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Music Performance Anxiety and Its Relation to Parenting Style and Sensory Processing Sensitivity

Über den Zusammenhang zwischen Auftrittsangst, elterlichem Erziehungsstil und Hochsensibilität

Ludivine Aubry[1], Mats B. Küssner*[2]

[1] Department of Psychology, Humboldt-Universität zu Berlin, Berlin, Germany. **[2]** Department of Musicology and Media Studies, Humboldt-Universität zu Berlin, Berlin, Germany.

Abstract

Music performance anxiety (MPA) is described as a complex phenomenon that arises through an interplay of environmental and personal factors. While previous research has found links between early life experiences and personality traits, the causes and the development of MPA remain poorly understood. This study aimed to assess the role of parenting style and sensory processing sensitivity (SPS) to better understand the causes of MPA. In total, 342 musicians between 18 and 65 years old, active in diverse musical genres in Germany and Austria, were analyzed in the final sample. The abbreviated German version of the Kenny Music Performance Anxiety Inventory (K-MPAI-24) was used to measure MPA. Parenting style was assessed retrospectively using the German version of the Measure of Parenting Style (MOPS) entitled Fragebogen Dysfunktionaler Elterlicher Beziehungsstile (FDEB). To measure the temperamental trait SPS, the German version of the Highly Sensitive Person Scale (HSPS-G) was used. Correlations were calculated to determine the relationships between parenting style and SPS in regard to MPA. Moreover, a moderation analysis was run to examine the interactive effect of parenting style and SPS on MPA. Although no interaction effect was found, the results indicate that abusive and over-controlling parenting as well as enhanced sensitivity may operate as risk factors for experiencing MPA. The present outcomes contribute to a better understanding of MPA and may facilitate supporting performers' psychological well-being.

Keywords: music performance anxiety, stage fright, parenting style, sensory processing sensitivity, musicians' psychological health

Zusammenfassung

Während Studien Zusammenhänge zwischen frühen Lebenserfahrungen und persönlichen Merkmalen aufzeigen, ist über die Ursachen und die Entwicklung von Auftrittsangst noch wenig bekannt. Basierend auf der Annahme, dass Auftrittsangst durch ein komplexes Zusammenspiel verschiedener Umwelt- und individueller Faktoren bedingt ist, zielt diese Studie darauf ab herauszufinden, in welchem Zusammenhang der elterliche Erziehungsstil und die Temperamentseigenschaft Hochsensibilität mit Auftrittsangst stehen. Insgesamt wurden 342 Musiker*innen zwischen 18 und 65 Jahren verschiedener Musikgenres in Deutschland und Österreich untersucht. Zur Erfassung von Auftrittsangst wurde die gekürzte deutsche Version des Kenny Music Performance Anxiety Inventory (K-MPAI-24) eingesetzt. Der elterliche Erziehungsstil wurde retrospektiv mit dem Fragebogen Dysfunktionaler Elterlicher Beziehungsstile (FDEB) erfasst, der deutschen Version des Measure of Parenting Style (MOPS). Zur Messung von Hochsensibilität wurde die deutsche Fassung der Highly Sensitive Person Scale (HSPS-G) verwendet. Um die einzelnen Zusammenhänge zu analysieren wurden Korrelationen berechnet. Darüber hinaus wurde eine Moderationsanalyse durchgeführt, um den interaktiven Effekt zwischen dem elterlichen Erziehungsstil und Hochsensibilität auf Auftrittsangst zu untersuchen. Obwohl kein Interaktionseffekt gefunden werden konnte, weisen die Ergebnisse darauf hin, dass insbesondere ein missbräuchlicher sowie überbehütender elterlicher Erziehungsstil, als auch eine erhöhte Sensibilität als Risikofaktoren wirken und mit Auftrittsangst im Zusammenhang stehen. Die vorliegenden Ergebnisse tragen zu einem besseren Verständnis von Auftrittsangst bei und bieten Erkenntnisse zur Verbesserung des psychischen Wohlbefindens von Musiker*innen.

Schlüsselwörter: Auftrittsangst, Lampenfieber, elterlicher Erziehungsstil, sensorische Verarbeitungssensitivität, Hochsensibilität, psychische Gesundheit von Musiker*innen

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*Korrespondenzanschrift: Department of Musicology and Media Studies, Humboldt-Universität zu Berlin, Unter den Linden 6, 10099 Berlin, Germany. E-mail: mats.kuessner@hu-berlin.de

Performing on stage is an essential part of a musician's existence. A number of performers seem to relish pre-performance anxiety when reappraising it positively as a form of excitement and consider a certain level of arousal fundamental to excel (Brooks, 2014; Osborne et al., 2014). Yet, it is assumed that 15% to 25% of musicians suffer from *music performance anxiety* (MPA; Spahn et al., 2011). Since the relation between performance quality and physiological as well as mental arousal can be described as U-shaped (following the Yerkes-Dodson curve; Yerkes & Dodson, 1908), it seems plausible that a certain amount of stimulation is necessary to achieve peak-performance. Nonetheless, excessive levels of stimulation lead to a decline in performance, impairing one's concentration ability, memory, and fine-motor skills (Krawehl & Altenmüller, 2000). A number of more comprehensive theories have been analyzed which take various individual, cognitive, and environmental variables into account to gain a better understanding of the complexity of MPA's emergence (Hancock & Ganey, 2003; Kenny, 2011; Papageorgi et al., 2007; Papageorgi, 2022; Patston & Osborne, 2016; Wilson, 2002). At present, however, an encompassing and unambiguous explanation about its origin does not exist.

According to DSM-5 (American Psychiatric Association, 2013), MPA can be classified as a specific social anxiety disorder (Matei & Ginsborg, 2017). However, the exact clinical classification is still subject to some debate (Kenny, 2011; Wiedemann et al., 2022). The psychotherapist Dianna Kenny defines MPA as an "experience of marked and persistent anxious apprehension related to musical performance that has arisen through specific anxiety conditioning experiences and which is manifested through combinations of affective, cognitive, somatic and behavioural symptoms" (Kenny, 2010, p. 433). To distinguish between maladaptive and healthy forms of MPA the Kenny Music Performance Anxiety Inventory (K-MPAI; Kenny, 2009) was developed. This inventory takes into account the complexity of the performance anxiety phenomenon and is based on Barlow's emotion-based theory of anxiety disorders (Kenny, 2009). According to Barlow (2000, 2002), a triple set of interacting vulnerabilities must be considered when looking into anxieties' etiology: a generalized biological (heritable) vulnerability, a generalized psychological vulnerability, and finally, a specific psychological vulnerability. He argues that it is crucial to consider different components, as well as their interplay, all at the same time.

While there has been a great deal of research about the origin and emergence of anxiety itself, many unanswered questions about MPA's nature and development persist. Given that Kenny (2011) considers MPA to be the highest threat to a performer's psychological wellbeing, a greater understanding of this anxiety phenomenon is imperative. Studies have shown that MPA can already be observed at a young age and possibly affect musicians throughout their whole careers, provoking long-lasting impacts on a performer's physical, cognitive, and mental health (Kenny, Arthey, & Abbass, 2014; Kenny & Osborne, 2006; Matei & Ginsborg, 2017; Ryan, 2005).

The Role of Parenting Style

Parental behaviour affects a child's development and can be a risk factor regarding the experience and the development of anxiety (Affrunti & Woodruff-Borden, 2015; Barlow, 2000). A few attempts have been made to investigate the impact of attachment and parenting style on MPA, and outcomes do vary (Kenny, 2011; Kenny, Driscoll, & Ackermann, 2014; Kenny & Holmes, 2015; Wiedemann et al., 2020). For instance, Kenny (2011) describes the importance of considering early life experiences such as the role of parental environment when addressing the development of MPA. The original version of the K-MPAI includes items associated with the underlying factor Parental Empathy, emphasizing the importance of a parent's behaviour when investigating the experience of MPA (Kenny, 2015). In another study, Dobos et al. (2019) discussed the relation between MPA and dimensions of perfectionism, arguing that parental criticism seemed to be a significant factor in predicting MPA. McPherson (2009) proposes that the parent-child interaction does play an important role with regard to a child's musical learning history, as parenting style influences a child's ability to cope with difficulties and its musical development overall. Wiedemann et al. (2020) explored the connection between MPA, parenting style, and adult attachment, reporting only a weak relationship between MPA and parenting style. Yet, compared to the paternal style, the maternal style interestingly seemed to have a stronger impact on the experience of MPA. Additionally, a survey indicated that music students did not consider the influence of the parent-child relationship to be a decisive factor in the emergence of MPA (Krawehl & Altenmüller, 2000).

Despite these mixed findings it is important to note that MPA can already be observed in the early stages of learning music. Thus, especially the investigation of early life experiences may contribute to a better understanding regarding the onset of this specific form of anxiety (Kenny & Osborne, 2006). Nevertheless, it is important to keep in mind that each individual experiences and perceives environmental influences in their very own way. For this reason, it is necessary to not only explore environmental factors such as the parents' role, but also the extent to which other factors are key in understanding MPA's onset and manifestation.

The Role of Sensory Processing Sensitivity

Aron et al. (2005) stated that children who are highly sensitive may react particularly sensitively to adverse childhood experiences, leading to an increase in negative affectivity and thus resulting in shyness. Research furthermore indicated a meaningful relationship among *sensory processing sensitivity* (SPS), anxiety, and depression, suggesting that being highly sensitive increases the risk of experiencing psychological distress (Liss et al., 2005). Even though this rather new concept of SPS has not been investigated in relation to MPA before, there is preliminary evidence that certain traits are linked to the heightened experience of anxiety. For instance, perfectionism is suggested to be closely related to MPA, increasing self-doubt, negative self-talk, and lowering self-esteem (Patston & Osborne, 2016).

SPS is defined as an innate tendency to process and perceive information on a much deeper level and to experience feelings more intensely compared to the general population (Aron, 1997). In other words, highly sensitive people tend to respond more extremely to both negative and positive influences and experiences. While some people are more sensitive than others, SPS is thought to be a temperamental trait, manifested in our genes and associated with greater brain activity related to, for example, attention, awareness, self-other processing, and empathy (Acevedo, 2020; Acevedo et al., 2014). In a recent study, it was shown that females tend to be more sensitive than men and that sensitivity seemed to increase with age (Herzberg et al., 2021). Although SPS tends to affect only 20% to 31% of the population (Konrad, 2020; Lionetti et al., 2018), Aron (1997) stated that highly sensitive people often choose creative professions, such as writing, philosophy, or art. What is more, research has shown that SPS is related to certain aspects of creativity (Bridges

& Schendan, 2019). These findings suggest that SPS may be very present among professional musicians who face intense sensations while practicing or being on stage putting their creativity into practice.

So far, no study has investigated the effects of parental environment and SPS in the context of MPA. The findings reported earlier suggest that many musicians may score high on SPS and may thus be variously affected by different parenting styles, which, in turn, may affect the experience of MPA.

Aim of This Study

To further our understanding of MPA we assessed the impact of parenting style and SPS on MPA among musicians. Ultimately, a better understanding of MPA and its causes will help to develop adapted treatment alternatives in order to prevent and treat possible health issues among professional musicians.

We hypothesized that there is (a) a general connection between the experience of MPA and parenting style, (b) a general connection between the experience of MPA and the temperamental trait SPS, and (c) an interaction effect between parenting style and SPS on the experience of MPA.

Method

Participants

In total, the sample consisted of N = 342 musicians aged between 18 and 65 years (M = 30.11, SD = 9.86), most of whom identified as female (n = 214, 62.6% female; n = 124, 36.3% male; n = 4, 1.2% diverse). The majority of the sample was of German or Austrian nationality (n = 303, 88.6%).

Inclusion criterion to be considered a musician was based on 7 items of the German version of the Goldsmiths Musical Sophistication Index (Gold-MSI; Müllensiefen et al., 2014; Schaal et al., 2014) measuring Musical Training. According to an a priori power analysis to perform a moderation analysis with zero covariates, the sample size should consist of N = 99 to detect a medium effect of interest (ΔR^2 = .13) for the above stated hypothesis with sufficient power. The significance level was set to α = .05 (two-tailed), and the statistical power (1–β) to 0.90 (Cohen, 1988). To recruit a sufficiently large sample, performers of all musical genres and instruments were included in the survey. Further, an important criterium for inclusion in the final sample was that subjects grew up with both parents in their first 16 years of life, as parenting style was operationalized through the mother's and father's behaviour. Finally, good German language skills were required.

Recruitment took place primarily on social media platforms, displaying invitations on Instagram and in diverse music groups on Facebook. In addition, invitations were sent out to approximately 40 state and private music schools and musical institutions via university mailing lists all over Germany and Austria. As an incentive, each participant could receive personal feedback regarding their SPS score and in addition, take part in a prize draw to win one out of five 20€ vouchers of a music store.

Study Design and Procedure

An online questionnaire was developed using the software LimeSurvey (LimeSurvey GmbH, 2020). Completing the questionnaire took each participant approximately 20 minutes.

Prior to an individual's participation, general information about the course of the study, requirements for participation, and the questionnaire's purpose were presented. Participants were informed that all personal data given remained confidential and data protection was guaranteed. The survey was ensured to be completely anonymous and voluntary. Participation could be cancelled at any time without any disadvantage. As sensitive and emotional data were collected, contact details of counseling centers specialized in musicians' health were indicated in the introductory part and at the end of the questionnaire in case of any acute crisis. Finally, each participant provided informed consent. For any questions before, during, or after filling in the questionnaire, participants were asked to contact the researcher via email. After the introduction, relevant demographic variables and basic information about the participants' musical backgrounds and musical training were collected. Subsequently, three standardized and self-assessing instruments were presented to measure MPA, parenting style, and SPS. At the end of the questionnaire, participants were thanked and acknowledged for their contribution and involvement in the study.

Measures

Assessing Musical Training

To assess participants' musical ability, the seven items of the Gold-MSI subscale Musical Training (Müllensiefen et al., 2014) translated by Schaal et al. (2014) were included in the questionnaire. In total, between 7 and 49 points can be achieved, higher scores indicating more musical training. An evaluation of the German version of the Gold-MSI showed high internal consistency for the scale Musical Training ($\alpha = 0.88$; Schaal et al., 2014).

Assessing Musical Background

Items to assess the participants' musical background comprised questions about the participants' main and additional instruments, the beginning of one's musical career, whether they are currently enrolled in a music study program, their main musical genre, whether they are part of a group or performing solo, and whether the participant is self-employed or salaried as a musician. Further items included the frequency of performance opportunities in a year and a question about other employments, aiming to identify whether their musical engagement is their main income or not. Participants were asked to consider the time before the Covid-19 pandemic when answering the question about the frequency of performances.

Assessing Music Performance Anxiety

To assess MPA the German abbreviated version of the Kenny Music Performance Anxiety Inventory (K-MPAI-24) was used, translated by Spahn et al. (2016). As the original 40-item version includes questions about one's affective relationship to the parents, attachment behaviour, and general anxiety, it was decided to use the 24-item version that focuses on performance-related questions only, with a possible sum score of 0–144. A higher score indicates higher traits of experienced MPA (Kenny, 2015). Although this version hasn't been extensively tested yet, Wiedemann et al. (2020) found no significant differences regarding the psychometric criteria when comparing the short to the longer version. Notably, the short version revealed equally satisfying internal consistency ($\alpha = 0.94$; Wiedemann et al., 2020).

Assessing Parenting Style

To investigate parenting style the German version of the Measure of Parenting Style (MOPS; Parker et al., 1997) was applied, translated by Rumpold et al. (2002). The self-assessing German translation of the questionnaire, entitled Fragebogen Dysfunktionaler Elterlicher Beziehungsstile (FDEB), includes 30 items in total. Fifteen identical items assess the mothers' and the fathers' behaviour, respectively. The retrospectively perceived behaviour and attitudes of the participants' parents were rated on a 4-point Likert scale, ranging from 1 (*not true at all*) to 4 (*extremely true*). The

experienced parenting style before the age of 16 was measured on three different dimensions: Indifference (6 items), Over-Control (3 items) and Abuse (6 items). The factor Indifference scored from 6–24, Over-Control from 3–12 and Abuse from 6–24. The higher the score, the greater the extent in each domain (possible global sum score from 30–120). An evaluation of the FDEB showed satisfactory high internal consistency for each item (α = 0.20 to 0.94; Rumpold et al., 2002).

Assessing Sensory Processing Sensitivity

To measure SPS the self-assessing instrument High Sensitive Person Scale (HSPS; Aron & Aron, 1997) was used. Formerly known as a one-dimensional construct, the sensitivity trait is today divided into three subdimensions: Ease of Excitation (EOE) portraying a tendency to be overwhelmed by internal and external stimuli; Aesthetic Sensitivity (AES) signifying the ability to be deeply touched by, for example, music or art; and Low Sensory Threshold (LST) which describes one's excessive sensory response to extreme external stimuli like unpleasant tastes or bright lights (Herzberg et al., 2021). In this study, participants were asked to complete the German version of the High Sensitive Person Scale (HSPS-G) translated and modified by Konrad and Herzberg (2017). Consisting of 26 items, sensitive processing sensitivity was measured on a 5-point Likert scale, ranging from 0 (*hardly at all*) to 4 (*extremely*). Ten items were associated with the factor EOE, scoring from 0–40. Five items belonged to the AES scale scoring from 0–20. LST was measured by 11 items, scoring from 0–44. All three factors showed high intercorrelations and satisfactory psychometric parameters. An evaluation of the HSPS-G further confirmed high internal consistency and test-retest reliability. Outcomes showed satisfactory α for each scale ranging from 0.65 to 0.90 (Konrad, 2020; Konrad & Herzberg, 2017).

Data Analysis

Prior to data analysis, low-end extreme values and outliers based on the seven items measuring Musical Training of the Gold-MSI ($\leq$ 3.40) were identified and excluded (n = 22) from the original data set (N = 417) to ensure a certain musical standard among all participants. Furthermore, only individuals that lived with both parents in their first 16 years of life were considered in the analysis, leading to an exclusion of n = 53 participants. Eventually, N = 342 participants were included in the final data analysis.

To determine the connection between parenting style and MPA, and between SPS and MPA, Spearman correlations were calculated. A non-parametric method was chosen since some of the scales showed naturally-occurring outliers. In the next step, a moderation analysis was conducted to examine the interaction effect of parenting style and SPS on MPA.

Processing of the data, frequency analysis, and Spearman correlations were calculated with IBM SPSS Statistics (Version 28.0). Moderation analysis was carried out using the regression path analysis modeling tool PROCESS macro V4.1 by Andrew F. Hayes for SPSS version 28 using Hayes's Model 1. The conceptual and statistical diagrams are displayed in Figure 1 and Figure 2. Confidence intervals were calculated using Bootstrapping with 5000 iterations in combination with heteroscedasticity consistent standard errors HC3 (Davidson & MacKinnon, 1993; Hayes, 2022).

Figure 1

Conceptual Diagram Model 1: Interaction Effect Between Parenting Style and SPS on MPA

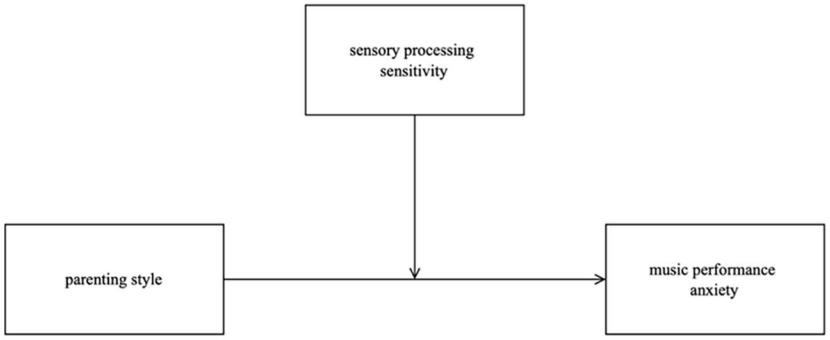
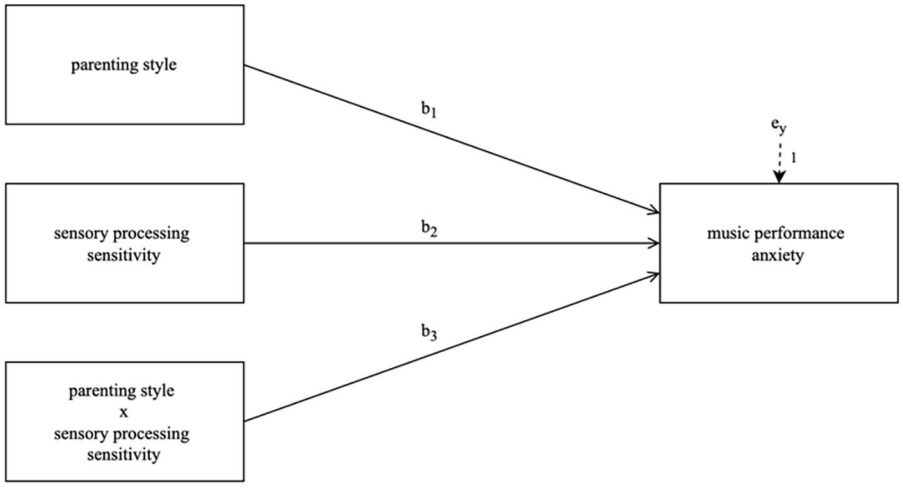


Figure 2

Statistical Diagram Model 1: Interaction Effect Between Parenting Style and SPS on MPA



Note. The diagram displays the conditional effect of parenting style on MPA = b1 + b3 * SPS.

Results

Descriptive Statistics and Correlations

Descriptive analyses are displayed in Table 1. On average, participants scored M = 66.64 (SD = 27.18) on the K-MPAI-24, M = 49.37 (SD = 14.49) on the FDEB and M = 56.83 (SD = 18.49) on the HSPS-G.

Table 1

Descriptive Analyses of K-MPAI-24, FDEB, and HSPS-G

Questionnaire	*M* (*SD*)	95% CI		*Mdn*	*Min/Max*
		LL	*UL*		
K-MPAI-24	66.64 (27.18)	63.75	69.53	66.50	12/132
FDEB global	49.37 (14.49)	47.83	50.91	46.00	30/105
FDEB mother	25.08 (8.19)	24.21	25.95	23.00	15/53
FDEB father	24.29 (9.20)	23.31	25.27	21.00	15/55
Indifference	18.18 (6.86)	17.45	18.90	16.00	12/46
Indifference mother	8.51 (3.57)	8.13	8.89	7.00	6/24
Indifference father	9.67 (4.44)	9.20	10.14	8.00	6/24
Over-Control	11.19 (3.20)	10.85	11.53	11.00	6/24
Over-Control mother	6.44 (2.28)	6.20	6.68	6.00	3/12
Over-Control father	4.75 (1.79)	4.56	4.95	4.00	3/12
Abuse	20.00 (6.93)	19.26	20.74	19.00	12/48
Abuse mother	10.13 (4.26)	9.68	10.59	9.00	6/24
Abuse father	9.87 (4.65)	9.37	10.36	8.00	6/24
HSPS-G	56.83 (18.49)	54.86	58.79	56.00	15/102
EOE	22.91 (7.97)	22.06	23.76	23.00	6/40
AES	14.59 (3.23)	14.25	14.93	15.00	3/20
LST	19.32 (10.49)	18.21	20.44	18.00	0/44

Note. N = 342; CI = confidence interval; LL = lower limit; UL = upper limit; K-MPAI-24 = 24-item version of the German Kenny Music Performance Anxiety Inventory; FDEB = Fragebogen Dysfunktionaler Elterlicher Beziehungsstile (German translation of the Measure of Parenting Style, MOPS); HSPS-G = German version of the Highly Sensitive Person Scale; EOE = Ease of Excitation; AES = Aesthetic Sensitivity; LST = Low Sensory Threshold.

Spearman correlations between MPA and parenting style are portrayed in Table 2. Parenting style was positively correlated with MPA, $r(340) = .37$, $p < .01$, that is, higher levels of the retrospectively perceived indifferent, over-controlling, or abusive parenting style were associated with higher levels of MPA. Positive correlations were also found between each subscale and MPA, displaying the highest positive correlation between the subscale Abuse and MPA, $r(340) = .38$, $p < .01$. Effect sizes of all subscales were low to moderate.

Spearman correlations between MPA and SPS are displayed in Table 3. SPS and MPA were highly correlated, $r(340) = .53$, $p < .01$, indicating that higher levels of SPS were associated with higher levels of MPA. Furthermore, all subscales of the SPS trait showed positive correlations with MPA. Strikingly, the construct EOE showed the highest positive correlation of all three subscales, $r(340) = .62$, $p < .01$. Effect sizes of all analyses were medium to high, with the exception of the subscale AES, which showed a comparably smaller effect size, $r(340) = .18$, $p < .01$.

Table 2

Spearman Correlations Between MPA and Parenting Style (Mother/Father)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. K-MPAI-24	—											
2. FDEB global	.37**	—										
3. FDEB mother	.30**	.83**	—									
4. FDEB father	.33**	.84**	.44**	—								
5. Indifference	.30**	.86**	.68**	.75**	—							
6. Indifference mother	.20**	.66**	.71**	.41**	.78**	—						
7. Indifference father	.27**	.76**	.48**	.80**	.88**	.47**	—					
8. Over-Control	.29**	.65**	.62**	.51**	.33**	.24**	.27**	—				
9. Over-Control mother	.23**	.55**	.72**	.26**	.30**	.25**	.25**	.85**	—			
10. Over-Control father	.20**	.43**	.15**	.59**	.17**	.09	.16**	.67**	.21**	—		
11. Abuse	.38**	.94**	.78**	.79**	.73**	.55**	.66**	.56**	.47**	.39**	—	
12. Abuse mother	.30**	.73**	.91**	.36**	.54**	.52**	.40**	.48**	.59**	.09	.78**	—
13. Abuse father	.30**	.71**	.31**	.90**	.57**	.32**	.60**	.41**	.16**	.54**	.75**	.25**

Note. N = 342; K-MPAI-24 = 24-item version of the German Kenny Music Performance Anxiety Inventory; FDEB = Fragebogen Dysfunktionaler Elterlicher Beziehungsstile (German translation of the Measure of Parenting Style, MOPS).

**$p < .01$.

Table 3

Spearman Correlations Between MPA and SPS

Variable	1	2	3	4
1. K-MPAI-24	—			
2. HSPS-G	.53**	—		
3. EOE	.62**	.85**	—	
4. AES	.18**	.52**	.24**	—
5. LST	.42**	.94**	.67**	.45**

Note. N = 342; K-MPAI-24 = 24-item version of the German Kenny Music Performance Anxiety Inventory; HSPS-G = German version of the Highly Sensitive Person Scale; EOE = Ease of Excitation; AES = Aesthetic Sensitivity; LST = Low Sensory Threshold.

**$p < .01$.

Moderation Analysis

A moderation analysis using PROCESS was conducted to examine whether the interaction between parenting style and SPS is associated with MPA. Results are shown in Table 4. Initially, the a priori visual inspection of the scatterplot with LOESS smoothing revealed an approximately linear relationship between all three variables. As linearity was given, the moderation analysis could be carried out. The overall model was significant and explained in total 32% of the variance, $\Delta R^2 = .32$, $F(3, 338) = 50.59$, $p < .001$. Both the predictor parenting style, $B = 0.35$, 95% CI [.16, .55], $t = 3.60$, $p < .001$, and the moderator SPS, $B = 0.68$, 95% CI [.53, .83], $t = 8.76$, $p < .001$, showed significant effects. In contrast, the interaction between parenting style and SPS on MPA was not significant, $\Delta R^2 = .00$, $F(1, 338) = 1.61$, $p = .21$, indicating that the relationship between parenting style and MPA was not moderated by SPS.

Table 4

Moderation Analysis: Parenting Style and SPS on MPA

					95% CI	
Effect	**Estimate**	***SE***	***t***	***p***	***LL***	***UL***
Intercept	67.383	1.370	49.201	< .001	64.689	70.077
FDEB	0.354	0.098	3.601	< .001	0.161	0.547
HSPS-G	0.681	0.078	8.756	< .001	0.528	0.834
Interaction[a]	−0.006	0.005	-1.269	.205	−0.016	0.003

Note. N = 342; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; FDEB = Fragebogen Dysfunktionaler Elterlicher Beziehungsstile; HSPS-G = German version of the Highly Sensitive Person Scale.

[a]Interaction effect between parenting style and sensory processing sensitivity.

Simple Effects Model

As no interaction effect was found, a simple effects model was calculated to outline only the main effects of the variables without considering their interaction (Hayes, 2022). The overall model was significant and showed, according to Cohen (1988), a high goodness-of-fit, ΔR^2 = .32, $F(2, 339)$ = 78.25, p < .001. Findings further revealed that parenting style was significantly associated with MPA, b = .17, 95% CI [.12, .50], t = 3.28, p = .001. In the same way, SPS was highly associated with MPA, b = .47, 95% CI [.54, .83], t = 9.31, p < .001. In sum, these outcomes indicate a meaningful relationship between the two predictors parenting style and SPS in relation to the criterion MPA.

Analysis of the FDEB and HSPS-G Subscales

To better characterize the relationships found based on the simple effects model, multiple linear regressions between MPA and the FDEB and HSPS-G subscales were carried out. Results are displayed in Table 5 and Table 6. Beginning with parenting style, the overall model was highly significant and was indicative of a moderate goodness-of-fit, ΔR^2 = .15, $F(3, 338)$ = 19.76, p < .001. The two subscales Abuse (p = .005) and Over-Control (p = .03) both showed significant results. In contrast, the subscale Indifference was not significant (p = .26). For the temperamental trait SPS, the overall model was significant and indicative of a high goodness-of-fit, ΔR^2 = .38, $F(3, 338)$ = 69.22, p < .001. Results further indicated a highly significant result for the subscale EOE (p < .001). In comparison, the subscales AES (p = .53) and LST (p = .89) were not significant.

Table 5

Multiple Linear Regressions Between MPA and FDEB

					95% CI	
Effect	**Estimate**	***SE***	***t***	***p***	***LL***	***UL***
Intercept	29.572	5.455	5.421	< .001	18.843	40.302
Indifference	3.767	3.342	1.127	.260	−2.806	10.340
Over-Control	6.938	3.186	2.178	.030	0.672	13.204
Abuse	11.054	3.870	2.856	.005	3.442	18.666

Note. N = 342; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; EOE = Ease of Excitation; AES = Aesthetic Sensitivity; LST = Low Sensory Threshold.

Table 6

Multiple Linear Regressions Between MPA and SPS

					95% CI	
Effect	**Estimate**	***SE***	***t***	***p***	***LL***	***UL***
Intercept	15.351	6.263	2.451	.015	3.032	27.670
EOE	2.053	0.200	10.277	< .001	1.660	2.446
AES	0.260	0.412	0.630	.529	−0.551	1.071
LST	0.023	0.167	0.140	.888	−0.305	0.352

Note. $N = 342$; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; EOE = Ease of Excitation; AES = Aesthetic Sensitivity; LST = Low Sensory Threshold.

Discussion

Summary of Results

The purpose of the current study was to gain a better understanding of MPA and its relationship to parenting style and SPS.

First, significant positive correlations were found between MPA and parenting style as well as for all three FDEB subscales Indifference, Over-Control, and Abuse. When comparing the mothers' and fathers' behaviour, only small differences in the magnitude of the correlations were found. Nonetheless, the ratings on the fathers' behaviour were slightly higher compared to the mothers' behaviour. These findings were further confirmed when running a main-effects analysis to investigate this relationship in more depth. The abusive parenting style seemed to have the greatest impact, closely followed by the over-controlling style of upbringing. Taken together, these findings provide evidence for a clear link particularly between the abusive and over-controlling parenting style and MPA. In comparison, a previous study only ascertained a weak dependency between parental behaviour and MPA (Wiedemann et al., 2020). However, they considered the mother's influence to be greater compared to the father's behavioural impact. Although MPA per se has not yet been intensively studied specifically in relation to an indifferent, over-controlling, or abusive parenting style, there is evidence in accordance with the present findings that exposure to sexual and physical abuse before the age of 16 is linked to higher levels of anxiety traits later in life (Lindert et al., 2014). Liss et al. (2005) further ascertained that low levels of parental care and high levels of over-protection were related to higher levels of anxiety. In many ways, it seems plausible that negative experiences—particularly those related to one's primary caregiver—can influence the experience of situations in which one is exposed to many opinions and overall performance pressure. Performing on stage can be something very personal, very intimate, in which a lot is about self-assertion. Assumably, a lack of self-esteem and arising self-doubts due to relationship instabilities could have a decisive influence on whether or not performing on stage is perceived as a comfortable experience.

Secondly, the results yielded significant positive correlations between MPA and SPS globally as well as for all three HSPS-G subscales EOE, AES and LST. The link between SPS and MPA was moreover affirmed by a main-effects analysis. Our findings thus suggest that the more sensitive a musician was, the higher the experienced level of MPA appeared to be. Correlations were especially high for the two subscales EOE and LST. Running a multiple linear regression of the HSPS-G subscales confirmed a particularly strong impact of the subscale EOE. All in all, these findings are in line with the literature, as the factor EOE embodies one's overstimulation in regard to internal and external stimuli (Konrad

& Herzberg, 2017). It can be assumed that someone who is already more sensitive compared to the general population reacts even more intensely to extreme stimulation in an exposed performance situation. As a result, staying present in the moment, being fully focused, and performing at one's best can become even more difficult and overwhelming. Our findings are consistent with the results of other studies reporting increased levels of anxiety when being highly sensitive (Liss et al., 2005; Neal et al., 2002) and demonstrate the first direct link between SPS and heightened anxiety experienced among musicians in the context of musical performances.

Thirdly, a moderation analysis was run to investigate a possible interaction effect between parenting style and SPS on MPA. Results did not show any significant moderating effect and revealed SPS as a non-moderator in regard to the relationship between parenting style and MPA. Although there is a possibility that the moderation effect is truly zero in the general population, there is nevertheless evidence in other areas of psychological functioning that the interaction of environmental influences and individual traits influence psychological outcomes. For instance, Booth et al. (2015) found that highly sensitive children who had been exposed to negative childhood experiences reported lower levels of overall adult life satisfaction compared to less sensitive individuals. Yet, the present finding is consistent with the results of a study examining the interaction between parenting style and SPS on depression and anxiety, revealing an interaction effect between low care and SPS for depression, but not for anxiety itself (Liss et al., 2005).

To sum up, no significant interaction between parenting style and SPS on MPA was found. However, the present results indicate that abusive and over-controlling parenting as well as enhanced sensitivity may operate individually as risk factors increasing MPA.

Limitations

To begin with, the data were collected during the Covid-19 pandemic. In a time when performing on stage is impeded due to several security and health restrictions, examining MPA raises the risk of response bias. Although participants were asked to consider the time before the Covid-19 pandemic when answering items enquiring MPA, it is possible that past restrictions and current burdens do have a non-negligible impact on the outcomes. For instance, studies investigating the Covid-19 pandemics' impact on psychological well-being and anxiety reported increased levels of anxiety (Schwinger et al., 2020; Skoda et al., 2021). Enhanced isolation, perceived job uncertainties, and insecurities related to the future may increase anxiety tendencies and sensitivity especially among professional musicians. Moreover, it is important to take into account that performing on stage is part of a musician's job, where admitting to vulnerability and nervousness is rather undesirable in a demanding society that strives for perfection. On the account of maintaining one's desired image, socially desirable answering cannot be completely ruled out (King & Bruner, 2000). Further, the sample of this study was limited to practicing musicians only and did not consider musicians who may have been discouraged of pursuing their musical career due to a high degree of MPA (Braden et al., 2015). Due to the self-selection of participants, a distortion of the present results is therefore possible. Finally, it is evident that the majority of the sample were women. On the one hand, studies disagree on the extent to which gender plays a role in the emergence of MPA (Dempsey & Comeau, 2019; Kenny, Driscoll, & Ackermann, 2014; Papageorgi, 2022; Robson & Kenny, 2017; Ryan 2004). On the other hand, research suggests that females are supposed to display higher traits of SPS (Herzberg et al., 2021). Considering an overrepresentation of the female gender in this sample and gender-related differences in the sensitivity trait, one needs to be cautious when generalizing these findings.

Future Research and Practical Implications

As a next step, it would be useful to extend the current findings by addressing other sample demographics and music-related characteristics in more detail and in coherence to the examined variables. There is evidence that sensitivity increases with age and that great musicians end their musical career because of experiencing excessive levels of MPA (Fernholz et al., 2019; Herzberg et al., 2021). There is further indication that years of musical training and accomplishments seem to only have little influence on MPA's emergence (Kenny, 2011). Future research could provide more information about, for instance, to what extent age and stage experience affect the emergence of MPA.

Moreover, there is preliminary evidence that situational variables must be taken into account when examining MPA, as the experienced anxiety is shaped by external circumstances. Studies have shown that especially singers showed increased stress responses in the presence of an audience and that auditions are particularly prone to provoking high levels of anxiety (Fancourt et al., 2015; LeBlanc et al., 1997). Further, solo performances seem to provoke more anxiety compared to group performances (Cox & Kenardy, 1993; Spahn et al., 2016). Papageorgi et al. (2007) also argued that MPA must be viewed as a time-bound construct, as its intensity varies throughout a performance situation. To add, early musical learning experiences and student-teacher atmosphere can have a decisive influence on the development of MPA (Osborne & Kenny, 2008; Patston & Osborne, 2016). Research has shown that teachers who promoted young musician's autonomy instead of displaying controlling behaviour supported the development of healthy musical passion and enhanced pupils' overall perseverance (Bonneville-Roussy et al., 2013). Future studies will have to explore performance circumstances and contexts more specifically and investigate in greater detail other intriguing questions like the role of musical genre, instrument, differences in musical training, coping strategies, type of performances, and learning experiences.

As the assessment of parenting style is limited to three different styles of parental behaviour—Indifference, Over-Control, and Abuse—future studies should examine various parenting styles and parental influence more extensively. A very recent study investigating 62 piano students found that parents' participation in the students' musical journey was not significantly associated with MPA. However, self-esteem, age, rehearsal times and parents having a musical background seem to play a role with regard to MPA's emergence (Ryan et al., 2023). In sum, many questions of how parents' involvement affects the development and occurrence of MPA remain unanswered. Finally, it would be revealing to examine the relationship between MPA and other temperamental traits, such as for example persistence, regularity, or adaptability.

Eventually it is important to stress once more the fact that MPA is a complex phenomenon affected by a variety of internal and external influences. The present study is an attempt to expand current knowledge, aiming to generate theoretical and practical implications. The treatment and prevention of MPA has gained more and more attention in the literature. There are indications that cognitive behavioural therapy works particularly well, and a combination of different therapeutic approaches are increasingly becoming the center of interest (Matei & Ginsborg, 2017). For instance, Steyn et al. (2016) found an increase in music students' well-being when combining mindfulness and psychological skill training. Supposing that parenting style does not influence the experience of MPA decisively underlines the assumption that treatments focused on the present might be more beneficial. Therapeutical methods like realistic self-appraisal, modification of maladaptive thoughts, systematic desensitization, mindfulness, and attention training may be helpful to reflect anticipatory expectations and to increase self-confidence and trust in one's own ability (Juncos et al., 2017; Nagel et al., 1989; Norton et al., 1978; Spahn et al., 2016). Furthermore, with regard to the effectiveness of treatments, possessing a higher level of sensitivity brings important advantages—even though at first sight, it may seem rather

unfavorable as SPS is supposed to promote the development of MPA. Studies found that highly sensitive individuals respond and benefit even more from therapeutic interventions as they react more intensely to positive influences overall (Nocentini et al., 2018; Pluess & Boniwell, 2015). Using this trait to one's advantage may not only reduce the fear of performing on stage, but even enhance the performance experience itself: experiencing intense feelings and emotions, while at the same time being more present in the moment than ever before.

Conclusion

The present study enhances our understanding of the relationship between MPA, parenting style, and SPS. Our results emphasize that environmental influences as well as individual traits need to be considered when investigating the development and occurrence of MPA. Findings indicate that parenting style as an environmental factor has an effect on how musicians experience and cope in performance situations. In addition, this study provides evidence of a strong positive association between the temperamental trait SPS and MPA. Future research should investigate MPA in relation to other relevant constructs, while also examining the ambivalent nature of sensitivity, which simultaneously supports an artist's creative process and potentially increases the adverse effects of MPA. This will provide a deeper understanding of MPA and pave the way for therapeutic interventions. Ultimately, these will offer better psychological support, enhance performers' well-being and, above all, support musicians and prevent them from quitting what they love most: performing on stage—for the audience, but especially for themselves.

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Competing Interests

The authors have declared that no competing interests exist.

Ethics Statement

The present study was conducted in accordance with ethical principles and standards. It was reviewed and approved by the Ethics Committee of the Department of Psychology at Humboldt-Universität zu Berlin (No. 2021-49).

Data Availability

The research data for this article are freely available (Aubry & Küssner, 2023).

Supplementary Materials

For this article, the following Supplementary Materials are available (for access, see Index of Supplementary Materials below).

- Codebook
- Data

Index of Supplementary Materials

Aubry, L., & Küssner, M. B. (2023). *Supplementary materials to "Music performance anxiety and its relation to parenting style and sensory processing sensitivity"* [Data set]. PsychArchives. https://doi.org/10.23668/psycharchives.12611

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