

Body image in autism: An exploratory study on the effects of dance movement therapy

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Abstract

Body image has rarely been investigated in Autism Spectrum Disorder. Recent advances in embodiment research on nonverbal improvements in Autism Spectrum Disorder have encouraged the investigation of this topic. In the context of the clinical study of autism and schizophrenia in the Heidelberg Node of the TESIS-network, we investigated the effects of dance movement therapy (DMT) on body image in autism with the Body-Image-Sculpture-Test a projective test from clinical body psychotherapy. We applied the Body-Image-Sculpture-Test as a primarily nonverbal test in which the participants' task was to form a human figure from clay within ten minutes and without visual feedback. Ten young adults with autism spectrum disorder participated in the Body-Image-Sculpture-Test before and after ten weekly sessions of dance movement therapy in a professional rehabilitation and training institution in Southern Germany. The participants in this exploratory study showed a significant improvement at post-test on all five dimensions of the Body-Image-Sculpture-Test: proportions, dimensions, connectedness, completion, and surface quality. The strength of the evidence is limited due to the lack of a control group and the small sample size. Yet, the study yields the first results indicating improvement in body image after dance movement therapy in autism, in the form of individual effects (improvement of body image) and intersubjective aspects (through the interviews) after interactive body-based mirroring exercises and intersubjective experiences in a group context.

Keywords: Autism spectrum disorder; Young adults with autism; Body image sculpture test (KST); Body image changes; Dance movement therapy; Mirroring intervention

Introduction

Intersubjectivity is fundamentally different in individuals with autism compared to individuals without autism. The ability to perceive others, to feel with them, or to take their perspective, the ability to socialize, to make conversation, small talk, to relate to others, or to establish bonding is impacted in autism. For individuals without autism, social interaction with persons with autism is often experienced as awkward or strange [1-5].

Dance movement therapy (DMT) addresses the nonverbal abilities to relate nonverbally, and to feel comfortable when relating nonverbally. It further addresses the ability to sense one's own body, to distinguish self from other, and to feel comfortable in one's own body and in relationships with others. From an embodiment perspective, DMT strengthens the resources of persons with autism, improves their body perception and body image, and increases their well-being, their social competences and their empathy. A feasibility study of DMT with young adults with autism spectrum disorder (ASD) based on a series of mirroring interventions showed that body awareness, social competence, well-being/affect, and differentiation of self and other increased significantly after DMT, while empathy did not increase significantly [6].

Based on this feasibility study, the TESIS-group is presently conducting a multicenter RCT-trial on dance movement therapy with an ASD population. While the quantitative investigation on empathy and other variables of interest is still on-going, we investigated body image changes in this exploratory study using a qualitative projective approach, the body image sculpture test (KST) [1].

Body image

Body image is a concept pertaining to the conscious representation of one's body in the mind [7-11]. Generally, we distinguish between body image and body schema. Body schema describes the widely implicit (or unconscious) representations of the extension and functions of the body (from bottom-up sensory input), and body image encompasses the pre-conscious and conscious representations and evaluations of the body (also including top-down processes). What can be said about their relation?

In body psychotherapy, there is much agreement on "the self being primarily and foremost a bodily self" [12]. However, there is much conceptual confusion around the terms of body image and body schema. Schilder, who introduced the terms into clinical practice, used both terms in the same sense. Röhrich, sorting out the different uses, approximates a definition of body image as an aspect of our subjective body experience [9,10]. As a cognitive concept that constitutes, and differentiates itself individually, it develops based on experience and in close parallel to speech acquisition. Röhrich's conception of body image is made up of three change-sensitive components: body knowledge, body fantasies, and body concepts. Functionally, it symbolizes the individual reference to the

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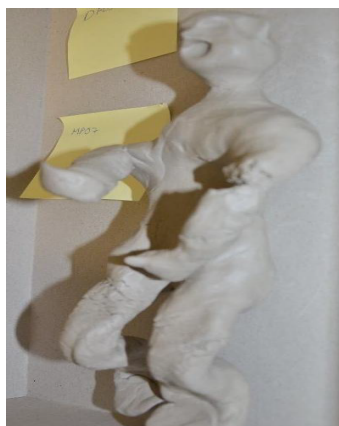


Figure 1: Interviewer: "What of the sculpture reminds you of yourself?"
Participant: "Feelings of inner deformation, of pathological self-less-ness."

body in social contexts and forms the basis of important intra-individual functions such as body boundaries, self/identity, and gender role identity. It contains the body schema. The body schema according to Röhricht develops perceptively and is ontologically earlier than the body image. It refers to representations of physical extensions and functions of the body [9]. However, Röhricht also emphasizes that no descriptive terminology is presently adequate to cover the complex Gestalt of the entire subjective body experience [9].

Shaun Gallagher makes a point of distinguishing between body image and body schema. Body schema describes the "non-conscious performance of the body" and refers to its physiological and behavioral functioning, its posture and habits as it interacts with, and is simultaneously part of, its environment [7]. The body image, then, is the perceptual, cognitive, and emotional conception of the body as it appears in consciousness. In awareness, the body as an image lives not as an integrated whole (as the body the schema does), but as a reflection that is abstract and disintegrated. This reflection is dependent on a multitude of factors, of which the body schema forms only a part [7].

The intra-individual functions of the body image and its relation to intersubjectivity are covered in recent mirror neuron research [13]. In a seminal article "The case for motor involvement in perceiving conspecifics", Wilson and Knoblich point out that covert imitation functions as part of a perceptual emulator, using implicit knowledge of one's own body mechanics as a mental model to track another person's actions in real time [14].

In ASD, with its many sensory processing differences, it is likely that the embodied self is profoundly affected [15,16]. Given the potential implication of body image for intersubjectivity, and the underlying difficulty with it in autism, body image in autism seems a topic worthwhile investigating [13,14].

Our study

We hypothesized that participation in ten dance movement therapy group sessions would improve the body image of young participants with ASD measured with the Body-Image-Sculpture-Test (KST [1,7,9,17]). The KST measures individual body image, yet with an inclusive understanding of aspects of intercorporeity, on the basis of the constant reciprocal influence of our own and others' body image [18,19].

The intervention

"Critically, what makes the "mirroring" idea and related phenomena

appealing is the possibility that they reveal a non-representational relation to others", referring to [13,20-22].

On the basis of the pioneering work of Janet Adler, we employed mirroring in movement [23]. We had manualized this mirroring for the purpose of a larger randomized study. Every session consisted of the same sequence of mirroring exercises and verbal processing.

Warm-Up (about 10 min): We used the Chace-Circle, a circle formation where the therapist picks up elements of each participant and asks the group to try them out ("can we all do what Mr. X does?," "can we all be with Mrs. Y?") and playfully change them ("can we make this bigger / smaller, louder / softer," etc.) [24]. The Chase-circle creates an atmosphere of being seen and accepted as one is, and a secure therapeutic space where participants can experiment and express their thoughts and feelings [24]. After the warm-up and creation of an atmosphere of acceptance, the participants split into dyads.

Dyadic movement part (about 20 min): A dyad consisted of either two participants or one therapist/assistant and one participant. Each participant had the opportunity to choose his or her preferred partner. First, one participant was asked to lead, the other followed; then upon the second song the partner was asked to lead and the first participant followed; and upon the third song both were asked to move freely but to always stay in contact with each other, no matter whether they were moving close to each other or at the opposite sides of the room. We emphasized that it was not important to exactly mirror the shapes of the other person's movements, but that it was important that their own movements reflected the quality of the other's movement, genuinely trying to 'be with them'. For the dyadic mirroring part, we used a mix of slower and faster music (short pieces of approx. 3 min recommended). This free dancing part also ensured that participants had the opportunity to freely choose the level of mirroring they preferred [25].

Baum-circle (about 20 min): Next, all participants came back together in a circle. The movement part then continued with a "Baum-circle" [26]. For this part of the session, participants were encouraged to bring a piece of their own music, which was meaningful to them. One volunteer at a time initiated movement to the music he or she selected, while remaining in the circle with the rest of the group; the volunteer was asked to focus on the expression of his or her feelings, while not paying too much attention to the others. All other participants were asked to follow in the same kinesthetically attuned way they did before in the dyads. The Baum-circle aims to establish rapport and empathy in the participants using kinesthetic attunement and emotional contagion [26,27]. Up to four volunteers initiated movement in the Baum-circle in each session. The aims were to 'feel with'/empathize, understand ("to go in the other's shoes"), and respect the other. Participants' use of this technique – originally developed for trauma patients – demonstrated that it was suitable for persons with ASD.

Verbal processing part (about 10 min): Finally, all participants sat down to reflect on the session, moderated by the therapist. In this context, the participants could verbally express their feelings and their opinion regarding the session. The therapist first encouraged the participants who initiated an improvisation in the Baum-circle to verbalize how it was to move, what they wanted to express, and how it felt to be reflected by the other group members. Then, the other participants were asked about their perceptions and feelings when they moved with the person. The aim was to provide and receive feedback suited to increase body-awareness, self-awareness, self-other awareness, empathy, and social skills, and to verbalize the non-verbal experiences and feelings.

The entire DMT session lasted 60 min.

Methods

Sample

The sample consisted of ten (N=10) young adults with ASD (8 men, 2 women; mean age = 23.1, SD= 8.7; range 17-43) at a professional rehabilitation institution in the Heidelberg region. Most participants belonged to either high-functioning or Asperger Symptom groups. The consultant from their program rated their degree of impairment (autistic symptoms level) as "light" in one participant, "medium" in five participants and "severe" in four participants. They were all part of the rehabilitation program for professional training at SALO & Partner GmbH in Southwest Germany, where they were part of the „ AuReA“-program (Autismus – Rehabilitation – Arbeit), a specific training program for persons with Autism with a focus on integration into the labor market.

Participants were required to be age 16 or older, and able to perform movement for one hour in a standing position. They did not receive any other form of psychotherapy while participating in the DMT study. The manualized intervention consisted of the mirroring-based DMT techniques described above and is fully described in Koch et al. [6].

Procedure

The KST was administered by one of the therapy helpers before the second therapy session; it was administered again after the last therapy session by the same therapy helper. The participants' task was to "close their eyes and form a human figure"; the complete instructions are in Box 1. Participants took between 10 and 30 minutes each, indicating that the times for completion varied greatly. Participants sat at a single table, with the prepared clay, a box, a towel, and the questionnaire. Participants were given the choice to either model the human figure with their eyes closed or to use the box covered with the towel in order to form the figure without visual feedback. Visual concealment is important to ensure that subjects go from the kinesthetically felt sense of the body rather than using visual comparison. When they were done modeling, participants completed a questionnaire on their thoughts, feelings and bodily sensations in relation to their sculpture. The questionnaire was used to provide participants the opportunity to reflect about the process and result of the sculpting without having to speak in front of the group (which often only yields stereotypical answers). The KST was conducted in small groups of participants (four at the most) to provide a safe space and the opportunity for personal communication with the therapy helper, who administered the test.

Instruments: The KST

"Bitte plastilieren Sie mit geschlossenen Augen eine menschliche Gestalt. Um ganz in Ruhe arbeiten zu können, haben Sie dafür so viel Zeit zur Verfügung wie Sie benötigen. Es ist Ihnen freigestellt, ob Sie die Figur stehend, sitzend oder liegend gestalten möchten. Sollte Ihnen die Menge Ton nicht reichen, können Sie gerne mehr bekommen. Falls Sie aber nicht allen Ton, den Sie jetzt in der Hand haben, verwenden wollen, lassen Sie einen Rest. Wenn Sie das Gefühl haben, dass ihre Figur fertig ist, öffnen

Sie die Augen bitte noch nicht. Stellen Sie sich zuerst vor, wie die Figur aussieht" [1].

"Please form a human figure with your eyes closed. You have as much time as you need. You can choose to make a figure that is standing, sitting or lying. If you need more clay, you can have more at any time. If you do not need all of the clay you have, you can leave a rest. When you feel you are done, do not open your eyes yet. First, I would like you to imagine what your figure looks like."

Box 1: Instructions for the KST; Note. There were two deviations from the original instructions: (a) we did not blindfold participants but merely instructed them to work with their eyes closed and (b) instead of the regular 10 min, we gave them as much time as they needed.

The Body Image Sculpture Test (Körperbild-Skulptur-Test, KST [1,19]; see also [28–30]) is a projective clay work task in which the participants are blindfolded and then asked to model a human figure (sculpture) from a piece of clay (of approx. 500g weight). For this study, participants were merely asked 'to keep their eyes closed' in order to leave them the maximum control possible.

Within the body work tradition in Germany, the earliest note we have of the use of a body sculpture test for embodying aspects of the body image is from the work of Gerda Alexander, the founder of Eutonie, a body work technique. She used it for a spatial image of the body. The tradition was picked up amongst others by Wadepuhl & Wadepuhl and by von Arnim and Schubert who each refined the technique. For our study, we used von Arnim's version [1,17,19,28-30]. In this tradition, the technique is informed by psychodynamic theory and mostly applied in clinical contexts.

The standardized instructions were the following:

We used the coding manual of von Arnim to categorize the figures. It contains ratings of five dimensions on a 3-point Likert-scale (0-2; poor to elaborate): connectedness, proportion, dimensionality, surface quality and completeness [17]. All different body parts were coded and then the median of each dimension was computed. Single coding dimensions:

Connectedness: Was the figure formed from one piece, how well is the figure connected, were the transitions between body parts roughly or thoroughly joined? The more connected the higher the score.

Proportion: Taking the properties of the torso as orientation, the rest of the figure is set in relation: are the proportions realistic? To account for left-right symmetry, pairs of body parts are coded separately. Proportion accounts for two-dimensional relations. The more realistic the proportions, the higher the score.

Dimensionality: Is the back of the sculpture flat? Does the figure have a realistic volume? Each body part is scored for three-dimensionality. The more realistic the three-dimensionality, the higher the score.

Surface quality: How is the surface worked (rough vs. thorough)? Are there deformations? The less roughness and deformation, the higher the score.

Completeness: How complete is the figure? Seven body parts are rated regarding completeness, paired body parts receive single scores. The more complete the figure, the higher the score.

Interrater-reliability of dimensional ratings

The therapy helper, a female student, rated the entire material and a second female observer rated 50% of the material to determine the observer agreement. Sculptures for the second rater were selected in a random draw. The intra-class-correlation was computed with a resulting intra-class-coefficient of rICC=0.70, indicating a good agreement [31,32].

Questionnaire

The questionnaire consisted of fifteen questions (see Appendix B) and served the purpose of including participants' reflections on the process and outcome of forming their sculpture.

Analysis

The analysis was done with simple pre-posttest comparisons

(within-subject) by t-tests. Results of the interviews were reported descriptively. The alpha-level was set at 0.05.

Results

Main results

From pre- to post-test the dimension of „proportions“ (prop) showed a significant increase $t(9)=-4.47, p=0.002$, as did „completion“ (com) $t(9)=-4.45, p=0.002$, „connectedness“ (con) $t(9)=-3.48, p=0.007$, „dimensionality“ (dim) $t(9)=-2.94, p=0.017$, and „surface quality“ (surf) $t(9)=-2.53, p=0.032$. Showed a significant increase; means in Table 1.

Interview Impressions

While participants' felt more insecure the first time around, interviews yielded many positive statements about the sculptures, but also statements reporting a „loss of control while forming“ or an „inner feeling of insecurity or inner suffocation“. All participants were able to name positive aspects of their figure. One participant stated at post-test to „feel more complete“. Many participants said they had imagined their sculpture just the way it was, two had imagined it to be smaller. Only two participants answered that they would not correct any aspect of their sculpture. In response to the question „what of your sculpture reminds you of yourself?“ some said the „form of a human body“. One participant said „Feelings of inner deformation, of pathological selflessness“, and was then offered to talk in private to address the severity behind his utterance. Participants took 10-30 min for sculpting (we did not standardize, but left more freedom for participants to work in their own pace).

Sculptures

All sculptures showed improvements at post-test. The figure at pre-test is presented on the left and the figure at post-test on the right side to enable direct comparison (Figures 2-11).

In many figures hands, feet, and other elaborated details were only found at post-test.

Discussion

Results suggest body image improvement in young adults with ASD on all dimensions of the KST after a DMT intervention based on therapeutic mirroring: connectedness, proportion, dimensionality, surface quality, and completeness. In sum, the sculptures that resulted have a low to medium structural level (expert judgment). However, there are no normative values for the KST yet. A replication of this exploratory study with a control group and a bigger sample in a randomized design is recommended. Validation of the KST in controlled studies with a larger N is needed. Given the effect sizes of the present study, $N=64$ would be needed to fulfil the requirements of power analysis.

Is it a coincidence that all sculptures improved? Since we had no control group, we cannot be sure and recommend repeating the study with an active control group. This is necessary in order to exclude the possibility that sculptures improved from t1 to t2, merely because participants were more confident / less anxious with the now more familiar task. Familiarity of situations in an important safety feature for persons with ASD.

Can the change in the sculptures be causally related to the DMT intervention of therapeutic mirroring? The answer to this question again would require a control group to draw a qualified conclusion about causal and other factors. An active control group might be an exercise



Figure 2: Subject 1 – Post-test (right side) shows an increase of proportion, completion, dimensionality, connectedness, and surface quality.



Figure 3: Subject 2 – Post-test (right side) shows an increase of dimensionality and elaboration (completion). Note the change in body posture from lying to sitting.



Figure 4: Subject 3 – Post-test (right side) shows an increase of proportion, completion, dimensionality, and connectedness; but also three arms (distortion).



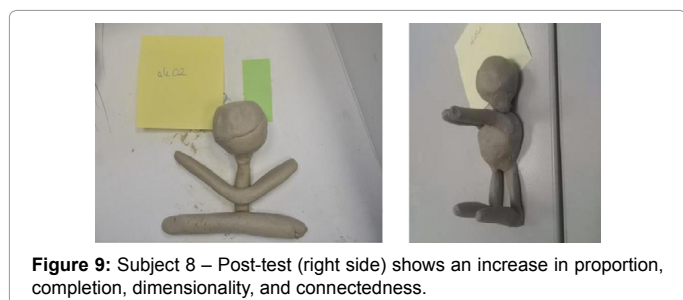
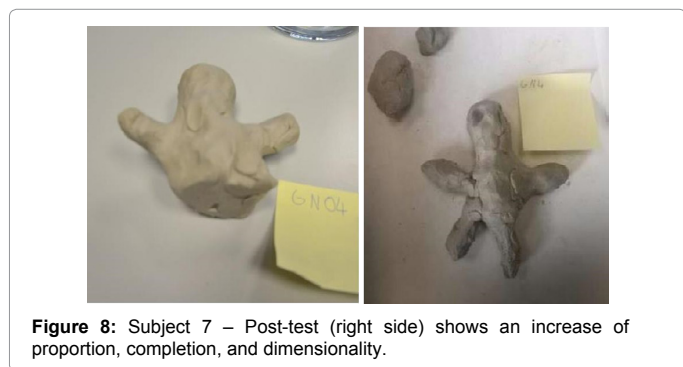
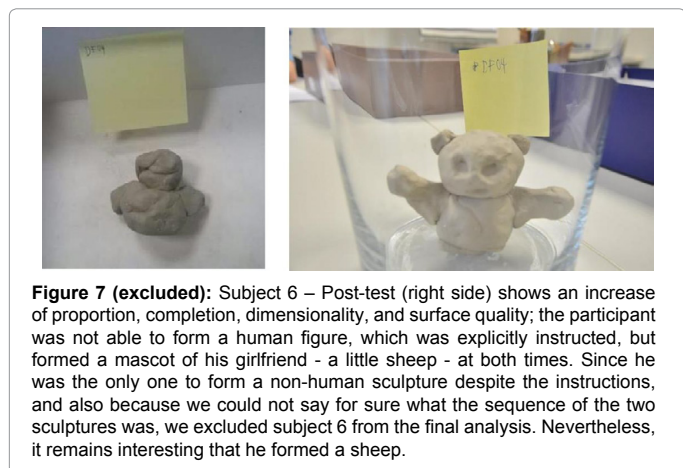
Figure 5: Subject 4 – Post-test (right side) shows an increase of proportion, dimensionality, connectedness, and surface quality.



Figure 6: Subject 5 – Post-test (right side) shows an increase of proportion, completion, dimensionality, connectedness, and surface quality. Note the higher degree of elaboration/details of the face, body (hands and feet), and clothing at t2.

ID	Code	con		dim		prop		surf		com		Total	
		t1	t2	t1	t2	t1	t2	t1	t2	t1	t2	Pre	Post
1	DS01	1,00	1,63	0,33	1,92	0,43	2,00	0,43	2,00	0,91	1,82	0,62	1,87
2	CW07	1,25	2,00	0,69	0,99	0,86	2,00	0,86	1,86	1,55	2,00	1,04	1,77
3	OB01	0,57	1,29	0,82	1,52	0,70	1,50	1,00	1,29	1,36	1,36	0,89	1,39
4	DF05	0,50	0,67	0,20	1,13	0,33	1,17	0,67	1,29	1,10	1,82	0,56	1,09
5	BK02	0,67	1,00	0,08	0,98	0,33	1,50	1,83	2,00	1,00	1,45	0,78	1,39
6	DF04	0,50	0,50	2,00	1,88	0,25	0,25	1,50	1,50	0,73	0,91	1,00	1,01
7	GN04	1,50	1,83	1,75	1,90	0,00	0,57	1,40	1,14	0,82	1,18	1,09	1,33
8	AK02	0,17	1,75	0,88	1,40	0,57	1,78	2,00	2,00	1,09	1,64	0,94	1,71
9	DW08	1,75	2,00	1,86	1,77	1,89	2,00	1,71	2,00	1,64	2,00	1,77	1,95
10	MP07	1,88	2,00	1,54	1,61	1,55	1,75	1,29	2,00	1,73	2,00	1,59	1,87

Table 1: Means of KST-Ratings; Note. In a sample of 10 participants with ASD receiving ten weeks of dance movement therapy (mirroring manual), 9 formed a human figure and showed improvement in body image – as operationalized by the connectedness, dimensionality, proportions, completeness and surface quality of the figure – at post-test. The inter-rater-reliability was good with rICC=0.70 (Wirtz and Caspar [31]).



group or another arts therapies group. Future studies should also use a second measure of body image, such as a suitable self-report measure. This is important, because the KST is a projective test and thus always subject to pre-assumptions and interpretations that may not be shared in the entire scientific community. There remains an interpretative leap in the questions of how the body image of the participants is expressed in the sculptures.

Future studies could use more extensive or more profound (verbal or written) interviews to allow participants to convey more information about their subjective body experience in a narrative form. In this way, we could obtain more differentiated, qualitative information about the body image in autism. This could, for example, be accomplished by integrating the EASE interviews of Parnas and colleagues with the KST interview (Appendix) [33]. This would involve adapting an intensive interview format, originally developed for schizophrenic patients, and applying it to participants with ASD.

Conclusion

“Real life skill is better understood, if the sensorimotor origin of cognition is not abandoned” Thelen [33].

In addition to the treatment of autism with cognitive-behavioural methods, there is a recent trend to include interventions on the sensorimotor level [6,35,36]. As resource-oriented approaches, sensorimotor interventions provide an important point of access for individuals with autism, affecting particularly the body-self and the improvement of social skills [6].

Nonverbal approaches such as dance or music therapy are particularly suited to address the social and emotional needs and difficulties in autism [37,38]. They often connect at a deeper level than verbal approaches, promoting nonverbal communication and expression as a pathway to empathy, smoother dialogues, and other moment-by-moment coordination with a conversational partner. Via the nonverbal, the body can activate resources that cannot be accessed by other means, promoting the lived experience of the body schema in interaction with the environment, and the conscious perception and emotional conception of this experience in the form of the body image. Reaching into preverbal connection to the self through music, movement, and mirroring modalities can help improve body image in autism, in conjunction with increased body awareness, self-other

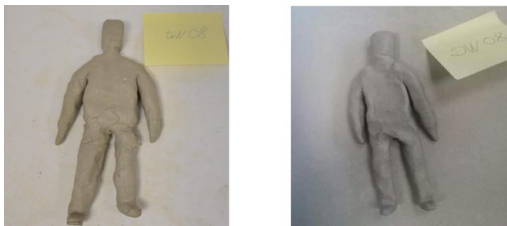


Figure 10: Subject 8 – Post-test (right side) shows a slight increase in connectedness and surface quality.



Figure 11: Subject 10 – Post-test (right side) shows mainly an increase in connectedness.

distinction, self-experienced social competence and well-being [6].

Results of this explorative study are only descriptive not conclusive. While further research is needed to support these preliminary findings, these first results support the assumption that DMT can promote the development of body image and body awareness, which underlie identity formation and formation of social skills, and thus addresses important core symptoms of autism.

Prof. Dr. Sabine C. Koch, psychologist and dance movement therapist, head of the dance movement therapy (DMT) department at SRH University of Heidelberg, Germany, and director of the arts therapies research institute RIART at Alanus University Alfter. She has published more than 100 papers and runs national and international projects in the arts therapies, addressing aspects of theoretical, methodological, qualitative, and evidence-based nature. Her most recent book is “Body memory, metaphor, and movement” (2012), and the most recent articles include a meta-analysis on effects of dance and dance therapy on health-related psychological outcomes, a paper on indications and contra-indications of DMT, factors of effectiveness in DMT, as well as evidence-based studies, e.g., on the effects of mirroring-based DMT on young adults with autism.

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