

Information S1

Accordance of the playfulness criteria based on mothers' free descriptions with playfulness models in children and youth

Method

We had the free texts rated by two external student raters to the extent they match with the existing playfulness models known for children and youth. This is the Liebermann model [7; further developed by 2] with the five playfulness dimensions physical, social, and cognitive spontaneity as well as manifest joy and sense of humor (see also section introduction) and the OLIW-model [8,31] with the playfulness dimensions Other-directed, Lighthearted, Intellectual, and Whimsical (see also section introduction). Therefore, we first assigned our playfulness characteristics tentatively to these playfulness models. These assignments are displayed in Table S2.1.

Table S2.1

Tentative assignments of the playfulness characteristics to the existing Playfulness models in children and adolescents.

Playfulness model: Proyer [8; OLIW]; 31 [OLIW-Youth]

OLIW_O	OLIW_L	OLIW_I	OLIW_W
1. actively initiating humor	5. carelessness	3. widespread interests	13. enjoying to fool around and be silly
2. playful exchange with others	6. risk-taking	4. active and explorative behavior	14. own style
	7. need for movement	9. creativity	15. willpower
	8. urge to talk*	10. imagination	
		11. cognitive spontaneity	
		12. to do things on his/her own in a playful way	

Playfulness model: Lieberman [28,35; extended by 2]

Physical Spontaneity	Social Spontaneity	Cognitive Spontaneity	Manifest Joy	Sense of Humor
4. active and explorative behavior	2. playfull exchange with others	3. widespread interests	5. carelessness	1. actively initiating humor
7. need for movement	15. willpower	9. creativity	8. urge to talk	13. enjoying to fool around and be silly
6. risk-taking**		10. imagination	12. to do things on his/her own in a playful way***	
		11. cognitive spontaneity		
		(12. to do things on his/her own in a playful way***)		
		14. own style		

Note. * Due to its social component, this characteristic can alternatively be assigned to other-directed playfulness. ** According to our analysis, this characteristic does not fit very well into this playfulness model. *** Due to the descriptive characteristic of quality, this characteristic can also be assigned to Cognitive Spontaneity.

For the ratings, in each model and for each playfulness dimension, one item was selected to represent this dimension. Items were selected according to selectivity and usability for children descriptions. The external raters had to decide the extent to which the content of this item/dimension was reflected in the mothers' free descriptions. The representative items are displayed in Table S2.2.

Table S2.2

The playfulness items selected for external ratings according to two playfulness models

Playfulness dimension	Selected item
<i>Playfulness model: OLIW [8,31]</i>	
Other-directed	He/she has close friends with whom he/she can just fool around und be silly.
Lighthearted	He/she is a lighthearted person.
Intellectual	If he/she has to learn something new under time pressure, he/she tries to find a playful way to think about the topics—this helps him/her learn.
Whimsical	He/she likes to swim "against the stream."
<i>Playfulness model according to Liebermann [7; extended by 2]</i>	
Physical Spontaneity	The child engages in spontaneous physical movement and activity during play.
Social Spontaneity	While playing, the child shows flexibility in his/her interactions with the surrounding structure.
Cognitive Spontaneity	The child shows spontaneity during expressive and dramatic play.
Manifest Joy	The child does show joy in or during his/her play activities.
Sense of Humor	The child shows a sense of humor during play.

Note. Items of the OLIW-model ranged from 1 ('not at all') to 7 ('totally agree') and of the Liebermann/Barnett-model from 1 ('doesn't sound at all like the child') to 5 ('sounds exactly like the child').

Results

For the OLIW-model, in general, the playfulness characteristics based on mothers' free descriptions are reflected in the dimensions of the OLIW-model. We obtained small to middle associations (Table S2.3), whereby for three out of four dimensions (Other-directed, Lighthearted and Whimsical playfulness), the correlations within the dimensions are numerically higher than the correlations with other dimensions. However, there are significant associations with other dimensions (e.g., Intellectual playfulness).

Table S2.3

Accordance of the obtained playfulness characteristics (dimensions) with the existing playfulness models (based on external ratings)

Playfulness model: Proyer [8; OLIW]; [OLIW-Youth; 31]					
Dimensions	O	L	I	W	
External ratings					
O	.39***	.18*	.25***	.05	
L	.09	.22**	.15*	.07	
I	.22**	.26***	.24***	-.05	
W	-.02	.22**	.10	.23**	

Playfulness model: Lieberman [28,35; extended by 2]					
Dimensions	Physical S	Social S.	Cognitive S.	Manifest Joy	Humor
External ratings					
Physical S.	.44***	.01	.02	.07	.01
Social S.	.00	.43***	.14*	.07	.17*
Cognitive S.	.09	.24***	.63***	.37***	.12
Manifest Joy	.27***	.08	.21**	.14*	.24***
Humor	.18*	-.01	.11	.10	.64***

Note. Dimensions = are based on tentative assignments of the playfulness characteristics to the playfulness dimensions of the playfulness models. External ratings = mean ratings of two independent student raters based on 1-item for each playfulness dimension (see Table 4).

S.=Spontaneity.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.