



Universiteit
Leiden
The Netherlands

“Nobody Here Likes Her”: the Impact of parental verbal threat information on children’s fear of strangers

Nimphy C.A., Elzinga B.M., Does A.J.W. van der; Bockstaele B. van; Pérez-Edgar K., Westenberg M, Aktar E.

Citation

Nimphy C.A., E. B. M. , D. A. J. W. van der, & Pérez-Edgar K., W. M. , A. E. (2024). “Nobody Here Likes Her”: the Impact of parental verbal threat information on children’s fear of strangers. *Developmental Psychobiology*, 66, 1-10. doi:10.1002/dev.22526

Version: Publisher's Version

License: [Creative Commons CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/)

Downloaded from: <https://hdl.handle.net/1887/4082159>

Note: To cite this publication please use the final published version (if applicable).

RESEARCH ARTICLE OPEN ACCESS

“Nobody Here Likes Her”—The Impact of Parental Verbal Threat Information on Children’s Fear of Strangers

Cosima A. Nimphy¹  | Bernet M. Elzinga^{1,2} | Willem Van der Does^{1,3}  | Bram Van Bockstaele^{4,5} | Koraly Pérez-Edgar⁶ | Michiel Westenberg⁷ | Evin Aktar^{1,2} 

¹Department of Clinical Psychology, Institute of Psychology, Leiden University, Leiden, The Netherlands | ²Leiden Institute for Brain and Cognition (LIBC), Leiden University, Leiden, The Netherlands | ³Leiden University Treatment Center (LUBEC), Leiden, The Netherlands | ⁴Research Institute of Child Development and Education, University of Amsterdam, Amsterdam, The Netherlands | ⁵Centre for the Advancement of Research on Emotion, School of Psychological Science, University of Western Australia, Crawley, Australia | ⁶Department of Psychology, Child Study Center, The Pennsylvania State University, University Park, Pennsylvania, USA | ⁷Department of Developmental Psychology, Institute of Psychology, Leiden, The Netherlands

Correspondence: Cosima A. Nimphy (c.a.nimphy@fsw.leidenuniv.nl)

Received: 29 November 2023 | **Revised:** 3 May 2024 | **Accepted:** 17 June 2024

Funding: This research was funded by a VENI grant #016.Veni.195.285 from the Dutch Research Council (NWO), as well as LUF research grant (CWB 7507/21-03-2017/EM); both granted to Dr. Evin Aktar. The funding sources had no involvement in the study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

ABSTRACT

Parental verbal threat (vs. safety) information about strangers may induce fears of these strangers in adolescents. In this multi-method experimental study, utilizing a within-subject design, parents provided standardized verbal threat or safety information to their offspring ($N = 77$, $M_{age} = 11.62$ years, 42 girls) regarding two strangers in the lab. We also explored whether the impact of parental verbal threat information differs depending on the social anxiety levels of parents or fearful temperaments of adolescents. Adolescent’s fear of strangers during social interaction tasks was assessed using cognitive (fear beliefs, attention bias), behavioral (observed avoidance and anxiety), and physiological (heart rate) indices. We also explored whether the impact of parental verbal threat information differs depending on the social anxiety levels of parents or fearful temperaments of adolescents. The findings suggest that a single exposure to parental verbal threat (vs. safety) information increased adolescent’s self-reported fears about the strangers but did not increase their fearful behaviors, heart rate, or attentional bias. Furthermore, adolescents of parents with higher social anxiety levels or adolescents with fearful temperaments were not more strongly impacted by parental verbal threat information. Longitudinal research and studies investigating parents’ naturalistic verbal expressions of threat are needed to expand our understanding of this potential verbal fear-learning pathway.

1 | Introduction

Adolescence is a sensitive period for developing normative and clinical forms of social fears (Beesdo, Knappe, and Pine 2009). Individuals with social fears experience fear of social situations and may consequently try to avoid them. These social situations include interacting with strangers, being watched in specific situations (e.g., eating or drinking), and performing in front of others (e.g., giving a speech) (American Psychiatric Association

2013). By gaining insight into how social fears and anxiety develop during adolescence, we can enhance our understanding of the processes and factors prevention and treatment endeavors should focus on.

The family is an important context in the development of adolescent’s social fears and anxiety (Kiel and Kalomiris 2019). These fears can be acquired via multiple pathways, including learning from or through parental behavior (Murray, Creswell,

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2024 The Author(s). *Developmental Psychobiology* published by Wiley Periodicals LLC.

and Cooper 2009; Nimphy et al. 2023). According to social fear learning theories, even without prior experiences with a novel stimulus, adolescents can learn indirectly from parents to be fearful of that stimulus (1) via observing and modeling parents' fearful reactions to it (also known as vicarious learning), as well as (2) via receiving verbal threat information from their parents about the stimuli (also known as instructional learning) (Olsson, Nearing, and Phelps 2007; Rachman 1977). Verbal information during childhood may be the origin of most fears in everyday life (Rachman 1977), as children and adolescents can express fears for objects or situations, they have not themselves encountered or experienced. In line with Rachman's social fear learning theory, previous research has shown that verbal comments by parents signaling threat can affect offspring fear reactions to novel stimuli (for reviews, see Muris and Field 2010; Percy et al. 2016). Laboratory studies revealed that verbal threat information has a significant effect on multiple indices of offspring fear, including cognitive (i.e., self-reported fear beliefs), physiological (i.e., heart rate [HR]), and behavioral (i.e., observed avoidance) indices (Muris and Field 2010; Percy et al. 2016). Parental verbal expressions of fear in the face of novel stimuli may thus shape their offspring's fearful reactions to these stimuli. In the current literature, the novel stimuli that were paired with the parental threat information were almost always nonsocial stimuli, such as novel toys or animals (Muris and Field 2010; Percy et al. 2016; Nimphy et al. 2024). Studying the acquisition of fear toward such objects (i.e., toys) can give insight into the general processes underlying fear learning. Understanding the acquisition of social anxiety may require studying fear acquisition in social contexts or toward social stimuli. Although the evidence is mixed, some findings suggest that social learning pathways, including learning via both modeling and verbal threat information from various sources (i.e., parents, teachers, and experimenters), can contribute to children's fear beliefs about *social* stimuli (for reviews and meta-analyses, see Askew and Field 2008; Muris and Field 2010; Nimphy et al. 2023, 2024). Regarding the social learning pathway via verbal threat information, one study investigated the effects of verbal information from adults, peers, and older children on children's fear beliefs regarding social situations in two experiments (Lawson, Banerjee, and Field 2007). The authors found that negative verbal information increased children's fear beliefs relating to this particular social situation (i.e., meeting a favorite celebrity). Another study found the effect of verbal information to play a role in fear acquisition, but the impact depended on the type of social activity considered and the source of information (Field et al. 2003). Although they provide invaluable insights, a limitation of these two studies is that they did not expose children to the actual social stimulus and consequently could not measure children's immediate *in vivo* reactions to this social stimulus. Furthermore, they did not include parents as the source of threat (vs. safety) information. Overall, research has rarely examined how *social* fears could be transmitted from parents to children via the verbal threat information pathway (Nimphy et al. 2024).

To date, only one study with a sample of 4- to 6-year-olds has experimentally investigated the proposed social fear-learning pathway by manipulating parental verbal threat information in the context of social stimuli (Aktar et al. 2022). Children reported more fear of a stranger when paired with threat information. However, they did not display heightened attention bias (i.e., a

preference to attend to stranger paired with threat information), HR response, or increased fearful/avoidant behavioral responses to the stranger paired with threat (vs. safety) information. Children's expression of fears and anxiety symptoms as well as the salience of various novel stimuli might differ depending on the developmental period (Weems and Costa 2005). Indeed, both early childhood and adolescence have been discussed as sensitive periods for the emergence of anxiety symptoms/disorder (i.e., separation anxiety) (Knappe, Sasagawa, and Creswell 2015). Importantly, social fears typically increase between middle childhood and adolescence, both in clinical and nonclinical samples (Bokhorst et al. 2008; Sumter, Bokhorst, and Westenberg 2009). As such, research is needed to understand whether the previous findings from a sample of 4- to 6-year-olds (Aktar et al. 2022) extend to older samples. As children show a clear increase in emotion understanding with increasing age and language skills (Pons et al. 2003), older children may have a greater cognitive or emotional sophistication to receive, internalize, and act upon verbal threat cues. In our current study, we assessed the impact of parental verbal threat information on children's fear to novel social stimuli in early adolescence.

In addition, we were also interested in the role of parental trait social anxiety in this fear learning pathway. Parents' social anxiety is one of the strongest risk factors for offspring social anxiety development (Cooper et al. 2006). Parents with anxiety disorders may pass on their fears to their offspring both through genetic and environmental pathways (Eley, McAdams, and Rijdsdijk 2015; Gregory and Eley 2007; Hettema, Neale, and Kendler 2001; Percy et al. 2016). Children who grow up with socially anxious parents may also be more receptive to parental negative comments about strangers, which could affect their acquisition of social fear and anxiety (Muris and Field 2010). Hence, adolescents of socially anxious parents might acquire more (intense) fears toward novel social stimuli after receiving negative information about these stimuli from their parents. The typical variation in parents' (social) anxiety levels has not yet been investigated as a possible moderator in the link between parental verbal threat information and *adolescent's* fear of social stimuli.

Besides parental anxiety, child fearful temperament has also been established as a key risk factor for the development of social anxiety (Clauss and Blackford 2012). Children with a fearful temperament may be more vulnerable to parental expressions of fear and anxiety (Belsky and Pluess 2009; Ingram and Luxton 2005; Nigg 2006). Prior research has found that fearful children had an increased HR, larger attention bias, and displayed more avoidance behavior toward a novel animal after they had been given threatening information about that animal (Field 2006; Field and Price-Evans 2009). To date, no study has tested these moderators in the verbal threat information pathway in parent-adolescent dyads.

1.1 | Current Study

In the current study, we aimed to assess the effect of parental verbal threat (vs. safety) information on adolescent's acquisition of fear of strangers in a community sample. As impairment of social interactions would be very impactful in an adolescent's life, we focused on investigating whether parental verbal comments

TABLE 1 | Sample characteristics.

Parents questionnaire data <i>N</i>	137	Children <i>N</i>	77
Mothers/Fathers filled in questionnaires <i>N</i>	75/62	Age <i>M</i> (<i>SD</i>)	11.62 (1.18)
Parents at lab visit (<i>N</i> , % mothers)	77 (65, 84%)	Girls <i>N</i> (%)	42 (55%)
Education level (%)		Birthplace, the Netherlands (%)	95.3
Primary school education	1 (1%)	School	
Primary professional education	2 (1%)	Primary school (%)	65%
(Higher) Secondary education	7 (5%)	Secondary education (%)	31%
Secondary scientific education	1 (1%)	Missing (%)	4%
Secondary professional education	27 (20%)		
Higher professional education	50 (37%)		
Higher scientific education	47 (35%)		
Work (%)			
Part-time	58 (43%)		
Full-time	66 (49%)		
Sick leave	2 (1%)		
No work	6 (4%)		
Other	4 (3%)		

Note: *N* = sample size, *M* = mean, *SD* = standard deviation.

impact how adolescents interact with a stranger in a social interaction task. Adolescents' acquisition of fear of strangers was assessed using cognitive (fear beliefs, attention bias), behavioral (observed avoidance and anxiety), and physiological (HR) indices. Based on theoretical models as well as previous work on the role of verbal threat information in child fear acquisition, we expected adolescents to report higher fear beliefs, show faster reaction times (RTs) in visual search tasks involving the strangers, express stronger behavioral anxiety and avoidance signals, and have higher HR responses toward the stranger paired with parental threat information compared to the stranger paired with safety information (Muris and Field 2010; Percy et al. 2016; Rachman 1977). We also explored whether the effect of parental verbal threat information is stronger for adolescents with more fearful temperaments and adolescents of parents with higher social anxiety levels. We explored these potential moderators in the cognitive, behavioral, and physiological components of fear reactions in early adolescence.

2 | Methods

2.1 | Participants

The sample consists of 77 Dutch children (35 boys and 42 girls) aged 9–14 years ($M_{age} = 11.62$ years, $SD = 1.18$) and 137 parents (55% mothers). See Table 1 for demographics. Most of the parents in this study were the biological parent of the child, highly

educated, and from a moderate to high socioeconomic level. One child participated with two mothers. The families were recruited through social media advertisements and printed flyers shared with schools and in public spaces (i.e., libraries) in the Leiden area. Families interested in participating were included if they have a Dutch- or English-speaking child between 9.5 and 13 years of age at the time of recruitment. This study was approved by the Ethics committee of the clinical psychology department of Leiden University (Ethics Number: 2019-10-24-E.Aktar-V1-1930).

2.2 | Design

In this multi-method experimental study, we used a within-subject design to test the impact of parental verbal threat (vs. safety) information about strangers on adolescents' behavioral, physiological, and cognitive responses to these strangers. This study focuses on the impact of parental verbal threat (vs. safety) information about strangers on their adolescents' fear acquisition in the *social interaction task*.

2.3 | Materials

2.3.1 | Child Fear Indices

2.3.1.1 | Child Observed Anxiety and Avoidance. During the social interaction task, the adolescent's anxious and avoidant

responses to each of the strangers were assessed using an adapted version of the coding protocol from Aktar et al. (2022). Adolescent *anxiety* was evaluated based on the frequency and duration of facial, bodily, and vocal/verbal expressions of fear. Adolescent *avoidant* behavior was assessed by observing the adolescent's tendency to avoid the stranger. Both were scored on a 5-point scale (1 = no avoidance/anxiety, 2 = fleeting/ambiguous avoidance/anxiety, 3 = moderate avoidance/anxiety, 4 = intense avoidance/anxiety, and 5 = very intense avoidance/anxiety).

The coding of the observed anxiety and avoidance during the social interaction started with the stranger's first word starting the conversation and ended with the stranger thanking the adolescent for the conversation. The 2.5-min interaction was divided into five 30-s episodes, with an additional interval added for cases where the conversation lasted longer. Four trained master students, who were blind to the condition, coded the adolescent's anxiety and avoidance behavior based on the recordings of the social interaction. Mean anxiety and avoidance scores were calculated per stranger (one for safety and one for threat). A higher anxiety and avoidance score indicates more observed adolescent anxiety and avoidance during the social interaction task. The recordings of 15 adolescents were double-coded to assess the inter-rater reliability among the four coders. The intraclass correlations (ICC) for the observed anxiety composite across the six coding intervals ranged from 0.54 to 0.96, with a mean of 0.81. The ICC for the observed avoidance score across the six coding intervals ranged from 0.85 to 0.98, with a mean of 0.96.

2.3.1.2 | Child Heart Rate. Adolescent's HR was measured using the VU Ambulatory Monitoring System (de Geus et al. 1995), and data were stored using the Data Analysis and Management Software. HR was recorded continuously during the social tasks. To measure HR, seven single-use Ag/AgCl hydrogel (4% chloride salt) electrodes were placed and attached to leads, (1) slightly below the right collarbone (4 cm to the right), (2) on the right side, between the lower two ribs, (3) at the apex of the heart on the left lateral margin of the chest approximately at the level of the processus xiphoidius, (4) at the suprasternal notch above the top of the sternum, (5) at the processus xiphoidius at the bottom of the sternum, (6) at the back of the spine, at least 3 cm above electrode 4, and (7) at the back of the spine, at least 3 cm below electrode 5. We used the PhysioData Toolbox (Version 0.6.1) to preprocess and clean the HR data (Sjak-Shie 2022).

We applied an ECG signal analyzer to the raw ECG data with a 1 Hz high-pass filter and a 50 Hz low-pass filter. The R-peaks were detected automatically by the software (with a minimum R-peak value of 0.5 mV and a minimum distance between R-peaks of 0.3 s). HR data were inspected visually and corrected manually in case of artifacts and/or misidentified R-peaks. No HR data were available for nine adolescents, due to stopping the experiment ($n = 1$), equipment failure ($n = 5$), and conversion error of the data file ($n = 3$). For two adolescents, we had partial data, meaning that there was HR data during the interaction with one of the strangers but not the other. Mean HR (beats-per-minutes or BPM) was calculated per stranger (one for safety and one for threat).

2.3.1.3 | Child Fear Beliefs. Adolescents reported their fear and avoidance of strangers with a modified version of the Fear Beliefs Questionnaire (FBQ) from Aktar et al. (2022) (original

version from Field and Lawson 2003). The social version of the FBQ included eight questions for each of the strangers, scored on a 5-point scale, ranging from 1 = no to 5 = yes, definitely. Higher scores on this questionnaire represent greater fear beliefs of the stranger. Cronbach's alpha of the subscale in the current sample was 0.81.

2.3.1.4 | Child Attention Bias. We assessed adolescents' attention bias to strangers (paired with threat vs. safety information) with a visual search task (for similar task, see Aktar et al. 2022), using a Dell laptop (1920 × 1080 pixel, image dimension 506 × 618 pixel per picture with 10 pixel between the pictures). Following a 500-ms fixation cross, we presented images of neutral facial expressions from nine models who were researchers acting as strangers on a 3 × 3 matrix. In total, the task consisted of 54 trials, of which 18 trials contained a picture of the threat-paired stranger, 18 trials contained a picture of the safety-paired stranger, and 18 trials contained neither of the information-paired strangers (but instead nine random strangers). The adolescents were instructed to press a button indicating the presence or absence of one of the two strangers they had interactions with during the experiment. RTs were averaged across trials per condition. Mean RT was calculated per stranger (one for safety and one for threat) and used as an index of the adolescents' attention to strangers. Faster RTs indicate heightened attention to a specific stranger.

The visual search data of two adolescents were missing due to stopping the experiment, and for three adolescents the equipment failed. Due to a programming error, 16 out of the 72 adolescents (22%) only performed 20 trials of the task, after which the script stopped. As previously employed in attention bias research (Van Bockstaele et al. 2021; Aktar et al. 2022), we used the scoring and outlier procedure for the visual search task described by Aktar et al. (2019). Specifically, we removed the trials in which none of the strangers appeared. Trials were also excluded if RTs were three *SDs* below or above the group mean (6 trials excluded) or their own mean (22 trials excluded). Lastly, data of three participants were removed due to high error rate (less than 50% correct). To calculate the reliability of the visual search task, we computed attention bias scores by subtracting the RT of the safety-paired stranger from the RT of the threat-paired stranger, separately for odd and even trials. Using 5000 random splits, the Spearman–Brown corrected reliability estimate was 0.36, 95% CI [−0.03, 0.65]. The reliability estimate was poor, probably due to the data of adolescents with low trial numbers. The Spearman–Brown reliability of the task for the adolescents who completed all 54 trials was better and in line with previous studies (i.e., Aktar et al. 2022), 0.50, 95% CI [0.25, 0.69]. We decided to only include data of adolescents with a total of 54 trials in the final analyses ($n = 54$).

2.3.2 | Moderators

2.3.2.1 | Child Fearful Temperament. Adolescents' temperament was measured using the Early Adolescent Temperament Questionnaire (EATQ-R, Ellis and Rothbart 2001), which consisted of items on a 5-point scale, ranging from 1 = almost always untrue to 5 = almost always true, filled in by the adolescent. For this study, we focused on the Shyness and

Fear subscales of the EATQ-R. The higher the mean score, the more fearful the adolescent's temperament is. Cronbach's alpha in the current sample was 0.78.

2.3.3.2 | Parental Social Anxiety. We assessed parent social anxiety with the short version of the Social Phobia and Anxiety Inventory (SPAI, de Vente et al. 2014). Items of the SPAI were scored on a 7-point Likert scale (1 = never to 7 = always) and have a high internal consistency (Cronbach's alpha of 0.95). We assessed parental social anxiety from the parent who visited the lab with the child. Higher scores on this questionnaire represent higher levels of parental social anxiety.

2.3.3 | Covariate

2.3.3.1 | Child Doubt of Manipulation. The impact of parental verbal threat (vs. safety) information on adolescent fear might depend on whether the adolescent believed the parental information. Therefore, we asked adolescents to rate their doubt of the manipulation before the debriefing on a continuous scale from 1 to 10, with a higher score indicating more doubt that the parent information was true.

2.4 | Procedure

This study is part of a larger project, which consisted of online questionnaires and a lab visit. First, adolescents and their parents filled in online questionnaires about parental negative emotions, parental (social) anxiety, adolescent anxiety, adolescent fear of negative evaluation, and adolescent temperament. Second, adolescents and their primary caregiver participated in a lab visit (see Figure 1 for lab visit procedure), during which adolescents' cognitive, behavioral, and physiological responses were assessed.

2.4.1 | Lab Visit

The lab visit included the intake, the social tasks with strangers, computerized attention tasks with stranger's faces, and a debriefing. This study used deception: Parents and adolescents were told that the study was about shyness and confidence, and they were not aware of the main aim of the study examining the effect of parents' verbal remarks about strangers. At the beginning of the visit, the parent-child dyad received general information about the study after which they provided their consent. Once the HR device and electrodes were attached to the adolescent, adolescents completed the first lab questionnaire. Meanwhile, the parent was invited to follow the experimenter to the control room. The parent was first debriefed about the deception and given the opportunity to withdraw or renew their consent to participate, then instructed on the manipulation, which entailed providing their offspring with verbal information about two strangers during the preparation phase for the performance task. No parent withdrew their consent. One stranger was described as kind and liked by other lab members, and the other unkind and not liked (see the Supporting Information Appendix).

Next, the adolescent participated in social tasks with adult (mostly female) strangers, including a social performance task,

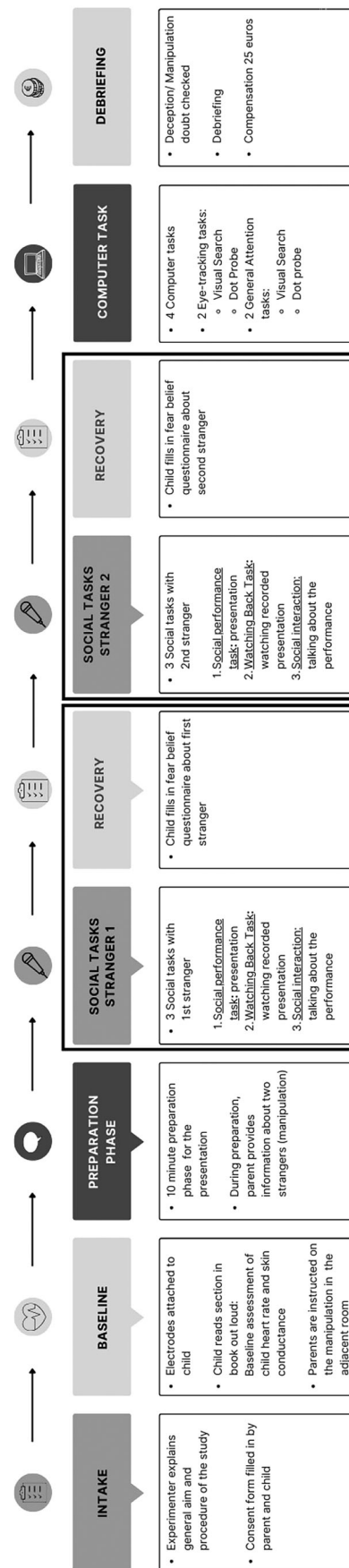


FIGURE 1 | Lab visit procedure.

a watching back task, and an interaction task. Before the social performance task, the adolescent prepared for the presentation with their parent for 10 min, during which the parent provided the manipulation (parent pointing at pictures on the wall and mentioning information about the strangers). Afterward the adolescent gave a 2.5-min presentation on shyness and confidence to a stranger they had received information about from their parent. The performance was recorded, and during the watching back task, both the adolescent and the stranger watched the recording of the adolescent's presentation afterward. In the final social task, the stranger and adolescent sat across from each other and talked about the adolescent's experience of the performance task. During this task, the stranger asked the adolescent questions for approximately 2.5 min, including for example how nervous the adolescent was during the presentation. After the conversation, the stranger thanked the adolescent and smiled once. Following a short break, the procedure was repeated with the second stranger (social performance, watching back, social interaction). During all tasks, the strangers were instructed to maintain a neutral but friendly attitude. Before and after each social task, adolescents also completed visual analogue scales on the intensity and frequency of their nervousness and physical symptoms, such as whether they experienced an elevated HR. The order of the interaction with the "threatening" and "safe" strangers was counterbalanced across participants.

After all social tasks were completed, the HR device and electrodes were removed and the adolescent took part in attention tasks, including a visual search task. The visit ended with a debriefing during which the adolescents were informed about the deception that was part of the study. Specifically, the adolescents were told that the comments from their parents about the strangers were in fact instructions from the experimenters, and that investigating the impact of these comments on their social interactions with the strangers was the actual aim of the study. The adolescent received a 25-euro gift card as a reward.

2.5 | Statistical Analyses

The current dataset has various measures of the adolescents' fear reactions during the stranger interaction task. First, the distributions of the study variables were checked for normality, and the scores were standardized. Next, correlations between fear indices were computed. We also checked whether adolescent doubt of the manipulation correlated with the outcome measures. The observed anxiety and avoidance scores, attentional bias to strangers, HR scores, and reported fear beliefs were analyzed using repeated general linear models. Each model included Stranger Information (safety vs. threat) as independent variable and an outcome variable (fear beliefs, observed anxiety, observed avoidance, HR, RT) as dependent variable. The main effects of moderators (child temperament and parental social anxiety) and two-way interactions with Stranger Information were tested in all models.

3 | Results

Descriptive statistics for and correlations between the variables of interest are presented in Table 2. None of correlations across

cognitive, behavioral, and physiological indices of adolescent fear were significant ($ps > 0.17$), except for one significant positive correlation between observed avoidance and HR during the interaction task with the safety-paired stranger ($r = 0.41$, $p < 0.001$). This indicates that adolescents who displayed more avoidance of the stranger paired with the safety information also had a higher HR when interacting with this stranger.

Furthermore, we found adolescent doubt of manipulation to be related to observed avoidance (but not to other outcome variables). Specifically, adolescents who doubted the manipulation more displayed less avoidance during the social interaction task, $r = -0.32$, $p = 0.01$. We therefore included adolescent doubt of manipulation as a covariate in the analysis assessing the impact of parental verbal threat information on observed avoidance.

3.1 | Reported Child Fear

Adolescents reported significantly higher fear beliefs for the strangers paired with threat ($M = 3.18$, $SD = 0.61$) than for the strangers paired with the safety message ($M = 2.80$, $SD = 0.61$), $F(1, 74) = 29.08$, $p < 0.001$, $\eta^2 = 0.28$, CI [0.14, 0.40]. In the models with parent social anxiety scores and adolescent fearful temperament scores included as moderators, no significant two-way interactions were found between Stranger Information and adolescent temperament, and between Stranger Information and parent social anxiety ($ps = 0.74$ and 0.24 , respectively). The main effects of adolescent temperament and parent social anxiety were also not significant ($ps = 0.12$ and 0.93 , respectively).

3.2 | Observed Child Fear and Avoidance

Adolescents' observed *fear* reactions to the strangers paired with the threat information ($M = 3.46$, $SD = 0.46$) did not differ from the reactions to the strangers paired with safety information ($M = 3.49$, $SD = 0.42$), $F(1, 76) = 0.43$, $p = 0.51$, $\eta^2 = 0.006$, CI [0, 0.03]. Adolescents observed *avoidant* reactions to the strangers paired with the threat information ($M = 3.36$, $SD = 0.51$) did not differ from the reactions to the strangers paired with safety information ($M = 3.40$, $SD = 0.66$), $F(1, 76) = 0.40$, $p = 0.53$, $\eta^2 = 0.005$, CI [0, 0.03]. The model including adolescent manipulation doubt as a covariate revealed no significant interaction between Stranger Information and doubt on avoidance, $F(1, 62) = 0.75$, $p = 0.39$. Rather, adolescents with more doubt were less avoidant of the stranger, independent of Stranger Information, $p = 0.01$.

In the models with parent social anxiety and adolescent fearful temperament scores included as moderators, no significant two-way interaction emerged between Stranger Information and adolescent temperament ($p = 0.48$) or between Stranger Information and parental anxiety ($p = 0.63$) on observed *fear*. The main effects of the adolescent temperament or parent social anxiety were not significant ($ps = 0.45$ and 0.93 , respectively).

In the models with parent social anxiety and adolescent fearful temperament scores included as moderators, no significant two-way interaction was noted between Stranger Information and adolescent temperament ($p = 0.38$) and between Stranger

TABLE 2 | Descriptive information and correlations between study variables.

	<i>N</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Child fear beliefs	76	2.98	0.52	—	0.04	0.07	0.06	−0.05	0.15	−0.01
2. Child heart rate	68	84.35	8.68	0.08	—	0.17	0.23	−0.11	0.27*	−0.002
3. Child observed fear	77	3.48	0.40	0.03	0.20	—	0.56***	−0.19	0.04	−0.03
4. Child observed avoidance	77	3.38	0.54	0.05	0.41***	0.49***	—	−0.04	0.07	0.28*
5. Child visual search RT	54	1993.93	542.10	−0.02	0.07	0.004	0.08	—	−0.06	−0.02
6. Child temperament	72	2.40	0.70	0.18	0.16	0.12	0.21	0.05	—	0.25*
7. Parent social anxiety	75	2.64	0.80	0.09	0.04	−0.06	0.09	0.06	0.25*	—

Note: *N* = sample size, *M* = mean, *SD* = standard deviation, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, top half correlations are between outcome variables assessed during the interaction task with threat-paired stranger, bottom half displays correlations between variables assessed during the interaction task with safety-paired stranger.

Information and parental anxiety ($p = 0.35$) on observed *avoidance*. The main effect of the adolescent temperament was not significant ($p = 0.31$), and the main effect of parent social anxiety was also not significant, $p = 0.05$.

3.3 | Child Heart Rate

Adolescents' HR during the interaction with the strangers paired with the threat ($M = 84.51$, $SD = 8.69$) did not differ from the HR responses to the strangers paired with safety information ($M = 84.31$, $SD = 9.37$), $F(1, 65) = 0.17$, $p = 0.68$, $\eta^2 = 0.003$, CI [0; 0.03]. In the models with parent social anxiety scores and adolescent fearful temperament scores included as moderators, no significant two-way interactions were noted between Stranger Information and adolescent temperament, and between Stranger Information and parent social anxiety ($ps = 0.11$ and 0.57 , respectively). The main effects of the adolescent temperament or parent social anxiety were also not significant ($ps = 0.09$ and 0.90 , respectively).

3.4 | Child Attention Bias

Adolescent RTs to the image of the stranger paired with threat information ($M = 1999.21$, $SD = 570.97$) versus safety information ($M = 1988.65$, $SD = 584.52$) did not differ, $F(1, 53) = 0.038$, $p = 0.85$, $\eta^2 = 0.001$, CI [0, 0.02]. In the model with parent social anxiety scores and adolescent fearful temperament scores included as moderators, the two-way interactions between Stranger Information and adolescent temperament ($p = 0.28$), and between Stranger Information and parent social anxiety ($p = 0.31$) were not significant. The main effects of the adolescent temperament or parent social anxiety were not significant ($ps = 0.97$ and 0.79 , respectively).

4 | Discussion

In this experimental study, we aimed to investigate the effect of parental verbal threat (vs. safety) information on adolescent's acquisition of fear of strangers during a social interaction task.

Adolescent's fear was captured on multiple indices, including the cognitive (fear beliefs, attention), behavioral (observed avoidance and anxiety), and physiological (HR) indices. Additionally, we also explored whether the impact of parental verbal threat information differed depending on social anxiety levels of parents or fearful temperaments of adolescents.

A single exposure to parent verbal threat information impacted adolescent's subjective fear levels. Adolescents reported more fear beliefs for the stranger paired with parental verbal threat information for the stranger paired with parental safety information. This showcases that adolescents that heard negative information about a social stimulus from parents just once, clearly understood and internalized the information, as seen in the subjective report. Our findings align with the results of Aktar et al. (2022), who also investigated the effect of parental verbal threat information about social stimuli on children's fear toward those social stimuli, but in 4- to 6-year-olds. Just as in Aktar et al.'s (2022) study, we found that parental verbal threat information increased adolescent self-reported fear, but it did not lead to heightened attentional bias, increased HR, and increased behavioral fearful or avoidant responses. The impact of parental verbal threat information about strangers on their children's fear responses regarding strangers may be limited to subjective reflection of parental input across a wide developmental window (from our study and Aktar et al. 2022).

Our findings are in contrast with evidence from earlier laboratory studies, which found that verbal threat information also impacted child cognitive (i.e., self-reported fear beliefs), physiological (i.e., HR), and behavioral (i.e., observed avoidance) fear indices (Muris and Field 2010; Percy et al. 2016). However, in these studies, children were mainly exposed to verbal threat information (from experimenters or parents) relating to novel nonsocial stimuli, such as animals (Muris and Field 2010; Percy et al. 2016), rather than social stimuli, as is the case in our study. It is possible that the intensity of the threat information in our study was not as strong as in other studies. Specifically, threat information about being negatively evaluated by a stranger might be less threatening than information that one could possibly be physically harmed (i.e., by an *animal that drinks blood*, see Field and Schorah 2007). Hence, the lower intensity of the parental threat information in our study

might explain why we did not find a significant effect of parental verbal threat information on the behavioral and physiological indices of child fear.

It may also be that the social evaluative nature of our manipulation (and that of Aktar et al. 2022) is more relevant for older adolescents. One study found that social anxiety and social performance symptoms are more prominent in adolescents aged 14–17 years, compared to 6–9 and 10–13-year-old children (Weems and Costa 2005). Future research could investigate whether parental verbal threat information about strangers, as operationalized in our study, increases cognitive, physiological, and behavioral indices of social anxiety during mid and late adolescence.

We also explored whether adolescent temperament and parental social anxiety symptoms exacerbated the effect of verbal threat information. We found no support for the idea that adolescents with more fearful temperaments show more fear to the stranger paired with threat information than the stranger paired with safe information on any of the fear indices. This is at odds with theoretical models (Belsky and Pluess 2009; Ingram and Luxton 2005; Nigg 2006) and contrasts with previous evidence (Field 2006; Field and Price-Evans 2009). Interestingly, one previous study found that children with more fearful temperaments show more fear and avoidance to the stranger paired with *safety* information (Aktar et al. 2022). In our study, as well as in the study by Aktar et al. (2022), children were directly exposed to the social stimulus (stranger). It could be that children with more fearful temperaments have more fear beliefs and a higher HR in *anticipation* of meeting the stranger paired with negative information rather than reacting differently to strangers paired with parental threat (vs. safety) information in the social interaction task. Taken together, we did not find any support for parental verbal threat information affecting adolescent's fear reaction more for adolescents with more fearful temperaments. Moreover, we did not find support for the hypothesis that adolescents of parents with higher social anxiety symptoms would be more affected by parent verbal threat information on any of the fear indices. It could be that parental social anxiety levels (in a community sample) are not a risk factor for enhanced social fear learning via verbal threat information but rather (over time) strengthen the tendency to avoid novel social stimuli or situations in general.

4.1 | Future Research

In our study, adolescents had to interact with an adult stranger. During adolescence, peer evaluations become increasingly important (Crone and Dahl 2012). Hence, adolescents might be more sensitive to being negatively evaluated by a peer than being evaluated by an adult that they might never see again. Future research could investigate whether the effect of parental verbal threat information on child fear to novel stimuli might vary for different intensities of threat messages and different social stimuli.

Moreover, we only exposed adolescents to parental verbal information once and assessed its effect immediately after. As we only found increases in fear beliefs, it would be interesting to investigate whether reinforcement shifts the impact onto other fear indices over time. Hence, experimental studies that include

multiple exposures to parental threat information or longitudinal studies are warranted to assess the impact of repeated exposure to parental verbal threat information on children's longer lasting social fears.

4.2 | Strengths and Limitations

The current study is the first to investigate Rachman's (1977) verbal fear acquisition pathway in the context of social stimuli using an early adolescent sample, while also considering possible parent and offspring risk factors that might impact adolescent's fear learning. In line with Lang's tripartite model, we measured fear responses in different response domains, including self-reported, physiological, and behavioral responses. Given that these response systems are only loosely related (Bradley and Lang 2000), we consider it a strength of our design to have measured fear responses in a relatively comprehensive manner, thus allowing to assess the effect of parental threat information on each of these outcomes. Nevertheless, the study also comes with its limitations.

First, we did not assess parental nonverbal fear expression during the delivery of the verbal threat information to their children. Hence, we do not know whether parental nonverbal communication influenced the effect of their verbal information. Further research could investigate whether the additional manipulation of parental behavior (nonverbal communication) on top of verbal information might lead to effects on behavioral and physiological adolescent fear responses to social stimuli.

Second, as we trained the participating parents to say the specific verbal statements during the experiment, these verbal statements might not capture how parents would express verbal threat information in real life. In our study, adolescents may have been less likely to display fear responses if the parents' verbal statements during the experiment did not reflect the way parents express fear in daily life. Hence, it is important to complement this experimental study with insights from more naturalistic studies, in which the impact of naturalistic verbal expressions of parental fear on adolescents' fear is captured.

Third, the impact of parental verbal threat information on adolescent fear and avoidance of the strangers might depend on the believability of parent's information. Thus, we cannot exclude the possibility that adolescents guessed the nature of the manipulation and doubted parental information, which might decrease the impact on their responses to the strangers. However, as we did not find a relationship between adolescent's doubt of the manipulation and the majority of their outcomes (their self-reported fears, HR, observed fear, or attentional bias), it is unlikely that it can explain the nonsignificant effect of the manipulation on adolescent observed behavior, physiology, and attention bias. Furthermore, our findings are in line with the previous study on this social fear learning pathway in parent-child dyads (Aktar et al. 2022), which was conducted in younger children (4- to 6-year-olds), and which also found an effect on self-reported fears. Nevertheless, future research on social fear learning pathways should consider assessing manipulation doubt in their study to assess and deepen our understanding of the role of believability of parental information in parent-offspring fear transmission.

Fourth, we may have lacked power for some of the investigated relations. Given the previous findings of a large effect of verbal threat information on physiological responses (Field and Price-Evans 2009; Field and Shorah 2007) with smaller sample sizes than ours, it is unlikely that lack of power can explain why we did not find an effect on adolescent physiology in our study. However, the size of the effects of verbal threat information on adolescent attention bias and observed behavior might be smaller than, for example, the effects on self-reported fear beliefs (see Aktar et al. 2022), meaning that we might have needed larger sample sizes to find potential significant differences between the conditions. Furthermore, we did not adjust the adolescents' fear indices with baseline measures. This might have made the measurement of physiological responses across conditions less sensitive and introduced more "noise" from individual differences. However, previous studies with a within-subject design that also measured physiological response by assessing average HR still found an effect of verbal threat information on child HR responses (Field and Price-Evans 2009; Field and Shorah 2007). Taken together, future studies could assess the effect of parental verbal threat information on for example adolescent behavior and attention with larger sample sizes. Lastly, our sample consisted of predominantly white participants with medium to high SES. Therefore, future research may need to include a more diverse sample to establish the generalizability of our findings.

5 | Conclusions

Overall, a single exposure to parental verbal threat information about a novel social stimulus-induced adolescents' subjective fear beliefs about this social stimulus. However, this subjective response does not seem evident in behavioral, cognitive, or physiological indices of fear. Future studies investigating parents' naturalistic verbal expressions of threat regarding social stimuli on adolescent's fear are needed to expand our understanding of this verbal fear-learning pathway.

Acknowledgments

We thank the families who contributed to this study.

Ethics Statement

This study was approved by the Ethics committee of the psychology department of Leiden University (Ethics Number: 2019-10-24-E.Aktar-V1-1930).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

References

Aktar, E., B. Van Bockstaele, K. Pérez-Edgar, R. W. Wiers, and S. M. Bögels. 2019. "Intergenerational Transmission of Attentional Bias and Anxiety." *Developmental Science* 22, no. 3: Portico. <https://doi.org/10.1111/dev.12772>.

Aktar, E., C. A. Nimphy, B. van Bockstaele, and K. Pérez-Edgar. 2022. "The Social Learning of Threat and Safety in the family: Parent-to-child Transmission of Social Fears via Verbal Information." *Developmental Psychobiology* 64, no. 3: <https://doi.org/10.1002/dev.22257>.

American Psychiatric Association. 2013. *Diagnostic and Statistical Manual of Mental Disorders*. <https://doi.org/10.1176/appi.books.9780890425596>.

Askew, C., and A. P. Field. 2008. "The Vicarious Learning Pathway to Fear 40 Years On." *Clinical Psychology Review* 28, no. 7: 1249–1265. <https://doi.org/10.1016/j.cpr.2008.05.003>.

Beesdo, K., S. Knappe, and D. Pine. 2009. "Anxiety and Anxiety Disorders in Children and Adolescents: Developmental Issues and Implications for DSM-V." *Psychiatric Clinics of North America* 32, no. 3: 483–524. <https://doi.org/10.1016/j.psc.2009.06.002>.

Belsky, J., and M. Pluess. 2009. "Beyond Diathesis Stress." *Psychological Bulletin* 135, no. 6: 885–908. <https://doi.org/10.1037/a0017376>.

Bokhorst, C. L., P. M. Westenberg, J. Oosterlaan, and D. A. Heyne. 2008. "Changes in Social Fears Across Childhood and Adolescence: Age-Related Differences in the Factor Structure of the Fear Survey Schedule for Children-Revised." *Journal of Anxiety Disorders* 22, no. 1: 135–142. <https://doi.org/10.1016/j.janxdis.2007.01.014>.

Bradley, M. M., and P. J. Lang. 2000. "Measuring Emotion: Behaviour, Feeling, and Physiology." In *Cognitive Neuroscience of Emotion*, edited by R. D. Lane and L. Nadel, 242–276. Oxford: University Press.

Clauss, J. A., and J. U. Blackford. 2012. "Behavioral Inhibition and Risk for Developing Social Anxiety Disorder: A Meta-Analytic Study." *Journal of the American Academy of Child & Adolescent Psychiatry* 51, no. 10: 1066–1075. <https://doi.org/10.1016/j.jaac.2012.08.002>.

Cooper, P., V. Fearn, L. Willetts, H. Seabrook, and M. Parkinson. 2006. "Affective Disorder in the Parents of a Clinic Sample of Children With Anxiety Disorders." *Journal of Affective Disorders* 93, no. 1–3: 205–212. <https://doi.org/10.1016/j.jad.2006.03.017>.

Crone, E., and R. Dahl. 2012. "Understanding Adolescence as a Period of Social-Affective Engagement and Goal Flexibility." *Nature Reviews Neuroscience* 13: 636–650. <https://doi.org/10.1038/nrn3313>.

De Geus, E. J., G. H. Willemsen, C. H. Klaver, and L. J. van Doornen. 1995. "Ambulatory Measurement of Respiratory Sinus Arrhythmia and Respiration Rate." *Biological Psychology* 41, no. 3: 205–227. [https://doi.org/10.1016/0301-0511\(95\)05137-6](https://doi.org/10.1016/0301-0511(95)05137-6).

de Vente, W., M. Majdandžić, M. J. Voncken, D. C. Beidel, and S. M. Bögels. 2014. "The SPAI-18, a Brief Version of the Social Phobia and Anxiety Inventory: Reliability and Validity in Clinically Referred and Non-Referred Samples." *Journal of Anxiety Disorders* 28, no. 2: 140–147. <https://doi.org/10.1016/j.janxdis.2013.05.003>.

Eley, T. C., T. A. McAdams, F. V. Rijsdijk, et al. 2015. "The Intergenerational Transmission of Anxiety: A Children-of-Twins Study." *The American Journal of Psychiatry* 172, no. 7: 630–637. <https://doi.org/10.1176/appi.ajp.2015.14070818>.

Ellis, L. K., and M. K. Rothbart. 2001. "Revision of the Early Adolescent Temperament Questionnaire." Poster presented at the Biennial Meeting of the Society for Research in Child Development, Minneapolis, MN, April 2001.

Field, A. P. 2006. "The Behavioral Inhibition System and the Verbal Information Pathway to Children's Fears." *Journal of Abnormal Psychology* 115, no. 4: 742–752. <https://doi.org/10.1037/0021-843X.115.4.742>.

Field, A. P., and J. Lawson. 2003. "Fear Information and the Development of Fears During Childhood: Effects on Implicit Fear Responses and Behavioural Avoidance." *Behaviour Research and Therapy* 41, no. 11: 1277–1293. [https://doi.org/10.1016/S0005-7967\(03\)00034-2](https://doi.org/10.1016/S0005-7967(03)00034-2).

Field, A. P., and K. Price-Evans. 2009. "Temperament Moderates the Effect of the Verbal Threat Information Pathway on Children's Heart Rate Responses to Novel Animals." *Behaviour Research and Therapy* 47, no. 5: 431–436. <https://doi.org/10.1016/j.brat.2009.01.020>.

- Field, A. P., and H. Schorah. 2007. "The Verbal Information Pathway to Fear and Heart Rate Changes in Children." *Journal of Child Psychology and Psychiatry and Allied Disciplines* 48, no. 11: 1088–1093. <https://doi.org/10.1111/j.1469-7610.2007.01772.x>.
- Gregory, A. M., and T. C. Eley. 2007. "Genetic Influences on Anxiety in Children: What We've Learned and Where We're Heading." *Clinical Child and Family Psychology Review* 10, no. 3: 199–212. <https://doi.org/10.1007/s10567-007-0022-8>.
- Hettema, J. M., M. C. Neale, and K. S. Kendler. 2001. "A Review and Meta-Analysis of the Genetic Epidemiology of Anxiety Disorders." *The American Journal of Psychiatry* 158, no. 10: 1568–1578. <https://doi.org/10.1176/appi.ajp.158.10.1568>.
- Ingram, R. E., and D. D. Luxton. 2005. "Vulnerability-Stress Models." In *Development of Psychopathology: A Vulnerability-Stress Perspective*, edited by B. L. Hankin and J. R. Z. Abela, 32–46. Thousand Oaks, CA: Sage Publications, Inc. <https://doi.org/10.4135/9781452231655.n2>.
- Kessler, R. C., P. Berglund, O. Demler, R. Jin, K. R. Merikangas, and E. E. Walters. 2005. "Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication." *Archives of General Psychiatry* 62, no. 6: 593–602. <https://doi.org/10.1001/archpsyc.62.6.593>.
- Kiel, E. J., and A. E. Kalomiris. 2019. "Emotional Development and Anxiety." In *Handbook of Emotional Development*, edited by V. LoBue, K. Pérez-Edgar, and K. A. Buss, 665–693. Cham: Springer. https://doi.org/10.1007/978-3-030-17332-6_25.
- Knappe, S., S. Sasagawa, and C. Creswell. 2015. "Developmental Epidemiology of Social Anxiety and Social Phobia in Adolescents." In *Social Anxiety and Phobia in Adolescents: Development, Manifestation and Intervention Strategies*, edited by K. Ranta, A. La Greca, L. J. Garcia-Lopez, and M. Marttunen, 39–70. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-16703-9_2.
- Lawson, J., R. Banerjee, and A. P. Field. 2007. "The Effects of Verbal Information on Children's Fear Beliefs About Social Situations." *Behaviour Research and Therapy* 45, no. 1: 21–37. <https://doi.org/10.1016/j.brat.2006.01.007>.
- Muris, P., and A. P. Field. 2010. "The Role of Verbal Threat Information in the Development of Childhood Fear. "Beware the Jabberwock!"" *Clinical Child and Family Psychology Review* 13, no. 2: 129–150. <https://doi.org/10.1007/s10567-010-0064-1>.
- Murray, L., C. Creswell, and P. J. Cooper. 2009. "The Development of Anxiety Disorders in Childhood: An Integrative Review." *Psychological Medicine* 39, no. 9: 1413–1423. <https://doi.org/10.1017/S0033291709005157>.
- Nigg, J. T. 2006. "Temperament and Developmental Psychopathology." *Journal of Child Psychology and Psychiatry* 47, no. 3–4: 395–422. <https://doi.org/10.1111/j.1469-7610.2006.01612.x>.
- Nimphy, C. A., M. Venetikidi, B. Elzinga, W. Van der Does, and E. Aktar. 2023. "Parent to Offspring Fear Transmission via Modeling in Early Life: A Systematic Review and Meta-Analysis." *Clinical Child and Family Psychology Review* 26, no. 3: 751–772. <https://doi.org/10.1007/s10567-023-00448-1>.
- Nimphy, C. A., V. Mitrou, B. M. Elzinga, W. Van der Does, and E. Aktar. 2024. "The Role of Parental Verbal Threat Information in Children's Fear Acquisition: a Systematic Review and Meta-analysis." *Clinical Child and Family Psychology Review* <https://doi.org/10.1007/s10567-024-00485-4>.
- Olsson, A., K. I. Nearing, and E. A. Phelps. 2007. "Learning Fears by Observing Others: The Neural Systems of Social Fear Transmission." *Social Cognitive and Affective Neuroscience* 2, no. 1: 3–11. <https://doi.org/10.1093/scan/nsm005>.
- Percy, R., C. Creswell, M. Garner, D. O'Brien, and L. Murray. 2016. "Parents' Verbal Communication and Childhood Anxiety: A Systematic Review." *Clinical Child and Family Psychology Review* 19, no. 1: 55–75. <https://doi.org/10.1007/s10567-015-0198-2>.
- Pons, F., J. Lawson, P. L. Harris, and M. De Rosnay. 2003. "Individual Differences in Children's Emotion Understanding: Effects of Age and Language." *Scandinavian Journal of Psychology* 44, no. 4: 347–353. <https://doi.org/10.1111/1467-9450.00354>.
- Rachman, S. 1977. "The Conditioning Theory of Fear-Acquisition: A Critical Examination." *Behaviour Research and Therapy* 15, no. 5: 375–387. [https://doi.org/10.1016/0005-7967\(77\)90041-9](https://doi.org/10.1016/0005-7967(77)90041-9).
- Sjak-Shie, E. E. 2022. *PhysioData Toolbox* (Version 0.6.3) [Computer software]. <https://PhysioDataToolbox.leidenuniv.nl>.
- Sumter, S., C. Bokhorst, and P. Westenberg. 2009. "Social Fears During Adolescence: Is There an Increase in Distress and Avoidance?" *Journal of Anxiety Disorders* 23, no. 7: 897–903. <https://doi.org/10.1016/j.janxdis.2009.05.004>.
- Van Bockstaele, B., E. Aktar, M. Majdandžić, K. Pérez-Edgar, and S. M. Bögels. 2021. "The Relation between Early Behavioural Inhibition and Later Social Anxiety, Independent of Attentional Biases to Threat." *Cognition and Emotion* 35, no. 7: 1431–1439. <https://doi.org/10.1080/02699931.2021.1963682>.
- Weems, C. F., and N. M. Costa. 2005. "Developmental Differences in the Expression of Childhood Anxiety Symptoms and Fears." *Journal of the American Academy of Child & Adolescent Psychiatry* 44, no. 7: 656–663. <https://doi.org/10.1097/01.chi.0000162583.25829.4b>.

Supporting Information

Additional supporting information can be found online in the Supporting Information section.