

Implications of the Feldenkrais Method of Somatic Education for Training College Students to be
Transformational Leaders

Mary Margaret Fonow, PhD*
Norton and Ramsey Professor of Social Transformation
School of Social Transformation
Arizona State University
Wilson Hall, 240 Orange Mall
Tempe, Arizona, 85281
mfonow@asu.edu

Judith A. Cook, PhD
Professor and Director
Center on Mental Health Services, Research and Policy
Department of Psychiatry
University of Illinois at Chicago
1601 W. Taylor Street, 4th Floor, M-C912
Chicago, IL 60612
Cook@ripco.com

Jane Burke-Miller, PhD
Consultant
Center on Mental Health Services, Research and Policy
Department of Psychiatry
University of Illinois at Chicago
1601 W. Taylor Street, 4th Floor, M-C912
Chicago, IL 60612

Richard Goldsand
School of Social Transformation
Arizona State University
Wilson Hall, 240 Orange Mall
Tempe, Arizona, 85281
Rich.goldsand@asu.edu

*Corresponding officer

Abstract: We explored the Feldenkrais Method as a tool for developing transformational leadership. 138 undergraduates at a large state university participated in a single-session, 35-minute Feldenkrais Awareness through Movement lesson via: 1) in-person instruction, 2) video/audiotape, or 3) audiotape only. We tested for changes in levels of body awareness, stress, and self-perceived empathic and communicative leadership capacities using standardized scales administered pre- and post-intervention. Significant increases were found in body awareness and self-assessed leadership capacities and significant decreases in stress between pre-and post-test. Body awareness and leadership increased significantly regardless of instructional modality, while stress reduction occurred for the in-person intervention.

Key terms; Feldenkrais, Social justice, somatic education, Transformational Leadership, Professional development, Leadership program design, Leadership pedagogies, Leadership knowledge and skills, Interpersonal skills

Implications of the Feldenkrais Method of Somatic Education for U.S. Training College Students to be Transformational Leaders

These are challenging times for social justice leaders across many domains but perhaps no more challenging than in the field of education. The increase in demographic diversity of the school-age population and the growth of class- and race-based disparities in educational opportunities and outcomes come at a time of unequal and declining state investment in public education. School leaders are under extreme accountability pressure without the necessary resources to achieve their goals, and rank-and-file teachers witness daily the social, economic and educational fallout from growing income inequality in the U.S. Schools are on the front line of most of today's social-justice issues, and their teachers and leaders will need both a deeper understanding of social-justice issues and leadership education that better prepares them to function in an environment where the playing field for their students is far from even. This reality calls for different models of leadership training that move away from relying solely on the development of standardized competencies and skills to embrace a more integrated or holistic approach that emphasizes leadership for liberation and social justice (Connors & Poutiatine, 2010, Jean-Marie and Brooks 2009). This requires greater attention to the pedagogy of leadership education. We are in the process of developing and refining an embodied pedagogy for transformational leadership applicable to a range of leadership contexts (including higher education), and our approach is more fully described below.

The aim of this study was to explore the use of somatic education as a potential strategy for developing transformational leadership capacities among college students. Somatic education is an experiential approach in which students acquire enhanced bodily awareness to achieve greater physiological control along with heightened self-knowledge and interpersonal abilities

(Brendel & Bennett 2016; Fisher & Robbins 2015; Fraleigh, 2015; Hamill, 2013; Strozzi-Heckler, 2007). The type of somatic education we studied was Feldenkrais, a method in which participants become more aware of bodily sensations through precisely guided movement sequences. This enhanced bodily awareness promotes new ways of moving that stimulate the development of multiple neural pathways. These afford the individual with new options for thinking, acting and feeling that support the relationship capacities that are needed for advocacy and social change. The purpose of our study was to test for changes in levels of body awareness, stress and leadership among college students who received Feldenkrais somatic education and to explore the interrelationships among these three outcomes and their potential value for training transformational leaders.

Literature Review

The Feldenkrais Method of Somatic Education

The Feldenkrais Method of somatic education was developed by the Israeli physicist and engineer Moshe Feldenkrais (1904-1984) and brought to the U.S. during the 1960s as part of the human potential movement (Reese, 2015). As of 2014, the method is taught in 18 countries on three continents with over 7,000 certified instructors (International Feldenkrais Federation, 2016). There are two forms of Feldenkrais. The first, called functional integration, involves one-on-one, hands-on, kinesthetic communication that is typically done with persons who have been injured or have a physical disability. The second is Awareness through Movement which involves verbally directed, gentle movement sequences typically done in groups led by certified Feldenkrais instructors. Students can be standing, sitting, walking or lying on the floor and are guided through a series of comfortable, easy movements that gradually evolve into movements of greater difficulty and complexity (Lyttle, 1997). The guided exercises work by making

individuals aware of their own habitual neuromuscular patterns and rigidities and by teaching participants new ways of moving while increasing sensitivity and improving bodily efficiency. For example, a Feldenkrais lesson on breathing would enhance students' awareness of how they habitually breathe and teach them different ways of using the breath to stay present in the here and now, avoiding being triggered by past events or anticipated future occurrences. Eye-hand lessons might teach students how information about one's environment is processed through these two bodily portals and how to use gentler movements to reduce information overload. Through greater awareness of the minute details of how one performs different actions, Feldenkrais students learn how to eliminate unnecessary energy expenditure and move with greater ease and less effort. At the same time, this allows the brain to create new patterns and affords the individual new options for thinking, acting and feeling. We based our intervention on the second form of Feldenkrais, Awareness through Movement, because the practice has an evidence base (described below), can be taught in a classroom setting to college students, is relatively physically undemanding, and can be done by people with different body types and capacities for physical exertion.

A growing body of research suggests that, in addition to having a positive effect on the way one moves, the Feldenkrais Method can induce relaxation (Wanning, 1993), elevate mood (Lake 1985) and reduce stress and anxiety (Kolt & McConville, 2000). Summaries of the research literature on outcomes of Feldenkrais interventions include studies finding significant reduction of pain, improvement of affect states, enhanced self-efficacy and self-image, and positive increases in a wide range of quality-of-life measures (Hillier & Worley, 2015; Smyth, 2012). In particular, Feldenkrais is associated with improvements in body awareness and stress reduction, as detailed below.

Body Awareness

Body awareness involves paying attention to internal bodily sensations and learning how to interpret their meaning. Somatic forms of education such as Feldenkrais direct the student's attention to bodily experiences such as movement, gestures, internal physical sensations and breathing, as part of personal learning and development. Feldenkrais has been shown to increase body awareness in patients with fibromyalgia (a disorder characterized by widespread joint pain, diffused soreness and stiffness) who report greater sensation of movement along with increased flexibility and reduced stiffness after exposure to the method (Smyth, 2012, p. 59). In a study of chronic pain sufferers (Ohmann et al., 2011), subjects reported "a liberating feeling" and being "more present in the body." Some research suggests that Feldenkrais can have a positive impact on body image and self-image in relation to feelings about the body. For example, a study of people with nonspecific musculoskeletal conditions (Malmgren-Oleson et al., 2001) found a decrease in negative self-image among Feldenkrais participants. Among women with eating disorders, Feldenkrais participants experienced a significant increase in satisfaction with overall body appearance. In summary, prior research suggests that exposure to Feldenkrais enhances body awareness and, in turn, can help improve physical comfort and self-image.

Stress

There is less research on changes in stress levels among Feldenkrais participants. A randomized controlled trial study of patients with multiple sclerosis found that levels of perceived stress declined significantly among Feldenkrais participants relative to controls (Johnson et al., 1999). A randomized controlled trial study of adults with stress-related illnesses found that those receiving a cognitive intervention that included Feldenkrais instruction had significantly better self-rated general health than controls at three- and six-month follow-ups

(Heiden et al., 2007). In addition to direct effects of Feldenkrais on stress levels, there is also evidence that it promotes relaxation (Ohmann et al., 2011; Wanning, 1993) which may, in turn, reduce stress. Thus, there is reason to believe that Feldenkrais somatic education may also lower stress levels among participants either directly or by promoting greater relaxation.

Embodied Transformational Leadership

Transformational leadership involves the ability to inspire action, motivate change, stimulate new thinking, adapt to different contexts and consider individual differences (Kuepers, 2011; Kuhnert & Lewis, 1987). In this style of leadership, the line between leader and follower is often blurred, with each reciprocally influencing the other and often exchanging roles depending on the situation; such relationships may inspire followers to become leaders and leaders to become more empathic (Burns, 1978). A social transformational leader is one who envisions a more just world and seeks to bring about positive change through action and advocacy. They seek, in other words, to become socially responsible and ethical leaders.

According to Kuepers (2011), embodiment is an important element of transformational leadership. Bodies and bodily performances—including physical stature, features, stance, gestures and voice—are central, yet ignored, elements in the enactment of leadership (Ladkin, 2008; Sinclair, 2005). Body-awareness provides the individual with opportunities to connect bodily sensations to affective states and thereby better manage negative emotions. The ability to regulate emotions and not be reactive is critical for staying in the present. Staying in the present allows leaders to listen to others, find flexible solutions and behave in ways that are congruent with their ideals, values and purpose. Brendel and Bennett (2016, p. 410) argue for an embodied leadership training model where, “leaders learn how to expand awareness to receive real-time insights, critically reflect upon those insights to inform new actions and behaviors, and transform

their way of being so that it grows their authentic capacity and is better aligned with their needs and intentions.” Through somatic practices such as Feldenkrais, we posit that individuals may “develop an embodied leadership presence that is internally sensed and read by others as open, engaged, and trustworthy” (p. 414).

Two important components of transformational leadership are empathy (Miller, 2009) and communication (Berson & Avolio, 2004). Empathy helps mobilize leaders to care about an injustice and to become willing to act to change the situation. In one study (Kellett, Humphrey, & Sleeth, 2009), people rated highly on empathy were regarded by their peers as exemplary task leaders as well as relational leaders. Empathy is also highly valued by followers, who are more likely to perceive leadership qualities in someone who is viewed as empathic. Empathy with the perspectives of others who do not share one’s point of view or life experiences is crucial to transformational leadership, particularly when an explicit leadership goal is promotion of diversity (Lee, 2003). In these situations, communication challenges abound for transformational leaders working across social and cultural boundaries to effect change. A major national study of leadership among college students (Dugan & Kornives, 2010) demonstrated that the number one factor associated with socially responsible leadership is the ability to have difficult conversations about socio-cultural issues despite the lack of shared positionality. Such conversations are by necessity relational, situational and fluid, requiring the ability to exchange positions. Successful leadership, from a communicative perspective, is neither leader-centric nor follower-centric (Fairhurst & Connaughton, 2014).

The idea that Feldenkrais education has the potential to contribute to transformational leadership training is relatively new. To our knowledge only one prior analysis, by Goldman Schuyler (2010), suggests that Feldenkrais can increase the likelihood that people will notice

how they feel when deciding or acting, rather than ignoring the somatic feedback that can signal when one is being reactive rather than acting with integrity. In helping students to pay close attention to what is taking place in each moment, Feldenkrais can anchor individuals in the here and now, effectively freeing them from expectations or anxieties based on past experiences or future expectations. This sense of being present may enable individuals to develop effective, powerful action in the world and make them better leaders (Goldman Schuyler, 2003).

Given the foregoing evidence and theorizing, we posit that the Feldenkrais Method has the potential to increase body awareness and reduce stress in college students. These changes, in turn, may promote enhanced transformational leadership capacities in college students by helping them to remain grounded and present in the moment. Thus, our first and second hypotheses are that Feldenkrais participants will experience significant increases in body awareness and significant reductions in stress. We also hypothesize that Feldenkrais participants will report significant increases in the extent to which they feel able to exercise empathic and communicative abilities in leadership situations.

Method

Participants

A convenience sample of 138 undergraduate students at Arizona State University (ASU) was recruited for this study. All participants were enrolled in classes in the ASU School of Social Transformation, a university division that offers the following areas of concentration: African and African American Studies; Asian Pacific American Studies; Women, Gender and Sexuality Studies; Social and Cultural Pedagogy; American Indian Education; and Justice and Social Inquiry. Study participants' gender distribution was 39.1% (n=54) female and 60.9% (n=84) male.

Procedures

An email was sent to all instructors in the School of Social Transformation soliciting permission to have their 300 or 400 level classes with at least 20 registered students recruited for the study. Eight classes meeting these inclusion criteria were then assigned to one of three instructional modalities (described below) using the table of random numbers. All human subjects research procedures were approved by the ASU Institutional Review Board. Researchers attended the class sessions where the intervention was administered, explained the nature and purpose of the study and elicited verbal informed consent from willing participants. Students were told that study participation was completely voluntary and separate from their coursework, that they could remain in the course if they chose not to participate in the research, that research participation would not affect their course grade or relationship with the instructor, and that they could elect to skip any questionnaire items they wished. The pre-test was then completed by all consenting students, followed by the intervention, and then completion of the post-test. Non-consenting students could leave the room. Pre- and post-tests consisted of paper-and-pencil self-report assessments, described below.

Intervention

Consenting students participated in a single-session, 35 minute Feldenkrais Awareness through Movement lesson that was taught free-of-charge by a certified Feldenkrais practitioner. We chose a single session because the findings of prior research demonstrated that one class can cause changes in participant outcomes. For example, a randomized controlled trial (RCT) of a single Feldenkrais session provided to 30 healthy volunteers found significant changes in both physical movement (neck flexion) and self-assessed exertion (less perceived effort in movement) among participants but not in controls (Ruth & Kegerreis, 1992). Another RCT study of 29

healthy university students found significant improvements in dexterity among experimental subjects compared to controls after a single session of Feldenkrais instruction (Bitter et al., 2011).

The intervention was administered via one of three instructional modalities: 1) in-person instruction, 2) watching and listening to a video/audiotape or 3) listening to audiotape only instruction. The audio-only session was taken from the videotaped session. All sessions began with an introduction to somatic awareness and learning and a brief description of what would be occurring during the class. Next, students engaged in a seated Awareness through Movement lesson on turning. This involved turning movements of the head, arm, eye and shoulder and attention to breathing. Following this, a brief discussion was led by the instructor or, in the case of non-live administrations, one of the researchers or research assistants, who followed a script to ensure uniformity. Attention was paid to making intervention content highly similar across the three instructional modalities. We tested video and audio methods of delivery to see whether a less expensive approach that did not require the presence of a trained Feldenkrais practitioner would work as well as the more expensive in-person modality. We also tested audio and video versions to evaluate the potential for offering an online version of our intervention and for streaming examples for interested students to reach a larger and more diverse audience.

Measures

In accordance with the study's conceptual model, three intervention outcomes were assessed. The first, body awareness, was measured using the Scale of Body Connection (SBC) (Price & Thompson, 2005), a 20 item self-report measure that includes two subscales: one assessing body awareness and the other assessing bodily dissociation. In prior research, this scale was shown to have acceptable construct validity and internal consistency reliability for each

subscale as measured by goodness-of-fit indices and Cronbach's alpha (Price and Thompson, 2005). We administered the body awareness subscale, consisting of 12 items, rated on a Likert-type scale ranging from one (not at all) to five (all of the time). Sample items included “I notice feeling different after peaceful experiences” and “I take cues from my body.” In this study, the measure demonstrated good reliability as determined by Cronbach’s alpha ($\alpha = .82$). This subscale has been used in studies of meditation (Daubenmier et al., 2013) and recovery from childhood sexual abuse (Price, 2005).

The second outcome was stress reduction, measured using the Undergraduate Sources of Stress Questionnaire (USSQ) (Blackmore et al., 2005). The USSQ is comprised of four subscales, and we used the Personal Issues Subscale consisting of six items that measure stress in social relationships, health and mood. Each subscale of the USSQ has been shown to have good internal consistency as measured by Cronbach’s alpha (ibid.). Respondents were asked to rate the extent to which each potential stressor was a source of stress to them using a five-point Likert-type scale ranging from zero (not at all) to four (a great deal). Sample areas queried included “relationships with family members,” “psychological health” and “loneliness.” In this study, the subscale exhibited moderate reliability ($\alpha = .65$). This scale has been used in studies of college students in three countries (Jacob et al., 2012) and undergraduate physiotherapy students (Walsh, 2010).

The third outcome was transformational leadership, assessed using the Ethical Leadership Scales (ELS), which were designed to be used to promote self-assessment of one’s mindset regarding ethical competence in leadership relationships (Berghofer and Schwartz, 2007). We chose a 13-item subscale called the Social Ethical Competence Subscale (SECS) to measure respondents’ self-perceptions regarding their ability to “act to induce desirable, ethically

grounded responses in others” (communicative leadership) and to “strive to understand and appreciate the worth of others” (empathic leadership) in leadership situations. Sample items for communicative leadership include “making it a point to keep others informed,” dealing with difficult issues straightforwardly,” “staying receptive to bad news as well as good,” and “seeking to be clearly understood.” Sample items for empathic leadership include “being able to walk in someone else’s shoes,” “being sensitive to others’ feelings and perspectives,” “listening deeply” and “being attentive to emotional cues.” Respondents rated their competencies on a Likert-type scale ranging from one (never) to five (always). This was the first time that the SECS was used to measure self-assessed leadership competence in a research study. It demonstrated good reliability for its total score ($\alpha = .83$) and communicative subscale score ($\alpha = .80$) and moderate reliability for the empathic subscale score ($\alpha = .66$).

Analysis

Frequency distributions and univariate statistics were calculated. We used one-sided paired t-tests to assess our directional hypotheses that body awareness and ethical leadership would increase while personal stress would decrease following Awareness through Movement participation. We next stratified these analyses by gender and exposure modality. Finally, we examined correlations among change scores and among measures at post-test using two-tailed Pearson correlations without hypothesized directions.

Results

Table 1 presents means and standard deviations for the three outcomes at pre-test for the total sample and individually by gender groups. Females had significantly higher body awareness and personal stress at pre-test than males. While there were no gender differences at

pre-test in total leadership or communicative leadership scores, males had significantly higher mean scores than females on the empathic leadership subscale.

Results of within-subjects paired t-tests of changes between pre- and post-test are shown in Table 2. These results revealed that body awareness increased significantly between pre- and post-test. Also observed were significant increases in leadership total score as well as both empathic and communicative leadership subscale scores from pre-to post-test. Finally, stress scores were found to decrease significantly between pre-and post-test.

Table 3 presents changes from pre- to post-test, stratified by gender group. As shown in this table, changes were consistent for both male and female/other participants with one exception. That exception was the outcome of stress, where the pre- to post-test decrease for males was found to be statistically non-significant.

Table 4 presents change scores from pre- to post-test among all participants (N=138) stratified by exposure modality (e.g., in-person, video with audio, and audio alone). As shown in this table, body awareness increased significantly ($p < .001$) for all three modalities, with the greatest changes in the in-person and audio instruction groups. Leadership and empathic leadership subscale scores increased significantly ($p < .001$) in all three modalities and, once again, the greatest increases occurred in the in-person and audio groups. Finally, there was a significant decrease in stress ($p < .05$) in the in-person group but not for the other two instructional modalities.

Finally, we examined correlations between the three outcomes at post-test. We found that body awareness was positively correlated with overall leadership (Pearson correlation $r = .41$, $p < .001$) and with both the empathic leadership subscale ($r = .47$, $p < .001$) and the communicative leadership subscale ($r = .28$, $p = .001$). Thus, following the intervention, the greater the students'

body awareness, the greater their degree of self-perceived ethical leadership competence. No significant relationships were found between stress and either of the other two outcomes.

Discussion

To meet the needs of college students for targeted training as transformational leaders and change agents rooted in theories of transformational learning, we are in the process of developing an educational intervention designed to promote transformational leadership and embodied activism. This larger intervention is part of the turn to contemplative practices in higher education and employs the Feldenkrais Method of somatic education along with insight meditation, and reflective writing and discussion. Because the Feldenkrais method is foundational to our approach, we wanted to explore empirically whether a Feldenkrais lesson, standing alone, could enhance college students' self-perceptions of communicative and empathic capacities for transformative leadership, increase awareness of bodily sensations and reduce stress.

Our findings confirmed each of our study hypotheses and revealed some suggestive future lines of inquiry. From pre- to post-intervention, students showed significant improvement in body awareness and self-perceived transformational leadership abilities and significant reduction in stress. Significant improvements in body awareness and leadership capacities were found regardless of type of instructional modality, although in-person instruction was associated with larger pre-post changes than the other two modalities. When examined by modality, significant reduction in stress was observed only for participants in the in-person class. Regarding gender, pre- to post-changes in women were significant for all outcomes while, for men, body awareness and leadership improved significantly but perceived stress did not. These results suggest that somatic education holds promise for improving body awareness and

transformational leadership among both men and women, regardless of instructional modality. Findings also underscore important interconnections between body, mind and emotions in preparing young people for transformational leadership roles.

Limitations

Some caveats apply to our study findings. First, study participants were not nationally representative of college students since they were recruited from a single state university in the Southwest. Second, without a control group, we are unable to attribute the pre-post changes in body awareness, leadership and stress that we observed to participation in the intervention itself. Third, the self-report nature of the measures we used may have introduced positive response biases from students wishing to portray themselves in a more “progressive” and “informed” light. Fourth, administering the post-test assessment immediately after the intervention did not allow participants additional time for changes in leadership, body awareness and other behaviors that might have been reflected in the attitudinal measures. While these limitations are not insignificant, our study is intended as an initial step in curriculum development that requires the demonstration of linkages between the components of our planned intervention. To ascertain whether we are heading in the right direction, establishing that these associations exist, even in a non-causal research design, is important to our next stage of intervention development.

Conclusion and Future Directions

The ASU School of Social Transformation (SST), the site of this study, is the ideal context in which to explore the impact of the Feldenkrais somatic method of education on developing students’ capacities for embodied transformational leadership. This innovative, transdisciplinary academic unit brings together diverse scholars, students and communities in ethnic studies, justice studies, popular education, and women, gender and sexuality studies that

are passionate about social justice and social change. SST offers graduate and undergraduate degrees in these fields as well as certificates in human rights, economic justice and social transformation. Over 12,000 students take a course in SST each year, and most students pursuing degrees are first-generation college students from families, tribal nations and communities that make up the vibrant diversity of the Southwest. They bring to the classroom their own experiences with and knowledge about systems of discrimination and domination and their struggles to resist and change them. Classroom discussions are thus rich and productive, but they can also be overwhelming, stressful and discouraging.

There was a significant reduction in stress after the Feldenkrais intervention compared to the pretest. The ability to reduce stress may allow students to regulate their own emotional reactions to injustice and to stay present-focused. Body awareness was also increased after the Feldenkrais lesson, suggesting that greater awareness of movement may help students notice how their bodies react to stress and negative emotions. By paying attention to physical sensations as a barometer for emotional and physical stress, students may be able to read when their actions are not congruent with their goals and ideals. When students move with greater ease and grace, they may embody an esthetically pleasing leadership style that conveys integrity and trust. Because body awareness is so strongly associated with mindfulness, we hope in the future to test the effects of Feldenkrais on mindfulness and to tease out the relationship between more explicit mindfulness practices such as meditation, dialogue and reflexive writing on transformative leadership.

The fact that both men and women experienced significant changes following the intervention suggests that all genders of every race and ethnicity can participate in the same training program together. Also, since we observed improvement in both live and recorded

sessions, there may be options for less expensive approaches that do not require the presence of an instructor, promoting greater accessibility for lower-income users. Similarly, there may be the potential for offering online instruction that would reach a larger and more geographically dispersed audience.

A number of questions remain to be addressed. Where does Feldenkrais fit into the larger picture of transformative leadership training for students who want to change the world? Can somatic practices create healthier agents of change capable of sustaining social action over time? How can we be more intentional in preparing students and others to be transformational leaders and followers? To answer such questions will require a more fully developed transformational leadership intervention, more rigorous research design and instrumentation, and measurement of outcomes by following students into the real-world as they seek to promote social justice and societal change. We hope that, by focusing on a specific somatic practice, our study's findings will contribute to the growing body of literature on embodied educational approaches to leadership training that seek ways to better prepare and support tomorrow's emerging leaders. Our approach falls within the phenomenological tradition of understanding embodied leadership as comprised by the interconnections of thinking, feeling, sensing and acting. By focusing on the whole person in relation to others, we seek to advance the view of leadership as co-created in the moment by the interaction of empowered individuals (Rosile, Boje & Claw, 2016).

Declaration of Conflict of Interests

The authors declare no potential conflicts of interest with respect to the research, authorship, or publication of this article.

References

- Berghofer, D. & Schwartz, G. (2007). *The ethical leadership scales*. Victoria, BC: Trafford Publishing.
- Berson, A. (2004). Transformational leadership and the dissemination of organizational goals: A case study of a telecommunication firm. *The Leadership Quarterly*, 15(5), 625-646.
- Bitter, F., Hillier, S., & Civetta, L. (2011). Change in Dexterity with Sensory Awareness Training: A randomized controlled trial 1. *Perceptual and Motor Skills* 112(3): 783-798.
- Blackmore, A. M., Tucker, B., & Jones, S. (2005). Development of the undergraduate sources of stress questionnaire. *International Journal of Therapy and Rehabilitation*, 12(3), 99-105.
- Brendel, W., & Bennett, C. (2016). Learning to embody leadership through mindfulness and somatics practices. *Advances in Developing Human Resources*, 18(3), 409-425.
- Burns, J. M. (1978). *Leadership New York*. NY: Harper and Row Publishers.
- Connors, D.A., & Poutiatine, M. (2010). Transformational learning for school leaders: Movement for social justice in school leaders preparation. *International Journal of Educational Leadership Preparation*, 5(3),
- Daubenmier, J., Sze, J., Kerr, C. E., Kemeny, M. E., & Mehling, W. (2013). Follow your breath: Respiratory interceptive accuracy in experienced meditators. *Psychophysiology*, 50(8), 777-789.
- Dugan, J. P., & Komives, S. R. (2010). Influences on college students' capacities for socially responsible leadership. *Journal of College Student Development*, 51(5), 525-549.

- Fairhurst, G. T. & Connaughton, S. L. (2014). Leadership: A communicative perspective. *Leadership, 10*(1), 7-35.
- Fraleigh, S. (2015). *Moving consciously: Somatic transformation through dance, yoga, and touch*. Urbana: University of Illinois Press.
- Fisher, K. & Robbins, C. R. (2015). Embodied leadership: Moving from leadership competencies to leaderful practices. *Leadership, 11*(3), 281-299.
- Goldman Schuyler, K. (2003). Awareness through movement lessons as a catalyst for change. *The Feldenkrais Journal, 15*, 39-46.
- Goldman Schuyler, K. (2010). Increasing leadership integrity through mind training and embodied learning. *Consulting Psychology Journal: Practice and Research, 62*(1), 21-38.
- Hamill, P. (2013). *Embodied leadership: the somatic approach to developing your leadership*. London: Kogan Page.
- Heiden, M., Lyskov, E., Nakata, M., Sahlin, K., Sahlin, T., & Barnekow-Bergkvist, M. (2007). Evaluation of cognitive behavioural training and physical activity for patients with stress-related illnesses: A randomized controlled study. *Journal of Rehabilitation Medicine, 39*(5), 366-373.
- Hillier, S. & Worley, A. (2015). The effectiveness of the Feldenkrais method: A systematic review of the evidence. *Evidence-Based Complementary and Alternative Medicine, 2015*(3): 1-12.
- International Feldenkrais Federation (2016) Member organizations. Available at: <http://feldenkrais-method.org/iff/member-organizations/> (accessed 01 12 2016).

- Jacob, T., Gummesson, C., Nordmark, E., El-Ansary, D., Remedios, L., & Webb, G. (2012). Perceived stress and sources of stress among physiotherapy students from 3 countries. *Journal of Physical Therapy Education, 26*(3), 57.
- Jean-Marie, G., Normore, A.H., & Brooks, J. (2009). Leadership for social justice: Preparing 21st century school leaders for a new social order. *Journal of Research on Leadership Education, 4*(1): 1-31.
- Johnson, S. K., Frederick, J., Kaufman, M., & Mountjoy, B. (1999). A controlled investigation of bodywork in multiple sclerosis. *The Journal of Alternative and Complementary Medicine, 5*(3), 237-243.
- Kellett, J. B., Humphrey, R. H., & Sleeth, RG (2009). Career development, collective efficacy, and individual task performance. *Career Development International, 14*(6), 534-546.
- Kolt, G. S. & McConville, J. C. (2000). The effects of a Feldenkrais Awareness through Movement program on state anxiety. *Journal of Bodywork and Movement Therapies, 4*(3), 216-220.
- Kuepers, W. M. (2011). "Trans-+-form": Leaders and followership as an embodied, emotional and aesthetic practice for creative transformation in organisations. *Leadership and Organisation Development Journal, 32*(1), 20-40.
- Kuhnert, K. W., and Lewis, P. (1987). Transactional and transformative leadership: a constructive/developmental analysis. *The Academy of Management Review, 12*(4), 648-657.
- Ladkin, D. (2008). Leading beautifully: How mastery, congruence and purpose create the aesthetic of embodied leadership practice. *The Leadership Quarterly, 19*(1), 31-41.

- Lee, M. (2003). Engaging the whole person through the practice of collaborative learning. *International Journal of Life-Long Education*, 22(1), 78-93.
- Lyttle, T. S. K. (1997). The Feldenkrais method: Application, practice and principles. *Journal of Bodywork and Movement Therapies*, 1(5), 262-269.
- Malmgren-Olsson, E. B., Armelius, B. A., & Armelius, K. (2001). A comparative outcomes study body awareness therapy, Feldenkrais, and conventional physiotherapy for patients with nonspecific musculoskeletal disorders: Changes in psychological symptoms, pain, and self-image. *Physiotherapy Theory and Practice*, 17(2), 77-95.
- Mehling, W. E., Wrubel, J., Daubenmier, J., Price, C. J., Ker, C. E., Silow, T., Stewart, A. L. (2011). Body awareness: A phenomenological inquiry into the common ground of mind-body therapies. *Philosophy, Ethics, and Humanities in Medicine*, 6(6), 1-12.
- Mezirow, J. (1994). Understanding transformative theory. *Adult Education Quarterly*, 44(4), 222-244.
- Miller, M. (2009). Transformational leadership behaviors and empathy with action. *Transformation: An International Journal of Holistic Mission Studies*, 26(1), 45-59.
- Ohmann, A., Astrom, L., & Malmgren-Olsson, E.B. (2011). Feldenkrais therapy as group awareness through movement for chronic pain: A qualitative evaluation. *Journal of Bodywork and Movement Therapies*, 15(2), 153-161.
- Price, C. (2005). Body-oriented therapy in recovery from child sexual abuse: An efficacy study. *Alternative Therapies in Health and Medicine*, 11(5), 46-57.
- Price, C. J., & Thompson, E. A. (2007). Measuring dimensions of body connection: Body awareness and bodily dissociation. *Journal of Alternative and Complementary Medicine*, 13(9), 945-953.

- Reese, M. (2015). *A life in movement: The definitive biography of Moshe Feldenkrais*. San Rafael, CA: Reese Kress Somatics Press.
- Rosile, G. A., Boje, D. M., and Claw, C. M. (2016). Ensemble leadership theory: Collectivist, relational, and heterarchical roots from indigenous contexts. *Leadership*, 742715016652933.
- Ruth, S. & Kegerreis, S. (1992). Facilitating cervical flexion using a Feldenkrais method: Awareness through movement. *Journal of Orthopaedic and Sports Physical Therapy*, 16(1), 25-29.
- Sinclair, A. (2005). Body possibilities in leadership. *Leadership*, 1(4), 387-406.
- Smyth, C. (2012). *The contribution of Feldenkrais method to mind-body medicine*. (Unpublished master's thesis). Saybrook University, San Francisco, California.
- Strozzi-Heckler, R. (2007). *The leadership dojo*. Berkeley, CA: Frog Books.
- Walsh, J. M., Feeney, C., Hussey, J., & Donnellan, C. (2010). Sources of stress and psychological morbidity among undergraduate physiotherapy students *Physiotherapy*, 96(3), 206-212.
- Wanning, T. (1993). Healing and the mind/body arts: Massage, acupuncture, yoga, t'ai chi and Feldenkrais. *Journal of the American Association of Occupational Health Nurses*, 41(7), 349-351.

Table 1. Descriptive statistics for outcomes by gender at baseline among undergraduate college students (N=138)

Scale	Total n=138 Mean (s.d.)	Female n=54 Mean (s.d.)	Male n=84 Mean (s.d.)	t-test, p-value 2-sided
Body awareness ¹	2.28 (0.58)	2.42 (0.61)	2.19 (0.55)	t=2.28 p=.024
Stress ²	2.38 (0.69)	2.59 (0.67)	2.24 (0.66)	t=3.03 p=.003
Leadership ³	2.24 (0.51)	2.18 (0.45)	2.28 (0.54)	t= -1.08, p=.283
Leadership empathy subscale ³	2.24 (0.67)	2.03 (0.60)	2.38 (0.68)	t= -3.12 p=.002
Leadership communication subscale ³	2.23 (0.54)	2.28 (0.49)	2.20 (0.58)	t= .87 p=.368

¹ Higher scores indicate greater body awareness.

² Lower scores indicate lower level of stress.

³ Higher scores indicate greater leadership.

Table 2. Pre-post changes among Feldenkrais Awareness through Movement participants

(N=138)

	Pre-post change Mean (s.d.)	Paired t-test	Significance (1-tailed)
Body awareness ¹	+0.97 (0.38)	29.79	p<.001
Stress ²	-0.05 (0.32)	-1.95	P<.05
Leadership ³	+1.56 (1.03)	17.73	p<.001
Leadership empathy subscale ³	+1.51 (1.30)	13.65	p<.001
Leadership communication ³	+1.58 (1.09)	16.93	p<.001

¹ Higher scores indicate greater body awareness.

² Lower scores indicate lower level of stress.

³ Higher scores indicate greater leadership.

Table 3. Pre-post intervention changes among Feldenkrais Awareness through Movement participants (N=138) stratified by gender

	Pre-post change Mean (s.d.)	Paired t-test	p-value (1-tailed)
Female			
Body awareness ¹	+1.05 (0.42)	18.41	p<.001
Stress ²	-0.06 (0.26)	-1.71	P<.05
Leadership ³	+1.67 (0.91)	13.51	p<.001
Leadership empathy subscale ³	+1.87 (1.16)	11.88	p<.001
Leadership communication subscale ³	+1.52 (0.97)	11.53	p<.001
Male			
Body awareness ¹	+0.93 (0.36)	23.91	p<.001
Stress ²	-0.05 (0.36)	-1.25	p=.107
Leadership ³	1.48 (1.10)	12.34	p<.001
Leadership empathy subscale ³	1.28 (1.34)	8.74	p<.001
Leadership communication subscale ³	+1.61 (1.17)	12.62	p<.001

¹ Higher scores indicate greater body awareness.

² Lower scores indicate lower level of stress.

³ Higher scores indicate greater leadership.

Table 4. Pre-post intervention changes among Feldenkrais Awareness through Movement participants (N=138) stratified by instructional modality

	Pre-post change Mean (s.d.)	Paired t-test	p-value (1-tailed)
Body awareness ¹	+1.02 (0.34)	23.37	p<.001
Stress ²	-0.09 (0.36)	-1.97	P<.05
Leadership ³	+1.66 (1.00)	12.85	p<.001
Leadership empathy subscale ³	+1.52 (1.30)	9.09	p<.001
Leadership communication subscale ³	+1.72 (1.02)	12.95	p<.001
Audio-Video			
Body awareness ¹	+0.88 (0.39)	15.16	p<.001
Stress ²	-0.04 (0.29)	-0.93	p=.180
Leadership ³	+1.31 (1.08)	8.22	p<.001
Leadership empathy subscale ³	+1.36 (1.48)	6.21	p<.001
Leadership communication subscale ³	+1.26 (1.11)	7.73	p<.001
Audio Only			
Body awareness ¹	+1.03 (0.44)	13.32	p<.001
Stress ²	-0.01 (0.29)	-0.04	p=.484
Leadership ³	+1.72 (0.98)	9.90	p<.001
Leadership empathy subscale ³	+1.71 (1.00)	9.62	p<.001
Leadership communication subscale ³	+1.77 (1.13)	8.84	p<.001

¹ Higher scores indicate greater body awareness.² Lower scores indicate lower level of stress

³ Higher scores indicate greater leadership.