

Receptions of Efficacy in Research of Psychomotricity: Why Kavale/Mattson's Study was not helpful and reflections about how to do better! *

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Introduction

1 Kavale/Mattson: An influential meta-study in the field of perceptual motor learning

The 1983 meta-analysis by US researchers Kenneth Kavale and P. Dennis Mattson on the efficacy of perceptual motor training has, over the past few decades, been frequently cited in the field of movement therapies. In August 2018, the research sharing platform ResearchGate as well as Harzing's Publishing or Perish indicate over 100 references to this authoritative contribution of Kavale/Mattson (1983).

Without a doubt, this meta-study has influenced research and discussion within the field of psychomotricity in Europe to date. From the perspective of the present, however, it is questionable whether the conclusions drawn from the study have actually been useful and expedient, with regard both to the development of the field of psychomotricity and to the self-perception of professional psychomotor therapists in Europe.

Abstract

If one follows traditional scientific understanding, psychomotricity suffers from the fact that its efficacy is not sufficiently proven. Research in this field has, to date, been sparse. This article demonstrates how superficial acceptance of results from other research areas or regions may be problematic. To this end, an influential US meta-analysis, its adaptation to the local context of psychomotor therapy in the German-speaking part of Europe, and the ensuing effects are here examined. This examination leads to a perspective indicating which research results from related disciplines could contribute to psychomotor research, and how new research approaches in the field of psychomotricity should refer to them. The main thesis of this article is that meta-studies should be used to provide indications for subject-specific research, but that a superficial discussion and adoption of their results is not helpful.

Keywords: Research methods, psychomotor therapy, psychomotor education, psychomotricity, efficacy, evidence

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Psychomotricity, to make this clear at the beginning, is the term used by the European Forum of Psychomotricity and related member countries (see www.psychomot.org) to describe the European understanding of psychomotor interventions in a holistic viewpoint. In order to gain a better understanding of this issue, it is very interesting to first take a look at the American concept of perceptual motor training as distinct from the European understanding of psychomotricity. This is followed by an in-depth inspection of the much-cited data sources of the Kavale/Mattson study. In concluding, the article offers a discussion, based on examples, of the study's reception and its consequences in professional practice, and makes suggestions for changes to research practices.

Kavale and Mattson published the results of their meta-analysis in an article titled, "One Jumped Off the Balance Beam: Meta-Analysis of Perceptual-Motor Training" (Kavale/Mattson 1983), an intentional reference to the Ken Kesey book (and later, film) "One Flew Over the Cuckoo's Nest" (1962). Kavale and Mattson based their analyses on data from studies found by way of "standard literature searches procedures that identified both published and unpublished studies" (Kavale/Mattson 1983, 166). The "presence of a control group" was the only criterion for inclusion. "Of the 180 studies, 110 (61%) were from journals, 39 (22%) were dissertations, and 31 (17%) were from other sources (ERIC documents, USOE reports, books, and conference proceedings)." (166) Thus, it seemed they had established a solid database.

The authors identified four "outcome classes": perceptual/sensory motor, academic achievement, cognitive/aptitude and adaptive behavior (167). These classes were divided into subcategories, which were then further refined into "special outcome categories" (168). The authors then calculated effect size and standard error for all these classes and categories, and related their calculations to "percentile ranks" (166) in order to allow classification of the intervention groups in contrast to the control groups. Their main interpretation of the data was that "perceptual motor training is not an effective intervention technique for improving academic, cognitive, or perceptual-motor variables" (165).

These results have been taken up by various others and have yielded differing interpretations regarding their significance for the field of psychomotricity, within German-speaking regions by (among others and in chronological order): Zimmermann (1996), Walter (2002), Gallinat/Rix (2004), Eggert (2009), Gebhard/Kuhlenkamp (2011), Richter (2010) and

Vetter (2013). With regard to the importance of movement intervention for learning, they are even included in the widely acclaimed meta-analysis “Visible Learning” by New Zealand researcher John Hattie (2009).

2 Current understandings of psychomotricity as it relates to the data from the US-American study

While there is great variety in the field of psychomotricity, in many parts of Europe it is viewed mostly as a holistic type of intervention by means of movement and play, oriented towards humanism and respecting a child’s developmental stage (cf. for example the lecture by Juergen Seewald (2013) at the European Congress of Psychomotricity in Barcelona regarding the situation in Europe). The aim of current practice is either to strengthen the self-concept (e.g. Zimmer 2012); to tackle developmental tasks in the sense of Havighurst and/or Erikson (e.g. Fischer 2009); or to use psychomotor situations in a phenomenological, hermeneutic or deep hermeneutic approach – in accordance with the notion that the case background should be understood as fully as possible – in order to work on clients’ issues or to gain insights (e.g. Seewald 2007; Lapierre/Aucouturier, 1986). Even in the case of approaches that seem functional at a superficial glance, character-building aspects are never disregarded (Naville/Marbacher 2012). Almost all current approaches demonstrate a multidimensional understanding of development (cf. overviews in Haas 1999; Vetter 2001). While they do aim to advance movement skills as such, these approaches focus more on improving the personal situation in order to enable – in the context of education, for example – greater participation in society, learning, and education. Conceptually, therefore, psychomotricity is not some kind of training to improve motor skills; it aims at supporting self-actualization and finding one’s own resources through offered movement situations. Therefore, the fact that mobility functions are improved through these methods is one of several aspects in the framework of a bio-psycho-social concept of diagnosis and intervention.

In the USA, the term perceptual motor training – which, as mentioned, is often used synonymously to the European term ‘psychomotricity’ – is separate from movement skill training, a term that denotes the training of movement skills (cf. Pless/Carlsson 2000). In their meta-analyses, Kavale/Mattson did not distinguish between these terms but included studies of all methods, regardless of whether they related to motor training, movement skills training, or learning support. Consequently, the data base for the meta-analysis contains both studies

that could, by our reckoning, fit into the category of psychomotricity intervention, and individual studies that focus on training of movement skills (cf. Nolan 2004, 68). Even among those studies that seem to follow the American definition of perceptual motor training, only a few correspond to the understanding of psychomotricity that has, for years, been prevalent within the “European world”. For example, ‘patterning’ (Doman, Delacato/Doman 1960) – the concept of training movement skills through constant repetition in reference to a hierarchically organized multi-stage model of development – hardly appears in psychomotor therapy approaches in Europe, and yet it is present within the pool of studies Kavale/Mattson draw from in their meta-analysis. Kavale/Mattson’s analyses, then, contain a considerable number of studies that are barely, not at all, or no longer in accordance with a European understanding of psychomotricity.

3 Analyses and hypotheses regarding the datasets

For the studies of perceptual motor training found in this meta-analysis, “The single inclusion criterion was the presence of a control group (...). This criterion eliminated clinical reports and case studies.” (Kavale/Mattson 1983, 166) The authors also admit the intentional inclusion of studies with methodological flaws: “Almost half of the 180 studies reviewed being rate low in internal validity.” (172).

One benchmark for assessing the validity of meta-analyses is the diligent, replicable and above all complete inclusion of those studies that fulfill the pre-determined, transparent inclusion criteria. Nolan (2004, 69) found that 14 of the 180 studies included in the Kavale/Mattson analysis lacked a control group (the studies in question are listed: Nolan, 2006, page 67); he also identified a further seven studies (which he also lists) whose results were used multiple times in the data analysis conducted in the meta-analysis – because those studies were published, as is quite common, in various academic articles, with basically identical data material throughout (67). A further seven studies were case histories or literature reviews without statistical content or analysis. Two more studies had “no intervention or no motor intervention” (69); twelve studies listed by name “contained incomplete data, different measures used for pre- and posttest or inconsistent handling of data” (ibid.); 34 studies had a sample size of < 20; and 22 scaled data only according to their ordinal relationship (69 et seq.).

Nolan, conducting an EBSCO research with the previously outlined criteria for the period of 1954-1979 (i.e. precisely the period investigated in Kavale/Mattson's meta-analysis), also found, "after eliminating duplications", 105 additional studies (68) that should have been considered but were not included in the meta-analysis (69). However, without further analysis, the nature and results of these studies remain open to interpretation. Nolan also points out the lack of important parameters and information in the publication of the Kavale/Mattson meta-analysis. For example, there is no mention of the search keywords that were used to select the studies or of the databases where the search was conducted; no precise quotation of studies; nor an exact description of the methods used to analyze the data.

From a modern perspective, it is striking that the Kavale/Mattson meta-analysis used studies spanning a period from 1954 to 1979. Thus, the most recent study included in the data analysis dates back to well over 30 years ago, while the oldest is over 60 years old (cf. Nolan 2004, 68 and 72 et seq.). In summary, and helped by Nolan's excellent 2004 analysis (which has, as far as possible, been verified and expanded by means of additional reflection), the following conclusions present themselves:

- American definitions of terms within the field of motor skills training differ considerably from the predominant European definitions of psychomotricity.
- After proper application of common, strict standards and guidelines for meta-analyses, and after eliminating duplications, studies with a different focus and poorly designed studies, only 70 of the 180 included studies should have been considered for inclusion. Among these 70 there is only a single (!) publication by an author whose concepts are sometimes referred to within the German-speaking world of psychomotricity (Ayres 1972). This is very likely the case for the entirety of the European world of psychomotricity.
- At least 105 further studies that should, according to Nolan, have been included in the Kavale/Mattson meta-analysis were left out at the time.
- The manner in which data was processed and presented seems unclear and incomplete.
- From a modern perspective, the databases that were analyzed are out of date.

Thus we must conclude that, by today's standards, the results of the Kavale/Mattson meta-analysis concerning the effects of perceptual motor training on the academic, cognitive, or

perceptual motor situation are of no use to the field of psychomotricity in Europe. Further engaging with the results of the meta-analysis as has thus far been done is therefore not only pointless but counterproductive – it distracts from more fertile research prospects involving questions tailored more specifically to European conditions and possibilities, which is something the subject is in dire need of. Furthermore, it also distracts from the task of finding the correct and appropriate methodological approach for the complex themes and approaches within this field.

4 Examples of reception of the study and consequences for practical application: an unfortunate mix of methods

The problematic nature of adapting research results from disparate fields and cultural contexts will now be demonstrated by putting the meta-analysis into context by means of a closer look at the meta-study in question and at selected examples. John Hattie, in his monumental 2009 analysis (based on over 700 meta-analyses) on the subject of learning outcomes at school, mentions “perceptual motor programs“ as one of the 138 factors he lists as influencing academic learning. His conclusions, after integrating the effects of movement training into the Hattie Barometer of Influences: among 138 influencing factors, perceptual motor programs rank at number 128, with an extremely poor effect size of $d=0.08$. As for the number of meta-analyses included, we read on page 153 that Hattie based his calculations on only one single study: that of Kavale/Mattson (see Hattie 2009, 153, and appendix A, No. 407).

In 2002, Walter published an article concerning this with a title referencing the original title of Kavale/Mattson’s publication: “Einer flog übers Kuckucksnest oder welche Interventionsformen erbringen im sonderpädagogischen Feld welche Effekte?” (in English: “One flew over the cuckoo’s nest, or: what forms of intervention lead to which effects in the field of special needs?” translation M.V.). With reference to the original sources in Kavale/Mattson’s work, he comes to the conclusion that psychomotricity is, essentially, useless (449 et seq.).

The study was taken up again in Germany, significantly later, in an article by Eggert (2009) (translated title of the article: “Problems of psychomotricity: can it really provide meaningful support for all children with special needs?”). Eggert, too, refers to the above-cited research report, claiming that “given the results as presented, psychomotricity would

appear to be practically useless. Proof of empirical results was not possible.” (Ibid., 461, translation M.V.)

Eggert (2009) is, in principle, correct in saying that a critical stance in examining the success of psychomotricity is both helpful and necessary. Eggert himself has shown in numerous publications and articles that he is an advocate of psychomotricity. However, it is questionable whether the above-described manner of reception of the research results, as well as some of the research derived from it up to date, are sufficient and adequate for pointing out strengths and weaknesses of the subject in a sufficiently precise way or to offer a long-term solution for the challenge of proving efficacy.

Indeed, research results can, as becomes apparent upon further inspection of his article, be misleading. Eggert himself points out possible effects of psychomotricity, in his article (Eggert 2009) and as a consequence of Kavale/Mattson’s results, in the following areas: He claims that a study by Beckmann et al (2003), to which he himself contributed, determined the existence of a high degree of correlation between movement skills and social behavior (Eggert 2009, 464). His conclusion: psychomotor intervention can be effective in children with a migration background (ibid.).

A publication on this same study, which Eggert views as a way around the lack of its discernible effects of psychomotricity as proposed in the Kavale/Mattson meta-analysis and which he cites as proof of efficacy, reports on a 13-month project conducted at an elementary school in Linden-Nord, a borough of Hannover. There were ten participants in the intervention group, which received treatment, and 13 participants in the control group, which did not receive treatment, resulting in a sample size of n=23 participants. The differences in development between both groups following intervention were assessed by instruments for measuring and documenting that were neither normalized nor standardized, and the assessment was apparently carried out by the same researchers who performed the intervention (inter alia, Cardenas 1996; Eggert 1993; Eggert 1997; video analyses; and more). The description of the study’s execution and of its results, effected predominantly by calculations of the mean of the qualitative diagnostics results, is interesting but incomplete in various places. The specific procedure is not documented, and there are omissions: “In the course of the study, it proved highly challenging to produce a graphic summary of the results of the motor development based on the assessment Pfiffigunde Helps with Diagnostics”

(Beckmann et al 2003, 8, translation M.V.). The measuring instruments were used to observe effects in areas of psychomotoric intervention. The article first describes these effects and then – in a display of self-criticism – questions them. “In this context, it should furthermore be pointed out that our support concept and our principles of action were aligned with the pedagogical objectives of the classroom teachers to a very high degree. Therefore, the efficacy of the psychomotor intervention must be seen as contingent on the interdependencies of people who were, directly or indirectly, involved in the intervention.” (Ibid., 12)

In this example, we see an unfortunate mixing of elements of both quantitative and qualitative research methods. The methodological design of the study is aimed at yielding quantitative results that have been generated by means of predominantly qualitative diagnostics. The interpretation of these results, however, follows predominantly quantitative methods. Without going into further detail, it is doubtful that the results of such studies are suitable for drawing general conclusions. It seems that the methodological possibilities were not employed to their full potential. For example, it is a well-known phenomenon – and is also acknowledged by the authors themselves – that the effects of a study might in fact not be owed to psychomotoric intervention but to interdependencies with other parameters. Modern longitudinal analyses try to counteract this phenomenon by means of using multiple-group designs. Just one single effect does not prove that the intervention was successful – this distinction seems to be lacking in the above-mentioned study. It can be assumed – and is pointed out in the article – that other factors unrelated to psychomotor intervention would also have had an effect in this project. Therefore, this study is not suitable to prove the efficacy of psychomotricity.

In her 2011 meta-analysis, based on 53 studies on correlation and 17 studies on intervention, Payr examined the correlation between motoric and cognitive development in children. Her research first shows a very heterogeneous situation with regard to the precise subject matter and the methodological quality of the studies. Subsequently, she cannot find any clear effects or correlations; she also includes psychomotor studies when she summarizes the reasons for the ambiguity of the data: “As far as methodological quality is concerned, a large number of the primary studies show deficiencies with regard to publication practice, theoretical foundation, a representative number of samples, and – in the case of intervention studies – randomization (Payr 2011, 415, translation M.V.).” Schwarz, who, in a review of longitudinal evaluation studies in which he also analyses psychomotor studies, describes the

effects of movement skills interventions and reaches a similar conclusion: “It is the task of future studies to achieve more precision in the methodological linking of intention, implementation, instrumentation/evaluation and the actual situation.” (Schwarz 2014, 62, translation M.V.).

The consequences of this ambiguity in the current state of research can be illustrated with a short example. It is typical of the current situation that measures of psychomotor intervention and therapy are legitimized by motoric deficiencies of the clients (for example by means of tests, such as the MABC-2 (Henderson/Sugden/Barnett 2007), that are normalized and standardized in accordance with test quality criteria. This is done despite the fact that, as has been pointed out above, eliminating such deficits is not necessarily the essence of the actual occupational definition in sense of what the professionals want to achieve today with their interventions. Thus, a psychomotor therapist working with up-to-date concepts may be faced with a situation where she has planned improvement and therapy sessions based on a bio-psycho-social understanding, but this then does not refer back to the legitimization of her actions as initially agreed upon and which focused more on sensomotor aspects.

A possible consequence of this is an often unclear situation when the therapy or improvement activity ends: The therapist, from her view and principles, feels that her intervention is successful when the situation has improved in an area other than the motor aspect. Perhaps this also makes clear that the real objective of the therapy was not to improve the motor situation, but rather that the measuring of the motor skills by means of scientifically proven tests at the outset of the intervention was merely a way to support the legitimization of psychomotor therapy or intervention. This in turn is probably motivated by a desire to effect an evidence-based decision in favor of psychomotor therapy, thereby circumnavigating the insecurity caused by the lack of evidence in those areas that form the core of psychomotricity today.

5 Hattie: How can meta-analyses be of significance for psychomotricity?

In recent years, new and more skillful approaches of the topics of effects and efficacy of psychomotricity have emerged, such as method triangulation and mixed-methods-designs, as is shown for example in several articles in the magazine “motorik“ (cf., inter alia, Behrens 2010; Böcker u. a. 2013; Ruploh u.a. 2013; Vetter 2013, in German with English abstracts).

A closer look at Hattie's widely acclaimed work (2009) – which, after its translation in 2013, was being discussed in Germany with much delay – clearly shows that questions of effects and efficacies must be answered within the academic field and that research must be more focused. Given that Hattie adopts terminology and data for perceptual motor programs basically 1:1 from a single meta-analysis – the work of Kavale/Mattson that has been criticized above – the earlier statement still applies that Hattie does not write about psychomotricity as it is understood in Europe (and of course, he does not claim to do so). However, without focusing and conducting academic research in the field of psychomotricity itself it probably is just a question of time until Hattie's findings are applied to psychomotricity, once again without any further reflection. Hattie has probably extended the half-life period of the data from the over 30-year-old Kavale/Mattson meta-analysis by many more years.

So what can be gained from meta-analyses for psychomotricity if they don't actually focus on the field? First of all one has to agree with the authors of the foreword and the translators of the German-language translation of Hattie's oeuvre when they warn of hasty interpretations and conclusions: "Looking at the reception of Hattie's 'Visible Learning', it is easy to find many examples for such a quick and superficial interpretation" (Beywl/Zierer 2013, VIII, translation M.V.).

Likewise, this article does not intend to offer a shortsighted interpretation. However, it must be permitted to ask what the actual benefits of Hattie's findings might be for research into the effects of psychomotricity, given that it is used in many European countries by those who work with children of kindergarten and school age. In this context, it is interesting to see that Hattie (2013) calculates the "effect size related to the self-concept" (in the chapter "The Contributions from the Students", p. 39 et seq.) as well as the effect size related to learning outcomes for supporting writing, playing, visual perception and tactile stimulation (in "The Contributions from the Curricula", p. 153 et seq.). At least these areas offer some interfaces with psychomotor intervention when they relate to school as an area of intervention. In Hattie's studies, all contributions cited achieve a medium or even high effect size. For example, when looking at the self-concept, which is a recognized focus of psychomotor therapy and intervention, the Hattie barometer shows high results in desired effects on learning outcomes in schools ($d=0,43$) (ibid., 46).

However – apart from the need for a more fundamental critique of methodology such as voiced, for example, by Brügelmann (2013) – one methodological factor that must be taken into account is the direction of the research questions. Hattie is above all interested in the effect of a good self-concept on learning outcomes, whereas the (research) question for psychomotricity looks at the effects of methods and techniques on improving the self-concept as such. Moreover, Hattie himself calls attention to the difficult causalities and directionalities when examining questions regarding the self-concept (46). Furthermore, it is of course absolutely necessary that there is a sophisticated, subject-specific re-appraisal of the terminology used in the context of the self-concept, such as been provided to a degree for psychomotricity by Zimmer (2012) and others; however, this cannot be considered here in greater detail for lack of space.

Independently of the foregoing, it is possible to identify some pointers that can be taken from such a meta-analysis. Referring to the meta-study by Valentine, Du Bois und Cooper (2004), Hattie mentions, among other things, various models to explain how learning outcomes and self-concept are connected. His conclusion is interesting: “Achievement is more likely to be increased when students invoke learning rather than performance strategies, accept rather than discount feedback (...) and effect self-regulation and personal control rather than learned helplessness in the academic situation“ (ibid., 47). These are some initial pointers as to what psychomotor promotion of the self-concept – provided that it is aimed at improving learning outcomes – could look like. “The willingness (...) to show openness to experiences are the key dispositional factors that relate to achievement“ (ibid., 47).

To offer a cautious conclusion: The focus of the research should not be on functional exercise programs – which, as explained above, do not really fit with the prevalent understanding of psychomotricity. Rather more interesting are those questions that focus on the effects of personality development. Thus, the above-mentioned pointers suggest research questions that are more accommodating to the concept of psychomotricity as it is currently understood. “The objective of psychomotricity is to nurture a child’s own initiative, to encourage it to take action on its own, to contribute to a broadening of its competences in acting and communicating by offering group experiences“ (Zimmer 2013, 186).

6 So how should research in the field of psychomotricity be designed?

The examples described above have shown how up to now, interpretation of quantitative research on the one hand and on the other, psychomotricity research as such have to some degree been plagued by problems – or worse, have created problems. Studies have employed an unfortunate mix of qualitative and quantitative methods; both studies in the field of psychomotricity itself and the reception of studies from related fields have not always distinguished between effects and impact factors, thereby creating false impressions.

Why has there been so little research in this field in the past? The challenges for high-quality research, listed here with regard to the specificities of psychomotricity, must be pointed out (cf. Vetter 2013):

- Those areas of psychomotricity that were regarded as potentially effective, and consequentially the direction the research in these areas has taken, varied greatly: was it a question of finding evidence for the improvement of motor functions (trivial hypothesis); a question of improving school learning outcomes (transfer hypothesis); or a question of stabilizing the personality as a whole (stability hypothesis) (Eggert 1995, cited from Kuhlenkamp 2003, 66)?
- The financial and personnel resources available for original research into psychomotricity are very limited, and that is not likely to change in the coming years.
- The approach to research is very demanding. According to Großmann (1997, 89), it is considered a significant methodological challenge if the measure in question (a) is of long duration, (b) is complex and (c) can be designed in a variety of ways. Psychomotricity ticks all of these boxes, making it very difficult to identify the correlations between cause and effect (cf. Payr 201, 99).
- In Europe, psychomotricity is offered in many different forms and by professionals with diverse training and background. Thus, field conditions for many research approaches are highly heterogeneous and therefore less than optimal.

Likewise, it is difficult to say what the precise subject of the research should be, given the diversity present in this field at the interface of pedagogy and therapy. Therefore, the question formulated in the title of Eggert's article – whether psychomotricity can “really support all children with special needs“ (2009, 460) – shows a lack of differentiation.

Replying to this, Gebhard und Kuhlenkamp (2011) are right to ask whether psychomotricity actually has this objective and where such a claim might lead with regard to research methodology; for such an all-encompassing claim would make it impossible for the concrete psychomotor research questions and methodology to be exact.

To this date, there have been no representative studies that, for example, undertake an original examination of psychomotor intervention designed to promote the self-concept. A common excuse has been the complexity of the task. In other words, there is hardly any evidence for the efficacy of psychomotoric intervention designed to promote the self-concept. Of course, Hattie himself does not offer evidence in favor of psychomotoric promotion of the self-concept as such. However, the conclusion that self-concept and learning seem to have a positive correlation is of significance also for the field of psychomotricity, since it relieves some of the burden of fundamental questions that it cannot – or should not have to – answer. One could say that from the perspective of psychomotricity, Hattie's findings suggest a direction and a focus: within the field of psychomotricity, it is not the self-concept and its effect “as such“ that should be examined, because according to Hattie, a positive correlation may be assumed as given and serves as a basis from which to start subject-specific considerations.

In practical terms, this means that the design for research into self-concept interventions by means of psychomotricity can modulate and evaluate individual variables in therapy: Working with feedback techniques, self-strategies and self-regulation techniques are areas that Hattie considers of significance and that psychomotor research approaches could complement or expand with specific regard to subject, region or setting. Thus the meta-analysis can help to find subject-specific focus (self-concept as a significant factor for learning at school and how psychomotricity relates to this), to find the correct starting point (for example a subject-specific discussion and review of significant variables of Hattie's data), or to work out in detail the particular psychomotor features (by identifying and examining special, complementing factors such as the significance and effects of the intervention medium “movement“ compared to other interventions in the area of self-concept).

To conclude, and also to look at the matter from a perspective of research methodology, the following questions could contribute to deeper insights:

1. Which subjective theories, convictions and attitudes with regard to the promotion of self-concept do professionals in the area of psychomotricity have, and how does this become apparent in practical application?
2. How is the behavior of therapists and/or the interaction between therapists and students affected by different settings?
3. How do diverse intervention settings (classroom or therapy room / sports hall; group / individual therapy) as used in psychomotoric promotion of self-concept affect learning and/or development? How successful are certain techniques or approaches used in psychomotricity compared to each other?
4. Does the way the relation or bonding between therapist and student is designed influence the successful outcome of the therapy?

From a methodological perspective, these questions demand a broad range of research approaches. Qualitative designs (e.g. for questions 1 and 4 including evaluations of interviews that draw on the principles of Grounded Theory, and for question 2 in form of video analyses) and designs based on RCT (e.g. for question 3: cross-sectional or longitudinal surveys) would complement each other in order to investigate the particular features of psychomotor intervention designed to promote the self-concept.

7 Conclusion and outlook

Meta-analyses can provide important pointers for specialist discourse and for formulating subject-specific research questions – and that, precisely, is their proper function. This article has demonstrated that a transfer of results from meta-analyses directly, as has been attempted on occasion, is rather counterproductive and not expeditious. It has been explained, by way of examples and bearing in mind that this currently still hypothetical, how research that takes into account methodological diversity while respecting high standards may offer a way to identify the potential effects of psychomotor interventions. Currently, a number of promising research projects are being conducted that begin to show that subject-specific research questions, and consideration of methodological diversity when answering those questions, can be advantageous. There is reason for optimism.

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