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Is harsh caregiving effective in toddlers with low inhibitory control? An experimental study in the food domain



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ABSTRACT

The aim of our study is to evaluate the validity of the “Caregiving × Temperament Paradigm” in the food domain. In this study, two prototypes of caregiving control have been contrasted: Harsh (forceful measures to curve the child’s behavior) *versus* Gentle control (supportive measures to direct the child’s behavior). In food domain, the most effective control to help a child to overcome initial dislike is repeated exposure. Our first objective was to test whether the repeated exposure displayed in a gentle context has a more beneficial effect on dislike shifting than the one displayed in a harsh context. Our second objective was to assess whether this effect was moderated by a temperamental characteristic (child’s inhibitory control). A randomized experimental protocol was used in day care-centers, involving 98 children aged 21–41 months. Children were asked to consume an initially rejected target food on five occasions either with a Gentle or a Harsh instruction. Children’s dislike for the target food was assessed via intake before and after the familiarization phase. Inhibitory control level was measured in 78 of these children using validated questionnaire. Four groups were created: Instructions (Gentle vs Harsh) × Inhibitory control (Lower vs Higher). After the familiarization phase, the consumption of the target food increased in all groups, but with a higher increase in children with high Inhibitory control with Gentle instruction, than for children with low Inhibitory control with Harsh instruction, the two other groups being in between. Our data fit a model of cumulative effects, and show that both gentle control strategies and high inhibitory control in children contribute to regulate disgusts experienced in some feeding contexts.

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1. Introduction

Infants and young children are dependent on parents and caregivers who provide conditions that will promote their growth and development. Since the original framework from Baumrind (1966), two prototypes of parental control have been contrasted: Harsh control (or forceful measures to direct the child’s behavior) *versus* Gentle control (or supportive measures to shape the child’s behavior). Their differential effects have been evaluated on several child outcomes, such as self-regulation (for a meta-analysis, see Karreman, vanTuijl, vanAken, & Dekovic, 2006), social adjustment (Chen, Huang,

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Chang, Wang, & Dan, 2000; Marbell & Grolnick, 2013; Nelson, Yang, Coyne, Olsen, & Hart, 2012), or conduct problems (Bates, Pettit, Dodge, & Ridge, 1998; Goodnight, Bates, Pettit, & Dodge, 2008), with an overall more positive effect of gentle over harsh contexts. In the food domain, the most effective control strategy to help a child to overcome initial disgust or negative emotions towards unfamiliar foods is repeated exposure: the more often a food is presented to the child, the better the acceptance. Repeated exposure enhances individual's affective response towards the stimulus (Anzman-Frasca, Savage, Marini, Fisher, & Birch, 2012; Birch, McPhee, Shoba, Pirok, & Steinberg, 1987; Caton et al., 2012; Maier, Chabanet, Schaal, Issanchou, & Leathwood, 2007; Oconnell, Henderdon, Luedicke, & Schwartz, 2012; Remington, Annez, Croker, Wardle, & Cooke, 2012; Rigal, 2005; Wardle, Herrer, Cooke, & Gibson, 2003). The first question to be addressed in our study was to determine whether the repeated exposure control strategy displayed with a gentle instruction has more beneficial effects on dislike shifting than repeated exposure displayed with a harsh instruction. To date, only indirect answers to this question are available in the literature. Firstly, data from correlational studies indicated that authoritarian or forceful contexts are associated with negative behaviors during childhood such as food neophobia (Cin Cin & Holub, 2012; Rigal, Chabanet, Issanchou, & Monnery-Patris, 2012), pickiness (Hendy, Williams, Riegel, & Paul, 2010), low intake of fruit and vegetable (Bante, Elliott, Harrod, & Haire-Joshu, 2008; Galloway, Fiorito, Francis, & Birch, 2006; Gregory, Paxton, & Brozovic, 2011; Hubbs-Trait, Kennedy, Page, Topham, & Harrist, 2008; Patrick, Nicklas, Hughes, & Morales, 2005; Vereecken, Keukelier, & Maes, 2004) and avoidance (Powell, Farrow, & Meyer, 2011). Secondly, experimental studies using a repeated exposure paradigm were all carried in a warm context. For example, Birch, Zimmerman and Hind (1980) showed that children eating repeatedly a disliked snack increased their liking for this snack more strongly in a social and warm context than children in a control condition (no social context). Overall, despite inconsistencies in methodology, the evidence suggests that the context of gentle controlling strategies is associated with less negative food behaviors than harsh controlling strategies. However, most of the past studies were cross-sectional and cannot disentangle the sense of the causality. Moreover, no study compared directly the effectiveness of gentle *versus* harsh context on the repeated exposure effect.

Beyond the effect of parental feeding strategies on children's food avoidance or dislike, some temperamental features of the child should be considered, as it is commonly done in current developmental studies in other fields. In relation to our study, the temperamental feature that has to be considered is inhibitory control or the capacity to stop, moderate, or refrain from a behavior under instruction (Rothbart, Ahadi, Hershey, & Fisher, 2001). Indeed, inhibitory control is a central component of executive functions which are under the control of the prefrontal cortex maturation (Vijayakumara et al., 2014). Inhibitory control allows gratification delay by avoiding impulsive responses, regulating one's emotions, and displaying flexibility (Carlson & Wang, 2007; Dowsett & Livesey, 2000; Schachar & Logan, 1990). So, following instructions is rendered possible by inhibiting a dominant response (e.g., not sampling the food) in order to implement more adaptive goal-oriented behaviors (e.g., sampling the food). Indeed, inhibitory control is positively associated with compliance (Linsdsley & Caldera, 2005; Morasch & Bell, 2011; Spinrad et al., 2012).

Overall, the findings related to the moderating effect of self-regulation (commonly assessed by measures of inhibitory control according to the model of Rothbart et al., 2001) on parenting are puzzling. According to the review of Kiff, Lengua and Zalewski (2011), the consistency of findings depends on the dimensions of parenting considered. When control is the predictor, the conclusion that children low in self-regulation appear to benefit from parental control is relatively well-established. For example, Bates et al., (1998) found that highly controlling mothers had children who were less likely to develop later externalizing behavior problems, but only in children with low inhibitory control. By contrast, when the affective components of parenting, such as warmth, are considered, Kiff et al. (2011) suggest that there is little consistent support for an interaction between self-regulation and parenting. In addition, different models predicting the effects of interaction between temperament and parenting have been described. The diathesis-stress view suggests that harsh contexts are likely to disproportionately affect children with difficult temperament, but not children with easy temperament (Zuckerman, 1999). According to the differential susceptibility model, children with difficult temperament are far more affected than others by both negative and positive contextual conditions (Belsky & Pluess, 2009; Belsky, 2005). Longitudinal findings support both models. For example, Mesman et al. (2009) found that sensitive parenting observed during a series of problem-solving tasks predicted a decrease in oppositional problems from ages 2/3 to 4/5, but that this relation was true only for children with difficult temperaments. By contrast, in a longitudinal study with children aged between 30 and 40 months and using observed measures of compliance, inhibitory control and mother's responsiveness, Kochanska and Kim (2013) found results clearly consistent with the diathesis-stress model: in children with high inhibitory control, the quality of the mother's responsiveness did not impact compliance, whereas in those low in inhibitory control, children were less compliant when they received unresponsive care than when they received responsive care. Finally, theory-testing results are inconclusive because data supporting both explanations have been reported. So, in the state of the art, it seems difficult to produce any prediction.

The current study is a randomized controlled trial that aims to evaluate whether inhibitory control moderates the impact of gentle *versus* harsh controlling feeding instructions on the child's ability to overcome, with repeated exposure, her/his dislike for a rejected food. As our protocol relies on a food exposure paradigm, the main outcome is the change in intake with repeated exposure, which is supposed to reflect the shift in emotion for the initially rejected food. More precisely, we assume that the consumption of the initially rejected food will increase with repeated exposure for all children, whatever the affective quality of the Instruction (Gentle vs Harsh) (Repeated Exposure Hypothesis). Our second hypothesis is that the size of the effect on intake will differ according to the affective tone of the Instruction (Gentle vs Harsh), with a stronger effect for Gentle over Harsh instructions (Instruction hypothesis). Finally, we assumed that the increase of intake will depend on

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