

Does engagement with the Feldenkrais Method® influence body awareness, motivation and self-regulation of adolescent dancers? A case study during the Covid-19 pandemic

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Abstract

As dance educators and researchers, our particular concern, beyond teaching dance skills, is to support the dance students in becoming self-determined, satisfied dancers, and somatic practices can play an important role in this process. This exploratory case study investigated the experience of the Feldenkrais Method in supporting motivation for dance, body awareness and self-regulation of adolescent dancers during the Covid-19 pandemic.

Twenty adolescent female recreational dance students recruited from the first author's dance studio took part in the study (intervention group: N=10, age M=14.80, SD=1.81, control group: N=10, age M=14.50, SD=2.06). Both groups were involved in regular dance classes; the intervention group participated in a 10-week Feldenkrais Method programme consisting of one lesson per week, the control group had no Feldenkrais Method lessons. The study was conducted online due to Covid-19 lockdown measures in place at the time.

Qualitative data was collected from the intervention group in the form of drawings, individual reports and feedback to capture individual experiences with the Feldenkrais Method.

In addition, two questionnaires were used in both groups to assess the impact of the intervention on body awareness and to explore motivation to dance, which were completed before and after the intervention. A two-way mixed ANOVA (analysis of variance) revealed tendencies towards increased interoceptive awareness and self-regulatory processes in the intervention group. The influence on motivation in dance classes could not be determined. Both groups showed a significant increase in *felt pressure/tension* and also a more self-centred focus, suggesting a possible influence of the pandemic. Thematic analysis of qualitative data revealed high levels of engagement and heightened awareness among those who took part in the Feldenkrais Method classes.

Results suggest that even a short Feldenkrais Method intervention under the influence of the Covid-19 pandemic may be appropriate for adolescents to improve their self-awareness, learning and self-regulation processes. Future research should investigate psychosocial and learning outcomes of

Feldenkrais Method interventions in general and with adolescent students in particular. Further research is also recommended to determine possible confounds of the pandemic and their influence on motivation.

Keywords

Dance Education, Feldenkrais Method, Motivation, Self-regulation, Covid-19 Pandemic, Interoceptive awareness

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For dance teachers, it is crucial not only to consider the purely aesthetic or technical aspects of dance, but also the personal characteristics of the dancer as they can play a key role in explaining dancers' engagement and achievement. Often in dance classes we see students who seem tense and lack confidence in their performance. This hinders their learning process and potentially impacts their achievement. As educators and researchers, our aim is to support dancers to learn in a self-determined and autonomous way, with a feeling of joy and confidence in their skills. We encourage the use of somatic practices in dance training as they shift the focus from goal-oriented skill acquisition to enhanced awareness and provide an opportunity for the dancers to see their body in relation to subjective perceptions, experiences, and interactions (Rouhiainen 2008; Stephens and Hillier 2020). This can play an important role in stimulating autonomy in self-regulating physical, motivational, and emotional experiences in dance. For the first author, who is a dance teacher and Feldenkrais Method practitioner, the approach of the Feldenkrais Method is particularly valuable, as it focuses on expending a minimum of energy for a maximum of efficiency, as one can return to a more neutral state with increased sensitivity to one's bodily organisation (Feldenkrais 1987). Instead of trying harder, dancers learn to make more efficient use of their strength capacities and to notice the differences between actions in order to achieve the necessary differentiated awareness (Buchanan and Ulrich 2001).

This appreciation for somatic practices is particularly relevant in the twenty-first century professional dance education, which takes a more holistic approach to dance training by integrating physical, intellectual and emotional aspects alongside technical proficiency (Sööt and Viskus 2013). Therefore, integrating these aspects into dance education at an early stage is an important step towards educating dancers for the twenty-first century.

While somatic practices are widely discussed and researched in relation to adult dancers, systematic research on how they influence adolescents dance learning is still limited (Fortin et al. 2002). This case study, grounded in action research, explores the experiences of adolescent recreational dancers with the Feldenkrais Method in relation to motivational and self-regulatory

processes, at a time of adversity. The study draws upon theories of motivation and self-regulation and takes into consideration the specific challenges of adolescence in dance education to better understand the potential role of the Feldenkrais Method in facilitating the development of self-awareness, motivation, and self-regulation in young dancers, especially at times of adversity.

The Feldenkrais Method

The focus of the Feldenkrais Method (Feldenkrais 1987) as a method of self-education and personal development, like many somatic practices, is on conscious movement exploration (Hillier and Worley 2015), which presents individuals with options and choices in relation to everyday movements and actions (Igweonu 2019). There is some debate that the Feldenkrais Method is more effective in terms of self-regulation than motor learning because it is based on an internal attentional focus that may interfere with motor learning (Ives 2003). The approach of heightening body awareness and fostering sensory and perceptual skills corresponds to an internal focus of attention and may be contrary to an intentionally goal-directed setting (Buchanan and Ulrich 2001, as cited in Ives 2003). In order to improve performing motor skills an external focus of attention during goal-directed activities may be preferable (Stephens and Hillier 2020). Other researchers propose that the kind of awareness of the body that may be part of Feldenkrais Method may also involve perception of the body in a more exterior way – that is not focused on the affective aspects of awareness of the bodily awareness, but more of the body as something can be sensed in terms of physical qualities of movement (Mattes 2016).

Feldenkrais Method lessons

Feldenkrais Method lessons can be delivered in the form of individual sessions (Functional Integration®, FI®) and group lessons (Awareness Through Movement®, ATM®). In this study, the programme consisted of group Awareness Through Movement lessons where participants lay on a mat and received verbal guidance on movement without demonstration. During the lessons, the practitioner observes and continuously asks questions to direct the participants' attention to movement (Buchanan and Ulrich 2001).

Aim of the lessons

The aim is to improve the participants' ability to perceive sensory information and change their behaviour in relation to a specific functional goal. For example, when dancing, to lift the leg or arm with minimal effort and maximum efficiency to increase not only the range of movement but also the aesthetic performance.

Moshe Feldenkrais (1987) chose the action-system (movement) as a starting point; this movement-oriented approach can be beneficial for dance students, as they are used for learning new movement and for modifying learned patterns. Different approaches can explain the underlying processes involved in the Feldenkrais Method (Buchanan and Ulrich 2001; Ives

2003). Parallels with dynamical systems theory have been noted, such as the belief that humans are self-organised systems and that behaviour results from the interaction of multiple systems that influence efficient movements and lead to different patterns of coordination. In this perspective, behaviour is seen as acquired rather than permanent and perturbations are necessary to change habitual behaviour (Buchanan and Ulrich 2001; Ives 2003).

From a neuropsychological perspective, it is posited that the Feldenkrais Method can enable individuals to make decisions and experience new situations both cognitively and physically. On a physical level, it guides the experience and perception of movement rather than just performing them. For dance students, this Method can help them find an individual approach to their own movement instead of just replicating dance movements instructed and demonstrated by the teacher (Howe 2018-2019). It has been shown that dancers who learned to use the Feldenkrais Method gained greater learning development and enrichment by relying on their own sensations, resulting in improved goal achievement and problem solving (Fortin et al 2002).

Feldenkrais Method lessons can help dance students make connections between information received, and feelings and perceptions created through movement exploration, increasing self-awareness and self-regulation. Awareness of one's sensory, motor, and cognitive experience during movement can create a basis for transforming experience into conceptual knowledge, and can involve the brain-body connection, behaviour, and metacognition (Garfinkel et al. 2015). Metacognition can be defined as the awareness of one's own thinking, the ability to evaluate one's actions and adjust one's behaviour appropriately. It includes aspects of self-regulation such as perspective taking and decision making (Kimmerle and Côté-Laurence 2003). Research has underlined the relevance and necessity of increased self-awareness as it is conducive to goal achievement, self-responsibility and creative problem solving, attributes considered increasingly important to meet the complex demands in dance education and to facilitate joyful and meaningful learning (Sööt and Viskus 2013).

One of the functions of the nervous system is to process sensory information to maintain homeostatic equilibrium. Perception of this function of the nervous system, through interoceptive awareness can provide a basis of awareness of phenomenon such as the brain-body connection, behaviour, and can support the development of *metacognition* (Christensen et al. 2018; Garfinkel et al. 2015; Khalsa et al. 2018; Vago and Silbersweig 2012). Body awareness describes one aspect of bodily-focussed self-consciousness, which manifests itself as an innate tendency of organisms to self-organise (Mehling et al. 2011).

The Feldenkrais Method aims to develop self-awareness through movement and attention to the experience of one's movement. *Interoception* is an important aspect of self-awareness, and interoceptive skill is essential in developing self-awareness through bodily experience. Measures of interoception were used in this study to help identify whether, and the extent to which, the Feldenkrais Method may enable adolescent dance students to perceive sensory signals from the body in relation to physical, emotional, and cognitive information and experiences. It has been suggested that though linking peripheral physiological states and

mental processes, by increasing awareness, the influence of emotions, perceptions, and motivation on behaviour can be better understood (Tsakiris 2018). Interoception can be described through three dimensions (Garfinkel et al. 2015). It is theorised the dimension, *interoceptive accuracy*, determines the degree to which an individual can accurately detect internal bodily sensations, such as detecting and counting their own heartbeat. Another dimension, *interoceptive sensibility*, describes an individual's subjective belief about their internal sensation, for example believing that they can focus on and detect internal bodily sensations. The third dimension, *interoceptive awareness*, explains the degree to which a person is confident in their interoceptive accuracy in relation to actual behavioural or movement accuracy. The Feldenkrais Method can therefore enable interoception, by inviting individuals to notice inner signs from the body in relation to their emotional states, perceptions, and experiences.

The Adolescent Dancer

Historically, dancers were viewed predominantly as trained bodies, educated through technical and proficient replication of specific movements from an early age (Sööt and Viskus 2013). In contrast to this approach, dance pedagogy in the twenty-first century shifted away from a focus on the performance itself to the awareness of how one moves considering students' characteristics (Sööt and Viskus 2013). Dancers are expected to be intrinsically motivated, to understand the meaning and purpose of the movements in order to find an individual expression in movement, raising questions about what skills are needed to develop this level of self-awareness and self-regulation.

In the experience of the first author, a dance teacher and Feldenkrais Method practitioner, it is often noticed that young dance students' performance declines through adolescence, not due to a lack of student engagement or skill but because of maturation processes, and it can significantly affect student confidence. Therefore, it is necessary that the dance teacher provides students with information, tools, and opportunities to nurture self-awareness, and to help them understand and manage the changes and challenges resulting from their developmental stage as well as the demands of the environment.

Here, it is particularly relevant to give special attention to the learning process of the young dancer as adolescence is marked by numerous physical and psychological changes with potential impact on physical and cognitive awareness, motivation and self-regulation (Kimmerle and Coté-Laurence 2003). From a developmental psychology perspective, this period can lead to changes in body image, self-concept and body awareness, which can also affect dance performance (Kimmerle and Coté-Laurence 2003). In addition, the brain and nervous system undergo considerable development during adolescence, particularly in the frontal and parietal regions involved in cognitive functioning, emotion processing and social recognition (Choudhury et al. 2006). This maturation is accompanied by psychosocial development, including the gradual development of a sense of self and autonomy in relation to others around them. Young

people are therefore particularly susceptible to external influence, and the societal patterns of beauty associated with dance can place a disproportionate focus on standards of physical appearance that conflict with the physical possibilities due to maturation processes (Bibiloni et al. 2013).

From a developmental perspective on learning, young people have not yet fully developed the range of competencies and learning strategies of an adult learner, such as perceptual skills, including kinaesthetic skills that require body awareness, or complex cognitive skills, including problem solving and focusing attention (Kimmerle and Côté-Laurence 2003). These skills, however, are needed for dance training and should be trained from an early age. Learning dance requires the ability to interpret verbal instructions and demonstrations, and to translate them into mental representations, while at the same time being aware of one's own performance. These skills include understanding a goal or task, but also metacognition in the sense of self-regulation and abstract thinking needed for problem solution, and also perceptual and cognitive skills that depend on maturation and motor experience (Kimmerle and Côté-Laurence 2003). In addition, spatial and temporal skills, as well as kinaesthetic skills are particularly required for orientation in space, awareness of limb position and efficient use of dynamics and force (Kimmerle and Côté-Laurence 2003).

The use of the Feldenkrais Method with adolescent dancers can therefore be of particular relevance during this developmental phase: drawing attention to inner states of the body, encouraging openness to new ways of achieving a goal and creative engagement with movement (Fortin et al. 2002; Wallman-Jones et al. 2022). Using bodily-focused strategies, the Feldenkrais Method may promote enjoyment and ease of execution of a movement (Coogan 2018-2019; Kampe 2018-2019). This contrasts with traditional approaches to dance practice that assume that pleasurable movement tends to lack the necessary effort in the form of pressure and force (Coogan 2018-2019). In addition, the maturation of the brain and nervous system is accompanied by psychosocial development, such as the development of emotional perspective-taking and the efficiency of perspective-taking. This raises the question of whether the Feldenkrais Method is suitable for this age group and whether the students are willing to engage in self-awareness and enjoy practising such a method. The use of somatic practices with adolescent dancers has shown some promising findings in terms of feasibility, and also effects on attention self-regulation and enjoyment, and yet, its empirical investigation is still in early stages (Long 2005; Murray and Pitches 2015; Wallman-Jones et al. 2022).

Motivational Processes and Self-Regulation in Dance

Motivation is embedded in the performative nature of dance; it is a key factor to sustain commitment and engagement in regular practice, and to regulate bodily, cognitive, and social processes to achieve one's potential (Lazaroff 2001; Ryan and Deci 2000). As proposed by Ryan and Deci's (2000) Self-Determination Theory (SDT), motivation refers to internal processes and personal characteristics, but also situational factors. Practices such as dance

teaching practices can support (or hinder) the satisfaction of individual psychological needs required for personal growth, performance and wellbeing (Ryan and Deci 2000). These authors suggest that these basic psychological needs are *autonomy*, *competence* and *relatedness*, and that their satisfaction fosters intrinsic motivation and self-regulated behaviour (Ryan and Deci 2000). These topics have been researched in dance education, showing relationships to performance quality and wellbeing (e.g. Quested and Duda 2010; Hancox et al. 2017). *Autonomy* refers to a feeling that behaviours are self-initiated or self-driven, and when supported by teachers, by valuing students' perspectives, encouraging problem-solving and offering choices, can promote engagement and wellbeing (Brodie and Lobel 2004; Jowett et al. 2016; Quested and Duda 2010). A sense of *competence* is fostered when people feel capable of responding to the challenges of the environment (Ryan and Deci 2000), and this can be fostered by teachers encouraging and emphasising self-development and personal progress. *Relatedness* refers to a sense of belonging and social connection, and also in terms of connection to one's own experiences (Isen and Reeve 2005). The Feldenkrais Method focuses on guiding individuals through self-initiated behaviours and toward developing a sense of bodily competence, and when delivered through group lessons, the three basic psychological needs can be satisfied, thus it may promote intrinsic motivation.

Another relevant consideration is the continuum of options that influence motivational climate and student motivation in the relationship between the teacher and student (Morgan et al. 2005). According to the Spectrum of Teaching Styles (Mosston and Ashworth 1990), teaching strategies can progress from a non-autonomous, externally regulated style to a fully autonomous and self-regulated style through several stages. A guided discovery style (i.e. teacher uses questions, students find a solution on their own) is beneficial for mastery and adaptive cognitive and affective responses. This is in line with the Feldenkrais Method approach, where lessons are taught in an autonomous, discovery-oriented way, guiding the student's attention and awareness so that they can find individual solutions themselves, as opposed to the traditional teaching approaches that tend to focus on prescribed solutions (Hillier and Worley 2015).

Developing dancers as agents of their own learning implies self-regulated learning, defined as an active and constructive process in which learners set goals of their own, monitor their learning and engage in behavioural, motivational and metacognitive strategies to control their surroundings, motives and cognitions (Ocak and Yamac 2013; Smit et al. 2017). The Feldenkrais Method engages with self-regulation processes, such as problem recognition, motivation, skill acquisition and application, process maintenance, and transfer of skills (Crews et al. 2001, as cited in Ives 2003). Self-regulation is understood in the Feldenkrais Method as a process to observe, examine, understand how to achieve the goal in a playful way rather than on the goal itself (Crews et al. 2001, as cited in Ives 2003). In the present study, the Feldenkrais Method Awareness Through Movement lessons were selected in terms of fostering self-regulatory processes related to dance teaching such as reducing effort to increase flexibility in the hip joints while moving the legs, or focusing on attentional processes to increase flexibility

in the back. While the effectiveness of the Feldenkrais Method to produce changes in motor performance is still being investigated, its benefits in terms of enhanced self-regulation, motivation and self-awareness and potential to facilitate perceived competence are well recognised (Ives 2003; Stephens and Hillier 2020).

Covid-19 Pandemic

The Covid-19 pandemic remains a novel situation, and its negative effects on young people's mental health and learning experiences as a result of protective measures such as lockdown have already been established world-wide (Al Omari et al. 2020; Jones et al. 2021; Stubbe et al. 2021). As teachers in dance contexts, we observed similar trends as reported in the literature, including a reduced sense of competence, high levels of anxiety, depression, and eating disorders. This scenario manifests itself in behavioural changes and even absenteeism due to hospitalisation reported by parents, affecting the learning process. Students seem more tense, have difficulty concentrating and give up more quickly if they cannot perform a dance step immediately.

Both vulnerability during adolescence, and exposure to adversity, are high risk factors which have the potential to impact young people's behaviour and emotions (Niwa et al. 2016). Negative experiences can affect homeostatic equilibrium, but when individuals successfully manage situations of significant adversity and adapt positively to the environment, they become more resilient (Sarkar and Fletcher 2014; Morgan et al 2013). Although we cannot establish the benefits of the Feldenkrais Method to mitigate the effects of the pandemic, research has shown its effects in reducing anxiety caused by past experiences or negative expectations about the future (Fonow et al. 2017), in increasing enjoyment and reducing social comparison (Wallman-Jones et al. 2022), which suggests its potential protective effect against adversity. Furthermore, developing the ability to effectively modulate one's own behaviour (self-regulation) and increasing awareness of the conditions that cause limitations and biases can be a first step towards overcoming them (Vago and Silbersweig 2012).

In this context, we acknowledged the potential impact of the Covid-19 pandemic and the lockdown measures in place at the time of the study in the findings, and also explored the potentially supportive impact of the study for young people against the negative effects of the pandemic (Niwa et al. 2016).

In summary, this project investigated the effect of a ten-week Feldenkrais Method intervention on adolescents' intrinsic motivation in terms of *enjoyment*, *competence*, *choice* and *sense* or *pressure* or *tension*, as well as the effects on self-regulation in terms of the ability to regulate inner processes. We explored the extent to which independent, mindful learning and movement exploration, as facilitated by the Feldenkrais Method, is appropriate for young dance students to strengthen their motivational and self-regulatory processes, taking into account the demands of dance education, their stage of development, and the influence of the Covid-19 pandemic.

Methodology

Research Design

We conducted an exploratory case study conducted in a private dance studio in Germany from December 2020 to February 2021 during the Covid-19 pandemic. At the time of the data collection and implementation of the intervention, Germany was under a full lockdown making necessary the delivery of the project in a virtual environment.

The first author led the project, and also taught Feldenkrais Method lessons and dance classes to participants in this study, drawing upon more than 30 years of experience as a dance teacher and 20 years of experience as a Feldenkrais Method teacher. The second author is a trained psychologist and dance science researcher and acted as research advisor. No Feldenkrais Method exercises were carried out in the dance classes, however, some principles of the Feldenkrais Method were incorporated, such as ensuring an appreciative, positive teaching climate, as the work as a Feldenkrais Method teacher has an influence on the way of teaching and this cannot be separated.

The intervention group participated in a 10-week Feldenkrais Method programme offered alongside the dance training with one Feldenkrais Method lesson per week, while a control group had no Feldenkrais Method lessons. Qualitative and quantitative measurements were used within an action research framework to capture the dynamics and nuances of embodied experience in context (Barcelona 2020; Prevots 2009). The aim was to ensure the quality and meaningfulness of the systematic research process by expanding theoretical knowledge and improving practice, thereby promoting agency and reflexivity in researchers and participants with a focus on improving teaching and learning conditions.

Trustworthiness procedures were considered by engaging with multiple modes of data collection, content analysis, reporting and discussion. In data gathering, precise details of the sampling method and participants descriptions were provided (Elo et al. 2014). The research project was explained to the students and their parents in detail. They were informed about confidentiality, safety, voluntary participation, and the possibility to withdraw without consequences. Parents gave their written consent for their children to participate, and students also gave their written consent to take part.

The Trinity Laban Research Ethics Committee approved this research project. There were no major ethical concerns anticipated.

Participants

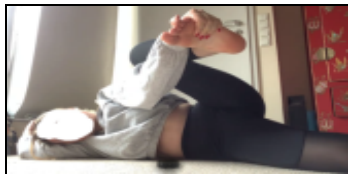
A convenience sample of twenty female adolescent recreational dance students participated in this study, recruited from the dance school. All participants took ballet or street dance classes once a week and had little or no experience with the Feldenkrais Method. They did not

participate in additional dance classes during the intervention. The selection criteria included: (a) age between 12 and 18 years old, (b) to have regular dance experience, and (c) to be interested in participating in the research project. The students were evenly and randomly distributed into an intervention (N=10) and control group (N=10). The intervention group was asked to participate in one-hour weekly Feldenkrais Method group lessons (Awareness Through Movement) for a period of ten weeks alongside their regular dance class. The control group did not participate in the Feldenkrais Method lessons or an additional class other than their regular dance schedule.

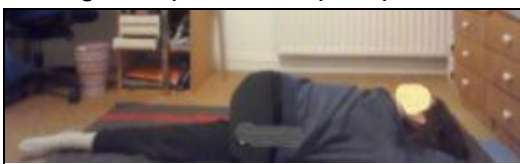
Feldenkrais Method Intervention

In this study, lessons were selected from Alexander Yanai (AY) material (Feldenkrais 1994-2004), which are original records from Moshe Feldenkrais, from the early 1950s to the late 1970s. Topics were chosen in their relation to dance training, such as leg extension and flexibility in the hip joints, and that are related to the main aims of the study, such as improving awareness and self-regulation processes (see Table 1). This should help students access the method by finding connections to their dance movements, finding out how to perform the movements efficiently and comfortably, and improving in this way. All Awareness Through Movement lessons make use of multiple principles of good movement and learning strategies, and in this study, each lesson emphasised one of the following Feldenkrais principles from the Method (Klinkenberg 2006) (see Table 1): reducing effort; self-questioning; novelty in repetition, attention, and variation; imaging; rest, pause, reversibility; and constraints.

Table 1
Description of the Feldenkrais Method lessons

Lesson topic, principle	Description	Focus
1. Circles with the legs (AY 199) □ Reducing effort	Holding the foot, making circles with the leg in different positions 	Flexibility in the hip joints
2. On the side, lifting the leg and straighten it (AY 101) □ Self-questioning	Lying on the side: holding the foot, lifting and straightening the leg towards the ceiling 	Flexibility in the hip joints, straightening the leg

3. Tossing parts of the body into the air (AY 168) □ Novelty in repetition	Lying on the back, throwing and dropping the hands, head, legs, arms, shoulders 	Releasing tension, relaxation
4. Oscillation with lifting the head towards sitting (AY 102) □ Novelty in attention	Lifting the head, to sit up and rolling 	Flexibility in the back
5. Twisting and bending in sitting (AY 119) □ Novelty in variation	Bend forward and to the side in straddle seat, legs spread 	Flexibility in the back and hip joints
6. A full circle with the leg swing (AY 108) □ Imaging	Swinging a leg in different positions 	Flexibility in hip joints
7. On the side, getting the spine flexible (AY 206) □ Rest	Lying on the side; side bending and lifting the head, lengthening the arm 	Spine and back flexibility
8. With the arms forwards; turning the arms (AY 113) □ Pause	Sitting and turning to right and left 	Torso flexibility

9. Back and pelvis rotation with elbows and legs (AY 137) ☐ Reversibility	Turning from prone to supine position 	Spine and back flexibility
10. Painting with the soles of the feet (AY 111) ☐ Constraints	Moving the feet on the floor while lying on the back, exploring range in hip joints 	Flexibility in the hip joints

Note: AY refers to the Alexander Yanai material, original records from Moshe Feldenkrais's public teaching (Feldenkrais 1994-2004).

During the lessons participants were frequently encouraged to reflect and make choices about how they move, thereby increasing their awareness. The practitioner asked the following questions as a recurring strategy (Coogan 2016; Kampe 2016):

- Is the movement easy and flowing?
- Can you take care of yourself while doing the movements?
- How many parts of the body are involved in the movement?
- Can you breathe freely while doing the movement?
- Can you find the most effective way to move?
- Does this movement match you, is it good for you?
- How can you apply decision making into everyday life?

For the intervention group, qualitative data based on drawings, individual statements and lesson feedback and quantitative data based on questionnaires were collected (see Table 2). Three months after the intervention ended, the participants of the intervention group were interviewed again to determine any changes in their experiences and perceptions of the intervention. For the control group, only questionnaire-based quantitative data were collected at the same time as the intervention group (see Measures).

Table 2

Outline of the data collection timeline across the 10-week Feldenkrais Method intervention

Timeline	Activity	Data collection measures administered
Before intervention	Testing only	Questionnaires, drawings

Weeks 1-10	Feldenkrais Method lessons in addition to dance classes	Lesson feedback after each lesson
Midpoint after 5 weeks		Drawings, individual statements
One week after intervention	Testing only	Questionnaires, drawings, individual statements
Follow up 3 months after intervention	Testing only	Interviews

Due to the lockdown restrictions, the project was delivered online, and the participants received a weblink by email to join the Feldenkrais Method lessons virtually. They were asked to turn their camera on and to interrupt if they wanted to ask a question. The dance classes were also held online; this meant a greater limitation for the dance classes than for the Feldenkrais Method classes, as Feldenkrais Method lessons are usually held on a mat and the instructions are verbal, without demonstration, so that students can figure out the optimal way to move, rather than imitating the teacher or the other students in the class. However, online teaching did pose some challenges. It required that the participants were familiarised with the use of technology and had access to electronic equipment (computer, tablet) to engage with the lessons. It also reduced the multimodal nature of somatic teaching to a more two-dimensional level and considerably restricted communication. As the participants already had experience in using video conferencing tools through home-schooling and online dance classes during the first lockdown in the spring of 2020, participants were used to working virtually. However, as the method was unknown to the students, it posed an increased difficulty. The first author and Feldenkrais Method practitioner was not sure if she could convey the idea of this Method and the joy of doing it in an online format.

The exchange of qualitative data (pictures, individual statements) and quantitative data (questionnaires) was carried out by email, and the feedback after each lesson was exchanged verbally directly after the session and noted down by the first author.

Measures

Participants in both groups completed the Intrinsic Motivation Inventory, (IMI, McAuley et al. 1989) and the Multidimensional Assessment of Interoceptive Awareness (MAIA, Mehling et al. 2012).

The Intrinsic Motivation Inventory (McAuley et al. 1989) was used to measure participants' subjective experience with the dance activity. In the present study, four of the original six subscales were used due to the proximity of motivational concepts to principles of Feldenkrais Method and to reduce questionnaire fatigue. Participants were asked to refer to their motivation in relation to dance classes: *interest/ enjoyment* (e.g. "I enjoy doing this activity very much"), *perceived competence* (e.g. "I think I am pretty good in this activity"), *perceived choice* (e.g. "I

believe I had some choice doing this activity”) and *felt pressure/ tension* (e.g. “I did not feel nervous at all while doing this”). Participants answered a Likert scale ranging from 1 (not at all true) to 7 (very true) with higher scores showing increased *interest, competence, choice*, and less *felt pressure/tension*.

Bodily awareness was assessed to explore aspects of self-regulation and subjective interoceptive sensibility, using the German version of the Multidimensional Assessment of Interoceptive Awareness (MAIA) validated by Mehling et al. (2018). The six subscales are *awareness/ noticing* (e.g. “I notice when I am uncomfortable in my body”), *not-distracting* (e.g. “I distract myself from unpleasant sensations”), *attention-regulation* (e.g. “I can notice an unpleasant body sensation without worrying about it”), *self-regulation* (e.g. “I can refocus my attention from thinking to sensing my body”), *body listening* (e.g. “I listen for information from my body about my emotional state”) and *trusting/ confidence* (e.g. “I feel my body is a safe place”). Answers were given in a Likert scale from 0 (never) to 5 (always), with higher scores showing higher interoceptive awareness and less distraction from unpleasant sensations.

Statistical analysis

Quantitative data were used in the form of two questionnaires, used in both groups to assess the impact of the intervention on body awareness and to explore motivation to dance, which were completed before and after the intervention.

The responses to the Intrinsic Motivation Inventory (IMI, McAuley et al. 1989) and the Multidimensional Assessment of Interoceptive Awareness (MAIA, Mehling et al. 2012) were given a score and analysed using the SPSS (2020) computer software. Total score and mean score were calculated separately for each subscale in both questionnaires as suggested by the original authors. Demographic data (age M+ SD) were assessed for intervention group (n=10) and control group (n=10) before intervention. The critical alpha level was set to .05 for all analyses.

Exploratory analysis was conducted to determine the normal distribution of the data (Kolmogorov-Smirnov and Shapiro-Wilk Tests). Post hoc statistics were used to account for the small sample size. Before the intervention, an independent t-test was conducted on the baseline data to determine whether there was a statistical difference between the means of the two groups (homogeneity).

The results of the intervention group were compared with the results of the control group to determine whether possible effects were due to the Feldenkrais Method intervention. Intra and between groups comparison were calculated using the appropriate parametric tests. A mixed between-within subjects analysis of variance was conducted with two levels (pre, post) and the two groups. This Two-way mixed ANOVA allowed to assess whether there is a main effect for the group, a main effect for time (pre-post) and/or an interaction effect between group and time, i.e. to assess whether the influence of the time including an intervention (intervention group) or

the passing of time without an intervention (control group) depends on the group, and covers all independent variables.

Qualitative data was gathered to capture students' experiences of the intervention (Dreyfus 1991). The art-based method, using drawings, which in addition to written articulation can be useful to encourage expression, capture attention, and can be enjoyable for young people (Flanagan et al. 2015), being an alternative to conventional processes of inquiry and more appropriate to young people (Knowles and Cole 2008). Verbal statements were gathered from participants in relation to the program and particular lessons, and subsequently thematic analysis with a semantic level approach was utilised for these texts (Braun and Clarke 2006). The result was a framework of inductively created codes and themes organised by literature-informed categories and grounded in a phenomenological framework. This approach tries to explore the phenomena that appear to a person who experiences them (Dreyfus 1991), valuing the participants' experiences and interpretations. The drawings were analysed by looking for emerging themes, categorising them and thus searching for possible explanations and patterns.

In addition to the theoretical frameworks addressed earlier in this paper, we also drew upon the PERMA model of well-being (Seligman 2011) to capture emotional and motivational experiences emerging in the qualitative analysis in terms of insight, growth and happiness (Kern et al. 2015). The PERMA model is based on positive psychology, which addresses factors of human strength such as optimism, flow and resilience and can be applied to many situations to explain individual experiences of enjoyment and mental health. PERMA refers to five components: *positive emotions, engagement, positive relationships, meaning, and accomplishment*, which provide a multidimensional approach to assessing the dimensions of well-being. These factors and processes affect optimal human functioning, for example in terms of education, insight, growth and happiness (Kun et al. 2016). In the analysis of the statements, a choice was made to focus on three of the original five dimensions of the PERMA model of well-being, due to their relevance to capture the experience in the lessons: (a) positive emotions (happy and joyful feelings that motivate and increase performance and physical health and create optimism), (b) engagement (commitment to an activity, can lead to a feeling of "flow"), and (c) accomplishment (productive, meaningful action, making progress towards a goal, satisfaction with oneself) (Kun et al. 2016). Participants knew that their data were anonymised and kept confidential, and engaged openly and voluntarily with the various methods of data collection.

Results

Quantitative Data

Participants characteristics

The age of the dance students ranged from 12 to 18 years (intervention group, age M=14.80,

SD=1.81; control group, age M=14.50, SD=2.06).

There were only two statistically significant differences found between groups or pre and post intervention. For the Intrinsic Motivation Inventory, there were increased *felt pressure/tension* scores in *both* groups after the intervention (IG pre Mean= 2.60, post Mean= 2.12, CG pre Mean= 2.94, post Mean= 2.34) ($p = .03$) (i.e. the feeling of more tension and pressure after the intervention).

Only one statistically significant improvement was observed after the intervention on the Multidimensional Assessment of Interoceptive Awareness for *both* groups. This was in the *not-distracting* scale of the (IG pre Mean= 2.06, post Mean= 3.00, CG pre Mean= 1.83, post Mean= 2.83) ($p = 0.000$) (i.e. the participants were less distracted by unpleasant sensations and better focused on themselves) and was related to the dance activity (see Table 3).

In terms of interoceptive awareness, non-statistically significant improvements were observed in the intervention group in awareness, attention-regulation, self-regulation and body-noticing but not in the control group. A decrease in trust in bodily experience was observed in both groups after the intervention.

Table 3

Descriptive statistics. Two-way mixed ANOVA pre and post-test.

*Indicates a statistically significant change $p < .05$

Variable	Intervention Group		Control Group	
	Mean	Standard Deviation	Mean	Standard Deviation
IMI1 Interest				
Pre	6.41	0.43	5.52	1.39
Post	5.85	0.99	5.70	0.71
IMI2 Competence				
Pre	4.70	1.40	4.83	0.93
Post	4.95	1.00	4.86	0.68
IMI3 Choice				
Pre	5.68	1.03	5.40	1.17
Post	5.02	1.07	5.38	0.81
IMI4 Tension*				
Pre	2.60	1.20	2.94	1.32
Post	2.12	0.73	2.34	0.75
MAIA1 Awareness				
Pre	4.77	1.07	4.72	0.63
Post	4.95	0.83	4.40	0.52
MAIA2 Not-Distracting*				
Pre	2.06	1.05	1.83	0.50

Variable	Intervention Group		Control Group	
	Mean	Standard Deviation	Mean	Standard Deviation
IMI1 Interest				
Pre	6.41	0.43	5.52	1.39
Post	5.85	0.99	5.70	0.71
Post	3.00	0.78	2.83	0.59
MAIA3 Attention-Regulation				
Pre	3.90	0.75	3.64	0.49
Post	4.07	0.69	3.67	0.58
MAIA 4 Self-regulation				
Pre	3.57	1.50	3.77	0.96
Post	4.00	1.22	3.10	1.05
MAIA5 Listening				
Pre	3.76	1.28	3.53	0.99
Post	4.16	1.10	3.23	0.75
MAIA6 Trust				
Pre	4.63	1.50	5.00	0.60
Post	4.30	1.44	4.80	0.74

Note. IMI: Responses were given in a scale ranging from 1 (not at all) to 7 (very true). MAIA: Responses were given in a score ranging from 0 (never) to 5 (always).

Discussion of Quantitative Data

In the Intrinsic Motivation Inventory, a tendency to decrease was observed in the intervention group, while the scores in the control group remained about the same. These findings seem to suggest that students in the intervention group showed less interest in the dance activity. This could indicate an increased awareness of the changed learning conditions in online dance classes such as fewer opportunities to make choices, little space, no choreographies and less communication, resulting in more accurate perceptions, or it could be due to other unexplored factors.

In terms of body awareness (MAIA), a tendency towards improvement was observed in the intervention group, while the control group showed a decrease or the same scores. This may indicate a tendency for the positive impact on increased self-awareness as a result of participation in the Feldenkrais Method lessons.

Both the intervention and control groups reported high scores on the intrinsic motivation scales (IMI) interest and choice at baseline and high scores in the body awareness scales (MAIA) awareness and trust. The question arises whether the already high motivation and awareness at the beginning can be further increased under difficult conditions of online dance classes. The scores for *felt pressure/tension* and *not-distraction* were lower at the start of the intervention

(lower scores mean higher results), indicating rises in high *felt pressure/tension*. This may suggest that participants were developing greater self-awareness of unpleasant emotions and coping with them during this period of time. This result suggests that there may be value in using a measure of bodily awareness in future research, particularly as the major circumstance of the Covid-19 pandemic and associated lock downs are likely to have impacted these results in unpredictable ways.

The quantitative results offer some insights on the potential of the Feldenkrais Method to develop interoceptive awareness and the impact of adverse environmental situations on motivation, which require further exploration using more robust experimental designs. The pandemic represents a major confound for this study, and it may be valuable to undertake a similar study in different circumstances.

Qualitative Data – Intervention Group Only

Satisfaction

The qualitative data showed that these young dance students in both groups had high levels of enjoyment and perceived choice in dance classes, especially before the intervention.

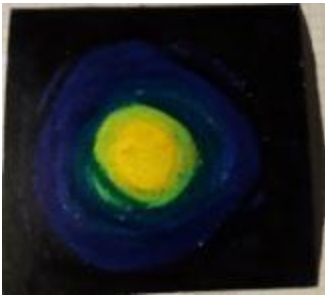
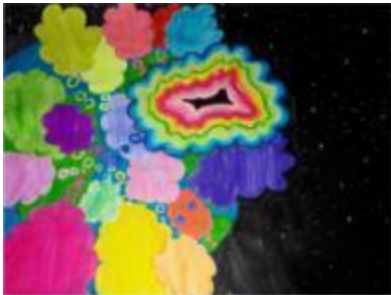
Drawings

The participants were asked to draw a picture expressing their mood at the beginning, at the midpoint and at the end of the intervention (see Appendix A). They used colours, realistic images and metaphors to express themselves. Based on our arts-informed research (Knowles and Cole 2008: 59-61), we suggest the drawings appear to show a positive development during the programme.

One girl (participant 1, Table 4), for example, chose dark colours at the beginning and lighter colours as the project progressed, suggesting a more positive mood. In her first picture she chose the metaphor of an enclosed sun, later coloured leaves covered two-thirds of the picture and then she painted curls in light colours.

Table 4

Example for the use of colours (pre/ midpoint/ post intervention) to express experiences - participant 1.

Participant	pre intervention	midpoint	post intervention
1			

Another student (participant 2, Table 5) expressed herself in a realistic way and drew a girl's face, presumably as a self-portrayal, at the beginning with an angry expression and turned away from the viewer, later with a look towards the viewer and at the end with a softer, more open look and a small smile, indicating progression towards a more positive mood.

Table 5

Examples for realistic drawings (pre/ midpoint/ post intervention) to express experiences- participant 2.

Participant	pre intervention	midpoint	post intervention
2			

A third student (participant 3, Table 6) mainly used metaphors, first together with dark colours and lighter toward the end of the study. Before the intervention, she drew a dancer standing on the edge of a jug. Halfway through she drew an egg whisk, which may be suggestive of her intention to describe her "mixed" experiences. At the end she used the metaphor of a lightened candle with a dancer on it, perhaps indicating a calmer, more content mental state.

Table 6

Examples for metaphors (pre/ midpoint/ post intervention) to express experiences- participant 3.

Participant	pre intervention	midpoint	post intervention
3			

Overall, the main metaphors used at the beginning of the study gave the impression of insecurity, lack of support, powerlessness, or dissatisfaction. This conveyed a subdued rather negative mood towards the beginning of the intervention and may have reflected the impact of the Covid-19 pandemic at the time. At the midpoint, the main impression was one of thoughtfulness and confusion; the mood was indecisive and reflective which could indicate the attempt to understand and engage with the Method. After the intervention, the drawings gave an increasingly positive impression, with some indication of contentment and joy (Table 7).

Table 7

Emerging categories, themes, and expressions in the analysis of drawings

Categories	Themes	Expression
1. Pre: Negative feelings	Insecurity, powerless, lack of support, dissatisfaction	Half-empty battery, angry face, dancer at an edge, question mark, wavy lines, dark colours
2. Midpoint: Process of reflection	Thoughtfulness, indecisive, confusion	Whisk, jigsaw puzzle, waves, thoughtful face, dark colours combined with brighter colours
3. Post: Positive mood	Satisfaction, happiness	Sun, flowers, candle, smile, dancing girl, spirals, bright colours

In conclusion, the drawings could be interpreted as expressing a move towards more satisfaction, a more positive mood and reflected the high engagement of the students.

Individual Written Statements

At the midpoint and at the end of the intervention the students were asked “What was your experience in the lessons?”. The participants wrote down their answers and sent them by email (see Appendix B). Therefore, these reports were not anonymous, and may have been subject to desires to please the teacher-researcher. The individual reports from midpoint to the end of the intervention showed a clear progress in understanding the Method and engagement with the lessons.

The first author led the process of analysis in consultation with the second author, and used literature on coding (Knowles and Cole, 2008, chapter 5). In addition to the three of the original five dimensions of the PERMA model of well-being (Seligman, 2011) - Positive emotions, Engagement and Accomplishment; a fourth theme was reported: Negative feelings and experiences (mental and physical) to take into consideration negative aspects of their experience reported by students (Table 8).

Table 8

Categories based on the PERMA model, themes and codes after the intervention

Categories	Themes	Descriptions based on codes
1.Positive emotions	Improved mental state	Much calmer Come down from school stress Enjoyment, relaxation
2.Engagement	Recognising the effectiveness and benefits of the method Dealing with the content	Good experience. Very interesting how different the body feels Enriching, always something new I realise how many parts of the body we actually need
3.Accomplishment	Awareness Productive outcome/ improvement Transfer to everyday life Satisfaction	I feel more patience with myself I try to apply the basic ideas in everyday life Always new experiences I have learned a lot of new things The new experiences are now in my head; I can use them, they help me I learned how much I can do for myself in a short time I learned something useful without pressure and expectations I can better control my posture+ breath
4.Negative feelings	Negative effect	It is not for me, I don't find the time to relax

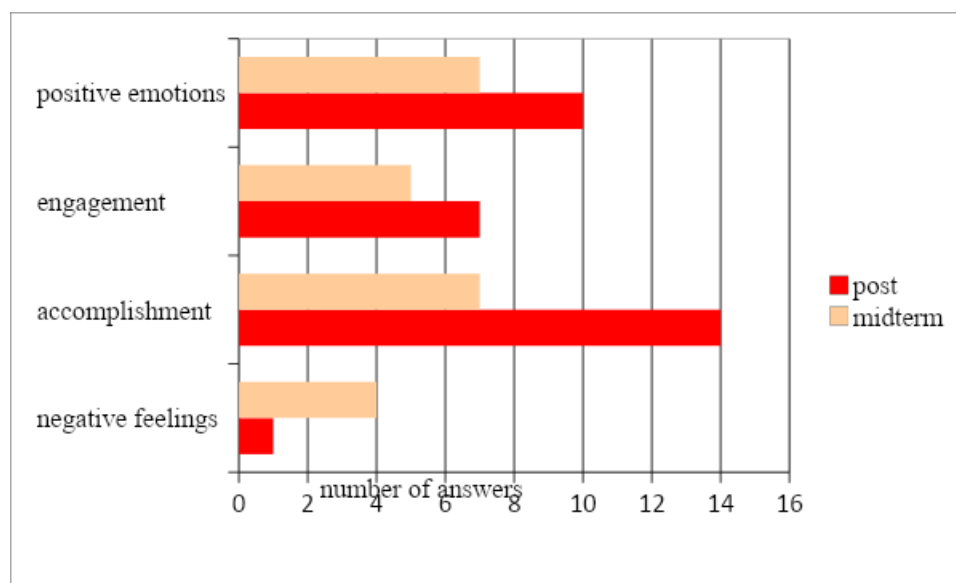
At the midpoint of the intervention, participants described an improvement in their mental state and began to recognise the benefits of the Method. They were aware of the changes occurring, were interested in new sensations and movements, and were satisfied with the outcome at the end of a lesson. They also reported tiredness during the lessons.

Similar themes were found at the end of the intervention. The students appreciated their

improved mental state and now reported the perceived benefits in a more differentiated way. They seemed to recognise how the method worked and tried to implement the principles in their everyday life (for example: “I feel more patience with myself.”, “The new experiences are now in my head; I can use them, they help me.”). Most students performed the movements without feeling exhaustion; only one student reported that she could not relax. The main difference in relation to the midpoint of the study was that students seemed more confident and familiar in the application of the method and transferring it into daily routines after the Feldenkrais Method lessons.

Overall, students’ experiences showed an improvement in positive emotions and engagement and a considerable improvement in accomplishment based on increased awareness (see Figure 1). However, negative feelings such as exhaustion were also reported, but these decreased in the course of the intervention.

Figure 1
Development from midpoint to post intervention.



Participant Feedback on Lessons

At the end of each Feldenkrais Method Awareness Through Movement lesson, participants were asked individually for a short verbal feedback on their experience of the lesson. In this way, the direct impression from the lessons could be captured and the participants had the opportunity to reflect on their own experiences as well as to know about their peers’ experiences. The practitioner wrote down the statements using pen and paper and kept a research diary. The lesson feedback offered a more differentiated view of how the lessons were experienced, how students coped with problems, and how they improved over the course of the intervention. One student reported a broad range of feelings that changed in the course of the

intervention. Another student did not know how to perform the movement at the start of the lessons and later rated the lesson as her favourite lesson. Another student described in detail how the lessons enabled her to cope with negative feelings and the benefits she felt (Table 9).

Table 9

Issues, strategies, and outcome: Feedback from participants

Issues	Strategy	Outcome
– Exhaustion – No idea how to move – Dizzy – Unpleasant – Difficulties to understand – No pleasure – Strenuous – Problems with spine/ back – I didn't get it right – Sometimes I understood, sometimes not – Hard to understand – Movement felt unnatural – I thought too much	– Helpful feedback – Several breaks – I took care of myself – It cracked in my back which was good – I kept going – I made the best of it – I took more breaks – I did it as I thought – I enjoyed the breaks and persevered, I was curious – I did it my way – I got to used to it – Without thinking it worked better – I modified the movements	– I felt a lot, I did it good – Easier to move, pleasant – More comfortable – Dizziness disappeared – Favourite lesson – Better lying – Light, improved turning – My back adapted to the floor – Many changes – Completely warm, relaxed – It was better at the end – It went well, much better – It felt different, don't know why – Very nice, really funny

In summary, the lesson feedback showed that all students had many positive experiences (for example, “completely warm”, “relaxed”) and felt accomplished during the lesson, but also faced some difficulties and challenges during the intervention (“hard to understand”). Sometimes the execution of a movement was unclear or unpleasant, for example due to spinal problems. At the end of the study, many seemed to cope better with the difficulties (“my back adapted to the floor”).

The coping strategies they found were related to self-care, finding creative solutions, and task behaviour. For example, students appeared to be more proactive in taking care of themselves (for example, “I took breaks”), they modified movements when necessary and trusted their competence (“I did as I thought”). Their perseverance to continue the lesson despite emerging problems and the experience of achieving improvement (“I was better at the end”) indicates a proactive and engaged task-oriented behaviour. The enjoyment during the lessons and the perception of successful achievement through personal improvements suggest that students understood and engaged with the Method (Figure 2).

Figure 2

Strategies related to self-care, creativity and task behaviour

self-care	creativity	task behaviour
• I took care of myself • I took breaks • I was more patient	• I modified the movements • I did as I thought • I made the best of it	• I persevered • I kept going • Feedback helped

Post Intervention Follow up

Three months after the intervention, participants were asked about their experience after finishing the Feldenkrais Method programme. In an online group session, they verbally answered the following question: "What is your experience with the Feldenkrais Method three months after the intervention?" The researcher wrote down the statements with pen and paper (see Appendix C). The aim was to find out to what extent the students remembered the lessons and whether they applied what they had learned.

Six out of ten students reported using the Method regularly; one used it sometimes; and three said they no longer used the Method. All participants who continued to use what they had learned, also reported a lasting improvement in their self-awareness. For example, one student stated that she is more aware of how she feels, while another reported that she pays more attention to what she feels in her body when she moves. The aspect of coping with pain was mentioned more often, indicating that their focus on themselves had improved.

It was encouraging that the majority of students used the Method. Nevertheless, it seemed that the students' experiences were already beginning to fade, suggesting that continued engagement with the method is necessary to achieve optimal and lasting benefit.

Discussion

The aim of this study was to investigate the extent participation in Feldenkrais Method lessons was associated with higher intrinsic motivation and enhanced self-regulation in adolescent female dance students. Quantitative findings obtained through the questionnaires confirm a tendency towards improvement in awareness and self-regulation in the intervention group. Overall improvement in interoceptive awareness scores were observed, suggesting that a Feldenkrais Method intervention might have a positive impact in developing self-awareness and motivation in young dancers.

However, the intervention group showed a decrease in intrinsic motivation on the experience in dance classes. The students participated in dance classes as a leisure activity, which means there was already a high level of motivation for dance at the beginning of the intervention, shortly before the lockdown was imposed. The descriptive statistics aligned with this observation, as it showed high scores in the subscales *interest* and *choice* before the intervention. This appears to be evidence of a “ceiling effect” and may indicate that these scales, or subscales, may not be useful for identifying changes in this population. It seems rather unlikely that their intrinsic motivation in terms of *interest/ enjoyment*, *competence*, *choice* and *tension/ pressure* would improve further, as the conditions of dance learning had changed considerably from face-to-face teaching to online teaching. The students danced alone at home, with little space and no social exchange, which may have impacted the quality of dance learning. The possibility of own decision-making was also limited, for example, about the choice of music or how to run the lesson in general, as questioning and involving the students in an online format takes much longer and disrupts the flow of class. The dance environment has an influence on intrinsic motivation (Nordin-Bates et al. 2012) and the lockdown circumstances appear to have impacted overall motivation of students.

The limited recruitment opportunities during the lockdown resulted in a small pool of participants, which may have limited the statistical analysis; more participants may have resulted in a more significant result. In addition, participants showed a wide age range, potentially reflecting different maturation levels. The maturation process is variable and depends not only on age but also on other factors such as experiences, therefore, the pace of development may be different for students of the same age or similar for students of different ages (Kimmerle and Coté-Laurence 2003). Previous studies with similar samples showed the feasibility of the Method with adolescents across a wide age range (Coogan 2018-2019; Wallman-Jones et al. 2022).

The quantitative findings showed a significant increase in *felt pressure/tension* occurred in both groups. This suggests that the pandemic may have had a wider impact on the study than the Feldenkrais Method. Students of the intervention group did not transfer the principle of reducing tension into the dance classes. This raises the question of how the practice and benefits of learning in Feldenkrais Method lessons can be applied to dance training and what influence external circumstances and the length of an intervention may have. For an optimal transfer of skills into dance classes, it seems necessary to use the Method regularly over a longer period of time so that students have the opportunity of practical integration of the experience to maintain the effects (Brodie and Lobel 2004; Shusterman 2002). Changes that involve a transfer from the physical to the cognitive and emotional level, as in the Feldenkrais Method, should be seen as a long-term process for optimal benefits.

In addition, participants in both groups improved significantly in the *not-distracting* scores. They seemed to have improved their focus on themselves, possibly because they were at home and less distracted by other things, but also more aware of their own feelings. It is not known to what

extent these results were influenced by the wider impact of the Covid-19 pandemic; this needs to be further explored.

The analysis of individual statements, drawings and the lesson feedback revealed interest, enjoyment and inherent satisfaction of the participants in the intervention group; all dimensions of intrinsic motivation (Ryan and Deci 2000). This was also reflected in a positive assessment of the lessons ("I have learned something useful without any expectation or pressure behind it"). From the perspective of the Feldenkrais Method practitioner and dance teacher (researcher 1), the results were surprisingly positive. I had noted in my research journal:

I was not sure whether I could convince young people of the value of the Method under such challenging conditions.

Students reported that they had fun, felt more competent at the end of the lesson and increased their autonomy in making their own decisions to adjust to the lesson and improve, which was also reassuring to the dance teacher under challenging circumstances. This suggests that participants' basic psychological needs were satisfied during the lessons, possibly impacting positively their motivation and self-regulatory processes during the lessons (Smit et al. 2017). This was further supported by the improvement in interoceptive awareness results in the intervention group, which refers to the metacognition dimension of self-regulation (Khalsa et al. 2018) in terms of awareness, attention regulation, self-regulation and listening to the body.

The heightened body awareness related to the Feldenkrais Method lessons emerging in the qualitative results were consistent with the questionnaire results in relation to dance classes, which showed a tendency to improve body awareness overall. In the Feldenkrais Method lessons, the self-regulated learning of the students became more evident at cognitive (more understanding), motivational (more enthusiasm and perseverance), and metacognitive (more reflective and decision-making capacity by finding movement solutions that were comfortable to perform and applying those to daily life) levels (Ocak and Yamac 2013). Results also suggest the potential transferability of self-care and coping skills into everyday life, and applying previously acquired knowledge in a new context (Fortin et al. 2002), as shown by the results at the end of the intervention and three months later.

Although on the one hand the pandemic may have affected the validity of the study, on the other hand, slight increases in interoceptive processes and self-regulation seem to suggest that the intervention may have been beneficial in supporting young dancers to deal with the negative effects of the pandemic, influencing resilience and adaptability under adversity (Baumann et al. 2007; Fonow et al. 2017; Niwa et al. 2016). The students seemed to have appreciated the programme, showed openness to new experiences, were willing to engage with it and share their experiences. The external circumstances may have favoured this, as there were few leisure activities and little exchange and communication.

In terms of developmental stage, the drawings, individual statements and lesson feedback

indicated that the students were willing to work on their personal development and enhanced both their emotional and physical self-perceptions, suggesting the suitability of the Feldenkrais Method, and the measurements used in this study, for this age group, as reported elsewhere (Wallman-Jones et al. 2022). However, considering differences in maturation across age, further exploration of these factors can offer more detailed insights into the differential benefits of the Feldenkrais Method in early and late years of adolescence.

In reflecting on these findings, we would like to offer a brief testimonial of the first author on the experience and impact of this study on her own practice as dance teacher and Feldenkrais Method practitioner (researcher 1):

After the Feldenkrais [Method] project was finished, it was difficult for me to evaluate possible changes in the dance training as the classes were still online for a few months. After the lockdown ended, all the students were very happy to be back in the dance studio and highly motivated. I noticed a greater openness towards me, willingness to get involved in the classes, and a greater attention to my instructions among the project participants. I am now trying to integrate the results into my teaching. This is not always possible because time is limited and an exchange with each individual student is not always practicable. For me, this project has meant being more open to the needs of the students, reflecting on my own teaching strategies, and now trying to integrate the findings into dance teaching.

My aim is to apply the following aspects of motivation and self-regulation support:

- Check physical, mental, emotional state of the students
- Notice their needs
- Enable self-determination by valuing their views and ideas
- Set achievable goals
- Enable learning without tension
- Offer exploration/experimentation
- Encourage awareness and attention
- Accept adjustments for self-care purposes
- Strengthen self-confidence
- Accept that not everything can be controlled and that is ok

In sum, findings suggest that participation in a Feldenkrais Method intervention can facilitate positive development of self-awareness and self-regulation, and can contribute to the fulfilment of basic needs and the resulting enjoyment, success in accomplishing tasks and the acquired knowledge. During adolescent developmental stages, students explore their motivational patterns and their capacities for self-regulation. The extent to which these positive benefits can facilitate intrinsic motivation for dance and be transferred to specific dance learning contexts needs to be further explored. This study may be valuable for future studies as it explores what measures might be valuable for adolescent dance students. Qualitative measurements seemed

appropriate as they allowed students to describe their experiences more openly and encouraged them to express themselves. The results of the questionnaire on awareness (MAIA) were consistent with the qualitative results, therefore its use could be recommended for further studies. The suitability of the Intrinsic Motivation Questionnaire (IMI) can be questioned as the results were already very high at the beginning and left little room for improvement.

Limitations

Despite the promising findings, these need to be considered with caution as we acknowledge the limitations encountered. Firstly, the study was conducted during a full lockdown period due to Covid-19 related governmental measures, which disrupted significantly daily life experiences and may have been impactful especially for young individuals. This also impacted the mode of delivery of the intervention. Another limitation to acknowledge is the potential researcher bias, as the first author was simultaneously the researcher and facilitator of the intervention, and had close knowledge of the group. On one hand, this implied the risk of potential biases, and its impact on the results; but it also added practical relevance and value as it guaranteed consistent teaching behaviour and its adaptation to the specific needs of the group.

Furthermore, the small samples, the wide age range of adolescents and the duration of the intervention under atypical and challenging circumstances can limit the interpretation and transferability of the findings. Future research should be aware of a possible “ceiling effect” and the suitability of the chosen subscales to identify motivational changes in this population.

Conclusion

The study of a ten-week Feldenkrais Method programme on intrinsic motivation and self-regulation of adolescent female dance students in a recreational dance context demonstrated an improvement in aspects of awareness and self-regulation. Whether the Feldenkrais Method also has a positive effect on intrinsic motivation in dance training could not be determined in this study, possibly due to the changes imposed by Covid-19 lockdown measures that affected dance learning and teaching contexts and individual experiences, as well as possible “ceiling effects”, where adolescent students of dance may start as highly motivated individuals.

This study suggests that the Feldenkrais Method may have benefits to develop self-awareness, self-regulated behaviours and motivation in adolescent dancers, which can be beneficial for optimal learning and wellbeing. The Feldenkrais Method has the potential to influence these aspects of development through its distinctive promotion of somatic awareness, including interoceptive awareness. This study was conducted at a time of severe adversity and yet positive results were observed, suggesting that the Feldenkrais Method might be useful to develop resilience and self-regulation strategies that help young people navigate through the negative effects of adverse situations, and transfer those skills across different settings. Considering the positive subjective evaluations of the Feldenkrais Method lessons, further

research on the transversal and transferable effects of the method on developing motivation in dance, self-regulation and self-awareness is recommended.

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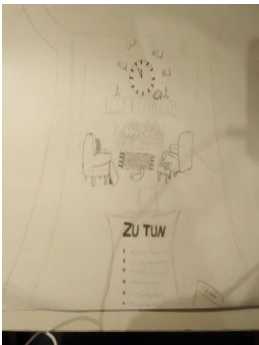
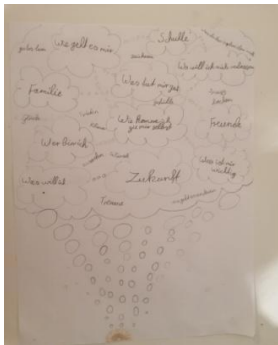
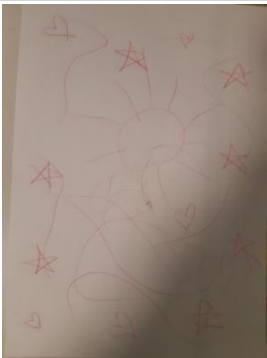
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Appendices

Appendix A: Examples drawings; pre, midpoint, post

Participant	pre intervention	midpoint	post intervention
4			
5			
7			

8			
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10			

Appendix B: Individual Statements

Pre- intervention: “What do you know about Feldenkrais?”

- I think through Feldenkrais you learn to perceive your body better and to listen to it. You generally get a better perception of yourself (feelings, breathing, what you want and what you don't want, do I feel uncomfortable or comfortable?) You learn this through certain exercises, which are calm but still encourage a certain amount of effort.
- I think Feldenkrais is a way to deal with your body and to feel yourself better.
- I know that you do exercises
- I don't know much about Feldenkrais. Only what Claudia told us.
- I understood that it is supposed to help you concentrate better when dancing and so on.
- Feldenkrais is an activity designed to give people more self-awareness through relaxing exercises. In addition, Feldenkrais can be used to relieve pain.
- Not much yet just that it is quiet.
- As I have already participated in it last time, I already know a lot about it.
- What I noticed most was the better and more conscious body awareness. In addition, after each lesson I had the feeling that I could move better and learn completely new

movements that I was not aware of or familiar with before. Another very good feature of Feldenkrais, in my opinion, is the calmness and composure, because you don't feel obliged to do all the movements, because you can simply imagine them.

- We learn to listen to our body and do relaxation exercises.

“What do you expect about the lessons?”

- I hope that Feldenkrais will help me to better perceive the things mentioned above. It should also help me to relax and get away from it all.
- I hope that the Feldenkrais classes in the next few weeks will help me to calm down and get away from the stressful everyday life by concentrating on my body and breathing. I also hope that my body awareness will improve and that this will have an effect on my dancing.
- That I feel better when I dance afterwards.
- I hope that it will be fun, something new and that it will improve me in ballet.
- I think I will definitely enjoy the course, but I have no expectations other than mentally.
- I hope that I will learn more about my body and find ways to control my breathing. I want to learn this activity because I would like to use it in everyday life.
- That it will be fun.
- I don't know what to expect because I don't know it.
- I expect relaxation and I expect above all to find myself again after all the stress of the last months. I also hope to be able to move better again in certain parts of my body and with certain parts of my body.
- I approach the project with an open mind, I hope to get a little relaxation with the help of the lessons

Midpoint: “What are your experiences?”

- I would describe my experience as fun and funny but also solving and refreshing.
- My experience in the Feldenkrais classes so far has been very positive. I often feel tense at the beginning of the classes and feel that I become more relaxed as the class goes on and stay relaxed after the classes.
- I find Feldenkrais totally relaxing. It is highly recommended, thank you.
- I liked the Feldenkrais lessons a lot. Sometimes I found it very strenuous and sometimes not at all. I didn't know most of the exercises before.
- My experience so far has been good because I am more flexible now.
- My experience in Feldenkrais so far has been sometimes exhausting, tiring or relaxing but definitely interesting! It's strange to see what a small, often repeated movement does to the body's sensation if you just pay attention to it. Because I guess I do a lot of movements in everyday life that are not good for me without listening to myself afterwards.
- Some classes are exhausting. You can always take a break, and at the end of the class you can do the exercise you did at the beginning better.

- So far, my experiences from the Feldenkrais lessons have been partly different, but never in a negative sense. Sometimes I have felt a big change that continued the next day, and sometimes there was no big change. Despite everything, I notice that it does me good.
- I feel more flexible and I look forward to Feldenkrais.
- I describe my experience in the Feldenkrais classes as beautiful. Sometimes it is very tiring but also sometimes relaxing.

Post intervention: “What are your experiences?”

- The experiences I have had are good. Only I realised that it is not for me, but it was a nice experience anyway.
- It was a good experience and it was fun!
- Since I have been in the Feldenkrais group, I feel much calmer and more relaxed in everyday life.
- It was fun. It was good to come down a bit after school hours.
- I really enjoyed participating in this project and getting to know Feldenkrais better.
- My experience in the Feldenkrais classes was very positive. I felt smoother and more relaxed after the lessons and I also felt in everyday life that I was more patient with myself and could control my posture/breathing better.
- I found it very interesting to feel how different the body sometimes feels after repeating seemingly small movements.
- I try to apply the basic ideas of Feldenkrais (taking care of yourself, no pressure to perform, etc.) in everyday life. And I also sometimes do the supine position in which we always relaxed when I have stomach aches or stress.
- I would describe my experiences as invigorating and liberating. It was always something new and enriching each time. It is also very interesting to do movements that you don't normally do consciously, but then realise how many parts of the body we actually need to make a movement. I always had a lot of fun!
- The Feldenkrais lessons have had a positive effect on me and my body, and I have also learned a lot of new things. These new experiences are now in my head, so I can use them in certain situations and they help me. The lessons themselves were always very different, but I felt a change every time.
- Feldenkrais was a way for me to allow my body to relax from everyday life. In Feldenkrais I learned how much you can do for your body in a short time. It was super fun to take part in the project! I also have the feeling that I have learned something useful, but without any expectations or pressure behind it. That's what I liked.
- With Feldenkrais I have learnt how to relieve, stretch and relax my body with relaxation and free, light movements, without any pain. If I am tense or sprained somewhere, or if I want to expand my range of movement by stretching for ballet, for example, I now know what simple movements I can do to achieve this goal without too much pressure.

- I find Feldenkrais totally relaxing, but I have to prepare for quite a lot of meetings at school at the moment and have a lot on my mind. Apart from that, it is highly recommended.

Appendix C: Three months after intervention

Awareness:

- “I am more aware of some things. I pay attention to my breathing and feel inside myself how I feel and notice my body.”
- “I repeat to be aware of my sensations.”
- “I become more aware of myself.”
- “I am more aware of my movements.”
- “I have felt small changes. Now I pay more attention to how my movements are.”
- “What I remember most is breathing, which I now also pay more attention to in everyday life.”

Relaxation:

- “I repeat relaxing in the supine position when everything gets too much for me.”
- “I use the exercises to relax.”
- “I liked the back exercises; they help me to come down.”

Pain management:

- “I repeat being aware of my bodily sensations in the supine position, to cope with stomach aches.”
- “When I have back pain, I use them to relax, for example the head roll.”
- “I can also better assess where I feel pain.”
- “When I'm in physiotherapy, the Feldenkrais experiences are helpful. For example, in one lesson we learned to stand up better; I bring that into the physio lessons to cope with my neck problems.”

Improvement of dancing:

- “I can use it very well in dancing; that's the icing on the cake. I can move my arms and fingers more beautifully.

Remembering:

- “A few exercises have stuck.”
- “There is something stuck, but not so intense.”
- “I don't remember all the exercises. Some of the exercises I still remember and use.”

- “I still know some exercises and use them.”

Biographies

Claudia Mölders, MFA, Feldenkrais practitioner, Dance teacher

Claudia Mölders runs a private dance studio in Cologne, where she teaches dance and the Feldenkrais Method and has carried out various projects researching the effect of the Feldenkrais Method on young dance students. She studied dance science at the University of Bern and at Trinity Laban Conservatorium of Music and Dance, London, has been a certified dance teacher of the Royal Academy of Dance since 1998 and completed the Feldenkrais training Neuss 8 with Chava Shelhav in 2003.

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