

Social Stress Task With Parental Support or Self-Instruction Decreases Negative Cognitions in Children With Social Anxiety Disorder

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Supplementary Information

Results With Age as a Covariate

To account for possible age effects, we provide additional results for the main effects and interaction effects regarding the cognitive processes (AR positive, AR negative, SFA, external focus, PEP positive, and PEP negative), controlled for age in months. It should be noted that the influence of age was not a primary research question in this study. The present results are therefore exploratory and should be interpreted cautiously due to the post-hoc nature of the analyses.

Analysis / Statistics

Statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 29.0.2.0. The level of significance was set at $\alpha = .05$ for all statistical analysis. Children were excluded from an analysis if $\geq 50\%$ of responses were missing in the corresponding questionnaire.

For additional analyses, mixed ANOVAs with Group (SAD, HC) as the between-subject factor and Session (T1, T2) as the within-subject factors and age (in months) as a covariate were conducted. The Greenhouse-Geisser adjustment was used to correct for violations of sphericity. Since ANOVAs with repeated measures are relatively robust against violations of the normal distribution assumption¹, no corresponding corrections were made in case of a violation of normal distribution. Due to multiple testing, the alpha level was adjusted according to Bonferroni-Holm².

A post-hoc power analysis was conducted using G*Power³, assuming a small effect size ($f = 0.25$) and a type 1-error rate of $\alpha = .05$ for an ANCOVA with fixed effects, main effects, and interactions. Considering the given sample of $N = 91$ with 4 groups (2x2 measurements) and $df = 1$, the power analysis revealed a power of 65.48%.

Main Analyses

As shown in Supplementary Table S1, the analyses revealed significant main effects for Group for all dependent variables except AR positive and PEP positive. Main effects for Session and Age were

SUPPLEMENTARY INFORMATION

not significant (both $ps > .05$). We found no interaction effects for Group x Session and Session x Age (all $ps > .05$; see Supplementary Tab. 2). For post-hoc analyses refer to the main manuscript.

Brief Discussion

Taking age into account, we still found differences between children with SAD and children without SAD regarding negative cognitive processes (AR negative and PEP negative) and the reported allocation of attention (SFA, external focus). In contrast to the results in which age was not considered, the analyses with age as a covariate no longer showed any difference regarding positive cognitive processes (AR positive and PEP negative). Additionally, we no longer found a main effect of Session, which was significant for all cognitive processes examined when not taking age into account.

However, given the post-hoc nature of the analyses and the low statistical power, the results should be interpreted with caution. We planned and preregistered a study procedure with the aim to compare children with SAD and children without SAD at a similar age when the disorder first emerges⁴.

Based on the results in the supplements, a difference between the groups would further emphasize the relevance of negative cognitive processes and reported attention allocation in children with SAD. However, the assumption that the cognitive processes can be changed by a second stress task with parental support or self-instruction, contrary to the model of Clark and Wells⁵, could no longer be supported. Furthermore, we could not confirm the relevance of positive AR and positive PEP, which would be in line with the theoretical assumption that children with anxiety disorders show no difference in positive cognitions in comparison to children without anxiety disorders⁶. As age may have a relevant influence on whether changes in cognitive processes occur, further studies on cognitive processes over the course of development in children with SAD are necessary.

Supplementary Table S1*Main Effects of ANOVAs with Age as a Covariate*

Dependent variable	<i>M (SD)</i>				<i>F tests</i>								
	SAD		HC		Group			Session			Age		
	T1	T2	T1	T2	<i>F</i> ^a	<i>p</i>	η_p^2	<i>F</i> ^a	<i>p</i>	η_p^2	<i>F</i> ^a	<i>p</i>	η_p^2
AR positive	0.717 (0.759)	1.101 (0.867)	1.288 (1.071)	1.369 (1.083)	4.707	.792	.051	0.186	> .999	.002	0.328	> .999	.004
AR negative	3.253 (1.143)	2.701 (1.430)	1.421 (1.043)	0.994 (1.084)	58.043	.030	.400	0.884	> .999	.010	0.065	> .999	.001
SFA	2.266 (0.871)	1.885 (0.917)	1.268 (0.826)	1.102 (0.767)	24.973	.030	.223	2.174	> .999	.024	1.725	> .999	.019
External focus	1.647 (0.931)	1.421 (1.047)	0.861 (0.771)	0.771 (0.757)	16.352	.030	.158	5.143	.650	.056	0.276	> .999	.003
PEP positive	0.739 (0.777)	1.107 (1.022)	1.253 (1.210)	1.496 (1.249)	3.442	> .999	.043	0.125	> .999	.002	0.818	> .999	.011
PEP negative	3.104 (1.295)	2.654 (1.442)	1.054 (0.984)	0.748 (1.008)	63.095	.030	.450	0.132	> .999	.002	0.63	> .999	.001

Note. SAD = Social anxiety disorder group. HC = Healthy control group. T1 = Session 1. T2 = Session 2. AR positive and AR negative measured by *TQ-C AR*^{7,8}, range: 0-5. SFA and External focus measured by *FAQ*^{9,10}, range: 0-4. PEP positive and PEP negative measured by *TQ-C PEP*^{11,12}, range: 0-5. Corrected *p*-values according to Bonferroni-Holm².

^a *F*(1,88) for AR positive, AR negative, SFA and External Focus. *F*(1,78) for PEP positive and PEP negative (difference due to missing data).

Supplementary Table S2*Interaction Effects of ANOVAs with Age as a Covariate*

Dependent variable	<i>M (SD)</i>				<i>F tests</i>					
	SAD		HC		Group x Session			Session x Age (in months)		
	T1	T2	T1	T2	<i>F</i> ^a	<i>p</i>	η_p^2	<i>F</i> ^a	<i>p</i>	η_p^2
AR positive	0.717 (0.759)	1.101 (0.867)	1.288 (1.071)	1.369 (1.083)	2.812	> .999	.031	0.017	> .999	.000
AR negative	3.253 (1.143)	2.701 (1.430)	1.421 (1.043)	0.994 (1.084)	0.142	> .999	.002	0.142	> .999	.002
SFA	2.266 (0.871)	1.885 (0.917)	1.268 (0.826)	1.102 (0.767)	4.350	.920	.048	0.793	> .999	.009
External focus	1.647 (0.931)	1.421 (1.047)	0.861 (0.771)	0.771 (0.757)	0.334	> .999	.004	6.535	.312	.070
PEP positive	0.739 (0.777)	1.107 (1.022)	1.253 (1.210)	1.496 (1.249)	0.304	> .999	.004	0.002	> .999	.000
PEP negative	3.104 (1.295)	2.654 (1.442)	1.054 (0.984)	0.748 (1.008)	0.490	> .999	.006	0.005	> .999	.000

Note. SAD = Social anxiety disorder group. HC = Healthy control group. T1 = Session 1. T2 = Session 2. AR positive and AR negative measured by *TQ-C AR*^{7,8}, range: 0-5. SFA and External focus measured by *FAQ*^{9,10}, range: 0-4. PEP positive and PEP negative measured by *TQ-C PEP*^{11,12}, range: 0-5. Corrected *p*-values according to Bonferroni-Holm².

^a *F*(1,88) for AR positive, AR negative, SFA and External Focus. *F*(1,78) for PEP positive and PEP negative (difference due to missing data).

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