five minutes, the experimenter re-entered the room and asked parents to fill out a questionnaire regarding their experiences during the puzzle activity. Finally, before leaving the room, both parents and children were debriefed about the real purpose of the study. The experimenter explained to the dyads that the puzzle task was not designed to measure logical thinking and that the provided standards were intended to induce either failure or success. Furthermore, parent-child dyads were informed about the real purpose of the free-choice phase and were given the possibility to erase the videotape of the interaction upon request. None of the participants asked to do so. Participants were also informed about the expected effects of the manipulations of ego-involvement and failure on the parent's behavior and on the parent's and the child's interaction and experiences. Moreover the experimenter invited them to reflect upon the effect of the manipulations on their behavior and invited participants to discuss any concerns they might have occurred during the debriefing.

2.3. Measures

2.3.1. Manipulation check measures

To evaluate the effectiveness of the manipulations, parents completed two measures. These measures were administered at the end of the experiment (see Fig. 1) rather than immediately following the experimental inductions to avoid eliciting parents' awareness of the manipulated variables. First, with respect to the type of induced involvement (ego-involved versus task involved), parents rated six slightly adapted items derived from the Child-invested Contingent Self-esteem Scale (Wuyts, Vansteenkiste, et al., 2015; e.g., "To what extent did you think that a failure of your child on the puzzle task implicated your failure as parent."). These items reflect parental experiences of ego-involvement (i.e., the experience that their self-worth got intertwined with the child's achievement in the puzzle activity). All items were rated on a 5-point Likert scale (1 = *not at all,* 5 = *very much*). Cronbach's α of this scale was 0.82. Second, to validate the manipulation of child performance, parents rated the success of their child's performance by indicating a score between 0 and 10.

2.3.2. Parent-reported experiences

To measure parents' tension experienced during the puzzle activity, they completed four items from the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Participants reported how tense (e.g., nervous, stressed) they felt after receiving the task instructions (i.e., the manipulation). To measure parents' concern with the child's failure, they filled out 4 items developed specifically for the

purpose of this study (e.g., "I felt worried that my child would perform worse than other children."). This measure was developed for the purpose of the present study and was inspired by Pomerantz and Eaton's (2001) measure of parental worry about children's performance. All items were rated on a 5-point Likert scale (1 = *totally disagree,* 5 = *totally agree*). Cronbach's α was 0.87 and 0.74 for tension and concern with child's failure, respectively.

2.3.3. Observed behavior

All parent-child interactions during both the experimental and free-choice phase were videotaped and rated using a detailed coding scheme consisting of several items. All items were rated on a 6-point scale ranging from 0 (*totally absent*) to 5 (*strongly present*). For the purpose of coding, the experimental phase was broken down into (a) a rule-explanation segment of variable length in which parents explained the puzzle rules and (b) a puzzle-solving segment of a fixed length (i.e., 10 min), which was broken down into 5 units (each consisting of 2-min intervals). Following Mauras, Grolnick, and Friendly (2012), we used units of 2-min to rate the interaction during the puzzle-solving segment. The rule-explanation segment as a whole and the five 2-min intervals of the puzzle-solving segment were coded with the same coding scheme and were analyzed together for the experimental phase. We deemed it informative to also code the rule-explanation phase because, depending on their condition assignment, parents may explain the purpose and actual steps involved in solving the puzzles differently (e.g., greater use of controlling language, less interest for the child's perspective). To obtain scores on the coded items and to conduct analyses on the items, we averaged scores for each item in the coding scheme across the 6 intervals (i.e., the rule-explanation segment and the 5 2-min intervals of the puzzle-solving segment).

The 5-min free-choice phase was broken down into three equal intervals of 100 s. Parent-child interactions during these intervals were only coded when the dyad worked on the free-choice puzzles for at least one third of the interval. To obtain scores on the coded items, we again averaged the ratings on each item across the three intervals within the free-choice phase. Each dyad was rated by a researcher who did not provide the experimental instructions to this dyad. As such, raters were blind to the dyads' experimental condition. One rater scored all 124 videotapes of the experimental phase and a second rater scored all 122 videotapes of the free-choice phase. Together with the other raters, a third rater scored the first 20 videos from the two phases. After coding each interval, coders discussed disagreements until consensus was reached. Next, both raters scored 21 additional randomly chosen videotapes independently. Below, the inter-rater reliability scores for the 21 independently rated tapes are presented.

2.3.3.1. Observed parental control relative to autonomy support during the experimental phase. We developed a new, multi-item coding system to code observed control relative to autonomy support during the experimental phase. Some of the items of this coding system were taken and adapted from previously used rating systems in different life domains (Deci, Driver, Hotchkiss, Robbins, & Wilson, 1993; Deci et al., 1982; Grolnick et al., 2002), while other items were newly formulated after having viewed the first five videotapes. All items were formulated with specific reference to the theme of parent-child interaction in the context of puzzling together and were rated on a 0–5 Likert scale, as mentioned before. The final coding scheme consisted of 10 items, 5 of which tapped into controlling behaviors and 5 of which tapped into autonomy-supportive behaviors. A brief description of these behaviors together with some illustrative examples is provided in Table 1. A full description of the codebook (along with a greater number of examples) can be obtained from the authors upon request. An exploratory factor analysis using Principal Axis Factoring was performed on these items, with ratings of each item averaged across the intervals. The scree-plot pointed to a one-factor solution, with an eigenvalue of 4.32. As can be noticed in Table 1, all items had a minimal loading of 0.39 and the factor solution explained 43% of the variance. All controlling items yielded a positive loading, while all autonomy-supportive items yielded a negative loading. To create a composite score of observed controlling, relative to autonomy-supportive, parental practices we averaged all items, thereby reverse scoring the autonomy-supportive items. The inter-rater intra-class correlation of the total score was 0.91. Cronbach's α was 0.84. To further examine the validity of this composite score, we computed correlations with two separate items coding parents' *overall* use of a controlling and generally autonomy-supportive style in each interval (i.e., "The parent imposes his/her own agenda and pace and leaves little room for the child to participate in the activity" and "The parent takes into account the child's perspective and preferences and encourages the child's initiative"). These items simply tapped into the degree to which parents, overall, were autonomy-supportive or controlling during the entire interval. As expected, these two items were correlated highly positively (r (124) = 0.88, $p < .001$) and negatively (r (124) = −0.89, $p < .001$), respectively, with the composite score of observed control, relative to autonomy support, underscoring the validity of our detailed coding system.

2.3.3.2. Observed parental control relative to autonomy support during the free-choice phase. To code parents' style during the free-choice phase, we only made use of the items tapping into overall control and autonomy support (thus not using the detailed coding schema). The main reason for this is that there was more variability in parents' and children's involvement with the puzzles during the free-choice period. While in the experimental period, all parents and children continuously worked together on the puzzles, in the free-choice period only some parents and children did (or did so for brief and interrupted periods of time). The heterogeneity in the duration and type of involvement in the free-choice period prevented us from using the detailed multi-item coding system because this system was developed to code dyads' continuous engagement in the puzzle task. Instead, we used the same two more general items as the ones we had used during the experimental phase to validate our detailed coding system This choice was deemed justified as these global items scores yielded a very strong correlation with the specific behavioral autonomy-supportive and controlling practices as rated during the experimental phase. To create a composite score of observed controlling, relative to autonomy-supportive, parental practices, we averaged the one general controlling item with the one (reverse-coded) general autonomy-supportive item. The inter-rater intra-class correlation of this score was 0.78. Cronbach's α was 0.72.

2.3.3.3. Observed dyadic reciprocity. To observe reciprocity of the parent-child dyads during the experimental and free-choice period, we used a three-item measure developed by Weinstein et al. (2010; Study 2). This measure taps into the frequency of leaning forward, behavioral synchronicity (e.g., mimicking each other's non-verbal behavior), and joint laughter. While Cronbach's α was satisfactory in the experimental phase (i.e., 0.65), the item 'joint laughter' needed to be removed from the scale in the free-choice period to obtain an adequate α of 0.73. The inter-rater intra-class correlations of the scale were 0.80 and 0.83 for, respectively, the experimental and free-choice period. A PFA on the items for reciprocity revealed a 1-factor solution explaining 60% and 58% of the variance in the experimental and free-choice periods, respectively, with an average item loading of 0.68. Detailed results of this PFA can be found in the online supplemental material.

2.3.3.4. Observed parental and child engagement. Based on extant observational measures of engagement (Reeve, Jang, Carrell, Jeon, & Barch, 2004), we used three items (i.e., enthusiasm/energy displayed during the activity, effort and persistence, and display of confidence) to tap into both parents' and children's engagement during both phases. We also rated their observed disaffection from the task, as

Table 1
Brief description of the ratings in the coding system for parental behavior.

Controlling behaviors and statements	Description	Factor loadings
The parent takes over the materials and the puzzle	The parent dominates the activity by claiming the materials and by excluding the child while making the puzzle	0.61
The parent uses controlling language	The parent uses pressuring language (e.g., You must, you have to, …), orders, and controlling questions and warnings ('Why are you doing this?' 'Put this piece over here', 'Watch out with that piece!')	0.70
The parent increases the pace	The parent rushes through the activity, emphasizes the time limit, watches the clock, and is focused on the number of puzzles that still needs to be finished	0.68
The parent guides every step of the process	The parent gives unsolicited advice and provides redundant information. The parent is too closely involved and does not allow space for the child to try out things independently. The parent interrupts the activity through his/her interventions	0.64
The parent criticizes the child, uses guilt-induction, expresses anger	The parent engages in critical and guilt-inducing language (e.g., "No, not like that!", "Why can't you just put this piece like that?")	0.47
Autonomy-supportive behaviors and statements		
The parent asks in an open fashion about difficulties, interests, and wishes	The parent displays openness and active interest in the child's preferences and potential difficulties (e.g., "Do you want to do the next exercise?", "Do you still have questions?")	−0.39
The parent encourages the child's initiative and active participation	The parent actively proposes the child to try out things independently, to search for solutions, and to take initiative (e.g., "How can we solve this?", "Please give it a try yourself")	−0.59
The parent provides a rationale	The parent addresses the child's questions about the activity, thereby providing meaningful rationales for the rules or for certain strategies to make the puzzles (e.g., "This is important because …")	−0.52
The parent gives encouraging feedback	The parent encourages the child to persist or to stay focused ad provides process-focused feedback in both verbal "Yes, almost there", "Well done") and non-verbal ways (e.g., thumbs up)	−0.86
The parent attunes advice to the child's needs	The parent gives advice and offers help when solicited by the child or in response to the child's display of helplessness	−0.53

indicated by three items (i.e., inattention and disinterest, discouragement and helplessness, and irritation). We performed a series of PFAs on the six items for (dis)engagement, thereby running separate analyses for the experimental phase and free-choice phase and for parents' and children's engagement (resulting in 4 PFAs). In all cases, the scree-plot pointed to a one-factor solution, explaining between 50% and 56% of the variance in the engagement ratings across targets (children, parents) and phase (experimental, free choice). The average factor loading across the 4 solutions was 0.62. In all analyses, all engagement items yielded a positive loading, while all disengagement items yielded a negative loading. Detailed results of these PFAs can be found in the online supplemental material. A composite score of observed engagement was created by averaging all items after having reverse coded the disaffection items. The inter-rater intra-class correlations were 0.82 and 0.95 for the parental ratings and 0.82 and 0.70 for the child ratings during, respectively, the experimental and free-choice period. Cronbach's α were 0.75 and 0.84 for the parental ratings and 0.76 and 0.82 for the child ratings during, respectively, the experimental and free-choice period.

2.3.3.5. Task performance. To measure task performance, we registered the number of puzzles assembled by each dyad during the 10-min puzzle phase. Because dyads could mistakenly conclude that they had correctly solved a puzzle, we also registered the number of mistakes dyads made while working on the puzzles. To obtain a relative score of puzzle efficiency, we divided the number of correctly solved puzzles by the number of puzzles assembled by each dyad (see also Sheldon, Zhaoyang, & Williams, 2013). The inter-rater intra-class correlations were 0.96 and 0.97 for the number of puzzles assembled and for the number of mistakes made, respectively.

2.3.3.6. Duration of free-choice behavior. We measured how long each parent-child dyad worked on the new puzzles during the 5-min free-choice phase. To obtain an adequate measure for the analysis, for each dyad, we computed a quotient of the duration of free-choice behavior on the total available free-choice time (i.e., 300 s). Scores ranged from 0.00 (for dyads who did not show any free-choice behavior) to 1.00 (for dyads who persisted during the whole free-choice phase). In total, 99 dyads displayed some free-choice behavior during the free-choice phase, with these 99 dyads persisting 87% (SD = 0.21) of the 5-min free-choice phase. The inter-rater intra-class correlation was 0.98.

3. Results

3.1. Preliminary analyses

3.1.1. Background variables

We first conducted a multivariate analysis of covariance to explore whether background variables were associated with the study variables. None of the background variables had a significant multivariate effect on the study variables, child gender (Wilks' Lambda = 0.74, $F(16, 46) = 1.03$, $p = .45$), child age (Wilks' Lambda = 0.75, $F(16, 46) = 0.98$, $p = .49$), parental gender (Wilks' Lambda = 0.76, $F(16, 46) = 0.91$, $p = .57$), parental age (Wilks' Lambda = 0.80, $F(16, 46) = 0.74$, $p = .74$), parental educational level (Wilks' Lambda = 0.80, $F(16, 46) = 0.72$, $p = .76$), children's official exam results (Wilks' Lambda = 0.82, $F(16, 46) = 0.65$, $p = .83$), and family structure (Wilks' Lambda = 0.82, $F(16, 46) = 0.62$, $p = .85$).

3.1.2. Manipulation check

To examine whether the manipulations were effective, we conducted a multivariate analysis of variance (MANOVA). As expected, only the social pressure manipulation yielded a univariate significant effect on parents' experienced ego-involvement during the puzzle activity ($F(1, 118) = 5.71$, $p = .02$, $\eta^2 = 0.05$) with parents in the high pressure condition reporting being more ego-involved (M = 2.21, SD = 0.63), compared to participants in the low pressure condition (M = 1.93, SD = 0.64). Furthermore, only the child performance manipulation yielded a significant effect on parents' ratings of the child's performance ($F(1, 118) = 32.68$, $p < .001$, $\eta^2 = 0.22$), with parents in the failure condition (M = 7.17, SD = 1.55) reporting a significantly lower score than parents in the success condition (M = 8.53, SD = 0.99). To conclude, the two manipulations showed anticipated effects on the intended manipulation check variables.

3.1.3. Randomization

Participants were randomly assigned to the conditions, with the number of participants per condition varying between 29 and 33. To examine whether assignment to the conditions was really random and unrelated to dyads' background characteristics, we performed a MANOVA with the two manipulations as fixed factors and with child age, parental age, children's official exam results, and parental education level as dependent variables. Neither the social pressure

Table 2
Descriptive statistics and correlations between the study variables.

	Mean (*SD*)	1	2	3	4	5	6	7	8	9	10	11	12	13
Parent measures														
1. Tension	1.74 (0.85)	–												
2. Concern with child's failure	1.80 (0.74)	0.30***	–											
Observed variables: Experimental phase														
3. Control vs. autonomy-support	2.55 (0.41)	0.08	0.25**	–										
4. Dyadic reciprocity	2.22 (0.51)	−0.02	−0.12	−0.43***	–									
5. Parental engagement	4.66 (0.24)	−0.18*	−0.06	−0.36***	0.52***	–								
6. Child engagement	4.63 (0.27)	−0.13	−0.05	−0.49***	0.50***	0.56***	–							
7. Number of puzzles assembled	4.24 (1.50)	−0.05	0.10	0.15	−0.19*	0.00	0.19*	–						
8. Number of puzzle mistakes	2.01 (1.76)	0.07	0.13	0.27**	−0.18*	−0.09	−0.04	0.66***	–					
9. Puzzle efficiency	0.74 (0.22)	0.00	−0.08	−0.36***	0.23*	0.09	0.16	−0.34***	−0.75***	–				
Observed variables: Free-choice phase														
10. Duration of free-choice behavior	0.71 (0.39)	−0.03	−0.06	−0.04	0.05	0.10	0.03	−0.06	0.08	−0.10	–			
11. Control vs. autonomy-support	1.77 (1.11)	−0.01	0.10	0.39***	−0.14	−0.09	−0.18	−0.13	−0.05	−0.13	−0.04	–		
12. Dyadic reciprocity	2.49 (1.08)	−0.05	−0.05	−0.14	0.12	0.14	0.09	−0.21*	−0.29**	0.29**	0.04	−0.33**	–	
13. Parental engagement	4.73 (0.63)	−0.09	−0.07	−0.14	0.20	0.33**	0.12	−0.04	−0.12	0.20+	0.31**	−0.32**	0.40***	–
14. Child engagement	4.82 (0.58)	−0.09	−0.07	−0.08	0.07	0.10	0.17	0.17	0.07	0.03	0.38**	−0.57***	0.28**	0.26*

* $p < .05$.
** $p < .01$.
*** $p < .001$.

manipulation (Wilks' Lambda = 0.96, $F(6, 87) = 0.55$, $p = .77$), nor the child performance manipulation (Wilks' Lambda = 0.90, $F(6, 87) = 1.68$, $p = .14$) yielded an effect on the background variables. Further, two chi-square tests indicated that child gender (Pearson $X^2(1, 124) = 0.00$, $p = 1.00$, Pearson $X^2(1, 124) = 0.88$, $p = .35$) and parental gender (Pearson $X^2(1, 124) = 0.00$, $p = 1.00$, Pearson $X^2(1, 124) = 0.06$, $p = .81$) were equally distributed across the four conditions. Given the lack of significant effects, dyads with different background characteristics appear to be equally distributed across different conditions. To conclude, the randomization across conditions was successful.

3.1.4. Correlations

Correlations between the study variables can be found in Table 2. Parent-reported tension and concern with failure were positively interrelated, but were mostly unrelated to the observed variables. Tension did correlate negatively with observed parental engagement during the experimental phase, while concern with failure correlated positively with observed control versus autonomy support during the experimental phase. As for the observed variables, in both the experimental and free-choice phase, observed parental control versus autonomy support correlated negatively with both parent and child engagement as well as with dyadic reciprocity. In addition, observed control versus autonomy support correlated positively with the number of puzzle mistakes and negatively with puzzle efficiency during the experimental phase. An opposite pattern of correlates with these performance outcomes was obtained for observed dyadic reciprocity during the experimental phase. Finally, in both phases of the experiment, dyadic reciprocity was positively correlated with parent and child engagement.

3.2. Primary analyses

3.2.1. Effects of the experimental manipulations

To investigate the effects of the manipulated variables, we conducted two sets of analysis of variance (ANOVAs), with the first set involving the dependent measures obtained during the experimental period and with the second set involving the dependent measures of the free-choice period. For each analysis, the manipulation of social pressure (i.e., ego-involvement versus task-involvement), the manipulation of the child's performance (i.e., failure versus success), together with the interaction between both manipulations were entered as independent variables, and the self-reported and/or observed variables were entered as dependent variables. To investigate the effect size of the experimentally induced pressures on the different outcomes we inspected the partial eta-squared values. According to Cohen (1992), a partial eta-square of 0.01 represents a small effect, 0.06 represent a medium effect, and 0.14 represents a large effect.

Table 3
Cell means and standard deviations for the four experimental conditions together with the effects of the social pressure manipulation and the child failure manipulation effects on parental experiences, interaction quality, and performance during the experimental phase.

	Task-involvement		Ego-involvement		Social pressure manipulation			Child failure manipulation		
	Success	Failure	Success	Failure	$F(1, 120)$	p	η_p^2	$F(1, 120)$	p	η_p^2
Parent-reported measures										
Tension	1.53 (0.66)	1.63 (0.84)	1.52 (0.70)	2.25 (0.96)	4.36	.04	0.04	8.27	.01	0.07
Concern with child's failure	1.52 (0.59)	1.74 (0.64)	1.78 (0.82)	2.14 (0.78)	6.69	.01	0.05	5.10	.03	0.04
Observed variables										
Control vs. autonomy-support	2.36 (0.38)	2.61 (0.35)	2.54 (0.37)	2.70 (0.47)	3.50	.06	0.03	8.16	.01	0.06
Dyadic reciprocity	2.31 (0.57)	2.27 (0.50)	2.15 (0.51)	2.14 (0.45)	2.51	.12	0.02	0.09	.77	0.00
Parental engagement	4.71 (0.26)	4.65 (0.25)	4.65 (0.19)	4.63 (0.27)	0.87	.35	0.01	0.72	.39	0.01
Child engagement	4.73 (0.33)	4.60 (0.24)	4.60 (0.23)	4.61 (0.28)	1.31	.26	0.01	1.60	.21	0.01
Performance measures										
Number of puzzles assembled	3.93 (1.41)	4.88 (1.81)	3.83 (1.17)	4.26 (1.37)	1.88	.17	0.02	6.78	.01	0.05
Number of puzzle mistakes	1.63 (1.40)	2.69 (2.15)	1.52 (1.40)	2.12 (1.75)	1.23	.27	0.01	7.23	.01	0.06
Puzzle efficiency	0.79 (0.22)	0.68 (0.22)	0.79 (0.20)	0.73 (0.23)	0.16	.69	0.00	4.24	.04	0.03

Table 4
Cell means and standard deviations for the four experimental conditions together with the effects of the social pressure manipulation and the child failure manipulation on duration of free-choice behavior and interaction quality during the free-choice phase.

	Task-involvement		Ego-involvement		Social pressure manipulation			Child failure manipulation		
	Success	Failure	Success	Failure	$F(1,95)$	p	η^2_p	$F(1,95)$	p	η^2_p
Duration of free-choice behavior	0.90 (0.19)	0.87 (0.23)	0.81 (0.23)	0.91 (0.18)	0.20	.65	0.00	0.64	.43	0.01
Observed control vs. autonomy	1.43 (0.97)	1.53 (0.79)	1.95 (1.11)	2.13 (1.39)	6.28	.01	0.06	0.39	.53	0.00
Observed dyadic reciprocity	2.79 (1.12)	2.56 (0.98)	2.20 (1.09)	2.42 (1.11)	2.84	.10	0.03	0.00	.98	0.00
Observed parental engagement	4.87 (0.69)	4.62 (0.72)	4.70 (0.65)	4.75 (0.44)	0.03	.86	0.00	0.56	.46	0.001
Observed child engagement	4.96 (0.57)	4.90 (0.52)	4.66 (0.64)	4.78 (0.60)	3.15	.08	0.03	0.07	.80	0.00

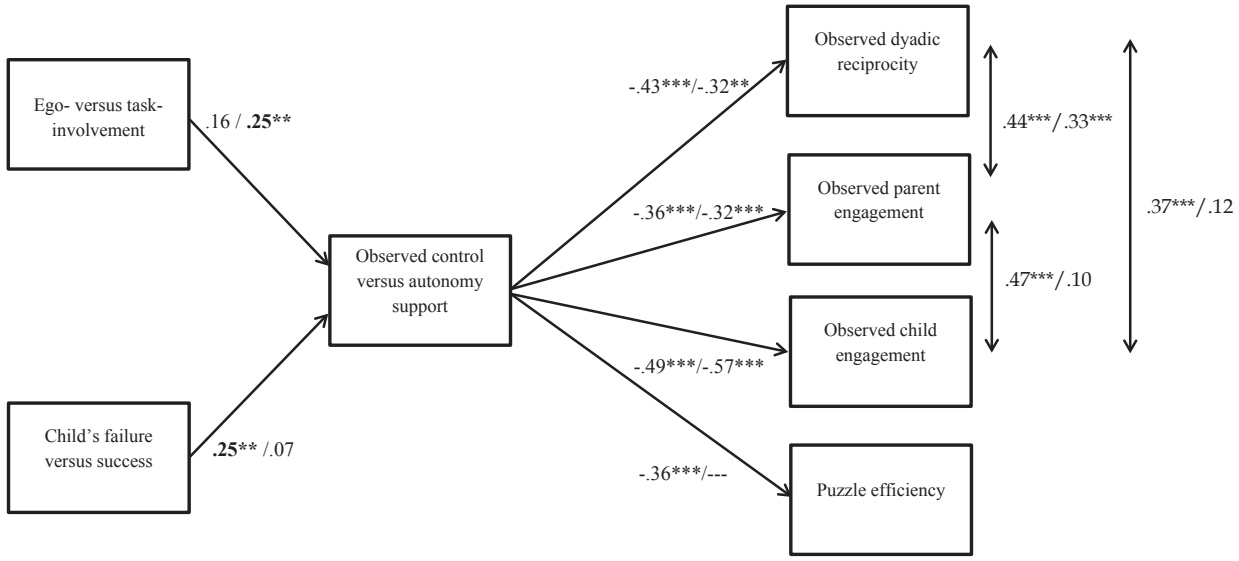

Fig. 2. Structural model with standardized path coefficients of the relations between the two sources of pressure, observed parental control (relative to autonomy support), and the outcomes in the experimental and free-choice phase. The first coefficient shown is for the experimental phase and the second coefficient is for the free-choice phase. $p < .05$. $^{**}p < .01$. $^{***}p < .001$.

The means and standard deviations of the parent-reported and observed variables together with the main effects of the two manipulated variables can be found in Table 3 (experimental phase) and Table 4 (free-choice period). For the parent-reported outcomes, both manipulations yielded a main effect on parental tension and concern with the child's failure. As hypothesized, parents in the ego-involvement and failure condition reported more tension and concern with the child's failure. Yet, for reported tension also an interaction effect emerged ($F(1,120) = 4.57$, $p = .04$, $\eta^2 = 0.04$). Only parents in the ego-involvement condition were susceptible to induction of child failure ($F(1,58) = 11.09$, $p = .002$, $\eta^2 = 0.16$). Parents in the task-involvement condition did not differ in terms of tension between the failure and success conditions ($F(1,60) = 0.31$, $p = .58$, $\eta^2 = 0.01$).

For the observed measures, social pressure had a main effect on observed control (relative to autonomy support) during the free-choice phase, while the child's performance predicted observed control during the experimental phase. As hypothesized, parents in the ego-involvement and failure condition were more controlling (relative to autonomy-supportive). None of the qualitative outcomes of dyadic interaction (i.e., dyadic reciprocity, parental engagement, child engagement) during both phases were directly impacted by any of the two manipulations or by their interaction. However, as will be discussed in greater detail below, these outcomes were related indirectly via the observed interaction style of the parent. As regards the performance indicators, the child performance manipulation, but not the social pressure manipulation, had a main effect on the indicators of performance. Specifically, in the child failure condition, dyads assembled more puzzles but also made more mistakes, thereby displaying a lower puzzle efficiency overall. Finally, as can be seen in Table 4, the duration of free-choice behavior did not vary between the different conditions. Neither the free choice persistence measure nor the performance measure was predicted by the interaction between the two manipulations.

3.2.2. Integrated model

We tested two integrated models (i.e., one for the experimental phase and one for the free-choice phase), in which the two manipulated variables were entered as predictors of observed parental control (relative to autonomy support) which, in turn, was a predictor of all dyadic outcomes (observed dyadic reciprocity, observed child and parent engagement, and puzzle efficiency, with the later variable being included only in the experimental phase). The interaction between both manipulations was not included as a separate predictor as ANOVA-analyses had indicated that the interactions were systematically non-significant. To estimate these models we performed Structural Equation Modeling (SEM) analyses with manifest variables using MPlus 6 software with robust maximum likelihood estimation (Muthén & Muthén, 2010). We estimated a path model with manifest variables instead of estimating latent constructs because of sample size constraints. We inspected the comparative fit index (CFI), the root-mean-square residual (RMSEA), and the standardized root-mean-square residual (SRMR). Values lower or close to 0.06 for RMSEA and 0.09 for SRMR and values of 0.95 or higher for CFI reflect adequate fit (Hu & Bentler, 1999).

Estimation of the integrated models (Fig. 2) yielded adequate fit both in the experimental phase (SBS-$\chi^2(8) = 5.43$; $p = .71$, RMSEA = 0.00, CFI = 1.00, SRMR = 0.03) and in the free-choice phase (SBS-$\chi^2(6) = 3.08$; $p = .80$, RMSEA = 0.00, CFI = 1.00, SRMR = 0.03). The fit of these models could not be improved by

adding direct paths from the independent variables to the dependent variables. Path coefficients of these models are shown in Fig. 1. The manipulation of the child's failure (versus success) predicted parents' observed control during the experimental phase. Yet, in the free-choice phase only the social pressure manipulation had a significant effect on observed parental control. Further, there were significant negative associations between observed parental control and (a) observed dyadic reciprocity, (b) observed parental engagement, and (c) observed child engagement during both the experimental as the free-choice phase. Observed parental control also predicted less puzzle efficiency (d), which was measured only during the experimental phase.

Although the manipulations did not impact observed reciprocity and engagement directly, it is possible that they did so indirectly, that is, via the activated parental control. In such a case, observed parental control would still play an intervening role in the association between the manipulations and the observed outcomes (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). A Sobel (1982) test for indirect relations indicated that observed parental control indeed played such an intervening role as evidence was found for a significant indirect association from the child performance manipulation to all the outcomes (a-d) through observed parental control during the experimental phase ($ps < .05$). A Sobel (1982) test also indicated significant indirect associations from the social pressure manipulation to parent and child engagement through observed parental control in the free-choice phase ($ps < .05$) but not to observed dyadic reciprocity ($p = .06$).

4. Discussion

Pressure on parents is said to limit parents' time and psychological availability to be open and responsive for their children's needs (Belsky, 1984; Grolnick, 2003). As a result, parents would become more directive, thereby pushing the child towards parent-desired outcomes and providing solutions to the problem at hand instead of patiently allowing the child to find a solution independently. Although quite a number of studies examined the role of pressure arising from within parents' personality on parents' dispositional engagement in a controlling style (e.g., Soenens, Vansteenkiste, Duriez, & Goossens, 2006), comparatively less studies examined the contribution of social pressure on parents and of child characteristics on parents' situation-specific display of control. Further, because [with the exception of two studies performed by Grolnick et al. (2002, 2007)] most studies were correlational in nature, no strong claims about causal effects of these sources of pressure could be made. Therefore, in the present study we examined effects of social pressure and child failure using experimental methods on parents' experiences, on their interaction style, and on several dyadic outcomes.

4.1. Effects of pressures on parents' personal experiences and interaction style

Consistent with our theorizing, the two experimentally activated pressures had an effect on the way parents experienced the puzzle-solving activity. Specifically, when parents were informed that the activity was a reflection of the child's logical intelligence and were made responsible for the child's successful execution of the task (high social pressure condition) or when parents found out that their child was doing poorly (failure condition), they reported being more concerned with the possibility that their child would fail and feeling more tense themselves. Yet, the latter effect was characterized by an interaction indicating that parents only experienced tension when the two experimentally induced pressures were present simultaneously. This interaction may explain why previous research failed to find effects of ego-involved pressure on parents' feelings of tension (Grolnick et al., 2002).

Experimentally induced parental ego-involvement and child failure also led parents to make more use of controlling practices. These experimental findings, which represent the most important results from the current study, confirm and extend correlational findings showing that parental ego-involvement (e.g., Wuyts, Vansteenkiste, et al., 2015) and children's poor performance (e.g., Pomerantz & Eaton, 2001), both represent risk factors for the use of a more controlling and autonomy-suppressive parenting style. Interestingly, while induced child failure mainly led to observed controlling behaviors during the experimental phase, the experimental induction of social pressure led to observed controlling behaviors during the free-choice period. This difference in the *timing* of the effects on parents' behavior was not anticipated but represents an interesting finding. While the child's failure had an immediate effect on the use of a controlling style, the effects of the social pressure instructions were delayed. Presumably, parents in the failure condition quickly found out during the experimental phase that their child would not succeed in solving the predetermined number of puzzles. The experience of time pressure and the anticipation of child's failure were presumably experienced as explicit and acute sources of pressure, leading parents to immediately take over the puzzle solving process from the child. The fact that the effect of induced child failure on observed parental control faded out during the free-choice period can likely be attributed to the fact that a different context was created during the free-choice period. Specifically, the parent-child dyads were not provided with any additional standards during this period and they were free to (dis)continue working on the task. Due to the lack of time urgency during the free-choice phase and parents' reduced possibility to infer whether the child was failing or successful at the activity, it can be understood that the effect of child failure on parents' exerted control waned during this period.

In contrast, the induction of social pressure (through the priming of parental ego-involvement) elicited a more controlling parental style during the free-choice period. The rather limited effect of induced social pressure in the experimental phase is congruent with past experimental work (Grolnick et al., 2002). Different elements may help to understand this finding. First, it is not straightforward to prime parental feelings of ego-involvement in an experimental setting because the task at hand needs to be sufficiently important and relevant to the parent's self-worth. A child's performance on a puzzle solving task in a fairly artificial setting is less likely to appeal to a parent's self-worth than a child's performance on school-related tasks and exams in daily life. Second, during the experimental phase, the effect of the child's failure (versus success) may have overruled the potential effect of induced parental ego-involvement. The instructions used to induce social pressure may have been relatively subtle and implicit compared to the salient and explicit observation of the child's failure. In other words, it may have taken some time and processing before the instructions 'sank in' and began to affect parents' behavior. A third possible reason for the delayed effect of social pressure is that it was restated at the end of the experimental phase that task success was reflective of a fixed capacity (i.e., logical intelligence) in the ego-involvement condition. Holding fixed ideas about the child's capacities has been found to relate to the use of controlling parenting practices while parents worked with their child on a set of challenging problems (Moorman & Pomerantz, 2010). Thus, reiterating the notion of a fixed capacity may have been essential to trigger feelings of ego-involvement in parents and to make them use a more controlling style.

4.2. Costs associated with pressure on parents

The negative effects of the two sources of pressure were not limited to the parents' interaction style but also emerged, mainly indirectly, for various outcomes. Specifically, induced child failure had indirect effects, via observed parental control, on dyadic reciprocity, parent engagement, and child engagement during the experimental phase. For these outcomes, observed parental control played an intervening role: that is, as far as the social pressure manipulation elicited greater parental control, both children and parents were observed to be less engaged and to be less connected as a dyad. In the free-choice period, induced social pressure was also associated indirectly, that is, via

observed parental control, with reduced parental and child engagement (but not with dyadic reciprocity). These findings suggest that pressure on parents ultimately affects children negatively because pressure on parents activates elevated parental control which, in turn, backfires on the dyad's interaction quality and engagement. Future work may unravel the mechanism accounting for this effect, with impaired satisfaction of the psychological needs for autonomy, competence, and relatedness, being a viable candidate to account for the costs associated with parental control (Ahmad et al., 2013; Oga-Baldwin, Nakata, Parker, & Ryan, 2017).

To further illustrate this detrimental effect of pressure, we highlight the direct and indirect association of induced child failure on parent-child joint performance. Parents who witnessed their child's failure seemed to go through the puzzles faster, presumably because they felt a strong sense of time pressure. As a consequence, they assembled more puzzles with their child. Unfortunately, however, these dyads also made more mistakes, resulting in less efficient task performance, an effect that could be accounted for by parents' use of a controlling approach. These findings are consistent with previous experimental studies showing that pressuring conditions undermine individuals' deep-level cognitive strategies (Grolnick & Ryan, 1987; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005). Future qualitative research may want to deepen insight into the nature of these parent-child dynamics, for instance by making use of a video review task (see Ickes, Stinson, Bissonnette, & Garcia, 1990). After finishing the puzzle activity, parents could be asked to go through the video and to provide their ongoing thoughts and feelings when engaging in the activity. Such a more detailed analysis would enrich the current quantitative findings as greater insight would be gained in the exact moment when parents become concerned with their child's failure and in the question whether parents, consciously or unconsciously, begin to place pressure on their child on these moments.

Somewhat unexpectedly, the two sources of pressure were unrelated to persistence during the free-choice period. Possibly, it is more important to look at the quality of motivation for free-choice persistence behavior than at the duration of the persistence per se (Ryan, Koestner, & Deci, 1991). Future research would do well to measure parents' reasons for persistence (see Van der Kaap-Deeder et al., 2016), which could be more intrinsic or more introjected in nature. That is, parents may continue working on the puzzles because they enjoyed doing so during the experimental phase or because they feel pressured to prove themselves that their child is capable of solving the puzzles after all. Especially under conditions of failure, parents' persistence may be ego-involved in nature (Ryan et al., 1991; Vansteenkiste & Deci, 2003), which may help to explain why the two manipulated sources failed to predict persistence. The two sources of pressure were also unrelated to observed engagement. This may have to do with the measure of engagement, which combines elements of emotional and behavioral engagement. Perhaps pressure affects both elements of engagement differently (with pressure increasing behavioral engagement yet decreasing emotional engagement), such that the overall effect on engagement becomes non-significant. More generally, the finding that the two sources of pressure were related to all dyadic outcomes only indirectly may have to do with the relatively subtle nature of the experimental inductions. Possibly, more explicit and direct experimental instructions might affect these outcomes more directly. Future research would also do well to include measures of several other factors that may affect the dyads' outcomes (such as engagement) beyond the experimental manipulations, including participants' pre-existing levels of interest and competence in the puzzle activity.

4.3. Practical implications

The practical implications of the current findings are manifold. First, the findings demonstrate the risks associated with providing performance standards to parents that are not attuned to children's actual competence. The failure experiences following from such standards impact the quality of parents' involvement and students' subsequent engagement. If parents are informed inadequately about children's average performance (i.e., with the information not corresponding to the individual child's actual competence), parents may more easily become concerned with their child's failure and get involved in the children's homework in a steering and controlling way to avoid such failure. This finding suggests that teachers need to be mindful of which expectations and standards for performance they communicate to parents. Although some teachers may communicate about average standards for children (in a given age group) in an attempt to elicit greater effort-expenditure from both children and parents and to promote greater child performance, the current findings suggest that this strategy may backfire when these standards do not accurately reflect children's actual level of performance (and, hence, result in failure). Therefore, teachers can best be informed about the risks associated with the provision of misguided standards and at the same time be informed that there is great variability in the pace of achieving normative standards. To maintain children's engagement, teachers can best provide standards that are attainable, realistic, and well-attuned to individual children's competence levels and maturity.

Second, there likely exists variation in the degree to which teachers and schools more broadly make parents accountable for their child's performance (Wuyts et al., 2015). To the extent that parents experience such social pressures and are made responsible for their child's performance at school, they may adopt a narrower, outcome-oriented focus. The present findings suggest that such a focus may prevent parents from patiently following their child's rhythm, instead leading them to micromanage children's progress, which eventually forestalls children's engagement. Therefore, it is important for teachers and school boards to pay attention to the kind of messages they convey to parents. Instead of pointing out parents' personal responsibility in children's achievement, it is advised to highlight the importance of a patient and process-oriented approach where parents are made aware of individual differences in children's pace of progression.

Third, the findings of the current study suggest that intervention and prevention efforts should focus not only on altering parents' behaviors and practices. Although it is important to inform parents about the risks associated with controlling parenting and to guide parents in finding ways to be autonomy-supportive (e.g., Froiland, 2015; Joussemet, Mageau, & Koestner, 2014), the effects of interventions may be short-lived as long as sources of pressure on parents' functioning are not taken into account. Our findings show that parents' use of a controlling style is rooted in a complex network of social and child-driven factors. Hence, in addition to focusing on parents' behavior, we suggest that intervention and prevention programs also need to take into account parents' context and experiences of pressure. This can be done on several interrelated levels, including the level of social policy and the individual level of the parent.

An important goal for future research is to further investigate the interplay between the two sources of pressure examined in this study and parents' personality. For instance, parental self-critical perfectionism has been identified as an important antecedent of controlling parenting (Soenens et al., 2005). Possibly, parents high on self-critical perfectionism more easily perceive social standards as a source of pressure to be a successful parent. They may also be more likely to interpret a child's poor performance as a threat to their own worth as a parent. Thus, examining the combined role of parental personal traits and other sources of pressure may yield further insight in the origins of controlling parenting.

4.4. Limitations

The present study had a number of limitations. First, given the lack of a neutral condition, it is unclear whether the observed effects in the current study are carried by the pressure-inducing effect of the high

pressure conditions or the pressure-reducing effect of the low pressure condition. Second, one may wonder whether the manipulation of the child's performance in this study can be considered a pure operationalization of child behavior. Although parents were unaware about the feasibility for the child to finish the prescribed number of puzzles at the onset of the task, they may have realized quite quickly during the task that the prescribed standards were either impossible (in the failure condition) or easy (in the success condition). In addition to observing their child's failure to meet the standards (i.e. pressure arising from the child's behavior), parents may have felt that the standards themselves were demanding (i.e. pressure arising from socially prescribed standards). Also, parents in the failure condition may have become more sensitive to the fact that their behavior was video-recorded, thereby feeling obliged to provide guidance and help to their child. As such, at least in some parents' perception the failure-success manipulation may have involved a mixture of pressure arising from the child's performance and social pressure. Thus, future research would do well to develop experimental procedures that distinguish even more clearly between the different types of pressures. In this respect, children's failure versus success could have been communicated more directly to parent-child dyads, for instance, by providing positive or negative feedback halfway the experiment. Such a manipulation may yield more powerful effects than the current manipulation as parents find out only gradually (i.e., as the child was progressing through the puzzles) whether the child failed or succeeded on the task and as children themselves were not necessarily informed by their parents about the specific targets for success. Indeed, past research involving a direct manipulation of success versus failure feedback has revealed robust effects on individuals' intrinsic motivation (Deci et al., 1999), competence (e.g., De Muynck et al., 2017) and tension (e.g., Whitehead & Corbin, 1991). Third, the coding system for the observations developed in this study was used for the first time and needs to be validated in future work. A limitation was that most of the observations were coded by only one coder. Also, although we made use of observations, the obtained associations between the observed variables are still cross-sectional in nature. Quite possibly, there are bidirectional relations between the observed variables, with parents' and children's behaviors and experiences influencing each other in a reciprocal manner.

Fourth, one may raise concerns about the generalizability of our findings. As the participants' educational level was relatively high, there is a need to do similar studies in families with a lower socio-economic background. The recruitment procedure may have contributed further to a selection bias, with mainly highly involved parents signing up for the experiment. Unfortunately, no information was gathered among non-participating child-parent dyads such that it remains unclear to what extent a selection bias has occurred. Also, the nature of the task itself may limit the generalization of the current findings. Parent-child dyads were not familiar with the puzzle activity at hand, which may explain why situational factors impact on the parents' experiences and interaction style. Yet, the role of situational factors may be reduced in the case of routine-based and familiar activities with a longer history of parent-child communication patterns. Thus, future experimental work could examine whether the current findings generalize to more authentic and routine activities such as homework. Fifth, although no differences were found between mothers and fathers in the background analyses, we recommend recruiting more fathers in future studies. A more balanced gender ratio would allow one to perform multi-group analyses to investigate whether or not the structural relations between the study variables differ between mothers and fathers. Finally, given the negative effects of the manipulations of pressure observed in this study, it can be recommended for future experimental studies on controlling parenting to not only inform participants during the debriefing about the goal of the study but also to inform them about the benefits of a more autonomy-supportive style (Froiland, 2015; Joussemet et al., 2014).

5. Conclusion

In this study we tested the implications of two sources of pressure on parents' interaction style, on parental experiences, and on parent-child dyadic behavior: social pressure (leading parents to become ego-involved in their children's achievement) and the child's failure (versus success). The findings suggest that both pressures, in one way or another, lead to maladaptive consequences. Parents exposed to these pressures adopt a more controlling interaction style which, in turn, is related to decreased dyadic quality of interaction and performance. The maladaptive consequences associated with pressure on parents and with a controlling parental style are relevant to both researchers and practitioners. Future research can contribute to a better understanding of these dynamics and to the identification of ways in which parents' resilience against pressure can be strengthened.

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.cedpsych.2017.09.010.

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