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The Accuracy and Malleability of Parental Beliefs about Child Socio-Emotional Health*

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Abstract

We document systematic parental under-reporting of children's socio-emotional difficulties relative to children's self-reports, using representative data from Luxembourg, the United Kingdom, and Australia. To study the origins of this discrepancy, we develop a simple theoretical framework showing how parent–child gaps can arise from information frictions and differences in reporting styles. We complement the model with a novel survey design that elicits both parental beliefs about children's latent socio-emotional wellbeing and parental beliefs about children's self-reports, allowing us to disentangle the different sources of the discrepancy. Using a new survey from Luxembourg, we estimate that approximately 70% of the observed gap is attributable to information frictions. Consistent with a Bayesian model of signal extraction, belief accuracy declines when children experience high levels of distress. The precision of second-order beliefs is negatively correlated with parental education, income, and employment, and—paradoxically—with more accurate priors about aggregate parental under-reporting, a pattern we refer to as the *Capacity Paradox*. As predicted by the model, a randomized information intervention shifts both first- and second-order beliefs only among parents with weak priors and generates heterogeneous effects on intended parental investments. These findings highlight the central role of second-order beliefs in understanding parental misperceptions and the potential for targeted information policies to improve parental awareness of children's socio-emotional wellbeing.

Keywords: Parental beliefs; Child wellbeing; Information frictions; Second-order beliefs; Bayesian learning; Reporting bias; Information interventions.

JEL Codes: J13, J24, I10, I31

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1 Introduction

The ongoing crisis in child mental health underscores the urgent need for greater investment in children's wellbeing (e.g., Currie, 2025). Because parents are the primary investors in their children's human capital, their perceptions of children's needs and difficulties play a central role in shaping such investments. A crucial first step in addressing this crisis is to improve our understanding of how accurate parents' beliefs are about their children's socio-emotional wellbeing—and to what extent these beliefs are malleable. This question is central to parenting, mental health, and human capital development. Parental beliefs shape not only how children are supported emotionally, but also the types of educational and developmental investments parents choose to make—decisions that are often constrained or distorted by information frictions (e.g., Bergman, 2021; Caucutt et al., 2017).

A well-documented puzzle in child psychiatry is the low to moderate level of agreement between children's self-reports and the assessments provided by adult informants—most commonly parents or teachers (see Achenbach et al., 1987, for a seminal meta-analysis). This discrepancy raises a fundamental question: does it reflect unreliable judgment—often implicitly attributed to the child—or does it instead stem from informational frictions between children and adults (Van der Meer et al., 2008; Del Bono et al., forthcoming)? The distinction has important implications, particularly for whether (and how) parental beliefs can be updated through the provision of information.

We study the accuracy and malleability of parental assessments of children's socio-emotional wellbeing using a novel framework that distinguishes between first-order beliefs – parents' assessments of their child's latent wellbeing – and second-order beliefs – parents' beliefs about how their child reports that wellbeing. This distinction allows us to separate misperceptions arising from information frictions from those driven by differences in reporting styles.[1]

To guide the empirical analysis, we develop a simple theoretical framework in which discrepancies between parent and child reports arise naturally from imperfect parental information and differences in reporting behavior. A key implication of the model is that second-order beliefs are particularly informative: in the absence of information frictions, parents' beliefs about their child's report should coincide with the child's self-report. Second-order beliefs therefore allow us to identify parents with more accurate information about their child's underlying distress. Empirically, we find that approximately 70% of the parent–child reporting gap is explained by information frictions rather than differences in reporting styles. Moreover, consistent

[1] We use the terms first-order and second-order beliefs in a non-strategic sense, to distinguish beliefs about the child's latent state from beliefs about the child's own report of that state. This differs from the hierarchical belief structures commonly studied in Game Theory.

with the model's prediction from Bayesian signal extraction, belief accuracy declines when children experience high levels of distress. Finally, the model predicts that belief updating in response to new information is heterogeneous and depends on the strength of parents' prior beliefs. We test this prediction using an information treatment that provides parents with aggregate evidence on parent–child reporting gaps. Consistent with the theoretical framework, only parents who already believe that systematic discrepancies exist – whether in the direction of over- or under-reporting – revise their beliefs in response to the information, while parents holding strong priors of no bias remain largely unresponsive.

We begin by documenting the extent of parent-child discrepancies in measures of socio-emotional health across three cohort studies from Luxembourg, the United Kingdom, and Australia, highlighting systematic gaps between parental reports and children's self-assessments. Children in these cohorts span several generations: in the UK, we rely on the Avon Longitudinal Study of Parents and Children (ALSPAC), which follows children born in the early '90s; in Australia, we draw from Growing Up in Australia – the Longitudinal Study of Australian Children (LSAC), which includes two cohorts born in the early 2000s; last, in Luxembourg, we collected a dedicated survey in 2021 targeting children born between 2007 and 2009.[2] Our main measure of socio-emotional difficulties comes from the Strengths and Difficulties Questionnaire (SDQ; Goodman et al., 2000), widely regarded as a reliable screening tool for identifying emotional and behavioral difficulties in children.[3] Our findings show that parents tend to underestimate their children's socio-emotional difficulties relative to children's own self-reports. This underestimation is systematically observed across different measures of socio-emotional health and across the three different countries. The parent-child gap is consistently more pronounced for daughters than for sons, while the parent's gender does not seem to systematically affect it.[4] Importantly, rank–rank comparisons reveal systematic misalignment in relative assessments, indicating that parent–child discrepancies reflect more than scale normalization or random noise across respondents.

In order to measure second-order beliefs and therefore allow for a better understanding of the nature of these discrepancies, we conducted a second survey in Luxembourg in late 2023. Results from this survey replicate the finding of a parent-child reporting gap and show that parents' second-order beliefs are also systematically misaligned with children's self-reports, although to a lesser extent than the gap observed between parent and child first-order ratings. Our model implies that approximately 70% of the observed negative parent–child gap is attributable to informational frictions rather than to differences in reporting styles. Parents who correctly anticipate their child's self-assessment (i.e., parents with more accurate second-

[2] All studies are nationally representative of children in the relevant cohort, with the exception of ALSPAC, whose geographical scope is limited to the English county of Avon.

[3] For instance, Goodman et al. (2000) show that when the SDQ indicates a probable disorder, a formal psychiatric diagnosis is present in approximately 53% of cases, while a rating of "unlikely" corresponds to a diagnosis in only 1.6% of cases.

[4] This pattern is in line with the argument put forward by Haidt (2024), who suggests that societal expectations are often stricter for girls, leading others to expect greater emotional resilience from them.

order beliefs) display no systematic underestimation in their first-order reports. This suggests that the observed negative parent-child gap stems from information frictions rather than deliberate minimization. Furthermore, as predicted by the Bayesian updating model, the gap is increasing in the level of socio-emotional difficulties reported by the child.

The alignment of parents' second-order beliefs with child reports is negatively correlated with parental education, income, and employment status. Interestingly, parents who hold more accurate priors about the general tendency of parents to under-report children's difficulties are themselves less accurate in assessing their own child's wellbeing – a pattern we refer to as the *Capacity Paradox*. In addition, greater personality mismatch between parent and child is associated with lower belief accuracy. Guided by our theoretical framework, we interpret these findings as reflecting information constraints: parents in highly demanding occupations may have less time and cognitive bandwidth to observe, process, and interpret signals about their children's socio-emotional state, resulting in poorer information despite greater awareness of aggregate reporting biases.

In order to assess the malleability of parental beliefs, we designed an information experiment with approximately 500 parent-child pairs to test whether providing aggregate information about the typical parent-child gap could shift parental beliefs.[5] Parents were randomly assigned to either a treatment group, which received a brief message about the average discrepancy in socio-emotional health ratings observed in the 2021 Luxembourg data, or to a control group that did not receive this piece of information. Following the intervention, we elicited both first- and second-order beliefs to assess whether the treatment reduced information frictions – i.e., whether parents updated their beliefs in a way that brought them closer to their children's self-reports. Consistent with the model of Bayesian updating, we find that both types of beliefs are malleable in response to information, conditional on parents' priors (elicited following the framework proposed by Haaland et al., 2023). Specifically, parents who already believed there was a discrepancy (hence have weaker priors) – whether in the direction of over- or under-reporting – were more likely to update their assessments in response to the treatment. These findings suggest that simple, well-targeted information interventions can meaningfully improve parental insight into child socio-emotional health.

Following the information treatment, beside eliciting parents' beliefs about their child's socio-emotional health, we also collect a battery of variables related to future human capital investments. We show that parents exposed to the information treatment report different investment intentions compared to those in the control group. While the average treatment effect is null, results are highly heterogeneous: parents with stronger emotional attunement and better mental health plan to spend more time with their children

[5]The experimental protocol and analysis were preregistered at https://osf.io/4vue3/.

following the intervention. Responses are particularly pronounced for sons, with age-specific patterns in the type of intended investment.

This paper contributes to the literature in at least three ways. First, we introduce a novel conceptual and empirical framework for studying information asymmetries within households. By distinguishing parents' second-order beliefs from their first-order beliefs of child socio-emotional wellbeing, we provide a tractable way to measure the extent to which parents misperceive their children's internal states. This distinction makes it possible to separate information frictions from rater-specific interpretation and thereby offers a new tool for analyzing belief formation more generally.

Second, we contribute to the economics literature on parental beliefs in human capital formation (Attanasio et al., 2019, 2022; Bhalotra et al., 2025; Biroli et al., 2022; Boneva and Rauh, 2018; Caucutt et al., 2017; Cunha et al., 2022; Dizon-Ross, 2019; Giannola, 2024; Kinsler and Pavan, 2021; List et al., 2021; Tungodden and Willén, 2023). Prior work has typically focused on parental beliefs about children's cognitive skills or the returns to educational investments, often elicited in stylized production-function settings. We shift this focus to socio-emotional health, a domain increasingly recognized as central for later-life outcomes in education, health, and labor market success (Carneiro et al., 2007; Conti et al., 2010; Cunha and Heckman, 2008; Heckman et al., 2006). Unlike cognitive skills (which can be imperfectly measured using externally validated performance-based tests), socio-emotional wellbeing often lacks an objective benchmark, making parental assessments especially prone to misperception. By documenting systematic biases in parents' beliefs and showing that these beliefs are malleable in response to information, we provide suggestive evidence that reducing information frictions in this domain can affect parents' investment intentions.

Third, we contribute to the interdisciplinary literature on cross-rater differences in the measurement of child skills (e.g., Achenbach et al., 1987; Kraemer et al., 2003; Van der Meer et al., 2008; Romano et al., 2018; De Los Reyes et al., 2019; Del Bono et al., forthcoming). Prior work has shown that divergences across informants are systematic and often reflect differences in interpretation or reference points.[6] We add two new perspectives. First, we provide some of the first systematic, cross-country evidence on the direction of the parent–child gap in socio-emotional wellbeing, documenting that parents tend to understate their children's difficulties relative to own reports. Second, we show that a substantial share of these divergences can be attributed to informational frictions within the household.

The remainder of our paper is organized as follows. Section 2 provides a theoretical framework allowing

[6]Parents, teachers, and children often report divergent views of a child's emotional and behavioral problems. Notably, Goodman and Goodman (2009) find that parental ratings tend to exhibit higher sensitivity to clinical diagnoses compared to those of children and teachers, suggesting that parents may offer more accurate assessments. Recent studies, however, highlight the value of inter-subjectivity – incorporating multiple perspectives – to improve the identification of mental health problems (e.g., Romano et al., 2018; De Los Reyes et al., 2019).

for a clear distinction between noise in the information and behavioral biases. Section 3 presents the data and methodology. Section 4 documents cross-country evidence on parent–child reporting gaps. Section 5 examines second-order beliefs and Section 6 the information experiment in Luxembourg. Section 7 provides concluding remarks. We relegate additional details on data and results and a more detailed presentation of the model in the Appendix.

2 A Theoretical Framework of Parental Beliefs

In this section, we sketch the theoretical framework used to interpret our empirical results. Let us consider a static environment in which a child has a latent level of socio-emotional difficulty $D \in \mathbb{R}$. This latent difficulty D, which captures the child's underlying distress, can be measured using a questionnaire such as the SDQ.

The true level of difficulty D is drawn from a normal prior

$$D \sim \mathcal{N}(\mu_D, \sigma_D^2). \tag{1}$$

Parents do not observe D directly. Instead, they observe a noisy signal, $\tilde{D}$, which is inferred from the child's behavior and from the imperfect observation of their environment (i.e. what happens at school or outside).

For clarity of exposition, consider a simplified example in which D is measured by a single SDQ item, "I worry a lot," coded as 0 ("Not true"), 1 ("Somewhat true"), and 2 ("Certainly true"). Suppose that the child's level of worries can be best described by the middle category ($D = 1$). Parents, however, may perceive this signal imperfectly, while children may also have incentives or attitudes that lead them to downplay or exaggerate their worries. We use this stylized example throughout to illustrate the information structure of the model.

Children may not externalize their distress faithfully. To capture child-specific frictions in the expression of socio-emotional difficulty—including masking, exaggeration, or other non-deliberate behavioral responses—we introduce an unobserved *concealment (or amplification)* term κ.[7] We assume

$$\kappa \sim \mathcal{N}(\bar{\kappa}, \sigma_\kappa^2),$$

[7] We use "concealment" as shorthand for any distortion in externalization; it need not be intentional.

independent of the true difficulty D. Parents, who cannot observe D directly, observe a behavioral signal

$$\tilde{D} \;=\; D + \kappa + \varepsilon_X, \qquad \varepsilon_X \sim \mathcal{N}(0, \sigma_X^2), \tag{2}$$

where $\kappa < 0$ indicates masking (the child appears *less* distressed than they truly are) and $\kappa > 0$ indicates amplification (the child appears *more* distressed). The noise term ε_X captures idiosyncratic measurement error due to context, attention, or chance; larger σ_X^2 makes the signal less informative. For instance, if the true difficulty is $D = 1$ (e.g., "sometimes worries"), a child who masks with $\kappa = -1$ will, on average, be observed as $\tilde{D} = 0$ (e.g., "does not worry much"), absent measurement noise.

Parents do not observe κ. Instead, they hold beliefs about its distribution and may misperceive its mean. We model this as a bias in the perceived population average:

$$\tilde{\bar{\kappa}} = \bar{\kappa} + b, \tag{3}$$

where b is a *perception bias*. If $b > 0$, parents expect more amplification (or less masking) than is actually present, so children are, on average, *less* distressed than parents infer from behavior. If $b < 0$, parents expect more masking (or less amplification) than is actually present, so children are, on average, *more* distressed than parents infer. Accordingly, parents form beliefs

$$\tilde{\kappa} \sim \mathcal{N}(\tilde{\bar{\kappa}}, \sigma_\kappa^2),$$

and use these beliefs when mapping the observed signal $\tilde{D}$ into an estimate of D.

Overall, equation (2) highlights two conceptually distinct limits to parental information. First, κ captures systematic distortions in the externalization of distress - persistent, child-specific wedges between true difficulty and observed behavior. Parents may misperceive the average magnitude of this distortion, summarized by the bias b in (3). Second, ε_X captures purely idiosyncratic noise in the observed signal (context, attention, chance), generating random mis-measurement even when κ is correctly understood.

The child maps their latent difficulty into a self-reported questionnaire response. We assume the child's reporting function to be of the following form

$$S_c = D + \theta_c, \tag{4}$$

where θ_c is a child-specific reporting bias (e.g., a tendency to under- or over-report difficulties). In our

example above, if the child has a tendency to overstate difficulties and the bias is best estimated as $\theta_c = 1$, then she would report $S_c = 2$.

Parents believe that the child's report is generated according to

$$\tilde{S}_c = D + \tilde{\theta}_c, \qquad \tilde{\theta}_c \sim \mathcal{N}(\theta_c, \tilde{\sigma}_\theta^2) \tag{5}$$

where $\tilde{\theta}_c$ represents the parental belief about how the child's internal state maps into questionnaire responses (i.e. the child's reporting style).

As a parsimonious baseline, we assume parents have no systematic bias about their child's reporting style, so that $\mathbb{E}[\tilde{\theta}_c] = \theta_c$. We discuss the implications of relaxing this assumption below.[8] In our running example, this implies that, on average, parents interpret the child's report as $D + 1$ for any feasible D.

2.1 Parental beliefs

Parents do not observe D and form a belief given the observed $\tilde{D}$. In our Bayesian framework, we have

$$\tilde{D} \mid D \sim \mathcal{N}\big(D + \tilde{\bar{\kappa}},\ \sigma_X^2 + \sigma_\kappa^2\big)\,.$$

Thus the parents' posterior mean of D after observing $\tilde{D}$ is

$$m_p(\tilde{D}) \equiv \mathbb{E}_p[D \mid \tilde{D}] = \omega(\tilde{D} - \tilde{\bar{\kappa}}) + (1-\omega)\mu_D, \qquad \omega = \frac{\sigma_D^2}{\sigma_D^2 + \sigma_X^2 + \sigma_\kappa^2}. \tag{6}$$

Under correct perception ($b = 0$), this becomes $m(\tilde{D}) = \omega(\tilde{D} + \bar{\kappa}) + (1-\omega)\mu_D$. The wedge induced by misperception is

$$m_p(\tilde{D}) - m(\tilde{D}) = \omega b.$$

If parents under-estimate masking ($b < 0$), they add back too little masking and therefore under-estimate difficulty.

The parent's *second-order belief* about the child's report (what the parent thinks the child would report

[8] Several strands of the literature on self-reported wellbeing suggest that this is a plausible benchmark. Evidence of systematic bias in children's reporting styles varies by SDQ subscale and by relational context, with no clear indication of a uniform direction of bias in aggregate (Booth et al., 2023; Cheng et al., 2018). Moreover, this assumption is conceptually aligned with the notion of generalized response consistency (Benjamin et al., 2023), whereby individuals apply similar translation functions – i.e., mappings from latent states to response scales – across different types of questions, spanning both subjective and objective domains. In everyday settings, parents repeatedly observe their children making evaluations over objectively verifiable states (e.g., academic performance or food preferences), which play a role analogous to calibration questions in the framework of Benjamin et al. (2023).

on the questionnaire) is

$$S_p^{(2)} = m_p(\tilde{D}) + \tilde{\theta}_c. \tag{7}$$

The parent's *first-order belief* about how the child feels (their own assessment of child difficulty on the questionnaire scale) is represented as

$$S_p^{(1)} = m_p(\tilde{D}) + \theta_p, \tag{8}$$

where θ_p is determined by the parent's reporting style, and $\theta_p < 0$ captures a normative or motivational adjustment (e.g., "children are resilient" or a desire to downplay difficulties) that leads parents to under-report difficulties relative to their posterior $m(\tilde{D})$. Continuing the example, parents respond based on their best estimate of the child's true difficulty given the observed signal $\tilde{D} = 0$, so their posterior mean is $m(0)$. Suppose parents view the child as resilient (e.g., $\theta_p = -1$) and correctly believe that the child tends to over-report difficulties (i.e., $\tilde{\theta}_c = 1$). Then their two reports are

$$S_p^{(1)} = m(0) - 1 \qquad \text{and} \qquad S_p^{(2)} = m(0) + 1,$$

even though the true difficulty is $D = 1$ and the child reports $S_c = 2$. More generally, discrepancies between child and parent reports can arise from (i) distortions in externalization (κ), (ii) parental bias about those distortions (b), and (iii) the reporting styles of both parties (θ_c and θ_p).

2.2 Main Predictions

We next summarize the model's main qualitative predictions; proofs are provided in Appendix A.

Prediction 1 *In the aggregate, parents' first-order beliefs are systematically lower than child-reported distress if*

$$\omega b - (\theta_c - \theta_p) < 0. \tag{9}$$

Condition (9) is more likely to hold when parents systematically under-report (i.e., $\theta_p < 0$), children systematically over-report (i.e., $\theta_c > 0$), and parents underestimate the extent of masking (i.e., $b < 0$). The effect is amplified when ω is larger. Overall, the prediction highlights that observed parent–child discrepancies reflect both differences in reporting styles and bias induced by informational frictions.

Prediction 2 *In aggregate, parental second-order beliefs underestimate child reports, $S_p^{(2)} < S_c$, if and only if $\omega b < 0$. Conversely, $S_p^{(2)} = S_c$ implies $\omega b = 0$.*

In the baseline model, systematic underestimation of children's reports by parental second-order beliefs

arises solely from concealment and biased beliefs about concealment. In particular, parents match their child's SDQ report in expectation if and only if they hold unbiased beliefs about concealment, i.e., $b = 0$. Thus, second-order beliefs isolate this specific informational friction.

Moreover, if parents both (i) correctly anticipate the child's report (so $b = 0$) and (ii) do not distort their own reporting ($\theta_p = 0$), then parental reports - their first-order beliefs - track the child's underlying distress.

This result relies on the baseline assumption in (5) that parents, on average, correctly infer the child's reporting style. If we relax this assumption, then $S_p^{(2)} < S_c$ whenever

$$\omega b + \left(\mathbb{E}[\tilde{\theta}_c] - \theta_c\right) < 0.$$

This expression makes clear that two distinct (and non-deliberate) sources of informational friction can generate gaps in second-order beliefs: bias about concealment (b), and misperception of the child's reporting style ($\mathbb{E}[\tilde{\theta}_c] - \theta_c$).

A related concern is that $S_p^{(2)} - S_c \approx 0$ need not imply the absence of bias: opposing aggregate biases could offset. For example, $b < 0$ together with $\mathbb{E}[\tilde{\theta}_c] - \theta_c > 0$ could yield apparently accurate second-order beliefs even though parents still misinfer the child's latent socio-emotional state. In this case, correctly predicting the child's report would not guarantee accurate inference about underlying distress. While this is theoretically possible, existing empirical evidence does not point to such compensating aggregate biases (e.g., Booth et al., 2023; Cheng et al., 2018). A more plausible configuration, consistent with the literature, is that parents underestimate concealment ($b < 0$) and any systematic bias in perceived child reporting styles is weak or negative on average ($\mathbb{E}[\tilde{\theta}_c] - \theta_c \leq 0$).

Prediction 3 *Define the parent–child report gap $e_1(\tilde{D}) \equiv S_p^{(1)}(\tilde{D}) - S_c$, and the within-parent gap between first- and second-order beliefs $d(\tilde{D}) \equiv S_p^{(1)}(\tilde{D}) - S_p^{(2)}(\tilde{D})$. Then, in the aggregate, $e_1(\tilde{D}) - d(\tilde{D})$ identifies the informational friction in parents' inference about the child's latent distress, i.e.,*

$$e_1(\tilde{D}) - d(\tilde{D}) \;=\; m_p(\tilde{D}) - D.$$

Both $e_1(\tilde{D})$ and $d(\tilde{D})$ are observable in our data. Their difference therefore isolates the portion of the parent–child discrepancy that is attributable to informational frictions about the child's latent distress D, rather than to reporting-style differences. Below, we provide a formal decomposition and an empirical strategy to estimate separately the components due to informational frictions and reporting styles.

Prediction 4 *Noisier environments imply more disagreement between child report and parental second-order beliefs.*

Noisier environments, characterized by lower parental attention, greater complexity, or larger differences between parents and children, reduce the informativeness of signals about the child's underlying difficulty, leading to greater divergence between children's and parents' reports.

Prediction 5 *Given fixed reporting styles (θ_c, θ_p) and masking misperception b, then the expected gap between a child's report and her parent's first-order report is increasing in the child's true difficulty D (i.e. disagreement is largest for high difficulties):*

$$D_1 > D_0 \quad \Longrightarrow \quad \mathbb{E}\Big[S_c - S_p^{(1)}(\tilde{D}) \mid D = D_1\Big] \; > \; \mathbb{E}\Big[S_c - S_p^{(1)}(\tilde{D}) \mid D = D_0\Big] .$$

The child's report moves one-for-one with D, whereas the parent's posterior mean $m_p(\tilde{D})$ responds with slope $\omega < 1$ because parents filter a noisy signal and shrink beliefs toward the prior mean μ_D. Consequently, the parent–child gap increases with true difficulty at rate $1 - \omega$.

3 Data

We rely on two original surveys collected in Luxembourg by the Luxembourg Institute of Socio-Economic Research (LISER) to examine the accuracy and malleability of parental beliefs about their children's socio-emotional wellbeing. Both surveys include matched parent–child dyads and incorporate the Strengths and Difficulties Questionnaire (SDQ), our main measure of children's socio-emotional wellbeing. Survey 1 provides baseline evidence on parent-reported child distress (or parent fist order beliefs); Survey 2 introduces second-order beliefs and includes a randomized information intervention on social awareness.

To assess external validity, we complement the Luxembourg data with two cohort studies: the Avon Longitudinal Study of Parents and Children (ALSPAC) in the United Kingdom, and the Longitudinal Study of Australian Children (LSAC). Both include matched parent-child socio-emotional health reports, enabling us to replicate a descriptive analysis of parent-reported child distress across distinct institutional and cultural settings. While LSAC collected the SDQ scale for both raters, in ALSPAC the SDQ scale is only reported by parents (and, on occasion, teachers). In this dataset, we therefore use the Short Moods and Feelings Questionnaire (SMFQ; Angold et al., 1995), a measure of depressive symptoms that is administered to both parents and children at the same child ages.[9] The two datasets are described in further detail in Appendix G.

[9]The SMFQ is based on 13 items, responses to which are measured on a three-point Likert scale with values 0 'Not true', 1 'Sometimes', or 2 'True'.

3.1 Measures of Socio-Emotional Wellbeing and Rater Differences

Our main measure of children's socio-emotional wellbeing is the SDQ, a widely validated screening tool developed by Goodman (1997). The SDQ consists of 25 items, grouped into five subscales of five items each: (1) emotional symptoms, (2) conduct problems, (3) hyperactivity/inattention, (4) peer relationship problems, and (5) prosocial behavior. Each item is scored on a three-point Likert scale (0 'Not true', 1 'Somewhat true', 2 'Certainly true'), and subscale scores range from 0 to 10. For analytical purposes, two composite indices are commonly constructed: the Internalizing SDQ, which aggregates emotional symptoms and peer problems, and the Externalizing SDQ, which combines conduct problems and hyperactivity/inattention (Goodman et al., 2010). The sum of the internalizing and externalizing subscales yields the Total SDQ, a global measure of socio-emotional problems ranging from 0 to 40.

In our surveys, we administer rater-appropriate versions of the SDQ to both parents and children. Children aged 10 to 16 complete the self-report version of the SDQ, while parents respond to the parent-report version for the same child. This dual perspective allows us to assess discrepancies between self-reported and parent-assessed socio-emotional health across multiple dimensions. The full list of SDQ items, for both child and parent questionnaires, is provided in Appendix E.

Let SDQ_c denote the child's self-reported score and SDQ_p^j the corresponding score reported by the parent, where $j \in 1, 2$ indicates first- and second-order beliefs.For the sake of exposition we omit the superscript j in what follows (note also that the same metric is used for the sub-dimensions of the SDQ). These measures correspond to S_c, $S_p^{(1)}$ and $S_p^{(2)}$ respectively in the model. To quantify discrepancies between child and parent assessments of socio-emotional wellbeing, we employ two complementary measures:

i **Simple Difference:**

$$\sum_{i=1}^{N}(\text{SDQ}_{p,i} - \text{SDQ}_{c,i})$$

This measure captures the *average directional bias* in parental reporting. A negative value indicates that parents, on average, report lower socio-emotional difficulties than their children self-report (i.e., underestimation), while a positive value implies overestimation.

ii **Euclidean Distance:**

$$\sqrt{\sum_{i=1}^{N}\left(\text{SDQ}_{p,i} - \text{SDQ}_{c,i}\right)^2}$$

This measure reflects the overall *magnitude of disagreement* between parent and child assessments, irrespective of direction. It provides a general indicator of misalignment between the two perspectives.

These two metrics allow us to distinguish between systematic bias in reporting (simple difference) and the absolute level of disagreement (Euclidean distance) in evaluating children's socio-emotional health.

We compute the simple difference and the Euclidean distance based on the SDQ measures in the Luxembourg surveys and in LSAC; we use the SMFQ instead for the ALSPAC survey.

3.2 Survey 1: Baseline Data on Child-Parent Discrepancies

Survey 1 was conducted online in Luxembourg from June to July 2021 and corresponds to the second wave of the *Child Wellbeing Survey*. The survey followed children aged 11 to 14 who had participated in the first *Child Wellbeing Survey* administered in 2019 by LISER and the Luxembourg Ministry of Education. Out of 7,738 children who were invited, 2,119 responded.[10]

After excluding incomplete or inconsistent responses and dyads without parent assessments, the final analytical sample consists of 907 matched parent-child pairs. Appendix Figure F.1 presents a detailed overview of the survey implementation, response rates, exclusion criteria, and the construction of the final analytical sample.

The child questionnaire included sociodemographic characteristics and the SDQ self-report. Parents completed a parallel version of the SDQ and relevant socio-economic background variables. Parent and child questionnaires were completed independently. Data from Survey 1 could be linked to administrative registers via a unique personal identifier, allowing to have a reliable measure of household income.

Table F.1 reports summary statistics. On average, children reported higher levels of socio-emotional difficulties (mean total SDQ = 10.73) than their parents did (mean = 7.98), resulting in a negative parent-child gap of –2.75 points. We also compute the Euclidean distance across SDQ items to capture absolute disagreement, which averages 2.91 points. The sample is balanced in terms of child characteristics (gender and age) and includes diverse family and parental profiles.

3.3 Survey 2: Measuring second-order beliefs and Experimental Design

Survey 2 was conducted online in Luxembourg from November to December 2023. It targeted two groups: (i) parents who had responded to the third wave of the *Child Wellbeing Survey*, and (ii) individuals from the general population who had previously agreed to participate in LISER-led studies. Out of approximately 4,700 individuals invited, 1,130 initiated the survey.[11] After applying eligibility criteria, 660 participants

[10] To encourage participation, a lottery featuring child-oriented prizes was organized.

[11] To incentivize participation, respondents who completed the survey could choose between a €10 voucher, entry into a lottery for a €50 voucher, or the option to donate €10 to charity.

qualified, and 404 completed responses were obtained. An additional 100 complete responses were secured through a supplementary social media recruitment campaign. The survey did not include a longitudinal component.

The parent and child questionnaires covered a wide range of socio-emotional and psychological constructs. Like in Survey 1, parents reported their child's socio-emotional health using the Strengths and Difficulties Questionnaire (SDQ); we refer to this assessment as parents' first-order beliefs – their assessment of the child's socio-emotional health. In addition we also collected parents' second-order beliefs – their beliefs about the child's self-assessment. First-order beliefs were collected via the regular parent-rated SDQ questionnaire (see Appendix E), while for second-order beliefs we asked parents to complete the child self-rated version of SDQ questionnaire, preceded by the following text: "We have asked you to rate your child's behavior over the last six months. Now, we would like you to think about **how your child would reply** to these questions. Please rate the following items as you think your child would."

In addition, parents provided responses on Theory of Mind (ToM),[12] Big Five personality traits,[13] depressive symptoms (via the 9-item Patient Health Questionnaire, PHQ-9; Kroenke et al., 2001), the quality of the parent-child relationship (via the Child-Parent Relationship Scale - Short Form, CPRS-SF; Driscoll and Pianta, 2011), and relevant socio-economic background variables.

Children completed analogous modules, including basic demographic information, the SDQ (both self-assessment and priors on the accuracy of the parent's assessment), ToM, Big Five traits, depressive symptoms using the SMFQ, and the parent-child relationship.

To evaluate the malleability of parental beliefs to new information, we followed the general framework of Haaland et al. (2023). We first elicited prior beliefs over the average parent-child gap in child wellbeing assessments from all respondents. Then, a randomly selected half of the parent sample received a brief information message stating that, on average, parents in Luxembourg tend to report higher child wellbeing relative to the child's own self-reports. This treatment aimed to test whether a soft-touch, credible piece of information could improve the alignment of parental beliefs with child self-reports.

The final matched estimation sample consists of 495 parent-child pairs with complete information on the SDQ scales.[14] Summary statistics for the estimation sample are presented in Table 1, for the treated and control groups separately. These highlight the key demographic and psychometric characteristics of parent-

[12] We use the Developmental Read the Mind in the Eyes Test (DeRMET) developed by Brañas Garza et al. (2023).

[13] We use the Big Five Inventory Short (BFI-S; Gerlitz and Schupp, 2005), a 15-item version of the original 44-item Big Five Inventory. This version has been validated for children and adults alike, and was developed for implementation in the German Socio-Economic Panel (SOEP).

[14] To ensure response attentiveness, only participants who failed no more than one of two attention checks were included in the estimation sample. Appendix Figure F.2 provides a detailed overview of the survey implementation.

child pairs and serve as a basis for comparison with the earlier survey wave. In terms of demographics, the sample is broadly comparable to that of Survey 1, although respondents in Survey 2 were slightly more educated on average and included a greater proportion of fathers.

Table 1: Descriptive Statistics and Balance of Covariates: Survey 2

	(1) Control	(2) Treatment	(3) Difference (1)-(2)
Outcomes			
Child-reported total SDQ	9.854	9.913	-0.059
	[5.703]	[5.684]	(0.512)
Parent-reported total SDQ (1st order)	7.807	8.149	-0.342
	[4.976]	[5.418]	(0.467)
Parent-reported total SDQ (2nd order)	8.413	8.917	-0.504
	[5.522]	[5.483]	(0.495)
Parent-child difference (1st order)	-2.047	-1.763	-0.284
	[5.167]	[5.135]	(0.463)
Parent-child difference (2nd order)	-1.441	-0.996	-0.445
	[4.543]	[4.166]	(0.392)
Parent-child Euclidean distance (1st order)	2.775	2.787	-0.013
	[1.023]	[0.950]	(0.089)
Parent-child Euclidean distance (2nd order)	2.778	2.840	-0.062
	[1.121]	[1.058]	(0.098)
Controls			
Female	0.528	0.506	0.021
	[0.500]	[0.501]	(0.045)
Age	13.035	12.892	0.143
	[2.076]	[1.961]	(0.182)
Parent: mother	0.669	0.676	-0.007
	[0.471]	[0.469]	(0.042)
Parent: age	45.173	45.510	-0.337
	[6.129]	[6.703]	(0.577)
Parent: education			
Upper-secondary education	0.276	0.232	0.043
	[0.448]	[0.423]	(0.039)
Tertiary education	0.689	0.693	-0.004
	[0.464]	[0.462]	(0.042)
Parent: employed	0.858	0.876	-0.017
	[0.349]	[0.331]	(0.031)
Two-parents household	0.819	0.797	0.022
	[0.386]	[0.403]	(0.035)
Observations	254	241	495

Notes: Standard deviations in brackets and standard errors in parentheses. Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

The first part of column 3 provides an initial non-parametric assessment of the average effect of the information treatment on the outcomes of interest. While none of the differences between treated and control groups are statistically significant, the parent-reported measures of SDQ show qualitatively larger

values in the treatment group, suggesting that parents updated their beliefs in the expected direction (as mentioned above, the update is statistically different from zero when the treatment is interacted with priors). Notably, the difference in means in parent-reported SDQ is 6 to 10 times greater than in child-reported SDQ – an outcome that, as expected, should remain unaffected by the treatment. The bottom part of the column can instead be seen as a test of the effectiveness of the randomized assignment into treatment arms, which appear balanced in terms of observable characteristics.

4 Child and parent-reported SDQ

We begin by examining the distributions of child- and parent-reported socio-emotional difficulties (i.e. parental first-order beliefs) across three nationally representative datasets: Luxembourg (Survey 1), Australia (LSAC), and the United Kingdom (ALSPAC). As shown in Figure 1, all three countries show a similar pattern – one in which parents tend to report lower levels of child socio-emotional difficulties compared to what their children report.

Figure D.1 and Figure D.2 in the Appendix disaggregate the SDQ into its four subscales – emotional symptoms, conduct problems, hyperactivity/inattention, and peer-relationship problems – in Luxembourg and Australia respectively, revealing that the parent-child gap is present in each dimension.[15] The gap is less pronounced for peer-relationship problems, whose underlying items are arguably more easily observable for parents (e.g., whether the child has at least one good friend).

To examine whether these differences hold within households, we turn to matched parent-child pairs from each dataset and our measures of rater differences. Consistent with the evidence from Figure 1, Figure 2 shows that the distribution of the simple difference between parent-reported and child-reported Total SDQ scores (or SMFQ for the UK) is centred below zero across all three countries.[16] In each subplot, the red line represents a zero-mean normal distribution with the same level of dispersion as the observed differences – a plausible distribution if parent-child discrepancies in SDQ scores were due to random noise. In all cases, the observed distribution of differences is statistically distinct from the zero-mean normal distribution, suggesting that the bias is systematic rather than random.

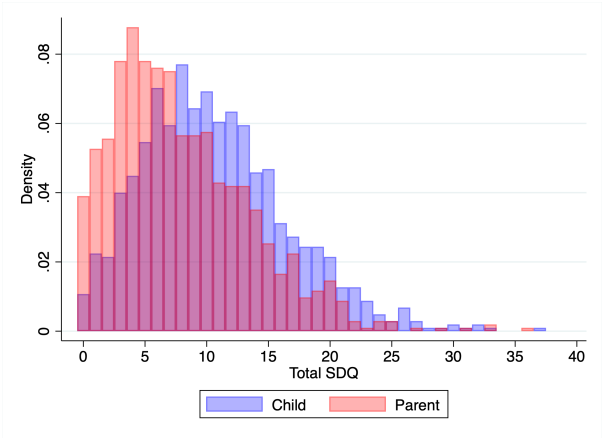
Even after re-centering the distributions of the simple parent-child differences at zero, Shapiro–Wilk tests reject normality in all samples, thereby indicating that the parent-child gaps are not the result of a simple

[15] Two-sided t-tests of differences in means across raters are statistically different from zero at the 1% levels for all four subscales.

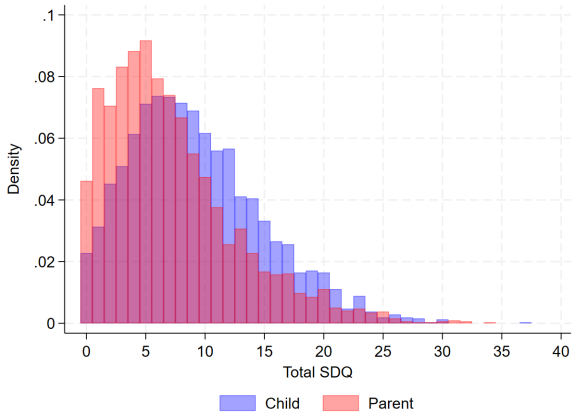
[16] Consistently, Appendix Figure D.3 shows that the distribution of the Euclidean distance between parent- and child-reported SDQ follows a similar right-skewed distribution across countries.

Figure 1: Distribution of total scores reported by children and parents

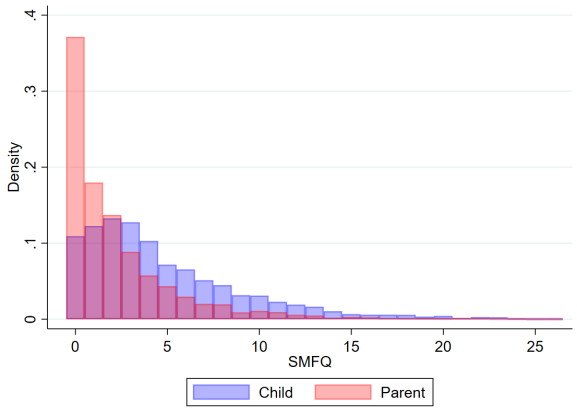
a) Luxembourg



b) Australia

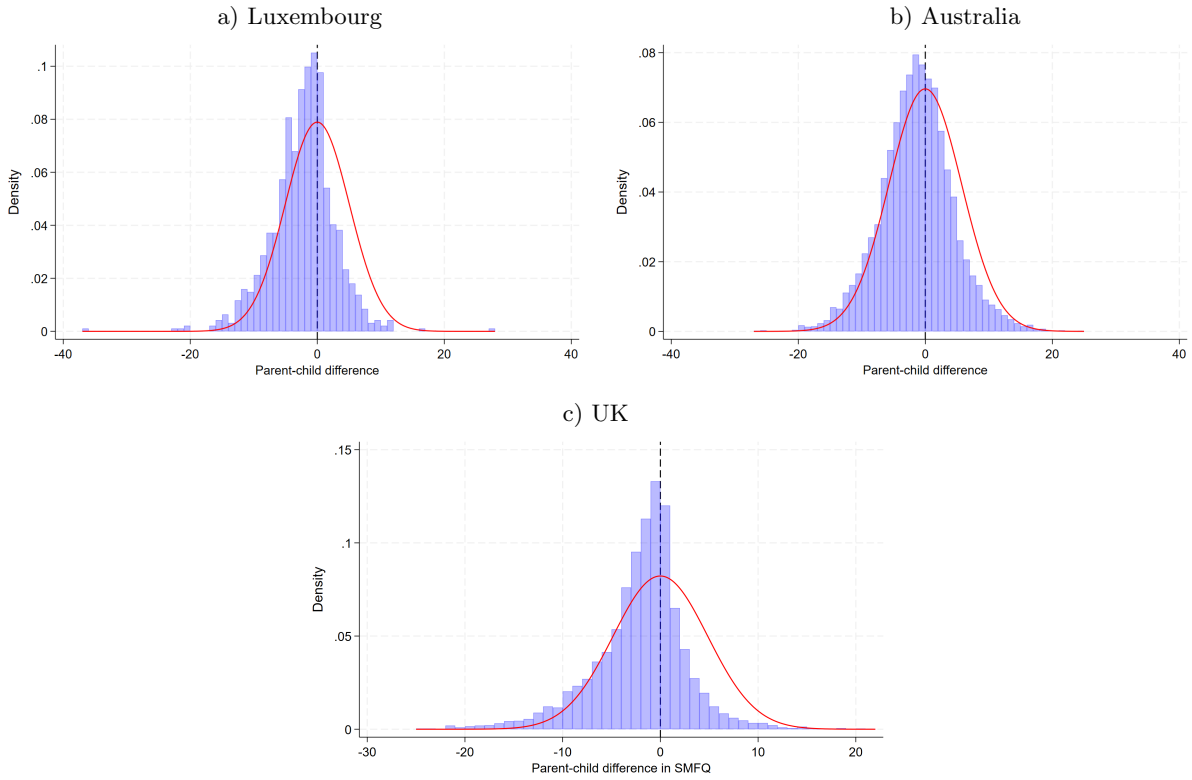


c) UK



Notes: The figure shows the distributions of total socio-emotional difficulty scores reported by children (self-reports) and by parents (parents' first-order reports). Higher scores indicate higher levels of socio-emotional difficulties. Measures are based on the SDQ in Luxembourg and Australia, and on the SMFQ in UK.

Figure 2: Distribution of simple difference in child and parent scores (matched pairs)



Notes: The figure shows the distribution of the difference between parent- and child-reported socio-emotional difficulty scores in matched parent–child pairs. Negative values indicate that parents report fewer difficulties than children. The red line corresponds to a zero-mean normal distribution with the same dispersion as the observed differences.

constant shift.[17] The evidence presented so far can be summarized as:

Result 1 *In aggregate, there is a negative difference between parental first-order beliefs and child report. This result supports Prediction 1, which implies a negative average gap when information frictions and reporting styles jointly satisfy* $\omega b - (\theta_c - \theta_p) < 0$.

We next explore the correlates of these discrepancies, focusing on both the simple difference (directional bias) and the Euclidean distance (magnitude of disagreement) between parent and child reports. Results are shown in Table D.1, for the two Luxembourg surveys, the UK (ALSPAC) and Australia (LSAC). Details on the definition of each variable in the three surveys can be found in Appendix G.

Since the bias measure (parent-child difference in total SDQ scores) is already negative on average, a negative coefficient in the odd-numbered columns of Table D.1 implies that the bias grows larger in absolute terms, rather than shrinking. The coefficient attached to the female gender indicator is robustly negative in the three countries, with a parent-child bias 0.8 to 1.3 points larger in magnitude for girls than for boys.[18] This gender penalty is driven by heterogeneity in parents' reports rather than children's self-reports, as the latter are stable across genders. Household income is also systematically correlated with a more negative bias across all surveys. For both gender and income, however, the larger bias in magnitude does not necessarily translate into lower precision, as shown by the varying magnitudes and signs of the Euclidean distance coefficients. These variations may reflect cultural differences or differences in data collection methodologies, and they represent an interesting avenue for future research.[19]

5 Results from Survey 2: Analysis of second-order beliefs

We now turn to the findings from the second survey conducted in Luxembourg in late 2023. First, we replicate our earlier findings that parents tend to overstate their children's wellbeing, focusing on the control group subsample to avoid confounding the information treatment effects. As shown in Figure D.12 in the Appendix, which compares children's self-reported SDQ scores with parents' reports, parents systematically report fewer socio-emotional difficulties than their children themselves.

Next, we compare child self-reported SDQ with parental reports, which include for the first time second-order beliefs (what parents think their child reported on the SDQ scale). As shown in Figure 3, there are substantial differences between the distributions: relative to children's self-reports, parents report lower

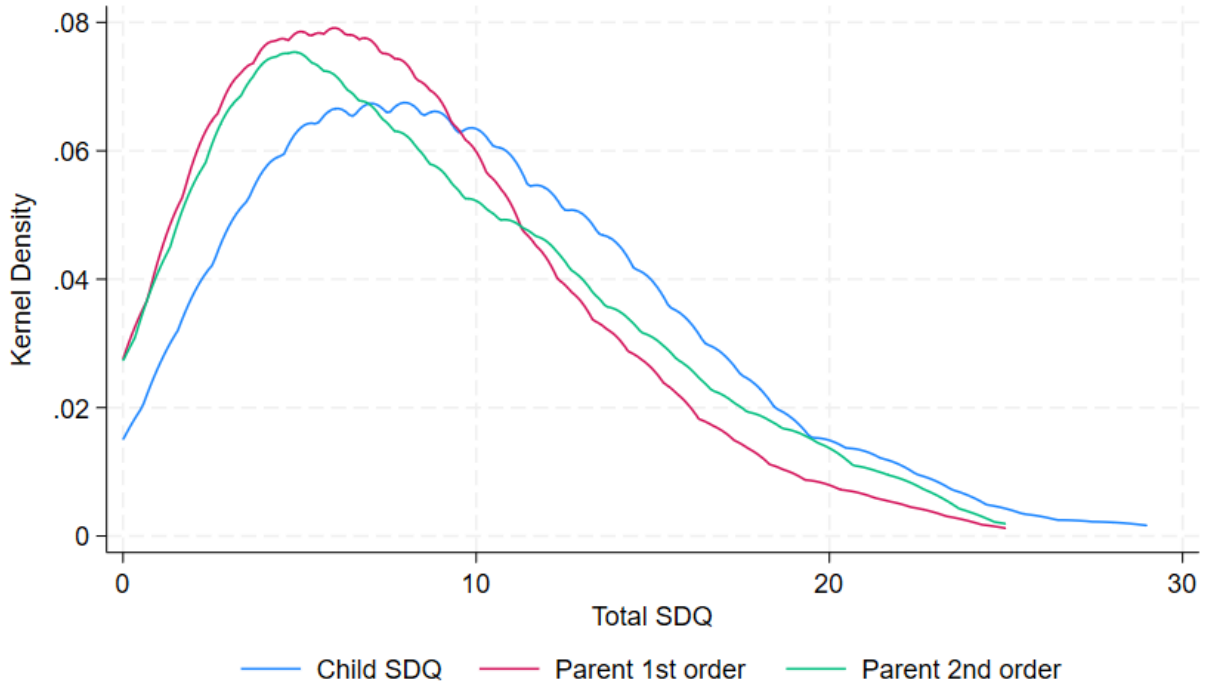
[17] Luxembourg Survey 1: W=0.95, p <0.000; ALSPAC: W=0.95, p <0.000; LSAC: W=0.98, p <0.000.

[18] In tables D.3 and D.2 of the Appendix, we estimates the same models for boys and girls separately.

[19] For example, household income comes from administrative data in Luxembourg Survey 1, while in the other surveys we built continuous measures of household income using mid-points of self-reported income bands.

levels of socio-emotional difficulties in both their own assessments and their second-order beliefs, although the gap is smaller for the latter. The means of the three distributions in Figure 3 – as reported in column 1 of Table 1 – are all pairwise statistically different at the 5% confidence level (see also Figure D.5 in the Appendix for a visual comparison between child-reported SDQ, parental reports and parental second-order beliefs).

Figure 3: Child SDQ, parental report of the child SDQ- and parental second-order beliefs in the control group



Notes: These are density functions of child- and parent-reported SDQ in the control group, estimated with the Epanechnikov kernel.

The distribution of the difference between first- and second-order beliefs in the control group (Figure D.5) is skewed and centered to the right of a zero-mean normal distribution, indicating that parents are, on average, aware that their children report experiencing more difficulties than the parents themselves believe their children are facing. While parents and children may rely on different reference points when evaluating child SDQ, their assessment of rank (how severe a child's socio-emotional problems are compared to others) might still be aligned. In order to test this, Figure D.6 plots the percentile rank of the child's self-reported SDQ against the parent-reported ones in the control group, separately for parents' first- and second-order beliefs. In both cases the linear slope of the estimated relationship is significantly lower than one, indicating

that for a given self-reported rank, parents tend to rate the child as having fewer difficulties.[20]

We then consider whether our descriptive results are sensitive to the way SDQ items are framed. Five out of the twenty SDQ items used for Total SDQ are positively framed as 'strengths' (those marked with the symbol † in Appendix E; for example, "Thinks things out before acting"), while the remaining fifteen have a negative connotation and can be interpreted as 'difficulties'. We first investigate whether parents and children differ in how they rate strengths and difficulties, by examining the average score per item within each group. As shown in Figure D.7, both parents and children tend to downplay the child's strengths more readily than they endorse higher levels of difficulties – although this tendency is more pronounced for parents' reported child beliefs.

We are then able to investigate how the measures of bias and discrepancy behave when disaggregating SDQ items into strengths and difficulties. To enable meaningful comparisons between subscales of different lengths, we normalized both the simple difference and the Euclidean distance by the number of items in each subscale (as in Figure D.7). Specifically, for the simple difference we computed the mean item-level difference (i.e., the total difference divided by the number of items), and for the Euclidean distance we calculated the root mean squared difference, defined as the square root of the average squared item-level differences. This normalization accounts for the unequal number of items in each subscale and ensures that both metrics reflect average per-item discrepancies between parent and child reports, making them directly comparable.

Results are presented in Figure D.8, which illustrates the average parent–child discrepancies on the SDQ subscales, separated by item valence (strengths vs. difficulties) and belief type (first-order vs. second-order). Consistent with Figure D.7, the mean item-level differences (left panel) show that the parent–child bias is negative for both difficulties and (the lack of) strengths, with a stronger bias for difficulties when relying on parents' reported child beliefs. The right panel, displaying the root mean squared differences, reveals a similar pattern: overall disagreement is greater for negatively framed items than for positively framed ones, with greater divergence for reported child beliefs. We summarize the main result from this section as follows:

Result 2 *In aggregate, there is a negative difference between parental second-order beliefs and children's self-reports; following Prediction 2, this implies that there is a bias in parental beliefs about children's concealment of their distress ($b < 0$).*

Recalling Prediction 3, we defined the difference between children and parental report as $e_1(\tilde{D}) \equiv$

[20]Figure Figure D.6 also shows that concordance between parents and children is stronger for parents' second- rather than reported child beliefs, showing that the improvement in alignment when moving from first- to second-order beliefs applies not only to levels but also to ranks. The slope of the linear fit between parents' second-order beliefs and child reports is 0.66 – substantially closer to 1 than the slope of 0.53 obtained when using parents' reported child beliefs (p-value < 0.001 for an F-test of equality of the slopes).

$S_p^{(1)}(\tilde{D}) - S_c$, and the difference between parental 1st and 2nd order beliefs as $d(\tilde{D}) \equiv S_p^{(1)}(\tilde{D}) - S_p^{(2)}$. From Table 1, in the control sample the difference $e_1(\tilde{D}) - d(\tilde{D}) = -1.441$ is about 70% of the total difference $e_1(\tilde{D}) = -2.047$, hence the information frictions account for 70% of the differences between parental and children reports. This leads to the following result:

Result 3 *Following Prediction 3, by comparing $e_1(\tilde{D})$ and $d(\tilde{D})$ we find that 1.441 out of 2.047 difference between children and parental report (about 70%) is due to information frictions.*

Parental Awareness

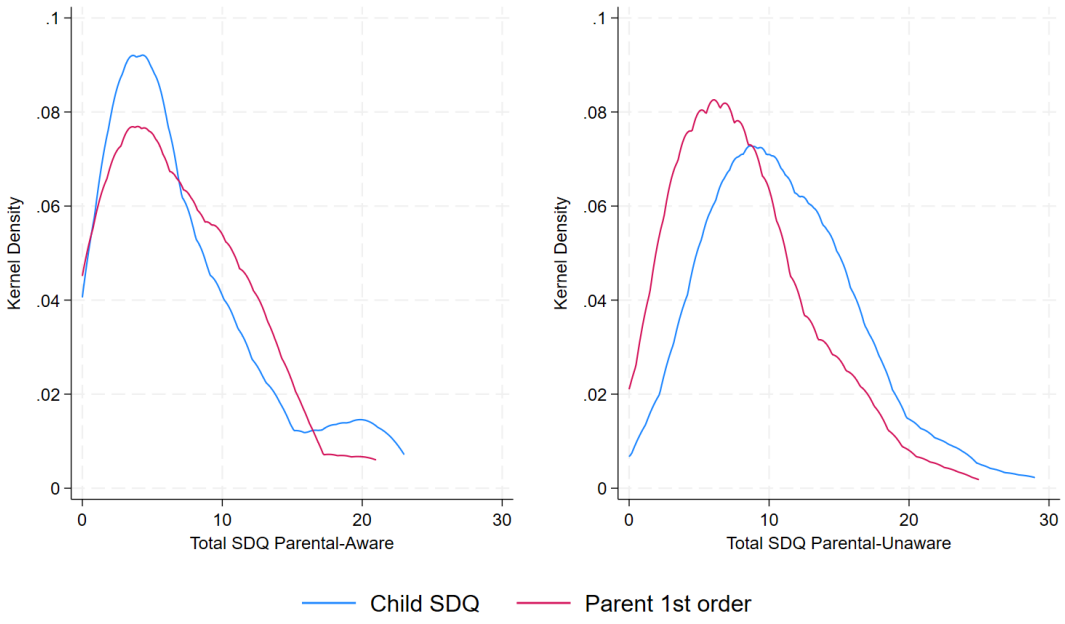
Prediction 2 implies that parents who give a good estimate of the child report, i.e. $S_p^{(2)} - S_c \approx 0$, have no information frictions because $b \approx 0$ and $\mathbb{E}[\tilde{\theta}_c] \approx \theta_c$. These parents are able to correctly estimate the level of child's distress, D. Accordingly, we define **Parental Awareness** as the accuracy with which a parent predicts their child's self-reported SDQ. Specifically, we classify parents as '*aware*' if they fall within the bottom 25% of the distribution of the Euclidean distance between their second-order beliefs and their child's actual SDQ responses.[21] From Appendix Figure D.9, we can observe that children have a good grasp of their parent's accuracy in guessing their responses, with only about 10% of children thinking that their parents, who we classify as 'aware', are not in fact accurate.

Figure 4 plots child SDQ report and parent report of child SDQ -awareness status. Parents with higher awareness tend to produce first-order reports that are more closely aligned with their child's self-assessment. The two-sample Kolmogorov–Smirnov test fails to reject the null hypothesis of equal distributions in the left panel – under the high parental-awareness condition (D = 0.082, p-value = 0.966). In contrast, the test strongly rejects the null in the right panel – under the low parental-awareness condition (D = 0.231, p-value < 0.001), indicating a significant difference between the two distributions. These results hold also when looking at the bias and discrepancy within parent-child pairs. Figure D.10 confirms that aware parents have no systematic gap between their first-order SDQ rating and the child's self-report, while the contrary is true for the unaware: the blue line, representing unaware parents, features a left-skewed distribution (mean = -2.791; p-value < 0.001); whereas the red line, representing aware parents, is centered around 0 (mean = -0.137 ; p-value = 0.359). Similarly, the average Euclidean distance for the parental-aware group is 1.906, significantly lower than the 3.118 observed among the unaware (difference in means p-value < 0.001). Appendix Figure H.1 illustrates the core conceptual framework of parental awareness.

What parent and child characteristics correlate with higher parental awareness? Following Prediction 4,

[21] We chose the 25% threshold as a compromise between identifying a group with relatively high predictive accuracy and maintaining a sample size large enough to support statistical inference. The results are qualitatively robust to the use of alternative cut-off points.

Figure 4: Child distress and parent-reported child distress beliefs by Parental Awareness



Notes: These are density functions of child- and parent-reported SDQ by parental awareness. The densities are based on observations in the control group only and are estimated with the Epanechnikov kernel.

we can expect more divergence between parent and child reports in contexts where parents pay less attention, where the external environment is more complex, where there are more parent-child differences. Table 2 presents marginal effects from a probit regression of parental awareness on a range of parent and child characteristics. Column (1) shows that higher parental education and parental employment are negatively associated with parental awareness. This suggests that parents engaged in intellectually demanding occupations and spending less time at home may be less attuned to their children's socio-emotional wellbeing. In addition, parents whose main language is French are more aware than those whose main language is German, as indicated by the survey language choice. Conditional on socio-economic controls, the French–German gradient likely reflects residual cultural or reporting heterogeneity across linguistic groups, or differences in the interpretation of questionnaire items. It may also capture variation in schooling environments, as many children from francophone families in Luxembourg attend French-speaking or international tracks, which may shape peer contexts and parent–school communication and, in turn, affect parents' awareness of children's socio-emotional wellbeing.

Consistent with the negative coefficients attached to higher parental education and parental employment, column (3) reveals a negative association between household income and parental awareness. One possible explanation is that higher income, which often accompanies more time-intensive or externally demanding

Table 2: Socio-Demographic Predictors of Parental Awareness

	(1) Baseline	(2) +Priors	(3) + Income
Mother	-0.006	-0.011	-0.046
	(0.046)	(0.046)	(0.049)
Age	-0.004	-0.004	-0.004
	(0.004)	(0.004)	(0.004)
Employed	-0.146**	-0.148**	-0.101
	(0.060)	(0.059)	(0.068)
Two-parents household	-0.029	-0.022	0.055
	(0.055)	(0.055)	(0.061)
Education: (Lower Secondary Baseline)			
Upper secondary	-0.188*	-0.160	-0.119
	(0.104)	(0.102)	(0.101)
Post secondary	-0.205**	-0.172*	-0.080
	(0.101)	(0.100)	(0.102)
Luxembourg Resident	0.033	0.037	0.073
	(0.071)	(0.071)	(0.077)
Survey Language (DE Baseline)			
EN	-0.021	-0.033	-0.038
	(0.059)	(0.058)	(0.062)
FR	0.125**	0.125**	0.098*
	(0.049)	(0.049)	(0.052)
LUX	0.001	0.015	0.034
	(0.083)	(0.085)	(0.100)
Number of parent's different nationalities	0.068	0.059	0.079
	(0.052)	(0.051)	(0.054)
Family size (excluding respondent)	0.016	0.013	0.015
	(0.020)	(0.020)	(0.022)
Daughter	0.051	0.052	0.037
	(0.040)	(0.039)	(0.042)
Child age	0.011	0.012	0.016
	(0.011)	(0.011)	(0.012)
Number of child's different languages	0.009	0.009	-0.005
	(0.018)	(0.017)	(0.018)
Number of child's different nationalities	-0.062	-0.056	-0.071*
	(0.039)	(0.038)	(0.041)
Duration (in seconds)	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Attention Checks (no errors Baseline)			
Failed first	0.102	0.097	0.088
	(0.079)	(0.077)	(0.082)
Priors: (Socially Aware Baseline)			
Socially Unaware (Equal Wellb.)		0.108**	0.115**
		(0.044)	(0.047)
Socially Unaware (Underst. Wellb.)		0.102*	0.127**
		(0.056)	(0.059)
Income (log)			-0.109***
			(0.042)
Treatment Effect Control	Yes	Yes	Yes
Observations	495	495	433

Notes: Standard errors in parentheses. Coefficients are estimated marginal effects from probit models of parental awareness the on the controls displayed in the table. All regressions additionally control for the assignment to the treatment. Parental Awareness is defined as belonging to the bottom 25% of the Euclidean distance between parent- and child-reported child SDQ. Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

jobs, may reduce parents' attentiveness to subtle signals of child distress. An alternative or complementary explanation is that parents higher on the socioeconomic scale may be more prone to projection or overconfidence biases, leading them to assume that their children are coping well – even when self-reported distress suggests otherwise.

Table 3 expands on Table 2 by sequentially including a wide range of parent and child psychological characteristics, while still controlling for the demographic factors included in column (1) of Table 2. Column (1) of Table 3 highlights the role of child personality, showing that higher conscientiousness in children is associated with greater parental awareness – suggesting that more orderly and self-regulated children may be easier for parents to understand. There is also some evidence that parental personality traits matter: in the specification of the model estimated in column (5), higher neuroticism is positively associated with awareness, possibly reflecting greater emotional sensitivity.

Finally, columns (5) and (6) of Table 3 demonstrate that greater psychological dissimilarity between parents and children – whether in terms of personality traits or Theory of Mind – is a robust negative predictor of parental awareness.[22] These findings reinforce the idea that parental awareness is not only shaped by external characteristics, but also by deeper psychological alignment between parent and child.

Result 4 *The evidence confirms prediction 4 that noisier environments, which can result from lower parental attention or greater differences between parents and children, imply more disagreement between second-order beliefs and child reports.*

Column (2) to (4) of Table 3 introduce measures of distress, related either to the parent (through the PHQ-9 scale), the child (through her own self-reported SDQ, and the parent-reported diagnosis by a medical professional of any behavioral, mental, or conduct disorder), or the parent-child relationship (through the conflict and closeness subscales of the CPRS-SF). Column (2) indicates that parental depressive symptoms and a conflictual parent-child relationship are negatively associated with parental awareness. However, when child self-reported SDQ is included in column (3), these associations become smaller, and child self-reported distress emerges as a strong negative predictor of parental awareness. This suggests that when children signal emotional unease – whether reflecting genuine distress or a cry for attention – parents may be less attuned, rather than more. We can therefore state:

Result 5 *Following Prediction 5, the expected gap between the child's report and the parent's first-order report increases with the child-reported level of difficulty.*

[22] Dissimilarity is here defined as the difference between the parent and the child for each of the variables in the "Parent-child differences in:" block. The only exception is for Big 5 personality traits, where dissimilarity is computed as the Euclidean distance between the parent and the child across all five personality traits.

Table 3: Psychological Predictors of Parental Awareness

	(1) Baseline	(2) +Background	(3) +Child SDQ	(4) +Diagnoses	(5) +Differences	(6) +Differences
Parent traits:						
Big 5: Openness	0.015	0.012	0.019	0.021	0.001	
	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)	
Big 5: Conscientiousness	-0.026	-0.040*	-0.027	-0.028	0.003	
	(0.021)	(0.022)	(0.021)	(0.021)	(0.021)	
Big 5: Extraversion	0.012	0.010	0.007	0.002	0.010	
	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)	
Big 5: Agreeableness	0.016	0.009	0.012	0.017	0.012	
	(0.023)	(0.024)	(0.023)	(0.023)	(0.021)	
Big 5: Neuroticism	-0.003	0.018	0.017	0.016	0.047***	
	(0.017)	(0.018)	(0.018)	(0.018)	(0.017)	
Theory of Mind	0.006	0.003	0.007	0.006	0.009	
	(0.012)	(0.012)	(0.011)	(0.011)	(0.010)	
Self-confidence on Theory of Mind	0.008	0.007	0.008	0.008	0.004	
	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	
Child traits:						
Big 5: Openness (child)	-0.011	-0.011	-0.005	-0.006		0.005
	(0.018)	(0.018)	(0.018)	(0.018)		(0.017)
Big 5: Conscientiousness (child)	0.093***	0.086***	0.045**	0.045**		0.028
	(0.020)	(0.020)	(0.022)	(0.021)		(0.021)
Big 5: Extraversion (child)	0.026	0.025	0.017	0.018		0.013
	(0.018)	(0.018)	(0.018)	(0.018)		(0.017)
Big 5: Agreeableness (child)	0.043*	0.020	0.006	0.006		0.003
	(0.023)	(0.023)	(0.022)	(0.022)		(0.021)
Big 5: Neuroticism (child)	-0.014	-0.015	0.031*	0.031*		0.032*
	(0.016)	(0.016)	(0.018)	(0.018)		(0.017)
Theory of Mind (child)	-0.004	-0.003	-0.004	-0.002		-0.002
	(0.010)	(0.010)	(0.010)	(0.010)		(0.009)
Self-confidence on Theory of Mind (child)	-0.002	-0.001	0.001	0.002		0.001
	(0.007)	(0.007)	(0.007)	(0.007)		(0.006)
Indices of distress:						
CPRS-SF conflict scale		-0.007**	-0.005	-0.006*	-0.006*	-0.005
		(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
CPRS-SF closeness scale		0.002	-0.000	0.000	0.002	0.002
		(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
Parent PHQ-9		-0.012**	-0.006	-0.008	-0.009	-0.006
		(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Child SDQ			-0.026***	-0.029***	-0.027***	-0.026***
			(0.005)	(0.005)	(0.004)	(0.005)
Any diagnosis				0.199***	0.150**	0.149**
				(0.071)	(0.069)	(0.068)
Parent-child differences in:						
Gender					-0.005	-0.011
					(0.039)	(0.039)
Age					-0.011	-0.006*
					(0.010)	(0.003)
Theory of Mind					-0.033**	-0.034**
					(0.014)	(0.014)
Self-confidence on Theory of Mind					-0.026***	-0.028***
					(0.010)	(0.009)
Big 5 personality					-0.059***	-0.040***
					(0.016)	(0.015)
Socio-Demographics Controls	Yes	Yes	Yes	Yes	Yes	Yes
Treatment Effect Control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	474	464	464	464	464	464

Notes: Standard errors in parentheses. Coefficients are estimated marginal effects from probit models of parental awareness the on the controls displayed in the table. All regressions additionally control for the assignment to the treatment, and for a set of socio-demographic controls (the full list is displayed in Table 2). Parental awareness is defined as belonging to the bottom 25% of the Euclidean distance between parent- and child-reported child SDQ. Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

Finally, column (4) shows that parents with children who have received a formal medical diagnosis for any mental or behavioral disorder display greater parental awareness, potentially because of the prompting of closer monitoring or the legitimization of concerns that might otherwise be overlooked.[23] Results from Tables 2 and 3 are summarized in a synthetic way in Appendix Figure H.1, with Figure H.4 illustrating the feedback loop between child distress and parental awareness.

Capacity Paradox and Social Awareness

We define **Social Awareness** based on a parent's prior belief about general discrepancies between parent and child reports. Specifically, parents who correctly believe that parents generally overstate their children's wellbeing are classified as socially-aware. Interestingly, column (2) indicates that parents who are socially aware – i.e., those holding the accurate prior that parents generally report higher child wellbeing than children self-report – tend to be less accurate in their second-order beliefs. In other words, while these parents are correct in theory, they are less able to accurately apply this awareness to their own child.

This result suggest the presence of a *Capacity Paradox*: higher socioeconomic status (education, income, employment) is associated with better general awareness (social awareness), worse specific accuracy (parental awareness) and larger parent-child gaps. Possible mechanisms at play could be time constraints from demanding jobs, reduced exposure to subtle distress signals, greater confidence/overestimation of child coping, different reference points or expectations. For ease of interpretation, Appendix Figure H.3 illustrates the *Capacity Paradox* in the form of a diagram.

Figure D.11 compares child SDQ scores and parental first- and second-order beliefs in the control group, based on the degree of social awareness. Across all levels of social awareness, the figure confirms the same pattern we find on average: child-reported SDQ scores are higher than parent-reported second-order beliefs, which in turn exceed reported child beliefs. Social awareness does not appear to significantly affect the SDQ levels reported by parents. However, children of parents who believe that parents and children report similar levels of child wellbeing ("Socially Unaware (Eq.)") tend to report lower SDQ scores on average.

Table 4 reports correlates of social awareness, presenting marginal effects from a multinomial logit model that relates social-awareness categories to a set of parental and household covariates. Two patterns stand out. First, unlike parental awareness, education is a positive predictor of social awareness. Second, parents who are completely unaware of the general bias appear to have lower Theory of Mind scores, whereas the other psychological traits are not systematically associated with social awareness.

[23] As shown in Table D.4 and Table D.5, results in Table 2 and in Table 3 are robust to the use of a continuous definition of parental (un)awareness, i.e. the Euclidean distance between parent second-order beliefs over child SDQ and child self-reported SDQ.

Table 4: Predictors of Social Awareness (Multinomial Logit)

	(1) Socially Aware (Overest. Wellb.)	(2) Socially Unaware (Equal Wellb.)	(3) Socially Unaware (Underest. Wellb.)
Mother	-0.054	-0.014	0.068
	(0.050)	(0.050)	(0.043)
Age	-0.006	0.007*	-0.001
	(0.004)	(0.004)	(0.003)
Education: (Lower Secondary Baseline)			
Upper secondary	0.202**	-0.088	-0.114
	(0.086)	(0.108)	(0.098)
Post secondary	0.228***	-0.027	-0.201**
	(0.080)	(0.103)	(0.095)
Employed	-0.033	0.021	0.012
	(0.068)	(0.068)	(0.051)
Two-parents household	0.047	-0.020	-0.028
	(0.058)	(0.058)	(0.043)
Daughter	0.018	-0.028	0.010
	(0.044)	(0.044)	(0.035)
Child age	0.008	-0.026**	0.018*
	(0.012)	(0.012)	(0.009)
Psychological Traits:			
Big 5: Openness	-0.021	-0.004	0.025
	(0.018)	(0.019)	(0.015)
Big 5: Conscientiousness	0.002	0.020	-0.022
	(0.022)	(0.023)	(0.017)
Big 5: Extraversion	-0.005	0.005	0.000
	(0.020)	(0.020)	(0.016)
Big 5: Agreeableness	-0.024	-0.009	0.033
	(0.025)	(0.025)	(0.021)
Big 5: Neuroticism	0.007	-0.012	0.005
	(0.018)	(0.018)	(0.014)
Theory of Mind	-0.000	0.022*	-0.021**
	(0.011)	(0.012)	(0.009)
Self-confidence on Theory of Mind	-0.002	0.003	-0.001
	(0.008)	(0.008)	(0.006)
Treatment Effect Control	Yes	Yes	Yes
Observations	495	495	495
Pseudo R-Squared	0.049	0.049	0.049

Notes: Standard errors in parentheses. Coefficients are estimated marginal effects from a multinomial regression of social awareness on the controls displayed in the table. Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

6 Results from Survey 2: Malleability of parental beliefs

To test the malleability of parental beliefs, we implemented an information-treatment experiment that examines whether parental beliefs - both first- and second-order - respond to simple, credible information about systematic discrepancies between parent and child reports of socio-emotional wellbeing.

The theoretical framework outlined before provides a natural lens through which to analyze the information treatment. Let the population-level average reporting gap be

$$G \equiv \mathbb{E}[S_c - S_p^{(1)}]. \tag{10}$$

Parents hold a prior belief about G of the form

$$G \sim \mathcal{N}(\mu_G, \sigma_G^2), \tag{11}$$

where μ_G captures whether they think parents in general over- or under-report difficulties. Accordingly, Appendix B derives the following testable predictions:

Prediction 6 *Belief updating depends on both the precision and the content of parents' priors about the aggregate parent–child reporting gap G. Parents with diffuse priors (large σ_G^2), or who place non-negligible probability on $G \neq 0$, update more in response to information. By contrast, parents with highly concentrated priors around $G = 0$ update little, even when exposed to informative signals.*

Prediction 7 *The information treatment shifts the average gap but not item-level distance.*

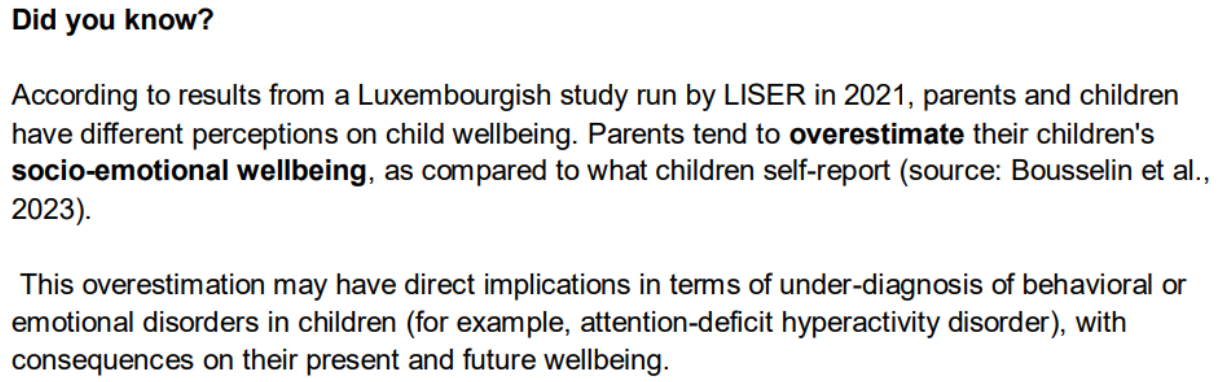
Parents in the treatment group received a short message indicating that, on average, parents in Luxembourg tend to overestimate their children's wellbeing compared to children's self-reports, and that this could have implications on the detection of behavioral or emotional disorders (see Figure 5 for the full text). The aim was to assess whether this information prompt could induce parents to update their first- and second-order beliefs about their own child, in such a way to reduce the bias and disagreement in parental assessments.

6.1 Evidence from the Information Experiment

We provide the following information to a randomly selected group of responders (see Figure 5).

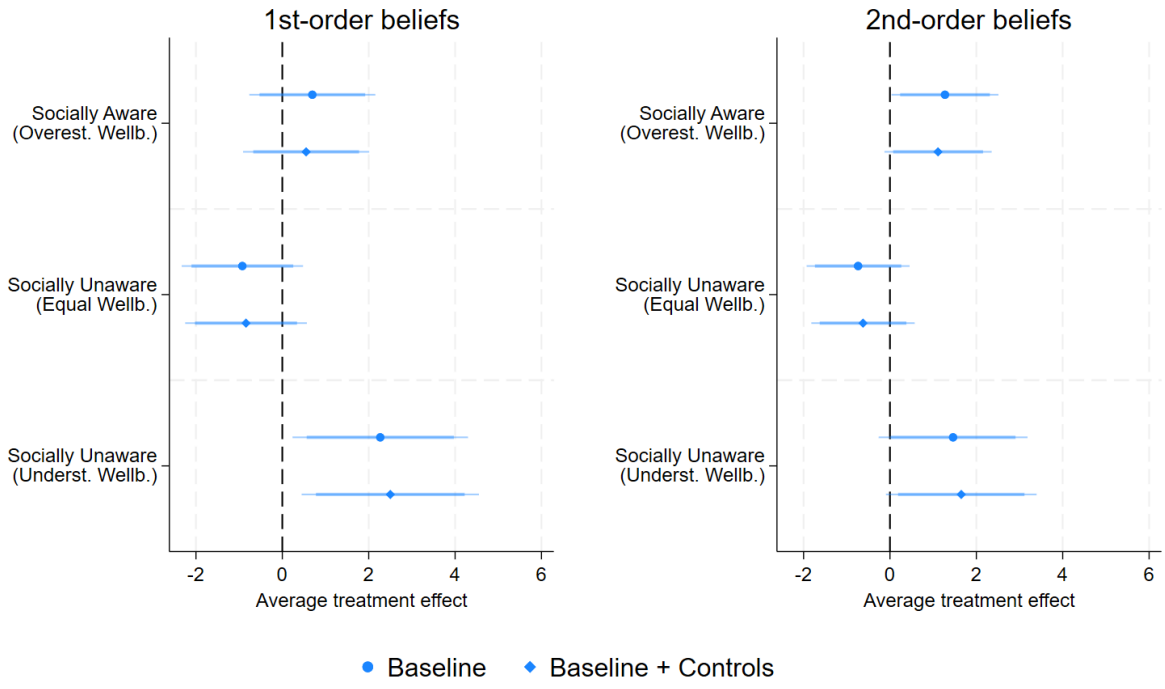
To evaluate the impact of the information treatment, we examine changes in both the gaps (i.e., the simple difference between parent and child SDQ assessments) and the Euclidean distance, conditional on

Figure 5: Information treatment



parents' prior beliefs. These prior beliefs are classified according to the framework developed by Haaland et al. (2023), and in line with our preregistered experimental protocol. Figures 6 and 7 illustrate the treatment effects across different prior belief categories.

Figure 6: Effect of information treatment on the parent-child difference in SDQ, by prior beliefs



Notes: Effect of information treatment on parent-child differences in SDQ, by prior beliefs. All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Shaded horizontal lines are for 95 and 90% confidence intervals.

Figure 6 shows the impact of the information treatment on both first-order and second-order belief gaps

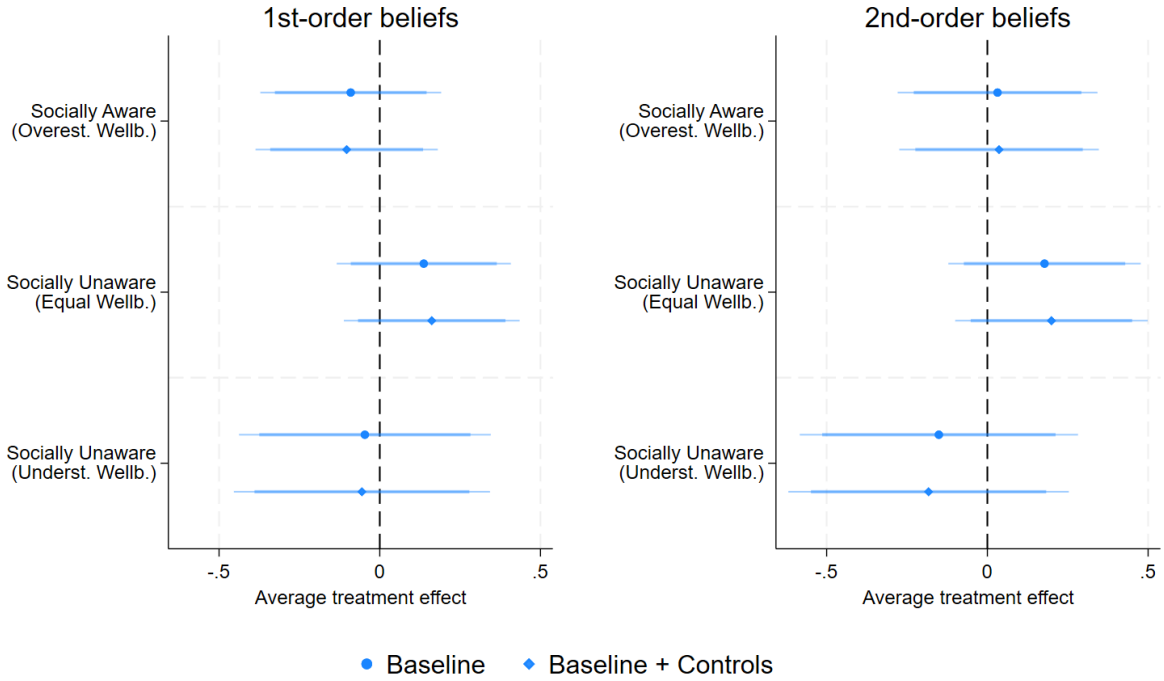
relative to child self-reports. Among parents who are socially unaware – those who incorrectly believe that parents generally underestimate their children's wellbeing – the treatment significantly reduces the negative gap in both first- and second-order beliefs. A similar effect is observed on second-order beliefs for parents who are socially aware – those who correctly believe that parents tend to overestimate their children's wellbeing. However, we find no significant treatment effect among parents who believe that parent and child reports are generally aligned.

Result 6 *Following prediction 6, parents with diffuse priors (large σ_G^2) or priors allowing for $G \neq 0$ update strongly (λ large). Parents who are dogmatically convinced that $G = 0$ (very small σ_G^2 around zero) update little ($\lambda \approx 0$).*

A predicted by our model, a different pattern emerges when considering the Euclidean distance between reported child beliefs and children's self-reports. As shown in Figure 7, the treatment has no detectable effect.

Result 7 *Following prediction 7, the information treatment shifts the average gap but not item-level distance.*

Figure 7: Effect of information treatment on Euclidean distances, by prior beliefs



Notes: Effect of information treatment on Euclidean distances, by prior beliefs. All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Shaded horizontal lines are for 95 and 90% confidence intervals.

Furthermore, when disaggregating the bias by the four subscales of total SDQ in Figure D.13, it appears that parents do not update their beliefs in each dimension equally. Instead, belief updating is concentrated in the subscales where the parent-child bias in reported child beliefs is the largest to begin with (as illustrated in Figure D.1): emotional symptoms and conduct problems. The belief-updating is the lowest for the peer-relationship problems, arguably the most easily observable of the four subscales. This is an indication that the information treatment induced some introspection, rather than a superficial general increase across all SDQ items.[24]

These results show that parental beliefs are malleable and that even minimal information provision can potentially affect parental understanding – at least among those predisposed to acknowledge differences.

6.1.1 Behavioral changes: parental investments intentions

The rationale for the survey experiment is rooted in the growing body of empirical evidence suggesting that parental beliefs about the returns to effort, ability, and early investments in children's skills are systematically biased and locally distorted (e.g. Kinsler and Pavan, 2021; List et al., 2021; Dizon-Ross, 2019; Boneva and Rauh, 2018). Our aim is to examine whether providing information about biases related to child wellbeing can also affect parents' investments child human capital.

In Appendix C, we extend the theoretical framework to account for how parental perceptions of child socio-emotional difficulties shape human capital investment decisions. In this framework, information that shifts parents' perceived difficulties can encourage higher investments in children's human capital. The predictions are as follows.

Prediction 8 *Higher perceived difficulty leads to higher parental investment.*

Prediction 9 *Information-induced increases in perceived difficulty raise parental investment.*

Prediction 10 *The effect of the information treatment on parental investment is heterogeneous.*

In order to test the implications of the model, after the information treatment, we additionally collect data on parents' future investment intentions. Although the theoretical model presented in Appendix C characterizes parental investment decisions, here we focus on the parents' stated investment intentions, which we interpret as a proxy for subsequent investment behavior. We first collect parents' future time-use intentions, focusing on time spent with children. For each of the following shared activities, we ask whether the parent plans to spend less, the same, or more time than usual in the coming months: helping with homework; having family meals; cooking together; doing chores (groceries, cleaning the house, running

[24]Figure D.14 shows that the null average treatment effect on the Euclidean distance holds for each subscale separately.

errands, etc.); doing cultural activities (visiting a museum, library, etc.); playing or other leisure activities indoors (board games, reading together, listening to music, etc.); playing or other leisure activities outdoors (hiking, playing a sport, shopping, etc.); disciplining your child (reprimanding, grounding, etc.); talking about your child's hopes and aspirations for him-/herself (educational choices, personal development, etc.); talking about your child's hopes and aspirations for society (environmental activism, integration of migrants, etc.); talking about your child's worries and fears about him-/herself (problems with friends, nightmares, etc.); talking about your child's worries and fears about society (public safety, inequality, etc.); talking about "difficult" personal subjects (sex and relationships, mental health, etc.); and talking about "difficult" societal subjects (politics, racism, etc.).

To capture common variation among these 15 measures, we run a principal component analysis (PCA), retaining four components with eigenvalues greater than one. Oblique-rotated, Kaiser-normalized loadings are shown in Table D.6 for each of the four components. Based on the loading patterns, we label PC 1 as 'Talking', as it loads more heavily on the last six measures of parental investment intentions; PC 2 as 'Leisure and togetherness', due to its highest loadings on leisure activities; PC 3 as 'Low discipline and family meals', given its negative loading on the disciplining variable and positive loadings on cooking together and family meals; and PC 4 as 'homework', due to a high loading exclusively on the variable 'helping with homework'.

Last, we measure parental intentions to enroll their child in a battery of extracurricular activities, spanning from individual and team sports, to youth organization and language classes. Approximately 37% of the parents in the estimation sample report intentions to enroll their child in any of the listed activities.

Using the four PCs and a binary indicator for enrollment intentions in at least one extracurricular activity (labeled here 'Extracurriculars'), we first test prediction 8, by checking whether parents perceiving higher difficulties for their children plan to invest more in them. Table D.7 shows that, conditional on initial levels of parental investments and treatment status, parents in the control group with higher first-order beliefs about their children's socio-emotional difficulties report higher investment intentions across all dimensions, with 'homework' and 'extracurriculars' being statistically different from zero.

Result 8 *Supporting prediction 8, parents who perceive higher socio-emotional difficulties for their children report higher investment intentions.*

We then test if the information treatment had any behavioral consequences in terms of parents' investment intentions. According to prediction 9, parents who updated their beliefs over their child's perceived difficulties should display higher investment intentions. Figure D.16, however, shows a zero average treatment effect on all measures of parental investments, regardless of the parent's social-awareness level. While we may lack

the precision to estimate some of these treatment effects, the point estimates are all below 20% of a standard deviation (10% of the mean for extracurricular activities), suggesting modest effect sizes at best.

Result 9 *We do not find empirical support for prediction 9, as investment intentions are statistically the same after the information induced increases in perceived difficulty.*

The absence of a treatment effect might be due to parents already operating at capacity in their investment levels. Additionally, they may be constrained in their ability to implement investments that entail monetary costs. Prior to the information treatment, we measure baseline parental investments in terms of the weekly frequency of the 15 time-use activities described earlier in this section. In Table D.8, we examine whether results are heterogeneous based on investment-capacity constraints and income constraints.[25] The results in the table show a null average treatment effect for unconstrained parents, suggesting that the overall null findings are not driven by attenuation due to monetary or capacity constraints. This interpretation is consistent with the results of Bhalotra et al. (2025), who find that information treatments aimed at shifting maternal investment beliefs have limited effects once the effort and cost constraints of implementing these investments are taken into account.

We then examine whether the average null treatment effects mask other forms of heterogeneity linked to differences in parents' psychological costs and capacity constraints, as reflected in their mental health and emotional attunement.Table 5 investigates whether parents who are better at recognizing others' emotions (high ToM) and parents who report no depressive symptoms are more responsive to the information treatment in terms of their reported investment intentions. The first group may be more attuned to their children's emotional states, while the second may have greater psychological resources to engage with and respond to their children's needs. The table shows that parents with ToM scores above the median who are exposed to the information treatment report plans to invest more than usual in the 'talking' and 'homework' dimensions. Similarly, parents who report no depressive symptoms express a desire to spend more time helping their child with homework as a result of the information treatment. This suggests that psychological wellbeing and emotional attunement may play a role in moderating parents' responsiveness to information-based interventions, even when average effects are null.

We lastly explore whether the results systematically differ based on the age and gender of the child.[26] Figure D.17 shows that parents' investment intentions respond to the information treatment only in the case of sons, not daughters, and that the effects vary by the child's age. For pre-adolescent boys (aged 12 or

[25] We define the binary variable 'High baseline investments' as indicating that the parent is in the top quartile of investment for at least one of the four principal components (PCs) of baseline parental investments. The PCs for baseline parental investments closely mirror those for future investment intentions (results available upon request).

[26] It should be noted that these two latter sources of heterogeneity were not pre-registered, so results should be interpreted with caution.

Table 5: Treatment effect on parental investments: the role of parental ToM and mental health

	(1) Talking	(2) Leisure & togetherness	(3) Low discipline & family meals	(4) Homework	(5) Extracurriculars (0-1)
Panel A: Theory of Mind (ToM)					
Treatment	-0.330**	-0.015	0.068	-0.196	-0.028
	(0.143)	(0.145)	(0.144)	(0.142)	(0.069)
Treatment × ToM above median	0.400**	0.007	0.030	0.428**	0.069
	(0.183)	(0.185)	(0.185)	(0.182)	(0.088)
Observations	495	495	495	495	495
R-squared	0.045	0.017	0.016	0.043	0.051
Panel B: Depression (PHQ-9)					
Treatment	-0.002	0.156	0.205	-0.138	0.079
	(0.133)	(0.133)	(0.132)	(0.130)	(0.063)
Treatment × No depressive symptoms	-0.190	-0.299	-0.208	0.369**	-0.122
	(0.183)	(0.182)	(0.181)	(0.178)	(0.087)
Observations	482	482	482	482	482
R-squared	0.036	0.029	0.017	0.050	0.066

Notes: Standard errors in parentheses. These are linear regression models. All outcome variables are standardized to have mean zero and standard deviation one in the estimation sample, except for 'Extracurriculars' which is expressed as a binary variable. 'No depressive symptoms' is a binary indicator for the parent being below the diagnostic cut-off for mild depression in the PHQ-9 scale (i.e., PHQ-9 score below 5; Kroenke et al., 2001). All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Regressions in Panel A additionally control for the 'ToM above median' dummy, while those in Panel B for the 'No depressive symptoms' dummy. Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

younger), parents exposed to the information treatment report intentions to increase investments in the 'low discipline and family meals' component by 0.4 standard deviations (SD). In contrast, for teenage boys, they express intentions to invest more in helping with homework, also by approximately 0.4 SDs. These findings, summarized in Appendix Figure H.5, imply that parents may adjust their investment strategies more readily for boys, particularly in ways that are developmentally targeted to their age.

Result 10 *Following prediction 10, the information treatment generates larger increases in parental investment intentions (i) among parents facing lower investment costs (both monetary and cognitive) and (ii) across child characteristics such as age and gender, reflecting heterogeneity in perceived returns to investment, as expressed through parents' investment intentions.*

7 Conclusion

This study provides new evidence on the accuracy and malleability of parents' beliefs about their children's socio-emotional wellbeing. Using newly collected data from Luxembourg and complementary evidence from the UK and Australia, we document a robust pattern of parental under-reporting of children's socio-emotional difficulties relative to children's self-assessments. Rather than interpreting this discrepancy as simple report-

ing error, we frame it as arising from differences in information and interpretation between parents and children.

To formalize this idea, we introduce a conceptual model of belief formation under uncertainty in which children translate psychological wellbeing into self-reports, while parents observe only imperfect signals and form beliefs about both children's underlying distress and their reporting behavior. This framework motivates the measurement of parental second-order beliefs – parents' beliefs about what their children report – which allows us to distinguish information frictions from evaluative biases. Consistent with the model, we find that second-order beliefs also underestimate child distress, though to a lesser extent than first-order beliefs, and that errors are largest when children report high levels of distress. This pattern suggests that parental underestimation is most pronounced when children's needs are greatest, a prediction of the model that is strongly supported by the data.

Second-order belief inaccuracies are more common among highly educated and employed parents, and in parent–child pairs with larger personality differences. These findings point to information constraints – such as limited time, attention, or interpretive alignment – rather than deliberate minimization, as a key driver of parental misperception. More broadly, they highlight that awareness of aggregate reporting biases does not necessarily translate into accurate assessments of one's own child.

The model further implies that parental beliefs may be malleable when priors are not overly strong. We test this prediction through an information experiment that provides parents with general evidence about systematic parent–child reporting gaps. The results reveal heterogeneous effects: parents who already believe that such discrepancies exist – whether in the direction of over- or under-reporting – update both first- and second-order beliefs, while those who perceive no bias do not. However, the intervention does not reduce absolute disagreement between parent and child reports, indicating that correcting aggregate beliefs alone may be insufficient to overcome deeper information or interpretative frictions.

Finally, we explore whether belief updating translates into changes in intended investments in children's human capital. While average effects are muted, responses are heterogeneous and systematically related to parental psychological and demographic characteristics, with particularly strong effects for sons and age-specific patterns in investment types.

Taken together, our findings underscore the importance of jointly measuring first- and second-order beliefs to understand parental assessments of child wellbeing. They also suggest that light-touch information interventions can improve parental awareness, but primarily among those already open to revising their beliefs.

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Appendix A Main predictions of the baseline model

Proof of Prediction 1. Consider the unconditional mean gap:

$$\begin{aligned}\mathbb{E}\Big[S_c - S_p^{(1)}(\tilde{D})\Big] &= \mathbb{E}\Big[D + \theta_c + \varepsilon_c - (m_p(\tilde{D}) - \theta_p)\Big] \\ &= \theta_c + \theta_p + \mathbb{E}\Big[D - m_p(\tilde{D})\Big] + \mathbb{E}[\varepsilon_c].\end{aligned}$$

Since $\mathbb{E}[\varepsilon_c] = 0$, it remains to evaluate $\mathbb{E}[D - m_p(\hat{D})]$.

Let $m(\tilde{D}) \equiv \mathbb{E}[D \mid \hat{D}]$ denote the *correct* posterior mean under the true data-generating process, which satisfies $\mathbb{E}[D - m(\hat{D})] = 0$ by the law of iterated expectations. Therefore,

$$\mathbb{E}\Big[D - m_p(\tilde{D})\Big] = \mathbb{E}\Big[D - m(\tilde{D})\Big] + \mathbb{E}\Big[m(\tilde{D}) - m_p(\tilde{D})\Big] = \mathbb{E}\Big[m(\tilde{D}) - m_p(\hat{D})\Big].$$

Under the Gaussian structure, the two posterior means take the linear forms

$$m(\tilde{D}) = \omega(\tilde{D} + \bar{\kappa}) + (1-\omega)\mu_D, \qquad m_p(\tilde{D}) = \omega(\tilde{D} + \bar{\kappa}_p) + (1-\omega)\mu_D,$$

so their difference is constant in $\tilde{D}$:

$$m(\tilde{D}) - m_p(\tilde{D}) = \omega(\bar{\kappa} - \bar{\kappa}_p) = \omega(\bar{\kappa} - (\bar{\kappa} + b)) = -\omega b.$$

Plugging into the mean gap yields

$$\mathbb{E}\Big[S_c - S_p^{(1)}(\tilde{D})\Big] = \theta_c + \theta_p - \omega b. \tag{A-1}$$

Hence systematic under-reporting by parents (i.e. $\mathbb{E}[S_c - S_p^{(1)}] > 0$) occurs whenever

$$\theta_c + \theta_p - \omega b > 0.$$

Proof of Prediction 2. Formally, under the Gaussian structure,

$$m(\tilde{D}) - m_p(\tilde{D}) = \omega(\bar{\kappa} - \bar{\kappa}_p) = -\omega b < 0,$$

so $m_p(\tilde{D}) > m(\tilde{D})$ for all $\tilde{D}$. Consequently, the unconditional average gap between the child's report and

the parent's first-order report becomes

$$\mathbb{E}[S_c - S_p^{(1)}(\hat{D})] = \theta_c + \theta_p - \omega b,$$

which is strictly decreasing in b. In particular, if b is sufficiently large such that

$$\omega b > \theta_c + \theta_p,$$

then the sign of the gap flips and parents *over-report* difficulty on average:

$$\mathbb{E}[S_c - S_p^{(1)}(\tilde{D})] < 0.$$

Thus, $b > 0$ attenuates systematic under-reporting by parents and can reverse it when parents' over-estimation of masking dominates the combined reporting-style and motivational components.

Proof of Prediction 3. Given $d(\tilde{D}) = \theta_p - \tilde{\theta}_c$, and

$$e_1(\tilde{D}) = m_p(\tilde{D}) + \theta_p - \big(D + \theta_c + \varepsilon_c\big) = \big(m_p(\tilde{D}) - D\big) + (\theta_p - \theta_c) - \varepsilon_c.$$

We have

$$e_1(\tilde{D}) - d(\tilde{D}) = \big(m_p(\tilde{D}) - D\big) + (\theta_c - \tilde{\theta}_c) - \varepsilon_c$$

Because there is no bias on average then $\theta_c = \tilde{\theta}_c$, and

$$e_1(\tilde{D}) - d(\tilde{D}) = \big(m_p(\tilde{D}) - D\big)$$

Proof of Prediction 4. The precision of behavioral information is captured by

$$\omega = \frac{\sigma_D^2}{\sigma_D^2 + \sigma_X^2 + \sigma_\kappa^2},$$

so higher noise σ_X^2 lowers ω and makes $m_p(\hat{D})$ less informative about D (it leans more on the prior μ_D). So $m_p(\hat{D})$ is a worse approximation of the true D on average, $m_p(\hat{D}) - D$ becomes more dispersed and biased towards μ_D. Hence,

$$\mathbb{E}\big[\|S_p^{(2)} - S^c\|\big] \text{ increases in } \sigma_X^2,$$

noisier $m_p(\hat{D})$ makes the distance $\|S_p^{(2)} - S^c\|$ larger. Therefore, the probability that parents are "aware"

(small distance between $S_p^{(2)}$ and S^c) decreases with σ_X^2.

Proof of Prediction 5. Recall that

$$S_c = D + \theta_c + \varepsilon_c, \qquad S_p^{(1)}(\tilde{D}) = m_p(\tilde{D}) + \theta_p,$$

and that the parent's posterior mean is

$$m_p(\tilde{D}) = \omega(\tilde{D} - \tilde{\bar{\kappa}}) + (1-\omega)\mu_D, \qquad \omega = \frac{\sigma_D^2}{\sigma_D^2 + \sigma_X^2 + \sigma_\kappa^2}, \qquad \tilde{\bar{\kappa}} = \bar{\kappa} + b,$$

with

$$\tilde{D} = D + \kappa + \varepsilon_X, \qquad \kappa \sim \mathcal{N}(\bar{\kappa}, \sigma_\kappa^2), \qquad \varepsilon_X \sim \mathcal{N}(0, \sigma_X^2), \qquad \varepsilon_c \sim \mathcal{N}(0, \sigma_c^2),$$

independent of D and of each other.

Then

$$\begin{aligned} S_c - S_p^{(1)}(\tilde{D}) &= D + \theta_c + \varepsilon_c - \big(m_p(\tilde{D}) + \theta_p\big) \\ &= D + \theta_c - \theta_p + \varepsilon_c - \Big(\omega(\tilde{D} - \tilde{\bar{\kappa}}) + (1-\omega)\mu_D\Big) \\ &= D + \theta_c - \theta_p + \varepsilon_c - \omega\big(D + \kappa + \varepsilon_X - \bar{\kappa} - b\big) - (1-\omega)\mu_D \\ &= (1-\omega)(D - \mu_D) + (\theta_c - \theta_p) + \omega b + \Big(\varepsilon_c + \omega(\kappa - \bar{\kappa}) - \omega\varepsilon_X\Big). \end{aligned}$$

Since $\mathbb{E}[\varepsilon_c] = 0$, $\mathbb{E}[\kappa - \bar{\kappa}] = 0$, and $\mathbb{E}[\varepsilon_X] = 0$, it follows that

$$\boxed{\mathbb{E}\Big[S_c - S_p^{(1)}(\tilde{D}) \mid D\Big] = (1-\omega)(D - \mu_D) + (\theta_c - \theta_p) + \omega b.}$$

Therefore,

$$\boxed{\frac{\partial}{\partial D}\,\mathbb{E}\Big[S_c - S_p^{(1)}(\tilde{D}) \mid D\Big] = 1 - \omega > 0}$$

(as long as $\omega < 1$, i.e. the signal is not perfectly informative). Equivalently, for $D_1 > D_0$,

$$\boxed{\mathbb{E}\Big[S_c - S_p^{(1)}(\tilde{D}) \mid D_1\Big] - \mathbb{E}\Big[S_c - S_p^{(1)}(\tilde{D}) \mid D_0\Big] = (1-\omega)(D_1 - D_0) \;>\; 0.}$$

Appendix B Information about the population reporting gap

Let the population-level average reporting gap be

$$G \equiv \mathbb{E}[S_c - S_p^{(1)}]. \tag{A-2}$$

Parents hold a prior belief about G of the form

$$G \sim \mathcal{N}(\mu_G, \sigma_G^2), \tag{A-3}$$

where μ_G captures whether they think parents in general over- or under-report difficulties.

An information treatment provides a signal

$$Z = G + \eta, \qquad \eta \sim \mathcal{N}(0, \sigma_Z^2), \tag{A-4}$$

for instance in the form of a statistic showing that parents typically under-report child difficulties.

Bayesian updating yields the posterior mean

$$\mu_G' = (1 - \lambda)\mu_G + \lambda Z, \qquad \lambda = \frac{\sigma_G^2}{\sigma_G^2 + \sigma_Z^2}. \tag{A-5}$$

Parents who are ex ante confident that $G = 0$ (small σ_G^2) have $\lambda \approx 0$ and hence update little; parents who already consider a non-zero gap plausible update more.

We assume that parents respond to the updated belief about G by updating their beliefs about the severity of the information asymmetry between parents and children. For example,

$$b' = b + \rho\mu_G', \qquad \rho \geq 0 \tag{A-6}$$

This improves inference about D by shifting the posterior belief $m_p(\tilde{D})$, and therefore affects both first- and second-order beliefs through a common inference channel, without improving item-level precision. The intervention pushes parents to lower perceived masking (higher b'), which then raises inferred difficulty via $m_p(\tilde{D})$.

Proof of Prediction 6. Parents hold a prior on the population reporting gap G,

$$G \sim \mathcal{N}(\mu_G, \sigma_G^2),$$

and observe a signal

$$Z = G + \eta, \qquad \eta \sim \mathcal{N}(0, \sigma_Z^2).$$

The posterior mean is

$$\mu'_G = (1 - \lambda)\mu_G + \lambda Z, \qquad \lambda = \frac{\sigma_G^2}{\sigma_G^2 + \sigma_Z^2}.$$

Hence:

- Parents with diffuse priors (large σ_G^2 then $\lambda \to 1$) or priors allowing for $G \neq 0$ update strongly.
- Parents who are dogmatically convinced that $G = 0$ (very small σ_G^2 around zero then $\lambda \approx 0$) update little.

Proof of Prediction 7. Suppose parents respond to μ'_G by adjusting global level terms, e.g.

$$b' = b + \rho\mu'_G,$$

Then first- and second-order reports shift by approximately constants across items. This implies:

(i) $\mathbb{E}[S_c - S_p^{(1)\prime}] = \mathbb{E}[S_c - S_p^{(1)}] + \omega(b - b')$ moves towards zero (average gap shrinks);

(ii) $\mathbb{E}\big[\|S_p^{(2)\prime} - S_c\|\big] \approx \mathbb{E}\big[\|S_p^{(2)} - S_c\|\big]$,

since item-level dispersion is unaffected. The treatment reduces the mean level bias but leaves the Euclidean distance largely unchanged.

Appendix C Parental Investments

C.1 Technology and parental objective

Future human capital is given by

$$H' = H - \phi D + \beta I, \tag{A-7}$$

where H is a baseline level of human capital, $\phi > 0$ captures the detrimental effect of difficulties D on H', and $\beta > 0$ captures the productivity of parental investment.

The parent does not observe D but holds beliefs about it. $\tilde{D}$ denotes the parent's perceived level of child

difficulty, and the parent chooses I to maximize

$$U(I) = -\big(\phi\tilde{D} - \beta I\big)^2 - \frac{1}{2}cI^2, \tag{A-8}$$

where $c > 0$ is a cost parameter. This specification implies that parents who perceive higher difficulty choose higher investment.

The first-order condition for (A-8) yields the optimal investment:

$$I^*(\tilde{D}) = \frac{2\phi\beta}{2\beta^2 + c}\,\tilde{D}, \tag{A-9}$$

so that investment is proportional to the perceived difficulty $\tilde{D}$.

C.2 Updated Perceived Difficulty and Investment

After observing $\tilde{D}$ and the information signal Z, the parent forms updated first-order beliefs

$$S_p^{(1)\prime}(\tilde{D}, Z) = m_p'(\tilde{D}) + \theta_p, \tag{A-10}$$

where the new posterior mean difficulty is driven by the new $\tilde{\kappa}' = \tilde{\kappa} + b'$:

$$m_p'(\tilde{D}) = \omega(\tilde{D} - \tilde{\bar{\kappa}}') + (1 - \omega)\mu_D, \tag{A-11}$$

Assuming that the perceived difficulty $\tilde{D}$ the parent acts on is their posterior belief (rather than their reported first-order belief), and substituting (A-10) into the optimal investment rule (A-9), we obtain

$$I^*(\tilde{D}, Z) = \frac{2\phi\beta}{2\beta^2 + c}\,m_p'(\tilde{D}). \tag{A-12}$$

Parents who under–estimate child masking (small b') invest less, and any treatment that shifts their perceived difficulties upward (increasing b') increases optimal investment. Heterogeneity in responses can be captured by letting the benefit and cost parameters β and c depend on parental characteristics such as mental health or relationship quality.

Proof of Prediction 8. Optimal investment is

$$I^*(\tilde{D}) = \frac{2\phi\beta}{2\beta^2 + c}\,m_p(\tilde{D}),$$

Thus

$$\frac{\partial I^*}{\partial m_p(\tilde{D})} = \frac{2\phi\beta}{2\beta^2 + c} > 0,$$

so parents who perceive higher difficulty invest more.

Proof of Prediction 9. The information treatment increases b thereby increasing $\bar{\kappa}_p$, therefore

$$m_p(\tilde{D}) < m_p'(\tilde{D})$$

It follows that

$$I^*(\tilde{D}) = \frac{2\phi\beta}{2\beta^2 + c}\, m_p(\tilde{D}) < \frac{2\phi\beta}{2\beta^2 + c}\, m_p'(\tilde{D}) = I^{*'}(\tilde{D})$$

for updating parents. Stated willingness to invest in child wellbeing should increase after the information treatment among those parents.

Proof of Prediction 10. Let the benefit and cost parameters depend on parental and child characteristics, $\beta = \beta(\chi)$ and $c = c(\chi)$, where χ summarises parental resources (e.g. income, mental health) and child characteristics (e.g. age, gender). Then

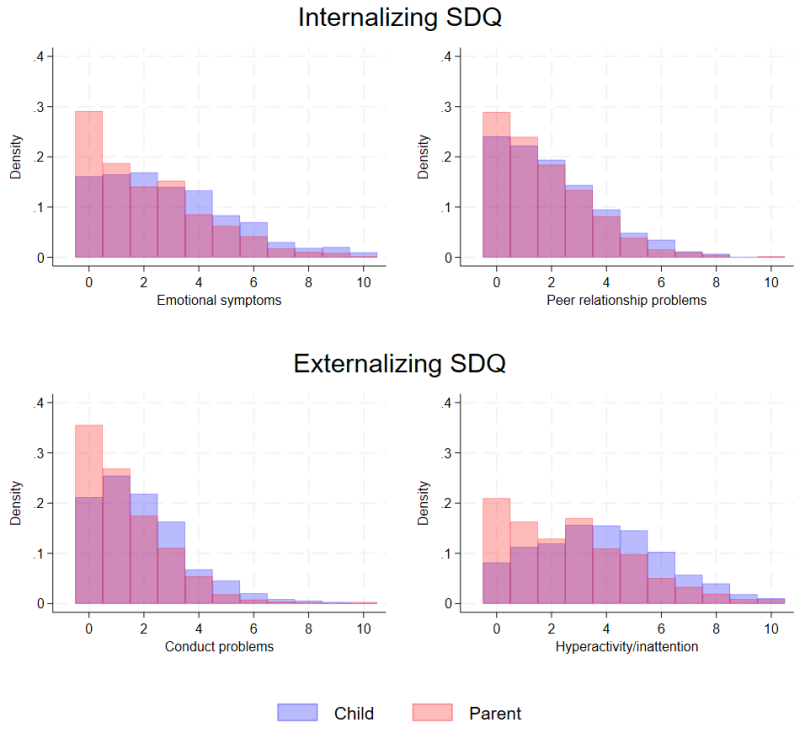
$$\frac{\partial I^*}{\partial m_p(\tilde{D})} = \frac{2\phi\beta(\chi)}{2\beta(\chi)^2 + c(\chi)}$$

varies across parents. The model predicts:

- stronger investment responses to a given increase in $m_p(\tilde{D})$ for parents with lower $c(\chi)$ (lower psychological or resource costs);
- age- and gender-specific patterns when $\beta(\chi)$ depends on child age or gender, with larger treatment effects on the types of investment perceived as most productive for that subgroup.

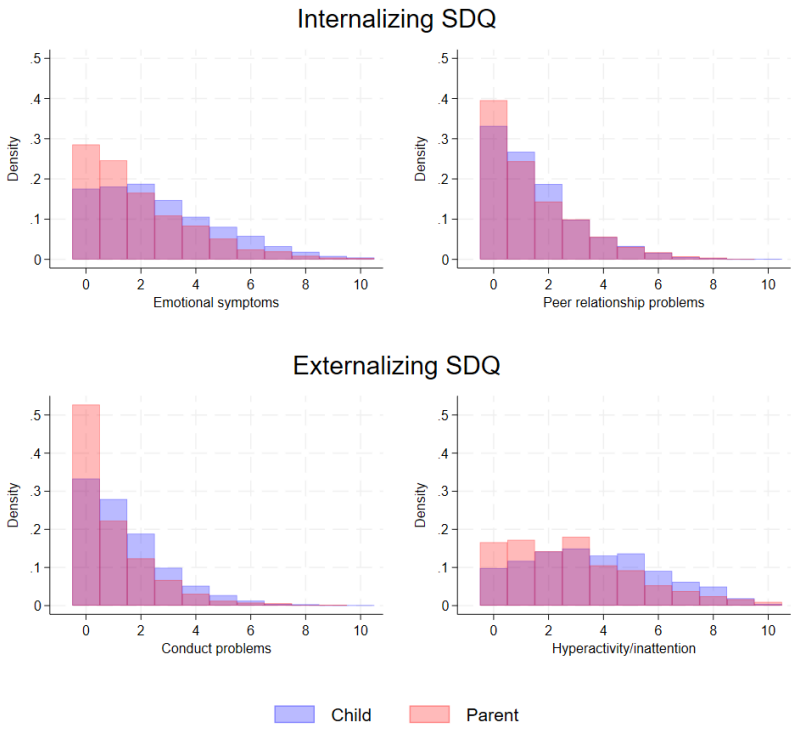
Appendix D Supplementary Figures and Tables

Figure D.1: Unmatched distributions by SDQ subscales-Luxembourg



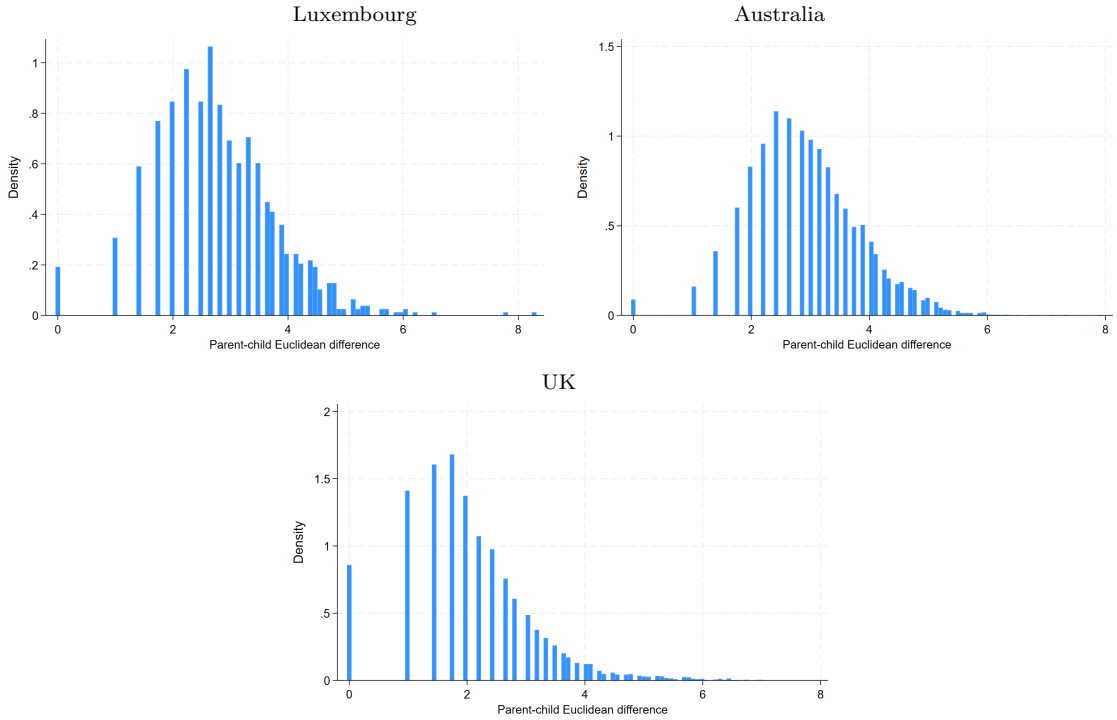
Notes: The figure shows the distributions of socio-emotional difficulty scores by SDQ subscale, reported by children (self-reports) and by parents (parents' first-order reports). Higher scores indicate higher levels of socio-emotional difficulties.

Figure D.2: Unmatched distributions by SDQ subscales-Australia



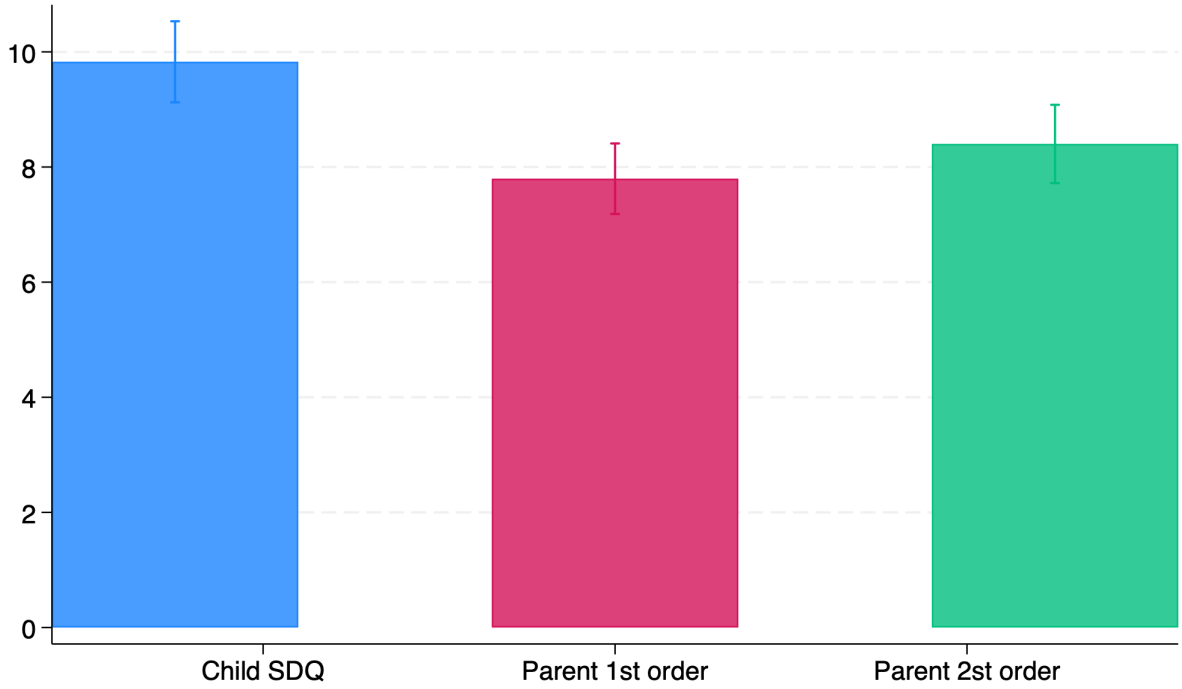
Notes: The figure shows the distributions of socio-emotional difficulty scores by SDQ subscale, reported by children (self-reports) and by parents (parents' first-order reports). Higher scores indicate higher levels of socio-emotional difficulties.

Figure D.3: Distributions of the Euclidean distances



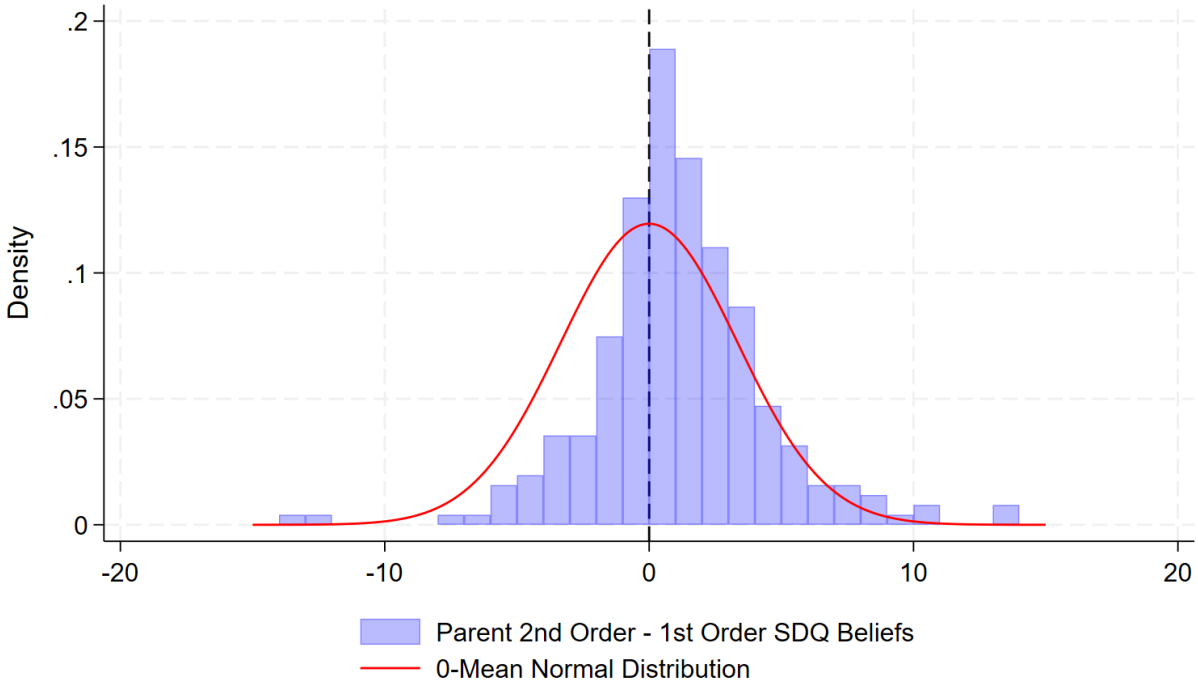
Notes: The figure shows the distribution of Euclidean distances between parent- and child-reported socio-emotional difficulty scores. Measures are based on the SDQ in Luxembourg and Australia, and on the SMFQ in UK. Larger distances indicate greater discrepancies between parent and child reports.

Figure D.4: Child SDQ, First and second-order beliefs in the control group



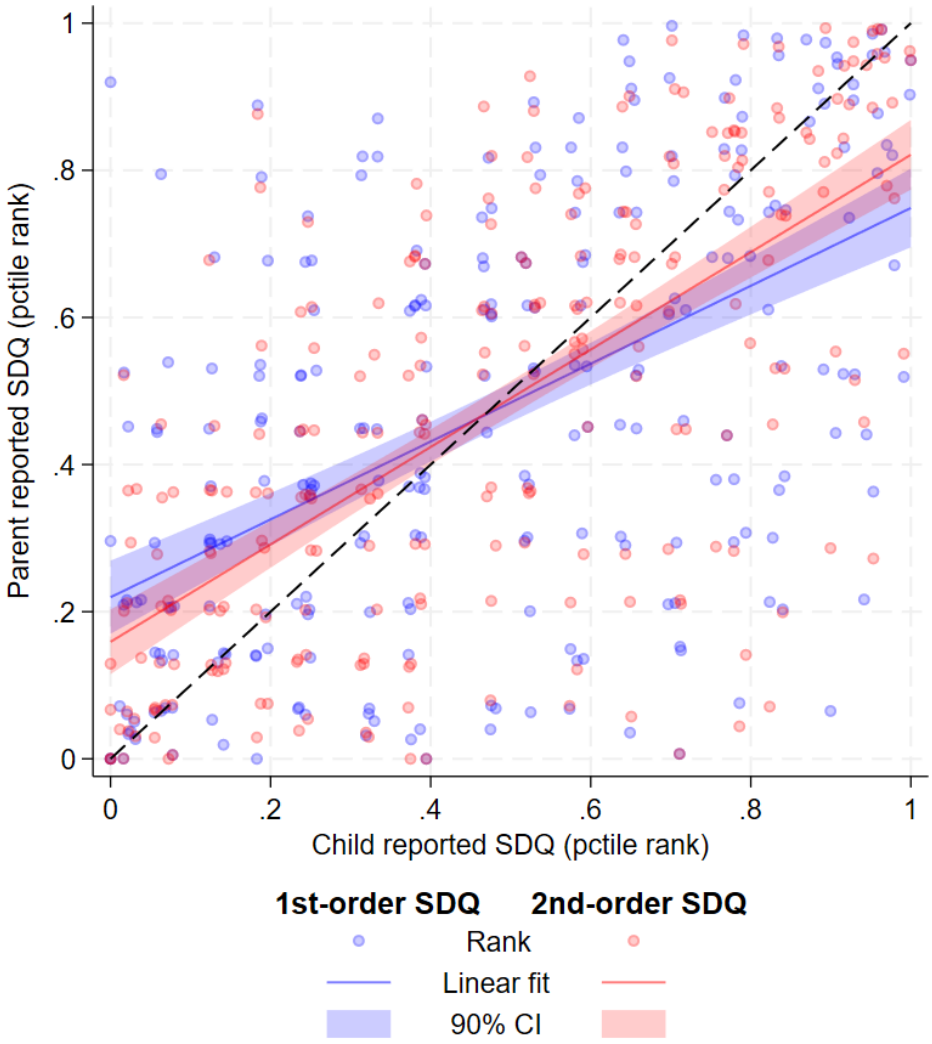
Notes: The figure reports mean total SDQ scores based on child self-reports, parents' first-order beliefs, and parents' second-order beliefs in the control group. Error bars represent 95% confidence intervals. Higher scores indicate higher levels of socio-emotional difficulties.

Figure D.5: Differences between parental first- and second-order beliefs



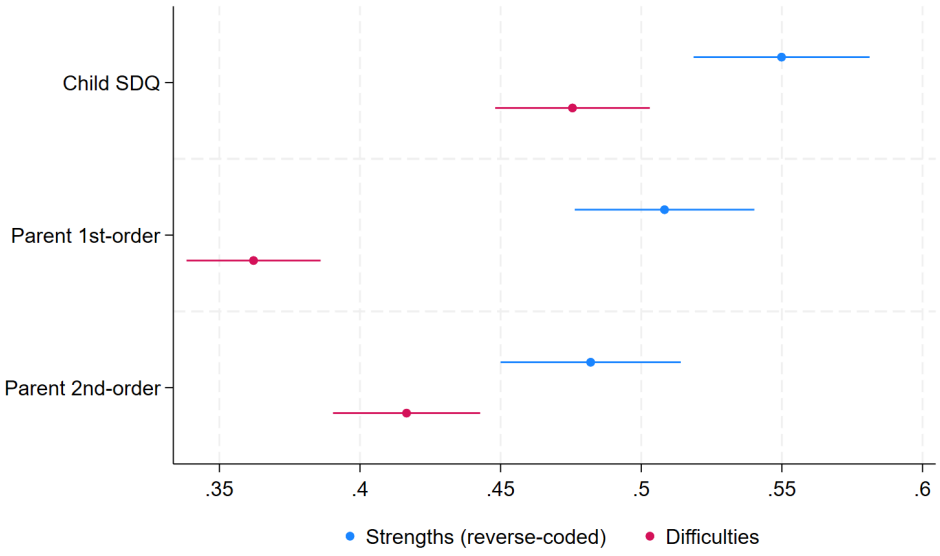
Notes: The figure shows the distribution of the difference between parents' second- and first-order SDQ beliefs. The red curve represents a zero-mean normal distribution with the same dispersion as the observed differences.

Figure D.6: Child-reported and parent-reported SDQ: ranks



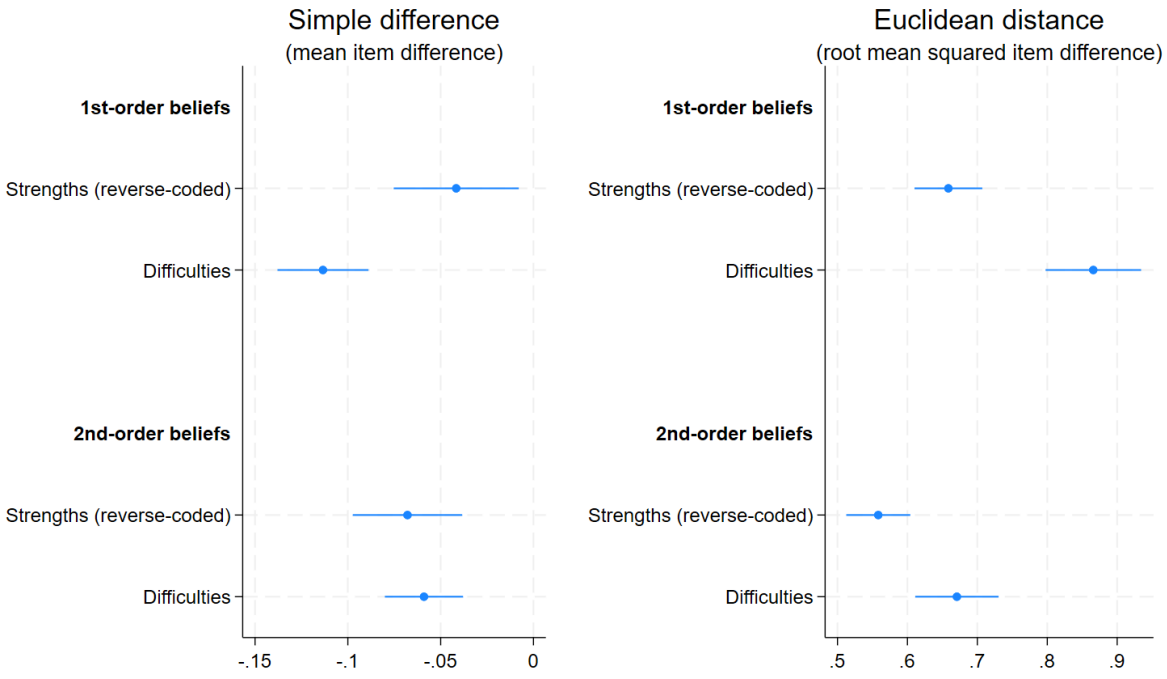
Notes: Scatter plot of parent-reported SDQ against child-reported SDQ. Points are displayed with a small spherical random noise (2% of the graph width) to reduce overlap and improve the visibility of individual observations. The dashed black line is the 45-degree line.

Figure D.7: Mean item-level SDQ for strengths and difficulties



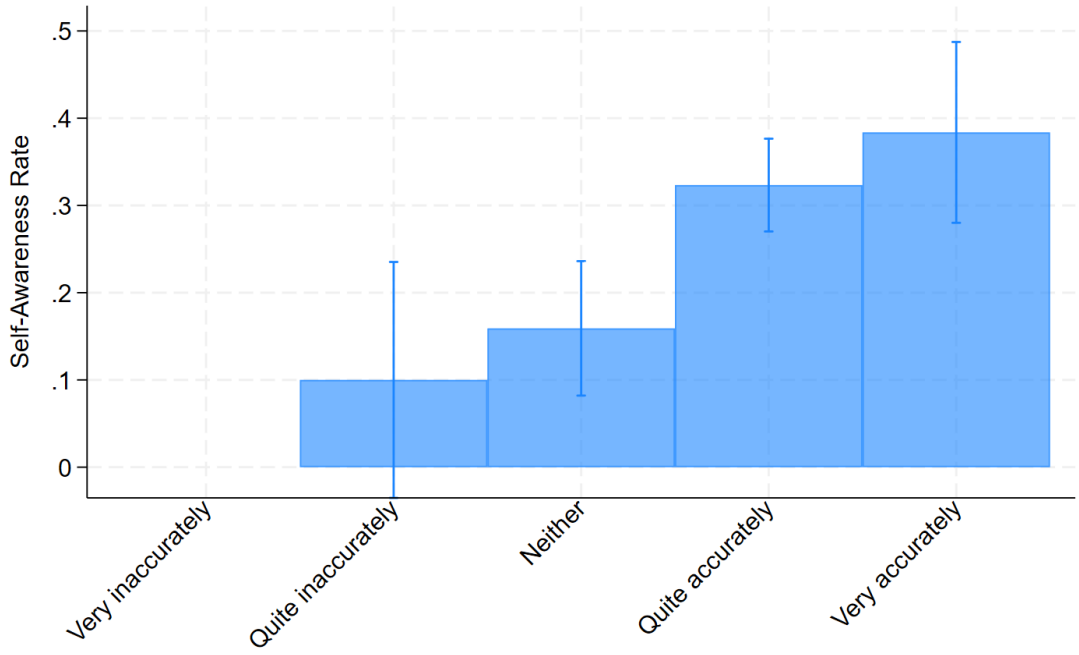
Notes: Dots are sample means, with 95% confidence intervals as horizontal lines.

Figure D.8: Average bias and discrepancy for strengths and difficulties



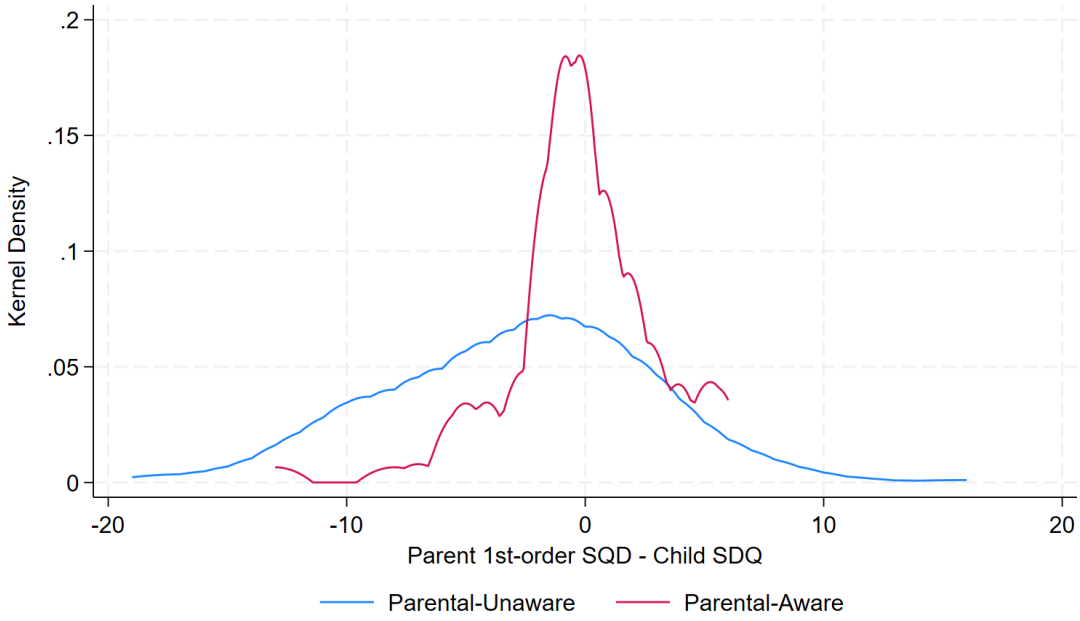
Notes: Dots are sample averages. Horizontal bars are for 95% confidence intervals of the means.

Figure D.9: Parental Awareness and child perceived accuracy



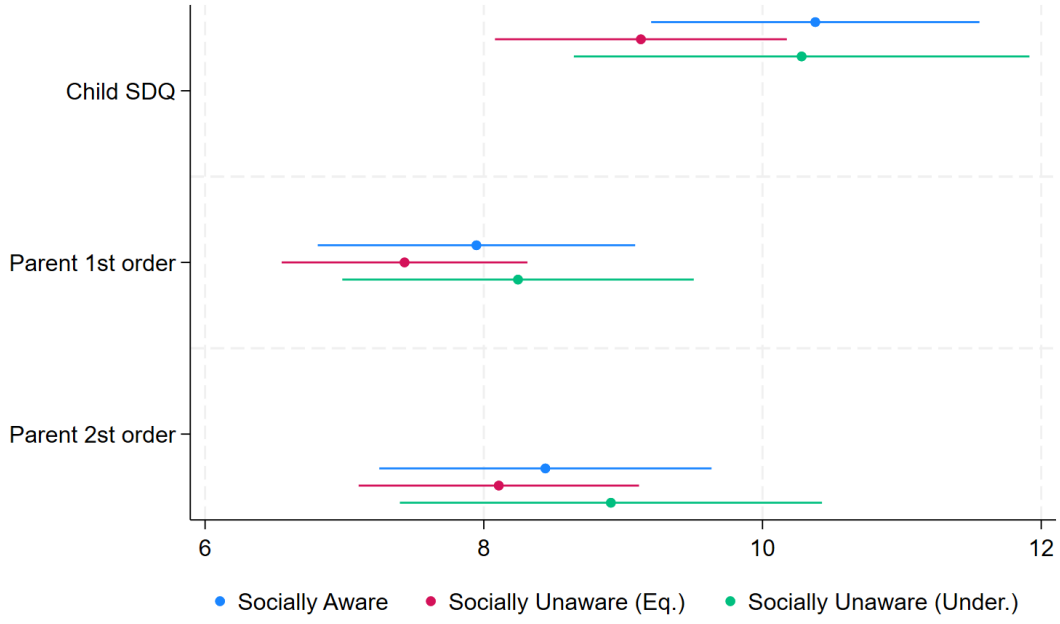
Notes: The figure reports the self-awareness rate by category of perceived accuracy. Bars are mean self-awareness rates. Vertical lines indicate 95% confidence intervals.

Figure D.10: Difference between parent-reported and child distress by Parental Awareness



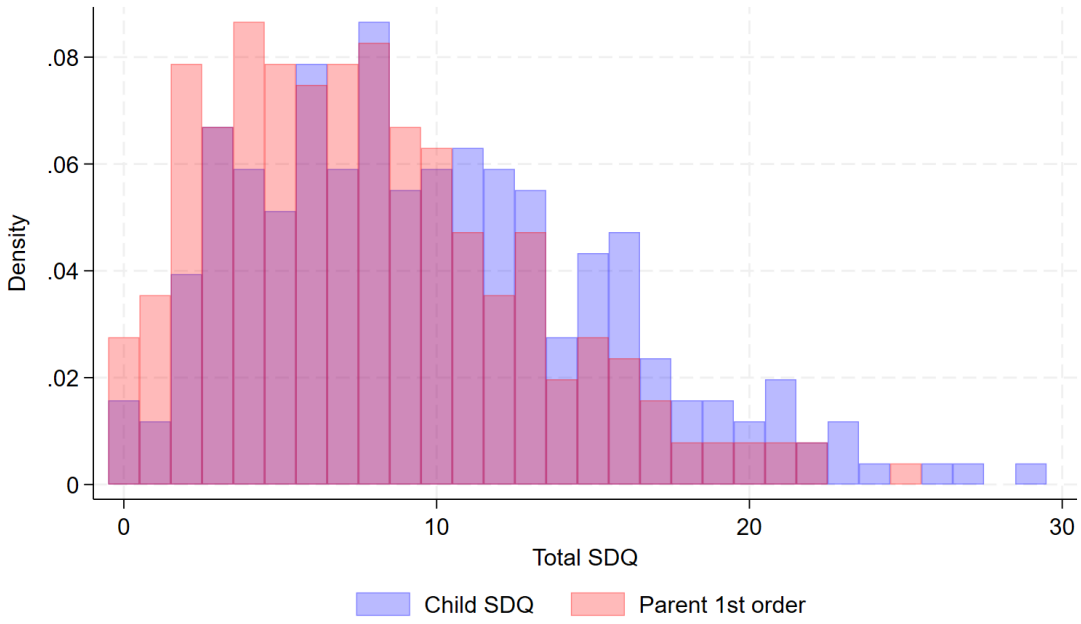
Notes: These are density functions of the simple difference between child- and parent-reported SDQ in the control group, estimated with the Epanechnikov kernel. Results are presented separately by the degree of parental awareness.

Figure D.11: Child Distress and parent-reported child distress and parents second order beliefs by Priors/Social Awareness



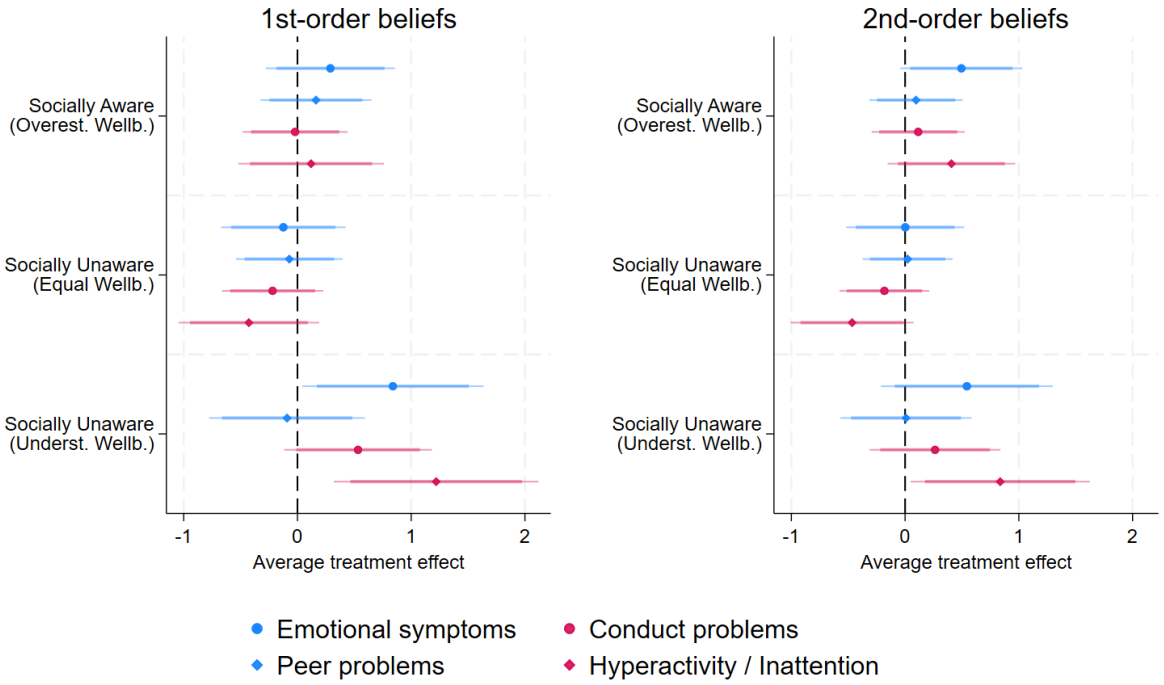
Notes: Dots are sample averages. Horizontal bars are for 95% confidence intervals of the means.

Figure D.12: Children's SDQ and parent-reported child distress in the control group



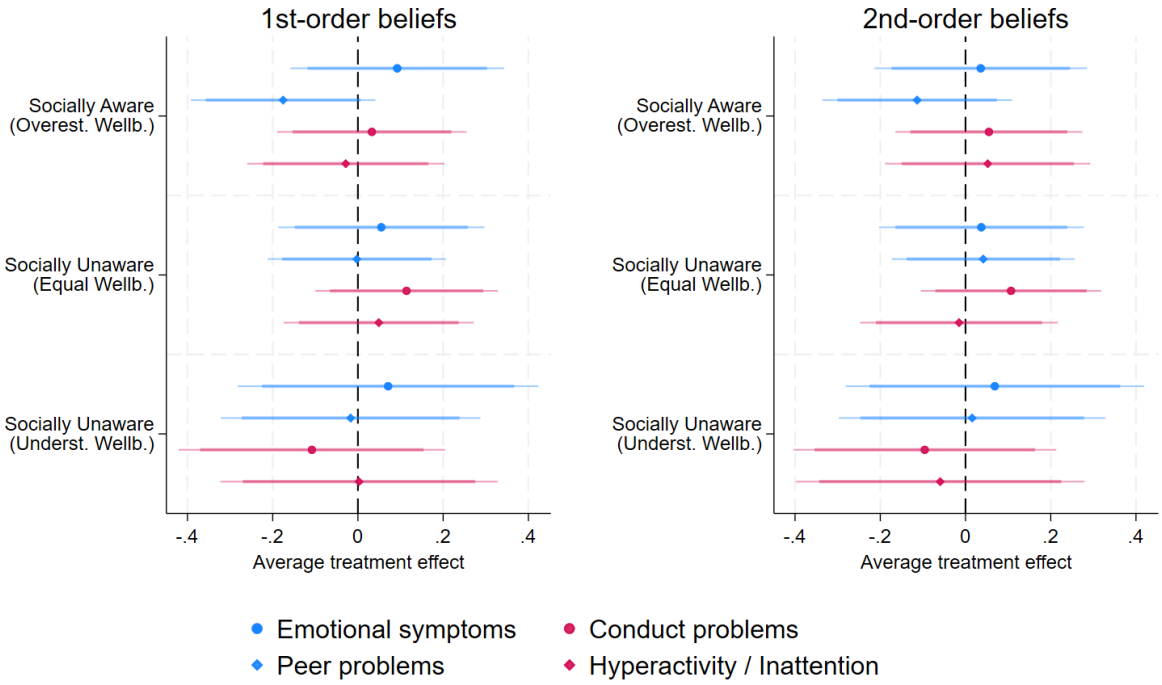
Notes: The figure shows the distributions of SDQ reported by children and by parents (parents' first-order reports) in the control group. Higher scores indicate higher levels of socio-emotional difficulties.

Figure D.13: Effect of information treatment on parent-child simple difference: SDQ subscales



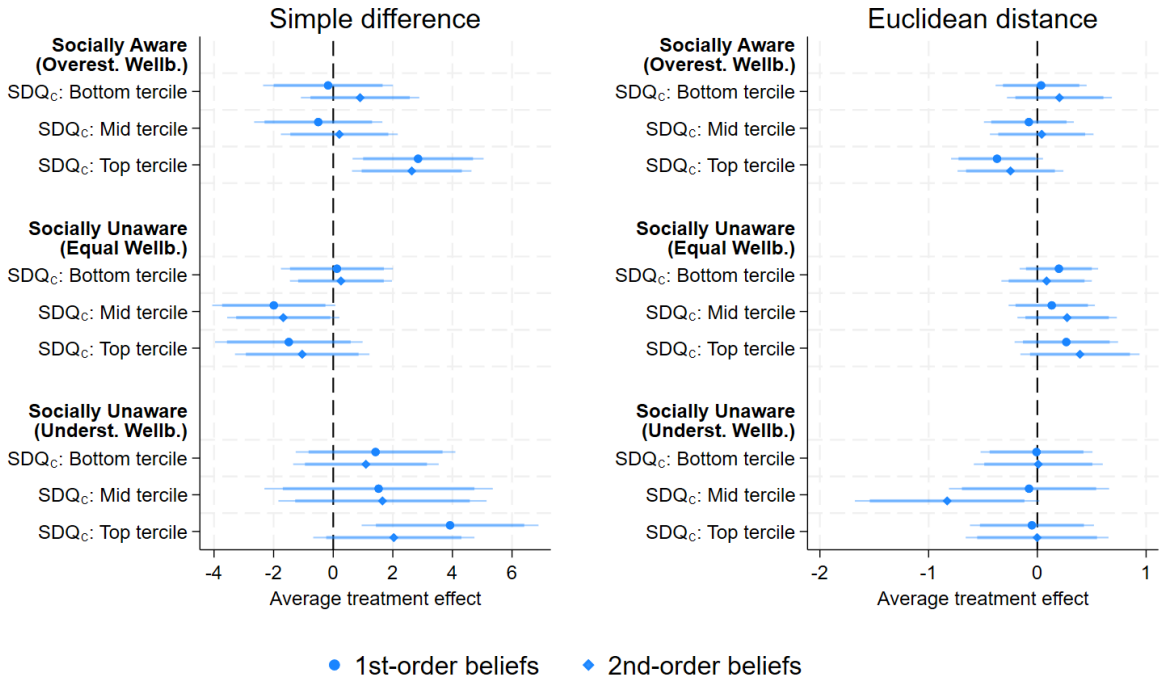
Notes: Results come from multivariate regression analyzes where the treatment status is interacted with parents' priors. Dots are total treatment effects on the simple difference between parent- and child-reported SDQ, for the level of social awareness indicated on the y-axis. All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Shaded horizontal lines are for 95 and 90% confidence intervals.

Figure D.14: Effect of information treatment on parent-child Euclidean distance: SDQ subscales



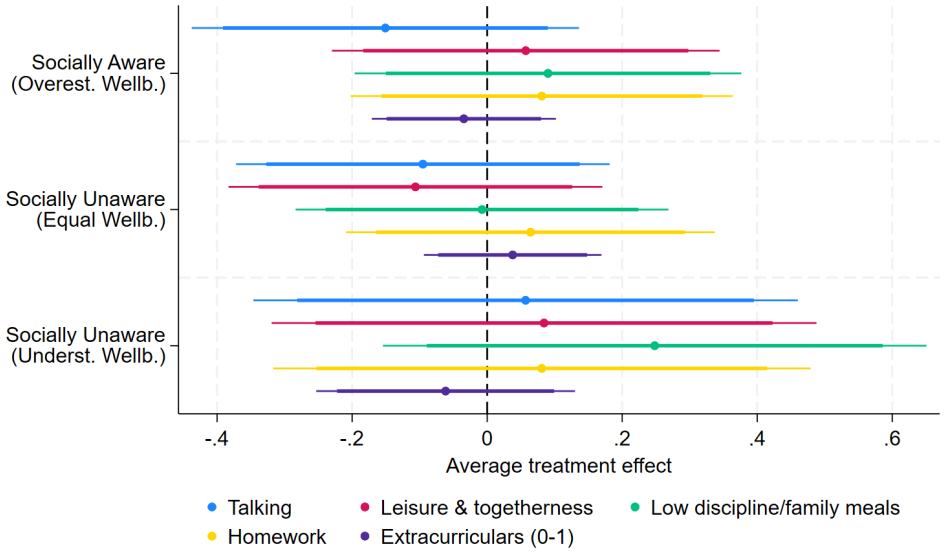
Notes: Results come from multivariate regression analyzes where the treatment status is interacted with parents' priors. Dots are total treatment effects on the Euclidean distance between parent- and child-reported SDQ, for the level of social awareness indicated on the y-axis. All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Shaded horizontal lines are for 95 and 90% confidence intervals.

Figure D.15: Effect of information treatment on parent-child bias and disagreement



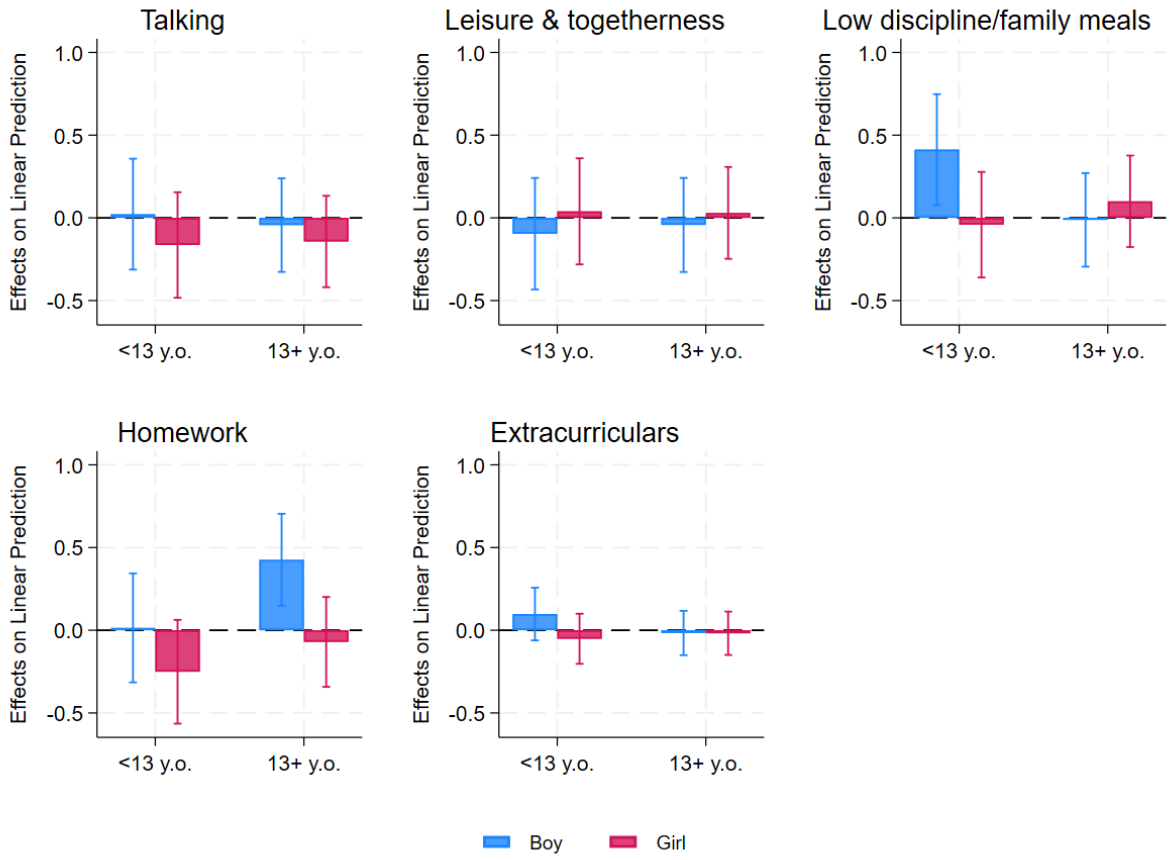
Notes: Results come from multivariate regression analyzes where the treatment status is interacted with social awareness and with the tercile of child-reported SDQ. Dots are total treatment effects, for the level of social awareness and child SDQ indicated on the y-axis. All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Shaded horizontal lines are for 95 and 90% confidence intervals.

Figure D.16: Effect of information treatment on parental investments, by prior beliefs



Notes: Results come from multivariate regression analyzes where the treatment status is interacted with parents' priors. Dots are total treatment effects on the investment type indicated in the legend, for the level of social awareness indicated on the y-axis. All investment variables are standardized to have mean zero and standard deviation one in the estimation sample, except for 'Extracurriculars' which is expressed as a binary variable. All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Shaded horizontal lines are for 95 and 90% confidence intervals.

Figure D.17: Effect of information treatment on parental investments, by child gender and age



Notes: Results come from multivariate regression analyzes where the treatment status is interacted with the child's gender and age. Bars indicate total treatment effects by gender-age groups. All investment variables are standardized to have mean zero and standard deviation one in the estimation sample, except for 'Extracurriculars' which is expressed as a binary variable. All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Vertical bars are for 95% confidence intervals.

Table D.1: Correlates of bias and disagreement in parent-child SDQ

	Luxembourg (Survey 1)		Luxembourg (Survey 2)				UK (ALSPAC)		Australia (LSAC)	
			First-order beliefs		Second-order beliefs					
	(1) Simple difference	(2) Euclidean distance	(3) Simple difference	(4) Euclidean distance	(5) Simple difference	(6) Euclidean distance	(7) Simple difference	(8) Euclidean distance	(9) Simple difference	(10) Euclidean distance
Female	-0.876**	0.207***	-0.836*	-0.017	-0.820*	-0.067	-1.281***	0.265***	-0.785***	-0.079***
	(0.341)	(0.0719)	(0.497)	(0.094)	(0.421)	(0.104)	(0.141)	(0.033)	(0.148)	(0.024)
Age	-0.054	0.040**	-0.055	0.018	0.021	-0.001			-0.032**	-0.005*
	(0.087)	(0.018)	(0.137)	(0.026)	(0.116)	(0.029)			(0.015)	(0.003)
First born	0.487	0.058	-0.766	0.312**	-0.617	0.340**	0.388***	-0.028	0.908***	-0.037
	(0.411)	(0.087)	(0.755)	(0.143)	(0.639)	(0.157)	(0.147)	(0.035)	(0.151)	(0.025)
Parent: mother	0.055	-0.037	-1.032*	0.078	-0.418	0.108			0.454	-0.081
	(0.412)	(0.087)	(0.556)	(0.105)	(0.471)	(0.116)			(0.358)	(0.059)
Parent: age	-0.018	-0.009	-0.066	-0.011	-0.059	0.005	-0.052***	0.011***	-0.382**	0.001
	(0.034)	(0.007)	(0.043)	(0.008)	(0.037)	(0.009)	(0.017)	(0.004)	(0.187)	(0.031)
Parent: immigrant	0.086	0.052	-0.264	0.137	-0.178	0.051	-0.571	0.212	-0.354*	-0.150***
	(0.406)	(0.085)	(0.526)	(0.100)	(0.446)	(0.110)	(0.588)	(0.139)	(0.203)	(0.034)
Parent: partner	-0.225	0.014	0.130	-0.297**	-0.418	-0.110	0.630**	-0.228***	0.117	-0.144***
	(0.515)	(0.108)	(0.684)	(0.130)	(0.580)	(0.143)	(0.294)	(0.070)	(0.243)	(0.040)
Parent: employed	-0.070	-0.064	0.398	0.071	0.090	0.290*	0.026	0.004	-0.027	-0.117***
	(0.281)	(0.059)	(0.809)	(0.153)	(0.685)	(0.169)	(0.194)	(0.046)	(0.162)	(0.027)
Parent: high education	-0.550	0.103	0.755	-0.054	0.308	0.030	0.059	0.048	-0.237*	-0.101***
	(0.362)	(0.076)	(0.600)	(0.114)	(0.509)	(0.125)	(0.190)	(0.045)	(0.131)	(0.022)
Log of household income	-0.308	0.048	-1.492***	0.361***	-0.939**	0.313***	-0.314*	-0.083**	-0.178**	0.029**
	(0.247)	(0.052)	(0.503)	(0.095)	(0.427)	(0.105)	(0.163)	(0.039)	(0.075)	(0.012)
Constant	2.928	2.092***	15.889***	-0.332	10.725***	-0.767	1.552	2.321***	2.392**	4.267***
	(3.549)	(0.748)	(4.751)	(0.900)	(4.026)	(0.991)	(1.184)	(0.280)	(1.199)	(0.199)
Mean of dependent	-2.75	2.91	-1.94	2.79	-1.24	2.82	-2.57	2.17	-1.87	3.05
Std. Dev. of dependent	5.12	1.08	5.18	0.99	4.38	1.09	4.82	1.14	5.66	0.94
Observations	907	907	433	433	433	433	4616	4616	5822	5822
R-squared	0.017	0.022	0.044	0.058	0.039	0.056	0.025	0.022	0.018	0.031

Notes: Standard errors in parentheses. Simple differences and Euclidean distances are computed based on the gap between parents' reported child beliefs (unless otherwise specified) about the child's SDQ and the child's self-reported SDQ. Columns (7) and (8) use the SMFQ scale instead of the SDQ. Regressions run on the Luxembourg – Survey 2 sample additionally control for treatment assignment (not shown in the table). Missing coefficients for the child's age and the parent's gender are due to data characteristics (i.e., children all belong to the same birth cohort; parent-rated SMFQ was collected via the mother's questionnaire). Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

Table D.2: Correlates of bias and disagreement in parent-child SDQ: girls only

	Luxembourg (Survey 1)		Luxembourg (Survey 2)				UK (ALSPAC)		Australia (LSAC)	
			First-order beliefs		Second-order beliefs					
	(1) Simple difference	(2) Euclidean distance	(3) Simple difference	(4) Euclidean distance	(5) Simple difference	(6) Euclidean distance	(7) Simple difference	(8) Euclidean distance	(9) Simple difference	(10) Euclidean distance
Age	-0.166	0.062**	0.003	0.022	0.084	0.004			-0.029	-0.003
	(0.128)	(0.026)	(0.200)	(0.038)	(0.175)	(0.040)			(0.022)	(0.004)
First born	0.863	-0.050	-1.019	0.227	-0.468	0.197	0.588***	-0.049	1.012***	-0.066*
	(0.576)	(0.117)	(1.155)	(0.219)	(1.012)	(0.234)	(0.222)	(0.052)	(0.211)	(0.036)
Parent: mother	0.029	0.078	-0.945	0.213	-0.600	0.185			0.304	-0.031
	(0.609)	(0.124)	(0.814)	(0.154)	(0.713)	(0.165)			(0.544)	(0.093)
Parent: age	-0.057	0.005	-0.124**	-0.019	-0.135**	-0.013	-0.049*	0.008	-0.652**	0.078*
	(0.050)	(0.010)	(0.063)	(0.012)	(0.055)	(0.013)	(0.026)	(0.006)	(0.266)	(0.046)
Parent: immigrant	0.442	-0.018	-0.131	0.209	0.042	0.035	-1.346*	0.251	0.226	-0.174***
	(0.580)	(0.118)	(0.802)	(0.152)	(0.703)	(0.162)	(0.816)	(0.191)	(0.295)	(0.051)
Parent: partner	-0.805	0.031	0.679	-0.216	-0.033	-0.104	0.796*	-0.362***	-0.245	-0.110*
	(0.733)	(0.149)	(0.974)	(0.185)	(0.853)	(0.197)	(0.455)	(0.106)	(0.337)	(0.058)
Parent: employed	-0.233	-0.010	-0.606	0.061	-0.475	0.350	0.106	-0.036	-0.034	-0.085**
	(0.404)	(0.082)	(1.233)	(0.234)	(1.080)	(0.250)	(0.299)	(0.070)	(0.224)	(0.038)
Parent: high education	-1.083**	0.057	-0.102	-0.096	-0.283	0.098	-0.156	0.136**	-0.220	-0.116***
	(0.522)	(0.106)	(0.897)	(0.170)	(0.786)	(0.182)	(0.286)	(0.067)	(0.178)	(0.031)
Log of household income	-0.464	0.020	-1.397*	0.401***	-1.120	0.319**	-0.534**	-0.039	0.036	0.032*
	(0.368)	(0.075)	(0.788)	(0.149)	(0.690)	(0.160)	(0.248)	(0.058)	(0.104)	(0.018)
Constant	7.418	1.757*	17.329**	-0.429	14.701**	-0.095	1.310	2.553***	0.235	4.110***
	(5.241)	(1.062)	(7.431)	(1.410)	(6.510)	(1.505)	(1.799)	(0.420)	(1.707)	(0.292)
Mean of dependent	-3.13	3.01	-2.32	2.79	-1.61	2.79	-3.20	2.30	-2.29	3.00
Std. Dev. of dependent	5.33	1.07	5.47	1.05	4.82	1.11	5.19	1.21	5.53	0.95
Observations	462	462	228	228	228	228	2357	2357	2872	2872
R-squared	0.037	0.017	0.048	0.067	0.057	0.059	0.012	0.011	0.014	0.028

Notes: Standard errors in parentheses. Simple differences and Euclidean distances are computed based on the gap between parents' reported child beliefs (unless otherwise specified) about the child's SDQ and the child's self-reported SDQ. Columns (7) and (8) use the SMFQ scale instead of the SDQ. Regressions run on the Luxembourg – Survey 2 sample additionally control for treatment assignment (not shown in the table). Missing coefficients for the child's age and the parent's gender are due to data characteristics (i.e., children all belong to the same birth cohort; parent-rated SMFQ was collected via the mother's questionnaire). Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.01.

Table D.3: Correlates of bias and disagreement in parent-child SDQ: boys only

	Luxembourg (Survey 1)		Luxembourg (Survey 2)				UK (ALSPAC)		Australia (LSAC)	
			First-order beliefs		Second-order beliefs					
	(1) Simple difference	(2) Euclidean distance	(3) Simple difference	(4) Euclidean distance	(5) Simple difference	(6) Euclidean distance	(7) Simple difference	(8) Euclidean distance	(9) Simple difference	(10) Euclidean distance
Age	0.070	0.015	-0.118	0.018	-0.055	-0.011			-0.032	-0.006*
	(0.119)	(0.026)	(0.191)	(0.036)	(0.152)	(0.041)			(0.021)	(0.003)
First born	0.006	0.180	-0.236	0.400**	-0.674	0.478**	0.173	-0.007	0.805***	-0.006
	(0.589)	(0.129)	(1.000)	(0.191)	(0.800)	(0.217)	(0.191)	(0.046)	(0.216)	(0.035)
Parent: mother	0.078	-0.148	-0.892	-0.060	-0.087	0.044			0.609	-0.124
	(0.555)	(0.122)	(0.759)	(0.145)	(0.608)	(0.165)			(0.478)	(0.077)
Parent: age	0.003	-0.023**	0.003	-0.001	0.027	0.029**	-0.057**	0.014**	-0.153	-0.070*
	(0.047)	(0.010)	(0.060)	(0.011)	(0.048)	(0.013)	(0.022)	(0.005)	(0.262)	(0.042)
Parent: immigrant	-0.196	0.091	-0.152	0.079	-0.278	0.081	0.612	0.162	-0.807***	-0.132***
	(0.573)	(0.126)	(0.701)	(0.133)	(0.561)	(0.152)	(0.854)	(0.206)	(0.279)	(0.045)
Parent: partner	0.458	0.004	-0.391	-0.349*	-0.634	-0.019	0.476	-0.101	0.493	-0.183***
	(0.723)	(0.159)	(0.975)	(0.186)	(0.780)	(0.211)	(0.374)	(0.090)	(0.351)	(0.056)
Parent: employed	0.069	-0.103	1.698	0.106	0.855	0.292	-0.048	0.050	0.002	-0.153***
	(0.393)	(0.086)	(1.065)	(0.203)	(0.852)	(0.231)	(0.246)	(0.059)	(0.234)	(0.038)
Parent: high education	0.008	0.175	1.721**	-0.022	0.919	-0.046	0.285	-0.046	-0.281	-0.083***
	(0.505)	(0.111)	(0.797)	(0.152)	(0.638)	(0.173)	(0.248)	(0.060)	(0.193)	(0.031)
Log of household income	-0.184	0.080	-1.809***	0.311**	-0.920*	0.252*	-0.082	-0.128**	-0.382***	0.026
	(0.333)	(0.073)	(0.661)	(0.126)	(0.529)	(0.143)	(0.211)	(0.051)	(0.107)	(0.017)
Constant	-1.491	2.617**	14.325**	-0.313	6.490	-1.327	0.515	2.345***	3.685**	4.311***
	(4.815)	(1.056)	(6.121)	(1.166)	(4.897)	(1.327)	(1.522)	(0.367)	(1.689)	(0.272)
Mean of dependent	-2.27	2.80	-1.52	2.79	-0.82	2.85	-1.92	2.04	-1.46	3.09
Std. Dev. of dependent	4.89	1.09	4.82	0.92	3.80	1.06	4.31	1.04	5.75	0.93
Observations	445	445	205	205	205	205	2259	2259	2950	2950
R-squared	0.002	0.036	0.075	0.078	0.050	0.099	0.006	0.011	0.019	0.033

Notes: Standard errors in parentheses. Simple differences and Euclidean distances are computed based on the gap between parents' reported child beliefs (unless otherwise specified) about the child's SDQ and the child's self-reported SDQ. Columns (7) and (8) use the SMFQ scale instead of the SDQ. Regressions run on the Luxembourg – Survey 2 sample additionally control for treatment assignment (not shown in the table). Missing coefficients for the child's age and the parent's gender are due to data characteristics (i.e., children all belong to the same birth cohort; parent-rated SMFQ was collected via the mother's questionnaire). Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

Table D.4: Socio-Demographic Predictors of Parental Awareness (Euclidean distance)

	(1) Baseline	(2) +Priors	(3) + Income
Mother	0.034	0.039	0.121
	(0.111)	(0.112)	(0.120)
Age	0.001	0.002	0.002
	(0.009)	(0.009)	(0.009)
Employed	0.360**	0.362**	0.293*
	(0.152)	(0.152)	(0.174)
Two-parents household	0.117	0.109	-0.048
	(0.136)	(0.136)	(0.153)
Education: (Lower Secondary Baseline)			
Upper secondary	0.465**	0.441*	0.320
	(0.231)	(0.233)	(0.243)
Post secondary	0.521**	0.497**	0.246
	(0.222)	(0.226)	(0.238)
Luxembourg Resident	-0.210	-0.211	-0.305
	(0.171)	(0.171)	(0.185)
Survey Language (DE Baseline)			
EN	0.026	0.032	0.019
	(0.155)	(0.155)	(0.164)
FR	-0.352***	-0.355***	-0.286**
	(0.121)	(0.121)	(0.128)
LUX	0.060	0.043	0.058
	(0.218)	(0.219)	(0.249)
Number of parent's different nationalities	-0.117	-0.106	-0.165
	(0.127)	(0.128)	(0.136)
Family size (excluding respondent)	-0.057	-0.055	-0.067
	(0.050)	(0.050)	(0.055)
Daughter	-0.059	-0.061	-0.029
	(0.097)	(0.097)	(0.104)
Child age	0.004	0.002	0.000
	(0.027)	(0.027)	(0.029)
Number of child's different languages	-0.086**	-0.085**	-0.046
	(0.043)	(0.043)	(0.046)
Number of child's different nationalities	0.240***	0.233**	0.237**
	(0.092)	(0.092)	(0.098)
Duration (in seconds)	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Attention Checks (no errors Baseline)			
Failed first	-0.088	-0.081	-0.092
	(0.177)	(0.177)	(0.190)
Priors: (Socially Aware Baseline)			
Socially Unaware (Equal Wellb.)		-0.133	-0.153
		(0.109)	(0.117)
Socially Unaware (Underst. Wellb.)		-0.099	-0.135
		(0.136)	(0.144)
Income (log)			0.288***
			(0.108)
Constant	2.360***	2.435***	0.317
	(0.591)	(0.594)	(1.003)
Treatment Effect Control	Yes	Yes	Yes
Observations	495	495	433

Notes: Standard errors in parentheses. Coefficients are estimated marginal effects from probit models of parental awareness the on the controls displayed in the table. All regressions additionally control for the assignment to the treatment. Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

Table D.5: Psychological Predictors of Parental Awareness (Euclidean distance)

	(1) Baseline	(2) +Background	(3) +Child SDQ	(4) +Diagnoses	(5) +Differences	(6) +Differences
Parent traits:						
Big 5: Openness	-0.019	-0.016	-0.041	-0.042	0.006	
	(0.043)	(0.043)	(0.040)	(0.039)	(0.038)	
Big 5: Conscientiousness	0.076	0.108**	0.070	0.076	0.001	
	(0.050)	(0.053)	(0.049)	(0.049)	(0.048)	
Big 5: Extraversion	-0.010	0.001	0.022	0.029	0.004	
	(0.044)	(0.044)	(0.041)	(0.041)	(0.040)	
Big 5: Agreeableness	-0.082	-0.052	-0.065	-0.072	-0.074	
	(0.057)	(0.058)	(0.054)	(0.053)	(0.051)	
Big 5: Neuroticism	0.022	-0.014	-0.001	0.001	-0.073*	
	(0.041)	(0.043)	(0.040)	(0.040)	(0.038)	
Theory of Mind	0.002	0.008	-0.004	-0.002	-0.006	
	(0.027)	(0.027)	(0.025)	(0.025)	(0.023)	
Self-confidence on Theory of Mind	-0.024	-0.022	-0.027*	-0.029*	-0.014	
	(0.018)	(0.018)	(0.017)	(0.016)	(0.015)	
Child traits:						
Big 5: Openness (child)	0.026	0.029	-0.008	-0.002		-0.015
	(0.043)	(0.043)	(0.040)	(0.040)		(0.038)
Big 5: Conscientiousness (child)	-0.234***	-0.218***	-0.068	-0.071		-0.033
	(0.049)	(0.049)	(0.049)	(0.048)		(0.047)
Big 5: Extraversion (child)	-0.088**	-0.091**	-0.060	-0.056		-0.036
	(0.044)	(0.044)	(0.041)	(0.041)		(0.039)
Big 5: Agreeableness (child)	-0.161***	-0.118**	-0.068	-0.069		-0.058
	(0.053)	(0.053)	(0.050)	(0.049)		(0.047)
Big 5: Neuroticism (child)	0.045	0.047	-0.121***	-0.120***		-0.108***
	(0.038)	(0.038)	(0.040)	(0.040)		(0.038)
Theory of Mind (child)	-0.005	-0.006	0.005	0.001		0.002
	(0.024)	(0.024)	(0.022)	(0.022)		(0.020)
Self-confidence on Theory of Mind (child)	0.019	0.017	0.017	0.014		0.011
	(0.017)	(0.017)	(0.016)	(0.016)		(0.014)
Indices of distress:						
CPRS-SF conflict scale		0.017*	0.008	0.009	0.012	0.010
		(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
CPRS-SF closeness scale		-0.018	-0.010	-0.012	-0.017	-0.015
		(0.014)	(0.013)	(0.013)	(0.013)	(0.012)
Parent PHQ-9		0.021	-0.000	0.001	0.002	-0.002
		(0.013)	(0.013)	(0.013)	(0.012)	(0.011)
Child SDQ			0.095***	0.099***	0.087***	0.092***
			(0.011)	(0.011)	(0.009)	(0.011)
Any diagnosis				-0.392**	-0.321**	-0.286*
				(0.161)	(0.157)	(0.157)
Parent-child differences in:						
Gender					-0.129	-0.122
					(0.092)	(0.091)
Age					0.005	0.004
					(0.024)	(0.008)
Theory of Mind					0.051*	0.051*
					(0.029)	(0.030)
Self-confidence on Theory of Mind					0.052**	0.063***
					(0.020)	(0.020)
Big 5 personality					0.148***	0.108***
					(0.036)	(0.034)
Socio-Demographics Controls	Yes	Yes	Yes	Yes	Yes	Yes
Treatment Effect Control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	474	464	464	464	464	464

Notes: Standard errors in parentheses. Coefficients come from linear regression models of the Euclidean distance between parent second-order beliefs and child-reported SDQ the on the controls displayed in the table. All regressions additionally control for the assignment to the treatment, and for a set of socio-demographic controls (the full list is displayed in Table 2). Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

Table D.6: Principal-component (PC) loadings of parents' investment intentions

	PC 1: Talking	PC 2: Leisure and togetherness	PC 3: Low discipline and family meals	PC 4: Homework
Homework	0.004	-0.087	-0.221	0.895
Family meals	0.123	0.075	0.387	0.384
Cooking	0.053	0.410	0.502	-0.002
Chores	-0.004	0.248	0.349	0.326
Cultural activities	0.014	0.807	-0.061	-0.133
Indoor leisure	0.001	0.777	-0.082	0.070
Outdoor leisure	0.000	0.732	0.059	0.022
Disciplining	0.031	0.134	-0.776	0.177
Talk: aspirations (personal)	0.661	-0.027	0.150	0.093
Talk: aspirations (societal)	0.784	-0.053	0.074	-0.082
Talk: worries (personal)	0.816	-0.039	0.060	0.067
Talk: worries (societal)	0.855	-0.067	0.021	-0.011
Talk: sensitive topics (personal)	0.724	0.093	-0.156	0.052
Talk: sensitive topics (societal)	0.731	0.113	-0.187	-0.099

Notes: Values are loadings obtained from PCA of the 15 investment variables, with oblique rotation of the Kaiser-normalized loading matrix. The PC analysis is run on the estimation sample of 495 observations.

Table D.7: Parent's first-order beliefs and investments intentions

	(1) Talking	(2) Leisure & togetherness	(3) Low discipline & family meals	(4) Homework	(5) Extracurriculars (0-1)
Parent 1st order	0.010	0.021	0.004	0.026**	0.018***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.006)
Observations	495	495	495	495	495

Notes: Standard errors in parentheses. These are linear regression models. All outcome variables are standardized to have mean zero and standard deviation one in the estimation sample, except for 'Extracurriculars' which is expressed as a binary variable. All regressions control for the child's age and gender and the parent's age, gender, education, employment status, the presence of a cohabiting partner, the four PCs of baseline parental investments, and the treatment status. The treatment status is additionally interacted with parents' first-order beliefs, so that the coefficients displayed in the table refer only to the reference group – i.e. the control group. Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

Table D.8: Treatment effect on parental investments: the role of constraints

	(1) Talking	(2) Leisure & togetherness	(3) Low discipline & family meals	(4) Homework	(5) Extracurriculars (0-1)
Panel A: Capacity constraints					
Treatment	-0.065	-0.030	0.142	-0.018	-0.055
	(0.143)	(0.143)	(0.143)	(0.142)	(0.068)
Treatment × High baseline investments	-0.034	0.039	-0.090	0.142	0.067
	(0.185)	(0.185)	(0.185)	(0.183)	(0.088)
Observations	495	495	495	495	495
R-squared	0.028	0.023	0.018	0.038	0.052
Panel B: Income constraints					
Treatment	-0.134	-0.019	0.049	0.076	0.019
	(0.107)	(0.108)	(0.108)	(0.107)	(0.051)
Treatment × Income in bottom quartile	0.164	0.030	0.127	-0.039	-0.115
	(0.199)	(0.199)	(0.199)	(0.198)	(0.094)
Observations	495	495	495	495	495
R-squared	0.030	0.022	0.021	0.032	0.064

Notes: Standard errors in parentheses. These are linear regression models. All outcome variables are standardized to have mean zero and standard deviation one in the estimation sample, except for 'Extracurriculars' which is expressed as a binary variable. 'High baseline investments' is a binary indicator for the parent being in the top investment quartile for at least one of the four PCs of baseline parental investments. All regressions control for the child's age and gender and the parent's age, gender, education, employment status and the presence of a cohabiting partner. Regressions in Panel A additionally control for the 'High baseline investments' dummy, while those in Panel B for the 'Income in bottom quartile' dummy. Statistical significance is coded following the standard notation: *** if the p-value is lower than 0.01, ** if the p-value is lower than 0.05, * if the p-value is lower than 0.1.

Appendix E SDQ Questionnaires

E.1 Child Self-Rated Version (Ages 11–17)

Introductory text: "For each item, please mark one box for 'Not True', 'Somewhat True' or 'Definitely True'. It would help us if you can answer all the items as best you can, even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of how things have been for you over the last six months."

Strengths and Difficulties Questionnaire (Child Version)

Subscale	**Items**
Emotional Symptoms	- I get a lot of headaches, stomachaches or sickness
	- I worry a lot
	- I am often unhappy, down-hearted or tearful
	- I am nervous in new situations. I easily lose confidence
	- I have many fears, I am easily scared
Conduct Problems	- I get very angry and often lose my temper
	- †I usually do as I am told
	- I fight a lot. I can make other people do what I want
	- I am often accused of lying or cheating
	- I take things that are not mine from home, school or elsewhere
Hyperactivity / Inattention	- I am restless, I cannot stay still for long
	- I am constantly fidgeting or squirming
	- I am easily distracted, I find it difficult to concentrate
	- †I think before I do things
	- †I finish the work I'm doing. My attention is good
Peer Relationship Problems	- I am rather solitary, I prefer to play alone
	- †I have at least one good friend
	- †Other children or young people generally like me
	- Other children or young people pick on me or bully me
	- I get on better with adults than with people my own age
Prosocial Behavior	- I try to be nice to other people. I care about their feelings
	- I usually share with others (food, games, pens etc.)
	- I am helpful if someone is hurt, upset or feeling ill
	- I am kind to younger children
	- I often volunteer to help others (parents, teachers, children)

Notes: items marked with † are reverse-coded for the computation of SDQ subscales. All subscales (except prosocial behavior) are coded so that higher values imply more difficulties.

E.2 Parent Rated Version (Child Ages 4-17)

Introductory text: "For each item, please mark one box for 'Not True', 'Somewhat True' or 'Definitely True'. It would help us if you can answer all the items as best you can, even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of your child's behavior over the last six months."

Strengths and Difficulties Questionnaire (Parent Version)

Subscale	**Items**
Emotional Symptoms	- Often complains of headaches, stomach-aches or sickness
	- Many worries, often seems worried
	- Often unhappy, down-hearted or tearful
	- Nervous or clingy in new situations, easily loses confidence
	- Many fears, easily scared
Conduct Problems	- Often has temper tantrums or hot tempers
	- †Generally obedient, usually does what adults request
	- Often fights with other children or bullies them
	- Often lies or cheats
	- Steals from home, school or elsewhere
Hyperactivity / Inattention	- Restless, overactive, cannot stay still for long
	- Constantly fidgeting or squirming
	- Easily distracted, concentration wanders
	- †Thinks things out before acting
	- †Sees tasks through to the end, good attention span
Peer Relationship Problems	- Rather solitary, tends to play alone
	- †Has at least one good friend
	- †Generally liked by other children
	- Picked on or bullied by other children
	- Gets on better with adults than with other children
Prosocial Behavior	- Considerate of other people's feelings
	- Shares readily with other children (sweets, toys, pens etc.)
	- Helpful if someone is hurt, upset or feeling ill
	- Kind to younger children
	- Often volunteers to help others (parents, teachers, other children)

Notes: items marked with † are reverse-coded for the computation of SDQ subscales. All subscales (except prosocial behavior) are coded so that higher values imply more difficulties.

Appendix F Survey flow

Figure F.1: Survey flow and data structure: Survey 1 (Child Wellbeing Survey)

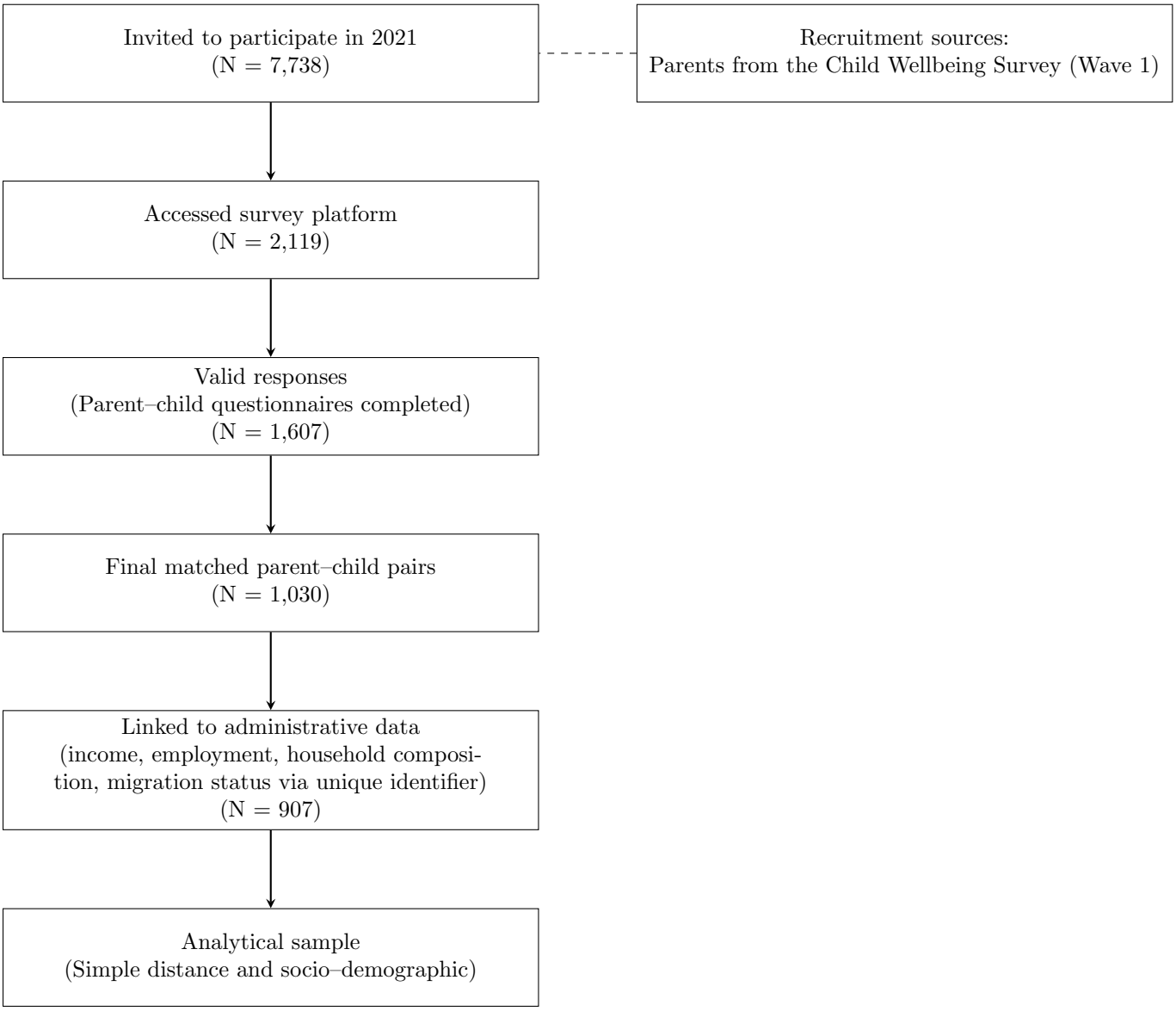
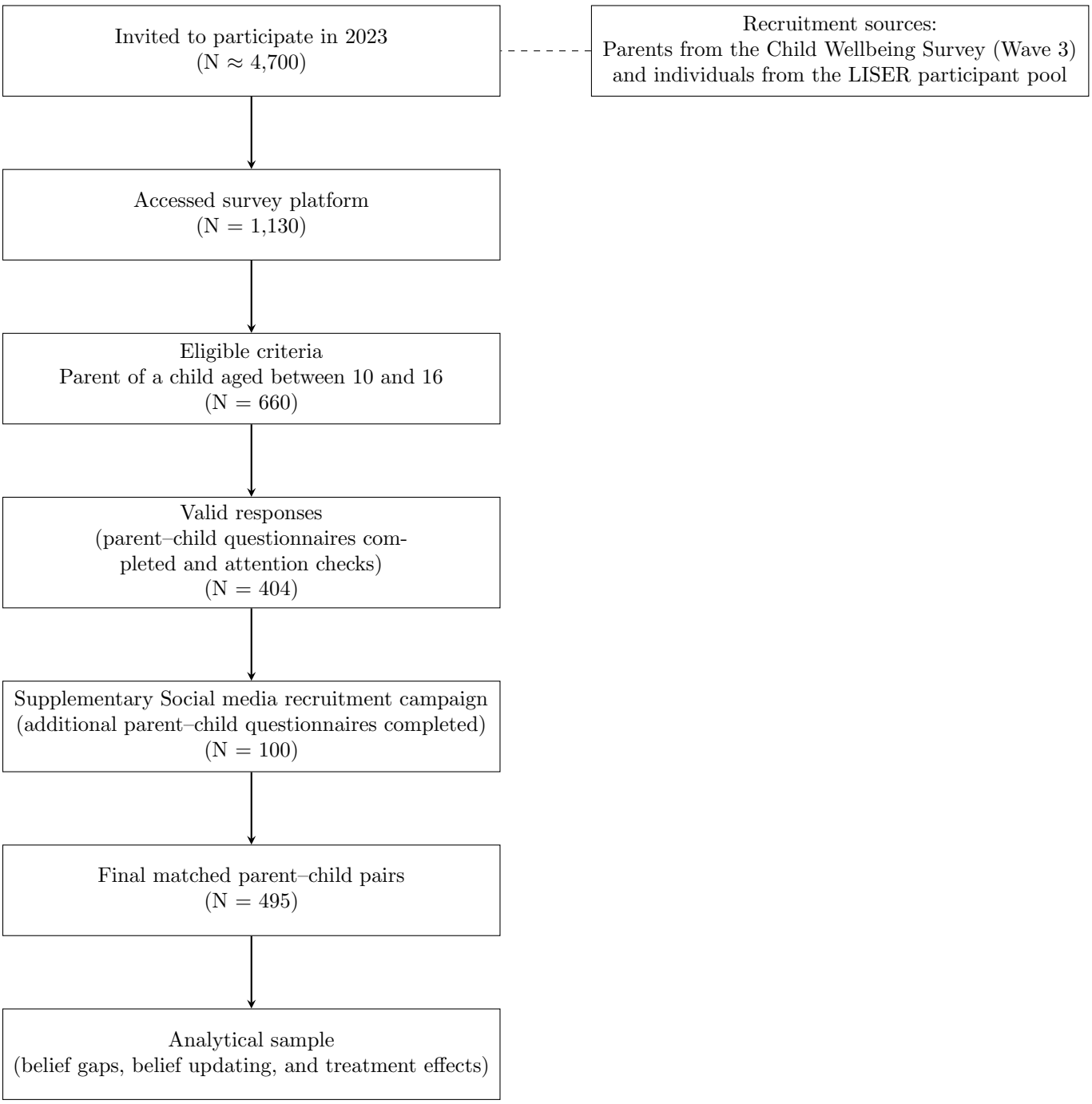


Table F.1: Descriptive Statistics: Survey 1

	Mean	Std. Dev.	Min	Max
Total SDQ				
Child-reported	10.73	5.90	0	37
Parent-reported (1st-order)	7.98	5.55	0	36
Simple difference	-2.75	5.12	-37	28
Euclidean distance	2.91	1.08	0	8
Controls				
Girl	0.51	-	0	1
Age	12.05	1.99	11	14
Only child	0.12	-	0	1
First born	0.70	-	0	1
Parent: mother	0.74	-	0	1
Parent: age	45.87	5.51	30	68
Parent: non native	0.73	-	0	1
Parent lives with a partner	0.87	-	0	1
Parent: education				
Less than high school	0.29	-	0	1
High school degree	0.21	-	0	1
University degree	0.50	-	0	1
Parent: employed	0.81	-	0	2
Income (log)	11.76	0.74	6	14

Notes: Income includes labor income and social transfers. N=907 observations.

Figure F.2: Survey flow and data structure: Survey 2 (Information Treatment)



Appendix G Comparative Datasets: LSAC and ALSPAC

To assess the external validity of our findings, we draw on two well-established longitudinal datasets from Australia and the United Kingdom:

- **LSAC – Longitudinal Study of Australian Children:**

  LSAC is a nationally representative cohort study, following two cohorts of 5,000 Australian children since 2004:

  - The B cohort (infant cohort): children born between March 2003 and February 2004.
  - The K cohort (child cohort): children born between March 1999 and February 2000.

  The study involves parents (both residents and non-residents), carers and teachers of the children, covering a broad range of topics including health, education, family dynamics, and social and economic environments.[27]

  To ensure comparability with the Luxembourgish surveys, we focus on children aged 12–13 years, selecting wave 7 (2016) for the B cohort, when children were aged 12–13 and wave 5 (2012) for the K cohort, also when children were aged 12–13. Each wave includes SDQ self-assessments from children aged 12–13 and parallel parent-reported SDQs.

- **ALSPAC – Avon Longitudinal Study of Parents and Children:**

  Also referred to as "Children of the 90s", ALSPAC is a UK-based long-term birth cohort study aimed at understanding how genetic, environmental, and social influences shape child and family health and development. Initially, the study recruited over 14,000 pregnant women in the Avon area with expected due dates between April 1991 and December 1992. This initial phase resulted in 14,062 live births, of which 13,988 children were still alive at age one. In the late 1990s, recruitment expanded to include additional eligible participants who had not joined earlier, bringing the total to 15,447 pregnancies and 14,901 one-year survivors. By September 2021, the cohort encompassed 14,833 distinct mothers through successive enrolment waves. ALSPAC uses a longitudinal framework with repeated assessments at key stages of child development. The data include a rich mix of survey responses, clinical evaluations, biological samples, and administrative records. This multifaceted design supports in-depth research into a wide spectrum of outcomes, from health and cognition to socioeconomic and environmental

[27] The research methodology and survey content of LSAC have been reviewed and approved by the Australian Institute of Family Studies Ethics Committee. Parental consent was obtained at each wave of data collection.

conditions (Boyd et al., 2013; Fraser et al., 2013).[28] We focus on the age-13.5 clinic assessment (TF1), where children completed the Short Mood and Feelings Questionnaire (SMFQ), a validated measure of depressive symptoms. Mothers additionally completed the same scale, referred to their child, at child age 13. Although the SMFQ differs from the SDQ, it captures related dimensions of socio-emotional wellbeing.

Both LSAC and ALSPAC allow us to replicate our analysis of discrepancies between parent and child assessments of socio-emotional wellbeing. The use of validated instruments across all three datasets ensures meaningful comparisons. Despite institutional and cultural differences, the patterns we observe – particularly systematic parental underestimation – are strikingly consistent, providing strong support for the external generalisability of our core findings.

[28] Please note that the study website contains details of all the data that is available through a fully searchable data dictionary and variable search tool. (http://www.bristol.ac.uk/alspac/researchers/our-data/). Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees. Informed consent for the use of data collected via questionnaires and clinics was obtained from participants following the recommendations of the ALSPAC Ethics and Law Committee at the time.

Table F.1: Harmonized Variables Across Datasets

Theme	**Variable**	**Description**	**Survey 1**	**LSAC**	**ALSPAC**
Child	Age	Age in years	✓	-	-
	Gender	Coded as binary (female=1, male=0)	✓	✓	✓
	Only child	Dummy for being only child	✓	✓	✓
	First born	Dummy for being first born	✓	✓	✓
Parents	Age	Age in years	✓	✓	✓
	Gender	Coded as binary (female=1, male=0)	✓	✓	✓
	Migration background	Dummy for native vs foreign born	✓	✓	✓
	Education	Categorical variable: less than high school; high school degree; university degree	✓	✓	✓
	Labor supply	Employment status: dummy for being employed vs non employed	✓	✓	✓
Household	Household income	Weekly household income	✓	✓	✓
	Partner in house	Dummy for presence of a partner in the household	✓	✓	✓

Notes: A tick (✓) denotes that the variable is available in harmonized form across datasets. The country of birth is used to determine whether the individual is a native or a foreigner. Education refers to the highest level of education obtained. Child Wellbeing Survey: Household income is derived from administrative records by aggregating individual incomes, including social benefits. Missing values are imputed using the mean. Survey 1 refers to the 2021 Child Wellbeing survey. LSAC/ALSPAC: Household income is self-reported. LSAC provides a continuous measure, whereas ALSPAC reports income in brackets; mid-points of each bracket are used for analysis.

Appendix H Summary diagrams

Figure H.1: Core Conceptual Framework Diagram

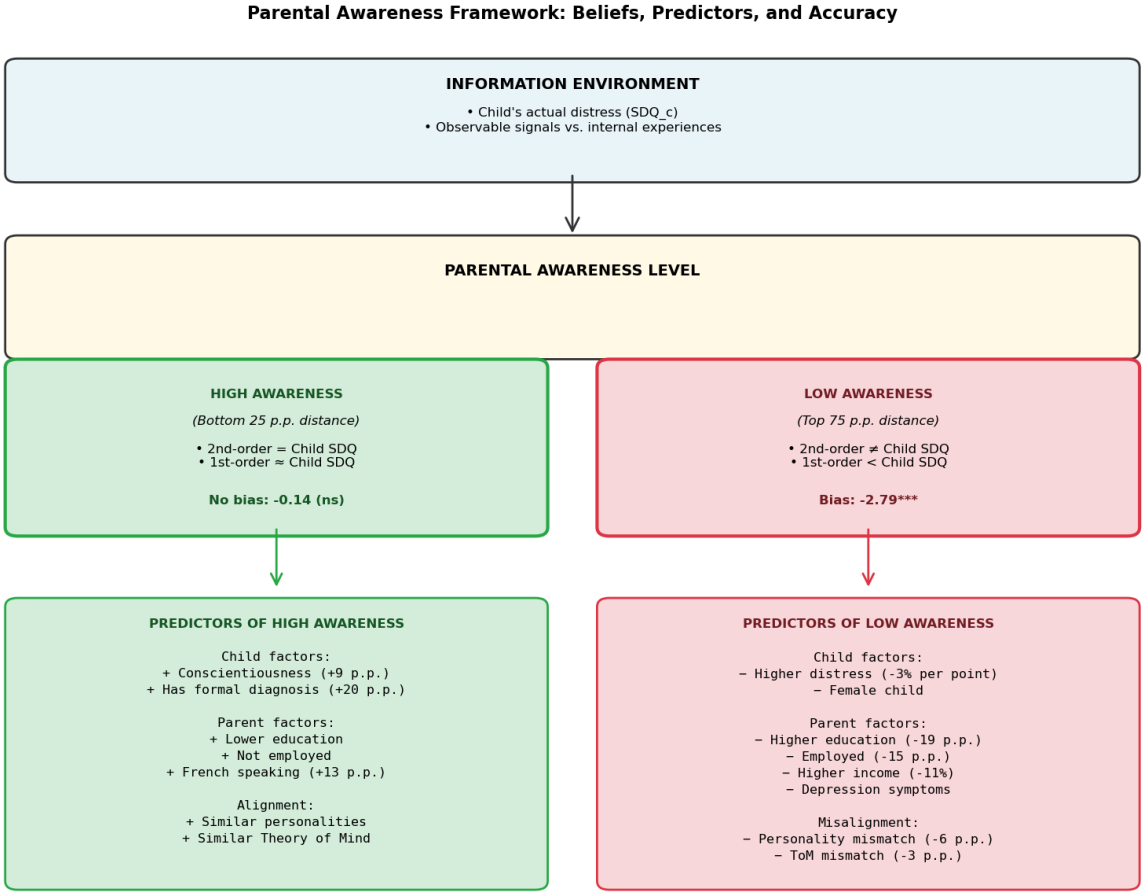


Figure H.2: Information Treatment Effects Diagram

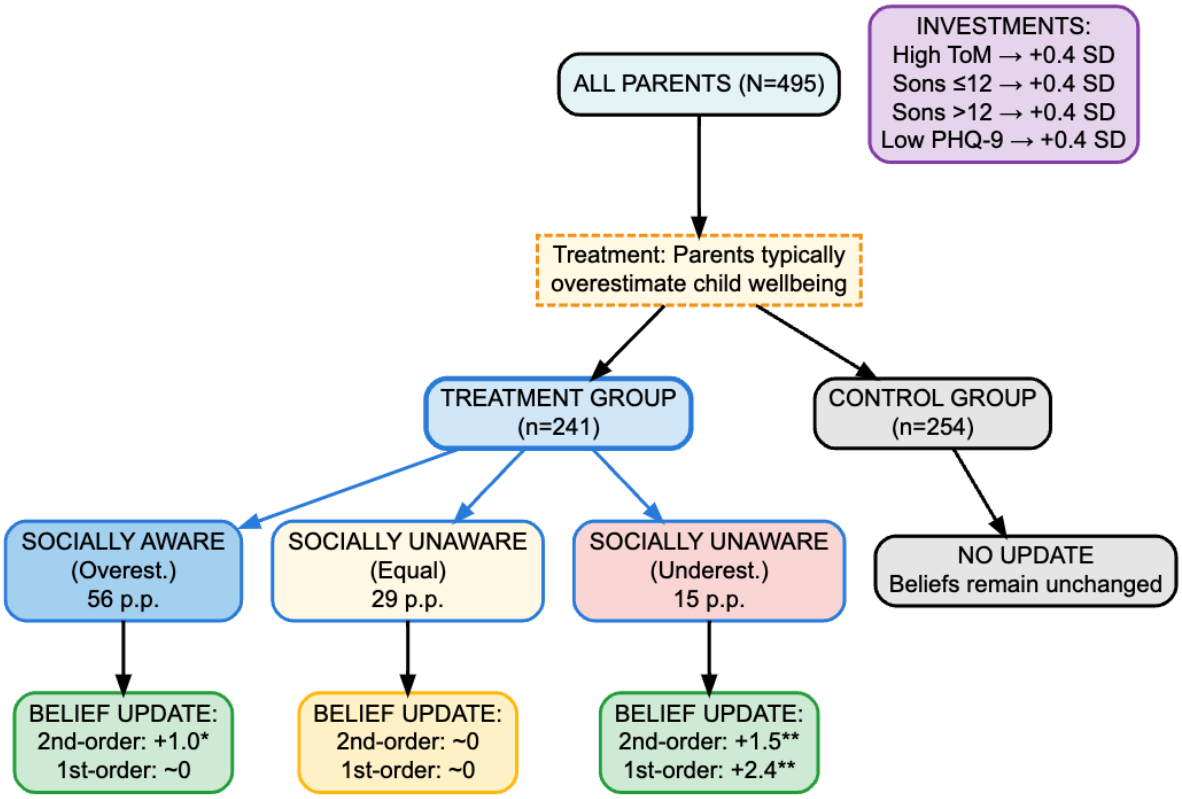


Figure H.3: The "Capacity Paradox" Diagram

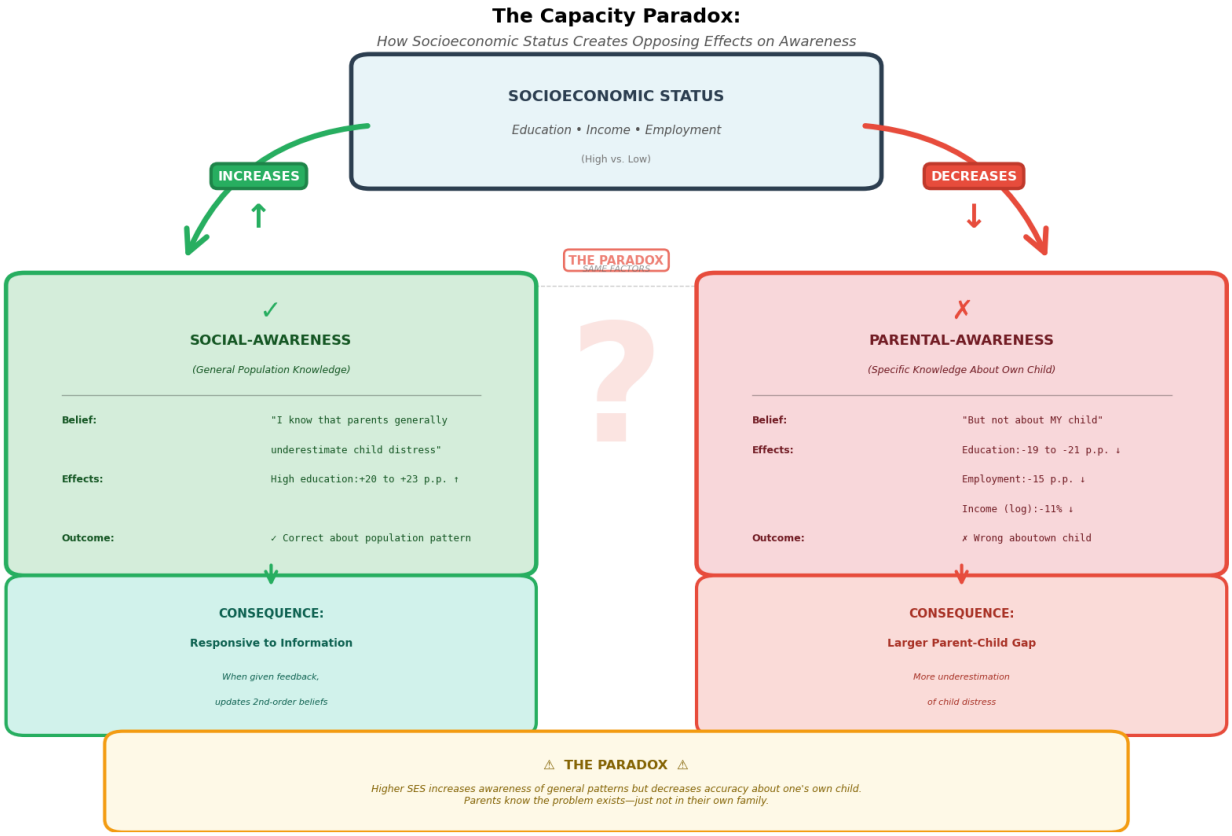


Figure H.4: Child Distress-Awareness Feedback Loop

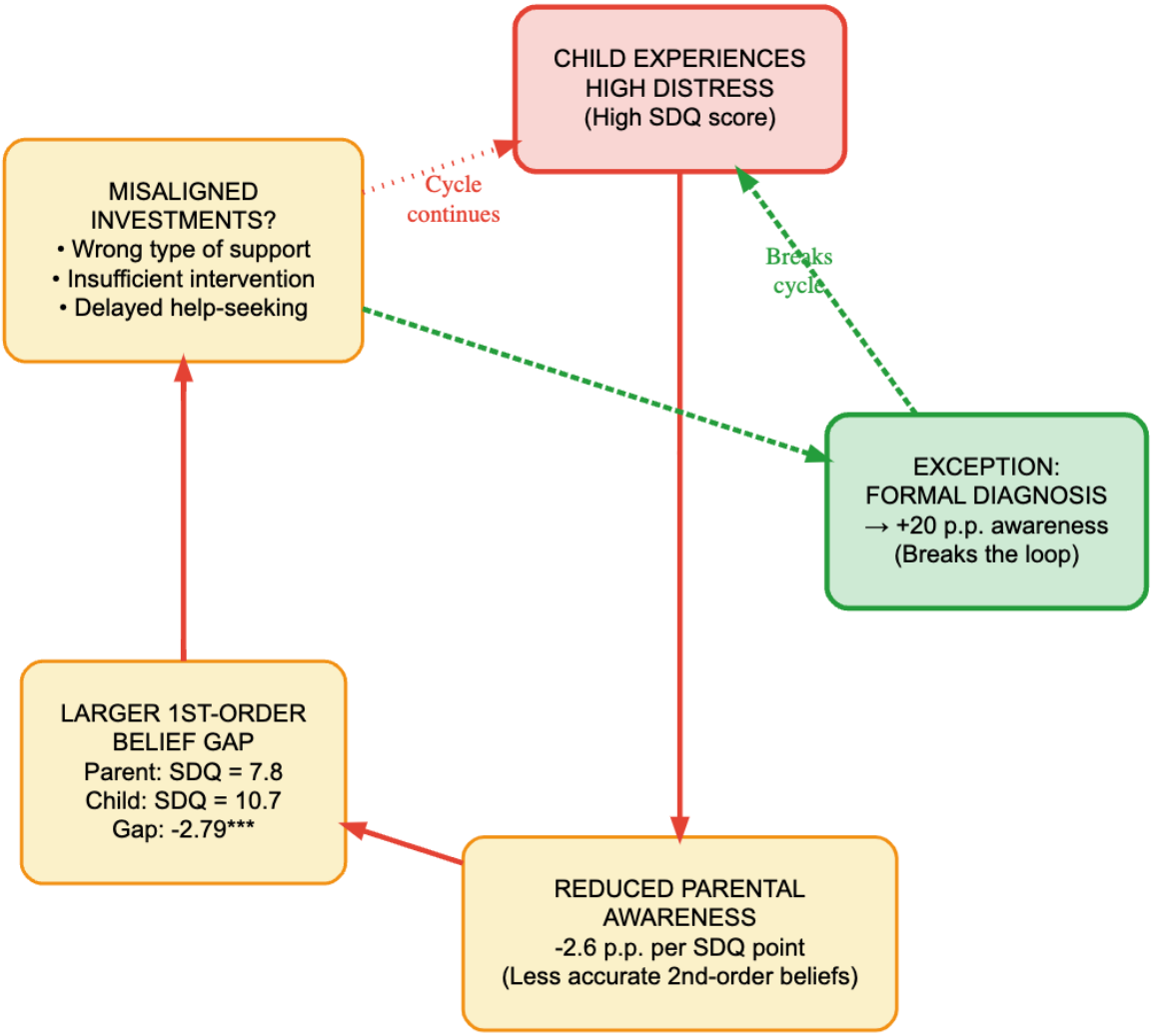
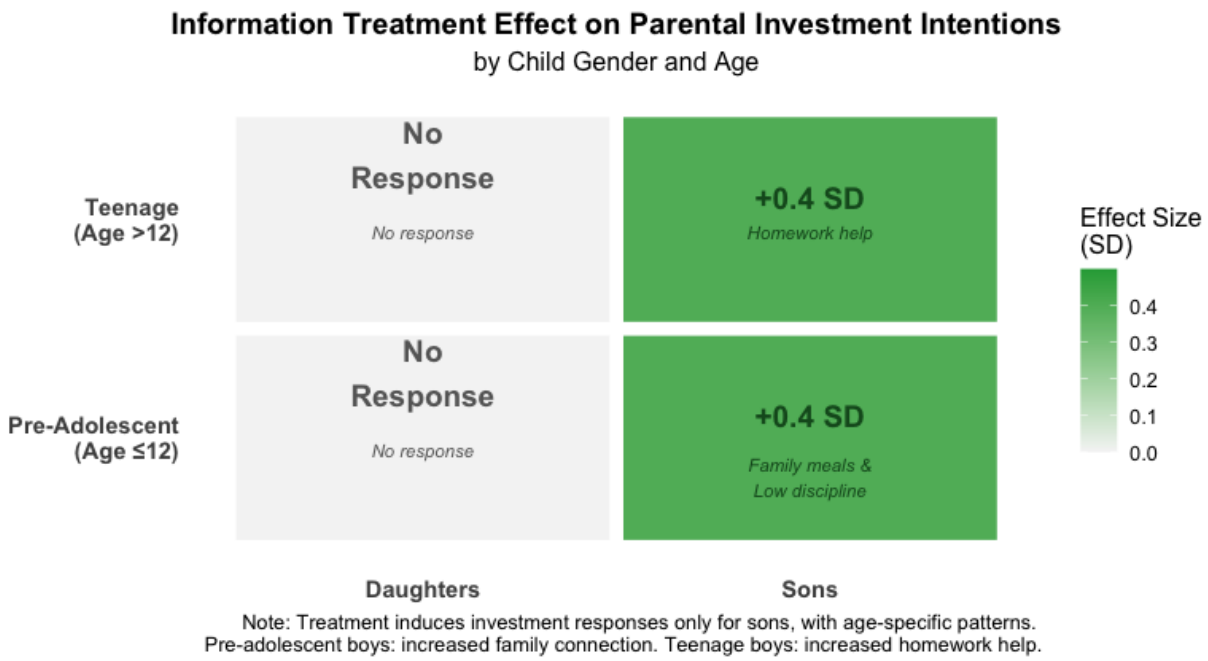



Figure H.5: Gender and Age Heterogeneity Matrix