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CHANGES OF 1ST GRADE SCHOOL CHILDREN'S EMOTIONAL AND SOCIAL COMPETENCES IN TANZPRO-BIODANZA INTERVENTION GROUP

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Abstract. *The aim of this study is to investigate changes of 1st grade school children's (age 6 - 7) emotional and social competences in TANZPRO-Biodanza intervention group. In total 22 sessions were carried out during the school year 2014 / 2015 - from the beginning of October, 2014 until the end of May, 2015. The Emotion Questionnaire (Rydell et al., 2003) parents' version was used to evaluate emotional competence – emotionality and emotion regulation. Prosocial scale, Internalizing and Externalizing scale of The Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997) parents' versions were used to measure social competence, i.e., prosocial behaviour and nonexistence of behavioural problems. Testing was performed in 3 time points – before intervention, after 10 sessions, and after intervention. Pre and post intervention results of social and emotional competence revealed different changes of experimental (n = 10) and control (n = 9) group pupils. Experimental group pupils showed statistically significant improvement in emotion regulation outcomes, prosocial and internalizing behaviour, but control group pupils showed decrease in emotion regulation outcomes and increase of internalizing behaviour. Both between-group and within - group analysis indicated, that internalizing behaviour results have most pronounced changes. Repeated measures ANOVA and Post hoc test with Bonferroni adjustment revealed statistically significant time effect for experimental group pupils ($F(2,18)=4.81$, $p=0.02$, $\eta2=0.35$) and tendency level with 90 % probability for control group pupils ($F(2,16)=3.40$, $p=0.06$, $\eta2=0.30$). Saliva cortisol showed decrease in pre and post levels, in some sessions achieving level of significance.*
Keywords: *dance, elementary school children, emotional competence, emotion regulation, intervention, saliva cortisol, social competence, TANZPRO-Biodanza.*

Introduction

Many scientists emphasize importance of social and emotional competences in child's development and stress that emotional competence is an established predictor of both social and behavioural outcomes (Izard, 2002; Trentacosta et al., 2006; Rydell et al., 2003), and emphasize the need for greater

presence in schools of preventive social and emotional competences enhancement programs. Middle childhood is a developmental period of substantial social transition, during which children enter school, become active members of peer groups, and establish dyadic friendships, what brings them in new social situations, with new social demands, in which the ability to manage emotions effectively can be particularly critical for establishing long-term success in peer relationships (Blair et al., 2015). High level of school adjustment is strongly associated with the development level of social and emotional competences, and the level of social and emotional development represents one of the important factors for ensuring a successful adjustment to the exposed educational demands (Magdalena, 2013).

Transit from kindergarten to primary school is difficult adaptation period for children and creates in children great emotional experiences/challenges (Černova, 2008). Necessity for emotional and social competences enhancing interventions for 1ˢᵗ grade children were also noted by Latvian elementary education evaluation, which indicated that elementary school children do not receive adequate support to social adaptation (Āboltiņa, 2011).

The author of differential emotion theory C.E. Izard emphasizes that the complexities of contemporary life place great demands on emotion systems, which are critical to evolution and adaptation, and that the socialization and nurturing of emotions, may often prove inadequate, which creates the need for emotion-centered preventive interventions, and many psychology-based prevention programs have proven effective in enchancing mental health or social and emotional competences and preventing behaviour problems (Izard, 2002).

TANZPRO-Biodanza® is evidence based dance/movement and emotion oriented program, which one of aims is to enhance communication and cooperation with others in empathic and tolerant way and is part nonverbal part of School of Empathy (for details see Stueck et al., 2013), and authors of the program (Stueck et al., 2010) note that it could be used in schools to support learning processes.

The purpose of this study was to examine changes of 1ˢᵗ grade school children's social and emotional competences in TANZPRO-Biodanza intervention group.

Problem of research

Although theoretically, dance may play a role in development of children's social competence and prosocial behaviour by serving as another cultural tool that can be internalized by the child and used for self-control and self-regulation, intervention programs for development of social and emotional competences typically offer structured activities and curricula that focus on verbal and

cognitive reflection regarding interpersonal encounters in the context of hands-on activities (Lobo & Winsler, 2006). Lobo and Winsler emphasise the lack of empirical studies of dance/movement interventions in children's development literature and in their empirical study examined intensive 8 week (2 sessions per week) creative dance/movement intervention program on the social competence of preschool children, and results revealed significantly greater positive gains over time in the children's social competence and both internalizing and externalizing behavior problems for the experimental group compared with the control group (Lobo & Winsler, 2006).

Authors of this study also found that there is lack of scientific research in the area of dance/movement and emotion based interventions, specifically for school 1st grade children's social and emotional competences development, therefore will continue this discussion by describing TANZPRO-Biodanza intervention comparing it to 7 principles for developing preventive emotion based interventions (for children up to 12 years) intended to enhance social and emotional competences and prevent the development of behaviour problems and psychopathology proposed by C. Izard (see Izard, 2002).

TANZPRO-Biodanza® is dance/movement oriented evidence based method (for details see Stueck et al., 2013), which was developed based on Rolando Toro Biodanza method – non-verbal and self-regulative emotion-dance- and contact-oriented intervention to improve emotional and social competences (Stueck, 2011), which comprehends itself as emotional training which makes it possible to experience the importance of emotions and to use them for an adequate organisation of one's own behaviour (Stueck et al., 2010). According to Izard (Izard, 2002), emotions are organizing and motivational factors in human functioning, which can facilitate behavioural change and the development of social and emotional competences.

In accordance with Biodanza theory, Biodanza sessions especially stimulate the limbic-hypothalamic system and causes endocrinological, vegetative and immunological reactions, using a variety of neurotransmitters, resulting in possible changes of experience and behaviour, which in turn can have effect of the body (see Figure 1, Stueck et al., 2007, Stueck, 2007). Special effect is the modulation and balancing of different emotions (improved regulation of anger, optimism, reduction of depression) (Stueck, 2011).

Self-regulatory potential of TANZPRO-Biodanza® sessions also applies to children's autonomic system, and assumption is that it will have not only psychological but also physiological effects. Previous research of TANZPRO-Biodanza® for elementary school students (age 7–8) has demonstrated decrease of saliva cortisol levels after the TANZPRO-Biodanza TANZPRO-Biodanza® sessions (Jaeger & Vogelsang, 2011).
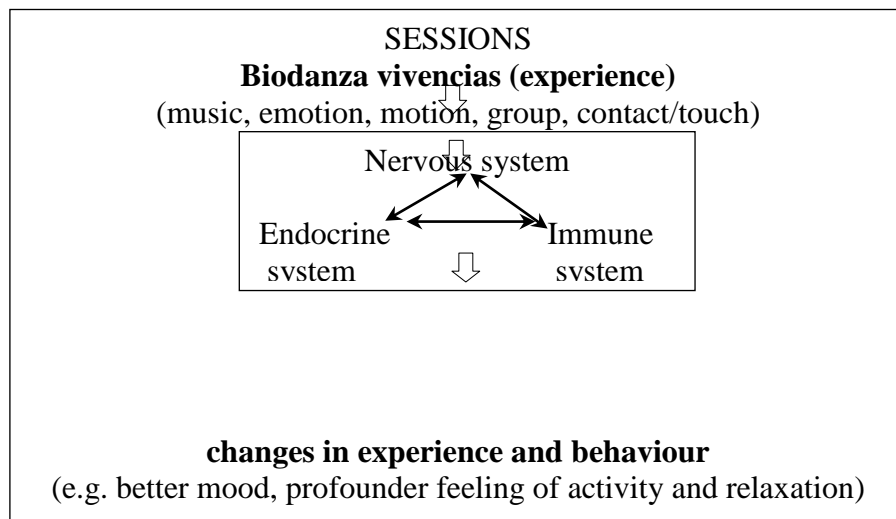
Figure 1 **The theoretical framework chain of effects in Biodanza.**
(Stueck, et al., 2007; Stueck, 2007)

Quasi-experimental studies designed to improve relationships, environments, or psychosocial functioning in children show that cortisol activity can be altered by psychosocial interventions and suggests that psychosocial interventions hold promise for promoting healthy regulation of physiologic stress-response systems in children and potentially preventing the onset of health problems later in life (Slopen et al., 2014). Taking into account the important role that the HPA axis plays in 'transducing' subjective social-environmental experience into physiological changes relevant to health (Adam & Kumari, 2009), saliva cortisol is one of the most common stress biomarkers within pediatric research (Slopen et al., 2014).

In this study we will analyse changes of pre and post intervention session saliva cortisol levels. Taking into account school children's likely accumulated tension in the first half of the school day, when the most intensive learning is in process, and that the irregular daily stress tend to result in increased cortisol levels (Adam, 2012), our assumption is, that saliva cortisol level after intervention will decrease. This result we base in assumption, that by implementation of the objectives of the intervention, will increase children's social and emotional competences, mutual relations, cooperation, support, empathy, and altogether will improve overall children's social environment in the classroom. Social context plays a powerful role in contributing to and buffering acute cortisol reactivity, with social threat being an important ingredient for acute cortisol increase, and positive social relationships may serve as effective buffers of cortisol reactivity (Adam, 2012).

Triggering positive emotions and improving emotion regulation are essential elements and aims of TANZPRO-Biodanza® (Stueck et al., 2013).

Izard emphasises in such programs also considerations of more global emotion related concepts such as attachment, sociomoral values, prosocial orientation, and caring community.

Research results

This study investigated changes of emotional and social competences of 1st grade school children in TANZPRO-Biodanza intervention group.

Participants. Participants were elementary school 1st grade children (ages 6.75 − 7.67 at the beginning of the research) from classrooms 1x and 1y. All together there are tree 1st grade classrooms in this school. Selecting the study sample we considered the affecting factors and selected the children from classrooms 1x and 1y, based on following factors - numbers of children in the classroom, teachers experience and classrooms location in the school. For selected classes these factors were the closest − 27 children in the classroom, teachers experience >10 years and similar teaching style (according teachers evaluation). Both classes are located in the same floor next to each other.

Experimental group (participated in the intervention sessions) - classroom 1x children. From 27 children, 23 participated in the intervention sessions. Participation in research was voluntary and from 19 parents, who agreed to participate in the testing (evaluating children's emotional and social competences), only 12 parents submitted questionnaires in all 3 research phases, from which only 10 were valid. So experimental group consist of 10 children − 7 boys (M=7.15, SD=0.30; age min=6.92, max 7.67) and 3 girls (M=7.34, SD=0.09, age min=7.25, max7.42).

Control group (no intervention) − classroom 1y children. From 27 children's parents 12 agree to participate in research, from which 9 submitted valid questionnaires in all 3 research phases. So control group consist of 9 children − 6 boys (M=7.18, SD=0.25; age min=6.75; max=7.42) and 3 girls (M=7.11, SD=0.24; age min=6.38; max=7.25).

Measures. In this study emotional competence was conceptualized as emotionality and emotion regulation. Social competence was conceptualised as prosocial behaviour and nonexistence of behavioural problems.

The Emotion Questionnaire (Rydell et al., 2003, Latvian version Grivza, Brudere-Ruska, Raikova) parents' version was used to evaluate emotional competence − emotionality and emotion regulation. Prosocial scale, Internalizing and Externalizing scale of The Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997, Latvian version Kristīne Līvena, Sandra Sebre, Marika Bērtule, Ņina Karagodina, Ieva Mālkalniete-Čelika) parents' versions were used to measure social competence, i.e., prosocial behaviour and nonexistence of behavioural problems − internalized and externalized behaviour

(Goodman et al., 2010). Cronbach's alphas and descriptive statistics are presented in Table 1 and Table 2.

Saliva cortisol measures. Saliva samples were collected before and after four sessions (for 1st, 5th, 10th, 22nd session). Participation in this test was based on voluntary basis. 10 children (5 boys, 5 girls) volunteered to participate. Saliva were collected from children using cotton rolls and placed in special containers. Saliva samples were frozen and using special cold container transported to Germany, where samples were analysed in Leipzig Immunological Institute in cooperation with Saxony University of Applied Sciences Leipzig (DPFA-Zwickau). For saliva sample testing saliva cortisol IBL International Cortisol Saliva ELISA kit was used (for more detail see www.IBL-International.com). 8 children (4 boys, 4 girls) saliva samples were valid for testing, 2 children data were not valid due to insufficient saliva volume in the sample.

Data analysis. For all statistical comparisons Kolmogorov-Smirnov test for normal distribution were performed. For social and emotional competences changes data were analysed in three phases: T1 – before intervention, T2 – after 10 intervention sessions, T3 – after all (22) intervention sessions. Taking into account small sample size (n<50), between group comparisons were done using t-Test for independent groups, within-group comparison of changes were done using t-Test for related groups. Analysis was done using SPSS 22 programme.

Results.

Emotionality was measured with questions regarding the frequency and intensity of reactions (Rydell et al., 2003). t-Test results (Table 1) shows that there are no statistically significant differences between groups in emotionality outcomes between the two groups. The results suggest that both groups are similar in emotion expression intensity, i.e. emotionality. However, statistical data indicate that average scores of anger, fear and sadness emotionality of experimental group children decrease, but for control group children increase. After intervention differences in anger emotionality reached statistically significant tendency level with 90 % probability (p<0.1) between experimental group children's and control group children's outcomes.

Emotion regulation results (Table 2) show that experimental group children show increase of all four emotion regulation (anger, fear, positive emotions-exuberance, sadness) outcomes, but control group children show decrease of all four emotion regulation outcomes. Between-group t-Test results show, that before intervention there are no statistically significant differences in emotion regulation scores, but after intervention there are statistically significant differences between experimental group and control group children in anger, positive emotions-exuberance, sadness regulation and overall emotion regulation, and fear regulation show differences in tendency level with 90 %

probability (p<0.1). Effect size of all differences can be evaluated as strong, because d' >0.8 (Cohen, 1988).

Table 1 **Cronbach's alphas, parent ratings of children's emotionality before intervention (T1), after 10 sesions (T2) and after intervention (T3), and t-Test results of between - group differences**
(Note: [+]p<0.1 Notations: M – Mean, SD – Standard Deviation.)

Variables	Time	Cronbach's α	Experimental group (n=10)		Control group (n=9)		t	p
			M	SD	M	SD		
Anger emotionality	T1	0.648	2.58	0.76	2.83	1.01	0.63	0.54
	T2	0.783	2.83	1.10	3.03	0.86	0.42	0.68
	T3	0.792	2.43	0.81	3.22	1.12	1.79[+]	0.09
Fear emotionality	T1	0.629	2.63	0.69	2.39	1.07	0.58	0.57
	T2	0.634	2.83	0.83	2.78	0.89	-0.12	0.91
	T3	0.847	2.20	0.96	3.03	1.19	1.68	0.11
Positive emotions-exuberance emotionality	T1	0.802	3.95	0.71	3.75	1.03	-0.50	0.63
	T2	0.673	3.93	0.77	3.50	0.63	-1.31	0.21
	T3	0.816	3.95	0.98	3.72	0.62	-0.60	0.56
Sadness emotionality	T1	0.487	2.78	0.51	2.53	0.86	-0.77	0.45
	T2	0.556	2.60	0.57	2.75	0.98	0.40	0.69
	T3	0.589	2.43	0.84	2.89	0.80	1.23	0.24

Assumption of this research was that experimental group will show increase in social competence outcomes, i.e., increase in prosocial behaviour scores and decreased in externalized and internalized behaviour scores. Experimental group children's outcome after intervention showed increase in prosocial behaviour, but control group children's prosocial behaviour did not change over time. Externalized behaviour showed differences in both group results before and after intervention, but after intervention increased statistical significance of these differences.

Both between-group and within-group analysis indicated, that internalizing behaviour results have most pronounced changes. Repeated measures ANOVA and revealed statistically significant time effect for experimental group pupils ($F(2,18)=4.81$, p=0.02, $\eta^2=0.35$) and statistically significant tendency with 90 % probability for control group pupils ($F(2,16)=3.40$, p=0.06, $\eta^2=0.30$).

Table 2 **Cronbach's alphas, parent ratings of children's emotion regulation and social competence before intervention (T1), after 10 sesions (T2) and after intervention (T3), and t-Test results of between - group differences**
($^+$ p < 0.1; *p<0.05; **p<0.01)

Variables		Time	Cronbach's α	Experimental group (n=10)		Control group (n=9)		t	p	Efect size, d'
				Mean	SD	Mean	SD			
Social competence	Prosocial behaviour	T1	0.813	7.90	1.60	7.22	2.77	-0.66	0.52	0.32
		T2	0.775	8.00	1.56	7.22	2.39	-0.85	0.41	0.41
		T3	0.722	8.90	1.66	7.22	1.99	-2.04$^+$	0.06	0.97
	Internalized behaviour	T1	0.640	3.70	2.79	3.56	2.35	-0.12	0.91	0.06
		T2	0.678	4.10	3.38	4.44	1.94	-0.28	0.78	0.13
		T3	0.685	2.30	1.89	5.56	2.92	2.92**	0.01	1.41
	Externalized behaviour	T1	0.713	6.10	2.08	8.78	3.38	2.10$^+$	0.05	1.02
		T2	0.751	6.10	2.33	8.78	3.46	2.00$^+$	0.06	0.97
		T3	0.756	5.60	2.46	8.67	3.50	2.23*	0.04	1.08
Emotional competence – emotion regulation	Anger	T1	0.489	3.65	0.40	3.59	0.80	-0.20	0.84	0.10
		T2	0.804	3.95	0.72	3.44	0.87	-1.39	0.18	0.67
		T3	0.847	4.10	0.85	3.30	0.73	-2.19*	0.04	1.06
	Fear	T1	0.674	3.52	0.72	3.56	0.96	0.10	0.92	0.05
		T2	0.854	3.96	0.87	3.54	0.81	-1.12	0.28	0.54
		T3	0.847	4.25	0.97	3.48	0.87	-1.81$^+$	0.09	0.88
	Positive emotions-exuberance	T1	0.741	3.75	0.73	3.70	0.66	-0.14	0.89	0.07
		T2	0.875	3.28	0.82	3.28	0.72	-1.98	0.06	0.96
		T3	0.887	4.10	0.73	3.39	0.60	-2.30*	0.03	1.12
	Sadness	T1	0.651	3.87	0.50	3.98	0.76	0.39	0.70	0.19
		T2	0.602	4.00	0.59	3.54	0.59	-1.71	0.11	0.83
		T3	0.814	4.35	0.59	3.59	0.69	-2.59*	0.02	1.26
	Overall Emotion regulation	T1	0.864	3.70	0.45	3.71	0.69	0.05	0.96	0.02
		T2	0.938	3.97	0.66	3.45	0.68	-1.71	0.11	0.83
		T3	0.950	4.20	0.70	3.44	0.63	-2.48*	0.02	1.20

Post hoc test with Bonferroni adjustment was used to analyse within-group differences of internalized behaviour in three time points (see Figure 2). Internalized behaviour outcome of experimental group children increased from pre (T1) level (M=3.70, SD=2.79) to 10 session (T2) level (M=4.10, SD=3.38), and then decreased to post intervention (T3) level (M=2.30, SD=1.80), showing statistically significant differences with pre intervention level (t(9)=2.94, p=0.05, d'=0.93), and statistically significant tendency with 90 % probability

with 10 session (T2) level (t(9)=2.79, p=0.06). Control group children's internalized behaviour outcome was increasing over time from pre intervention (T1) level (M=3.56, SD=2.35) to post intervention level (M=5.56, SD=2.92), showing statistically significant tendency with 90 % probability (t(8)=2.62, p=0.09, d'=0.87).
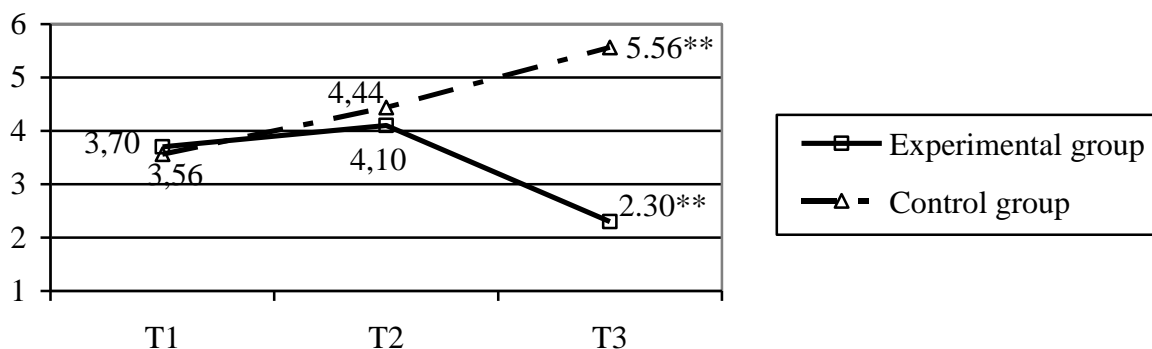
*Note. **p<0.01, T1 – before intervention, T2 – after 10 sessions, T3 – after intervention.*

Figure 2 **Internalized behaviour changes in time**

Saliva cortisol pre and post session level t-Test for paired samples results show decrease in cortisol levels in all sessions, except 10. session, where saliva cortisol level did not change. Decrease in 1. session saliva cortisol level show statistically significant change in pre and post levels.

Table 3 **t-Test results of experimental group children's (n=8) saliva cortisol pre and post session levels**
(*p<0.05)

	Pre	*Post*	*t*	*p*	*Effect size, d'*
	Mean (SD)	*Mean (SD)*			
1. session	0.426 (0.152)	0.307 (0.108)	2.36*	0.05	0.84
5. session	0.312 (0.119)	0.255 (0.107)	0.99	0.36	0.35
10. session	0.333 (0.122)	0.334 (0.182)	-0.02	0.98	-0.01
22. session	0.406 (0.190)	0.303 (0.144)	1.50	0.12	0.53

However, considering saliva cortisol changes of intervention as a whole, the average saliva cortisol levels of all 4 sessions in pre-post comparison showed statistically significant decrease from pre session level (M=0.369; SD=0.149) to post session level (M=0.300, SD=0.135), jo t(31)=2.44, p=0.02, d' =0.43; see Figure 3).
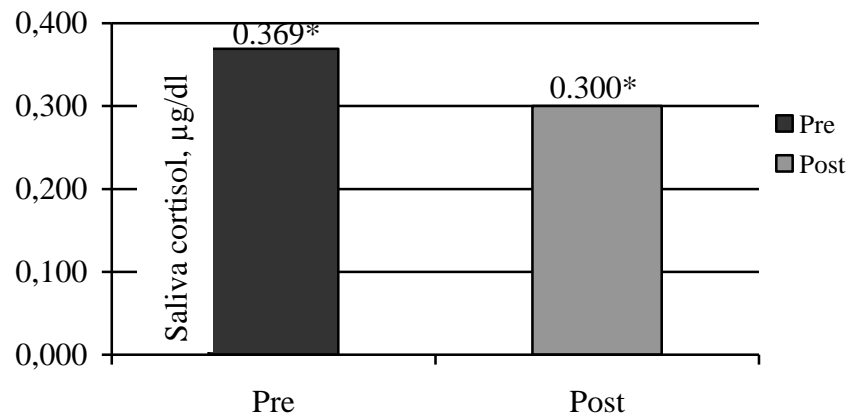
Figure 3 **Averaged saliva cortisol level pre-post changes (*p<0.05)**

t-Test results, comparing boys (n=4) and girls (n=4) saliva cortisol pre and post session levels, did not show statistically significant differences, however girls average levels were lower than boys in all cases. Due to small sample sizes, we did not analyse the data further.

Conclusions

The main purpose of this study was to examine changes of emotional and social competences of 1ˢᵗ grade school children in TANZPRO-Biodanza intervention group. Based on assumption, that interventions with aim to improve social and emotional skills and peer acceptance can contribute to positive social development and hinder development of problematic behaviour, our hypothesis was that experimental group children compared to control group children will have greater gains in development of social and emotional competences. The results show the following emotional competence changes.

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