An action research approach to introduce Dalcroze Eurhythmics Method in a community of older adults as a promising strategy for fall prevention, injury recovery and socialization

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Abstract
A community health programme was piloted at San Marcos Senior Activity Center in California over a two-year period, patterned from the Jaques-Dalcroze Eurhythmics method known to reduce fall rates by half, and improve cognition and mood in older adults. The programme involved live improvised music to cue synchronised and improvised body movements, memory and attention tasks, and cognitive-motor games, with collaborative support from older adult participants and kinesiology students. This article presents the older adults' perceptions on the strengths and challenges of the programme, and their recommendations for making improvements in the next action research phase. (Feedback from the kinesiology students appears in a follow-up article.) Focus group interviews revealed that the strengths of the programme included: 1) social and physical pleasure; 2) improved health, including balance, gait, recovery after an injury, confidence in mobility, metamemory skills, and a greater understanding of health promotion and fall prevention strategies; and 3) the collaborative nature of individualized support. Challenges during the first year included transportation, scheduling, and differences in skill levels among participants, however, these were resolved by the second year. Recommendations for improving the programme in the next action research phase include: continuing the current practice, attracting more participants who could benefit from the programme and retaining them, and securing funds to offset costs.

Keywords
Community-based programme, Jaques-Dalcroze Eurhythmics, fall prevention, older adults, kinesiology, health, exercise.

Un abordaje de la investigación-acción para introducir el método Dalcroze Eurhythmics en una comunidad de adultos mayores como estrategia prometedora para la prevención de caídas, recuperación de lesiones y socialización

Resumen
Un programa de salud comunitaria fue desarrollado en el Centro de Actividad Senior de San Marcos en California durante un período de dos años, modelado a partir del método Jaques-Dalcroze Eurhythmics, conocido por reducir las tasas de caída a la mitad, y mejorar la cognición y el estado de ánimo en los adultos mayores. El programa envolvió música improvisada en directo para señalar movimientos del cuerpo sincronizados e improvisados, tareas de memoria y atención, y juegos cognitivo-motores, con apoyo colaborativo de participantes adultos mayores y estudiantes de kinesiología. Este artículo presenta las percepciones de los adultos mayores sobre las fortalezas y los desafíos del programa, y sus recomendaciones para hacer mejoras en la próxima fase de la investigación-acción. (La devolución de

los estudiantes de kinesiología aparece en un siguiente artículo). Las entrevistas con los grupos focales revelaron que las fortalezas del programa incluyeron: 1) placer social y físico; 2) mejora de la salud, incluyendo el equilibrio, el modo de andar, recuperación después de una lesión, confianza en la movilidad, habilidades de metamemoria, y una mayor comprensión de las estrategias de promoción de la salud y prevención de caídas; y 3) la naturaleza colaborativa del apoyo individualizado. Los desafíos durante el primer año incluyeron transporte, programación y diferencias en los niveles de habilidad entre los participantes, aunque, estos fueron resueltos en el segundo año. Las recomendaciones para mejorar el programa en la próxima fase de la investigación-acción incluyen: continuar con la práctica actual, atraer a más participantes que podrían beneficiarse del programa y conservarlos, y asegurar fondos para compensar los costos.

Palabras clave: programa basado en la comunidad, Jaques-Dalcroze Eurhythmics, prevención de caídas, adultos mayores, kinesiología, salud, ejercicio.

Introduction

About one in three U.S. Americans aged 65 or older falls each year, according to a Centers for Disease Control and Prevention study (Stevens et al. 2012). In 2014, about 27,000 older adults died as a result from a fall, 2.8 million required emergency treatment related to a fall and of those, 800,000 had to be hospitalised. Bergen et al. (2016) found that 28.7% of older adults experienced at least one fall a year. Of those, 37.5% required medical treatment or had to restrict activity for at least a day. One in five falls results in a serious injury, such as broken bones or a head injury (Alexander, Rivara & Wolf 1992; Sterling, O'Connor & Bonadies 2001) and falls account for the most common cause of traumatic brain injuries (Jager, Weiss, Coben & Pep 1992).

Without intervention methods to prevent falls, we can expect the frequency of injuries to increase as the number of adults over 65 continues to grow. For example, in 2010, 13% of the population was 65 or older and in 2015 the percentage grew to 15. Given that life expectancy is now longer than ever historically (Arias 2015), and that the death rate from fall injuries for United States older adults nearly doubled between 2000 (29.6 per 100,000) and 2013, from 29.6 to 56.7 per 100,000 (Kramarow et al. 2015), preventing falls is an urgent health agenda priority. Research has shown that exercise programmes can reduce the risk of falls among older adults in the community (Gillespie et al. 2012; Lord et al. 2000). In their study of ambulatory and cognitively intact adults aged 60-75 years, Province et al. (1995) identified several techniques to be beneficial: endurance training, flexibility exercises, balance platform, Tai Chi (dynamic balance), and resistance training.

Older adults experience decline in cognitive function and higher rates of depression, and therapeutic intervention has been shown to improve wellbeing (Hill & Stigsdotter-Neely 2005; Hyler 2013). This finding fits the numerous sociological studies summarized by Umberson & Montez (2010) about the value of social relationships and its connection with health and wellbeing. Because enjoyment is positively correlated with cognitive functioning, as Theone and her colleagues found (2016), we assume our programme, Jacques-Dalcroze Eurhythmics (JDE), was a cognitive benefit for the participants in this study as confirmed by their own accounts.

Researchers at the University Hospital of Geneva, Switzerland applied a novel programme based on Jaques-Dalcroze Eurhythmics (JDE) that involve physical movement and multitask activities accompanied by live piano music. Long-term participants exhibited gait similar to that of young adults (Kressig et al. 2011). Quantitative results from their studies found the method to be a beneficial for older adults who were at risk for falls. In their 12-month controlled study, Trombetti et al. (2011), found that JDE intervention resulted in improved gait and balance for community-dwelling older adults, and reduced the rate of falls and the risk of falling. Another study by members of the same research team showed the same treatment for community dwellers increased cognitive function and decreased anxiety (Hars et al. 2014a). And, in their four-year follow-up study (Hars et al. 2014b), the 23 subjects who continued a programme with JDE concepts had better gait and balance than the 29 control group subjects who discontinued the programme, and they had reduced risk of falling.

With the goal of achieving similar results for improving or maintaining physical and cognitive health, and preventing falls, qualitative action research was applied to plan, implement and evaluate a community-based programme with a California older adult population. Our goal was not to replicate the earlier studies with supportive quantitative data. Instead, using a discovery process that involved collaboration between older adults at San Marcos Senior Activity Center, health science students, a licensed JDE instructor and professors from California State University, a two-year pilot programme was implemented with the ongoing goal of refining the programme through action research. Building from the prior JDE studies based on quantitative findings to support the efficacy of interventon (Hars et al. 2014a, 2014b; Trombetti et al. 2011), this qualitative action research me delivery. Unlike the earlier controlled studies where older adult participants were recruited from clinical settings and did not require assisted mobility devices, participants in this study were from the community, some required mobility devices, and none were excluded from participation. And, unlike prior studies on JDE, students and older adults collaborated in the development of the programme. This study represents three semesters of action research phases to develop and refine the activities so JDE could be adapted to a U.S. older adult population. JDE has a long history in Western Europe as a method for learning musical expression, and while it has taken roots in the U.S. for the same purpose (Bachmann 1991), it has not been applied in the U.S. to improve or maintain physical and cognitive health as an exercise programme for community-based older adults, nor has it been refined to fit individualised needs through action research methods. Action research is ideal for developing this programme because it engages the stakeholders whose lives are affected by an urgent health problem, and it represents an attempt to improve human conditions and professional practice (Reason & Bradbury-Huang 2013; Stringer 2014). This study was driven by questions to generate feedback from the older adult participants to identify effective strategies, areas that need further development, and develop strategies for making improvements in an ongoing programme: What are the strengths of the programme? What are the challenges? What do older adult participants recommend for making improvements? The first question is patterned from appreciative inquiry, an action research tradition that emphasises building from the positive aspects of practice (Cooperrider & Whitney 2005; Reed 2007; Whitney et al. 2010), and the next two are from action research approaches for identifying problems and developing solutions (Kemmis & McTaggert 2007; Lewin 1946; Sagor 2005, 1993;

Stringer 2008a, McNiff & Whitehead 2011). The programme began with conversations among university faculty who collectively specialize in the following domains: nursing and applied field experience; music therapy and applying the Dalcroze method; kinesiology and field experience; and health promotion. A mutual interest in responding to a public need in the older adult community brought them together to implement a programme to prevent falls, enhance recovery after an injury, and stimulate cognitive functioning. A condensed history of how the action research was planned and implemented over the course of three semesters is summarised in Appendix A.

Research Context

Based on music appreciation and somatic awareness, the community health programme was designed to serve older adults with physical therapy and strength-building activities, and engage memory and attention. Over the course of three semesters, older adults participated in 10 to 14 JDE classes once or twice weekly, supported by students from the Kinesiology Department at California State University San Marcos who supplemented the activities with warm-up, cool-down, strength-building and flexibility exercises.

JDE is a music education method that originated in Switzerland in the early twentieth century and continues to be a popular pedagogical method worldwide for training music students of all ages. For older adult classes, activities are designed to improve motor and cognitive skills such as listening, attention, memory, coordination, balance, and multi-tasking with progressively more complexity (Farber & Parker 1987). Activities require participants to move with the music, repeat movements they were taught earlier, synchronise body actions with musical rhythms, follow partner's movements, react immediately to random signals, repeat or echo movement sequences, interact with other people and objects, and follow verbal instructions and musical cues. Other activities are highly structured, requiring quick reaction time, planned responses, spatial orientation and performing simultaneous tasks, and further activities required creative improvisation. Applied at San Marcos Senior Activity Center, the goal of these activities was to activate the participants' sensory-motor skills associated with balance and mobility (e.g., weight shifting, balancing, flexing joints, co-ordinating muscle movements) and cognitive skills associated with interacting with the environment (such as attention, memory, decision making, dual tasking, planning, improvising). We chose JDE because of its successful tradition for implementing physical exercises in music education, and we wanted to explore how it could be adapted to a U.S. community-based older adult population by getting qualitative feedback from the participants. Our programme development approach was a progression of discovery phases, beginning with input from stakeholders and using feedback to make improvements as new understandings were acquired. Results from this cycle of research was intended to inform the next cycle as ongoing action research.

Research Methods

Action research is a systematic approach for improving practice and quality of life, and it is practiced in a variety of ways, depending on the epistemological, ontological and methodological assumptions (Beaulieu 2013). For example, some action researchers support a collaborative participatory process with stakeholders (Hall 1992; Hero & Reason 2001; Kemmis & McTaggart 2007; Park 1992; Park et al. 1993) while others engage in an autonomous process to improve individual practice, such as teacher research (Lytle & Cochran-Smith 1992; McKernan 1991; McNiff 2005; Stringer 2008). Some focus on problems and solutions (Freire 1970; Kemmis & McTaggert 2007; Lewin 1946; Park et al. 1993; Sagor 2005, 1993; Stringer 2008a; Whitehead & McNiff 2006), others ignore problems altogether, such as appreciative inquiry (Cooperrider & Whitney 2005; Reed 2007; Whitney et al. 2010), and others minimise preconceptions altogether, such as grounded action (Poonamallee 2009; Simmons & Gregory 2003). The design of this study was inspired by the teacher research tradition, whereby the research goals are first defined by the teachers (e.g., Creswell 2005; McKernan 2013; McNiff 2005; Sagor 2010; Stringer 2008). Our goal in this approach was to introduce a new programme to serve the older adult community, work with the participants to refine it, and determine what else is needed to improve efficacy. This approach was guided by Mertler's (2012) action research model: 1) identifying and limiting the topic, 2) gathering preliminary information, 3) reviewing related literature, 4) developing a research plan, 5) implementing the plan and collecting data, 6) analysing the data, 7) developing a plan for another phase, 8) sharing and communicating results, and 9) reflecting on the process. As with most approaches, the steps in this process overlapped with one another, whereby strategies for implementing activities were augmented by input from the participants as a collaborative effort.

Participants

Older adult participants between the ages of 65–94 years were recruited from several regional sources, mostly women and several men, regardless of their physical state: three retirement communities through in-house communications, a major newspaper, and professional meetings that promoted services for older adults. During the first semester, 24 older adults participated in the programme, but about 25% dropped out in the first month. When asked why they dropped out, explanations were mainly lack of interest, not wanting to sign an informed consent form for research, or a release of liability for unrelated medical concerns and travel constraints. Of those who continued the programme over the year, attendance was irregular for about 50% of the participants. Explanations for irregular attendance included medical concerns, irregular transportation, and scheduling problems. Eight participants attended regularly through the first year and a half. This irregular pattern of adherence resembles findings by Picorelli et al. (2014). In four of the studies they reviewed, older adults participated in 65% to 86% of the available sessions, and in five other studies, participation ranged between 58% to 77%. A review of community-based exercise classes for fall prevention by Nyman & Victor (2012) showed that adherence ranged between 42% to 79%.

A cohort of Kinesiology undergraduate students participated during each semester as part of their laboratory experience to learn about aging, physical therapy and contribute to the programme design, implementation and evaluation. Their feedback will appear in a follow-up study as the focus of the current work is on the older adults' feedback.

Planning and Implementation

During the earliest planning phase of the programme, we identified the scope of the programme through dialogue with several parties: 1) staff members at the San Marcos Senior Activity Center; 2) faculty members from the Kinesiology Department, the Human Development, and the School of Nursing at California State University San Marcos; 3) staff members at Health and Human Services Aging and Independence Services for the County of San Diego; and 4) Kinesiology students who participated in the programme. During the first semester, we drafted a research plan together by seeking answers to the following questions. What resources are needed? How do we recruit older adults to participate? How do we tailor JDE to fit what the literature indicates for physical and cognitive exercises? How do we engage the students and older adults in the activities? The result was an initial plan that included: 1) publicity, recruitment and information sessions for older adults; 2) scheduling programme sessions; 3) designing preliminary activities and instructions; 4) training students and co-constructing their feedback system; 5) engaging older adults and co-constructing their feedback system; and 6) developing a system for programme management, data collection and record-keeping.

Over the course of three semesters, the programme was piloted with a variety of activities. Some of the activities were designed and led by the authors, some by the students, and some by the older adults. At the conclusion of each activity, together we critically assessed the benefits of it, the challenges of engaging in it, and alternative approaches to fit individual needs. This process encouraged each person to contribute to the activity and participate at their comfort level. For example, some older adults had difficulty standing while catching and passing a ball, so they chose to sit for this kind of activity. Others chose to increase the complexity of activities by adding more challenging steps for themselves. Thus, while there was a general frame for each group activity, each member modified it to fit their own ability and expressive desire. And while activities were mostly interactive, some encouraged participants to move independently in improvised routines (e.g., dance steps, controlled walking). Two of the regular participants required a gait belt, supported by students to prevent falling during standing activities.

Data Collection

Collecting data was an ongoing process, and what was learned along the way was applied to update plans and refine activities, a process that is common in qualitative action research. At the end of each of the last two semester sessions, a focus group discussion was conducted with the older adults to encourage critical reflection and provide data about their perceptions for the next semester of programme planning and implementation. One focus group

had 15 members (13 women and 2 men) who participated in the first year, and the second group had 8 members (7 women and one man) who participated regularly since the onset of the programme. With the goal of using the input to improve the programme, participants were asked to identify the strengths and challenges of the programme, and offer recommendations for making improvements. Participants provided consent for participation as approved by the university institutional review board. Three open-ended questions were posed so participants could freely orient to topics that were most salient to them, and these served as the research questions for this study:

1. What were the strengths of this programme, or what did you like most?
2. What was most challenging, or what did you not like?
3. What do you recommend for improving the quality of the programmes?

Follow-up questions were asked to delve further in the responses, following Krueger & Casey's (2014) approach for getting more specific information to target research goals, and following Stringer's (2014) action-oriented framework for conducting focus groups with a facilitator, questions were displayed on a chart, each participant had an opportunity to respond in a respectful environment, and responses were recorded and posted to a chart in their own words. Analysis involved a collaborative process to summarise responses and identify common features, identify divergent perspectives, rate the level of agreement on interpretations through a voting procedure, and rank-order the priority of issues. Focus group discussions were recorded and transcribed, and each principal investigator independently crosschecked the data for reliability against: 1) the charted raw data and the collaborative interpretations, 2) their own observations of the programme sessions, and 3) each other's independent interpretations. Next, we applied Mertler's (2012) inductive process for reducing information and organising data patterns and themes in a framework for presenting key findings. To that end, we searched for words or phrases that reflected specific events or observations that were repeated throughout the data. Parsons and Brown (2002) described this qualitative research process as "systematically organising and presenting the findings of the action research in ways that facilitate the understanding of these data" (p. 56). To validate the accuracy of findings, Creswell's (2003) member-checking approach was also applied by asking participants to review raw data, analytic interpretations and reports, and clarify and expand on the information.

As indicated earlier, focus group discussions were also conducted with the students to invite their feedback for refining the planning and implementation of the programme, and the findings will be reported in a follow-up article. Feedback was mostly focused on pedagogical issues, such as corresponding lectures, exams, and assignments, and feedback regarding the programme activities was routinely applied to make refinements.

Results

When asked about the strengths of the programme, two dominant themes kept emerging through the focus group discussions: enjoying the social interaction and enjoying the activities. As researchers concerned about strategies for improving health, we expected comments to opened-ended questions to be oriented around health issues first, but participants initially oriented to social and pleasurable aspects of the programme, framed around de-

scriptors such as "fun." We had to dig deeper with follow-up questions to learn more about the potential health benefits of the programme. Findings in this section are summarised to first highlight enjoyment as the dominant theme, followed by topics the authors were especially interested in exploring: changes in mobility, balance and health; potential for enhancing recovery after an injury; understandings of fall prevention and health promotion; and the value of collaborative engagement for designing and implementing activities.

Social and Physical Pleasure

The most dominant response about the strengths of the programme revolved around enjoying the social interaction and the physical activities. When asked to identify the strengths of the programme in an open-ended format, social stimulation was the first response in both focus groups. Participants talked at length about their pleasure from interacting with the student assistants. As an example, the oldest participant said:

> *The socialisation adds a lot. Some seniors are homebound and don't get to interact much with other people. The kids really care about us. My two [students] are now really good friends. We talk every few days. Andrew's always checking in on me. And, he's always smiling. I don't know if I'm enjoying this more or if he is. What a sweet boy.*

Note that she emphasised being social versus being socially isolated, and that a new friendship provided frequent interactions that were enjoyable. A second person made a similar comment that characterised the social interaction as being pleasurable:

> *The students were great, so polite and friendly. You could tell they really wanted to help. They would try all sorts of different things to get us moving. And we all laughed so much. It was so much fun, I'm telling you. Very heartwarming to see how much they cared.*

Others had similar comments:

> *The kids [students] were so nice and they had fun too. They really cared and made sure we were safe, and they weren't stressed. They were so sweet.*

> *I don't interact with young ones much, so I enjoyed having them around. For me, the students made it so wonderful and fun. And, they made mistakes too, so we could all laugh together. They enjoyed it as much as us.*

Participants also shared comments that reflected a reciprocal appreciation for each other as "friends" in a "fun" social context.

> *I'm a social person, not the type who's going to sit around at home and do nothing… … I met so many nice friends here... …I'm having so much fun meeting you all.*

> *I met so many good people here. We play together, throw balls at each other, act silly if we want to and nobody cares. And, it's so much fun. They say it's good to laugh. Well I'll tell you, we do lots of laughing. People here are lots of fun.*

> *Yes, the folks in this class are amazing and I made some friends here. I feel blessed to have you all here.*

One participant who required a gait belt for activities alluded to the potential for embarrassment, yet the social dynamics did not produce this outcome. *"No one made me feel uncomfortable or there's no bashing competition, no judgment. People are wonderful and supportive."* Another person supported this view, *"There's an acceptance of each other no matter what, and it feels safe."*

Participants also expressed appreciation for the JDE instructor who directed most of the activities and played the piano through the exercises. *"Shoko was great, and so clear and helpful. She plays* so *nicely and makes it look easy, and you can tell she really cares about everyone*." Another said, "*She's so thoughtful and sweet. She knows just how to make things work for us and at the right speed. Sometimes she sped it up a little and I would make mistakes, but she brought it right back so we could do it."* Others added similar appreciative comments:

> *I like that she listened to us and played the songs we love, and that she was so sensitive about what we want. I like that she played stuff from my generation, songs I knew and love, and it was so cool that she sometimes played it differently to keep it interesting.*
>
> *It was so nice to hear her playing with such precision. Her timing, the fun added parts, and twists. What a nice touch.*
>
> *You could use CDs for this class and get similar results, but it just wouldn't be the same. You wouldn't have the same rhythm, the in-the-moment touches she makes, and the way she plays just for us.*

Comments about the music also reflected enjoyment in the corresponding physical activities: *"The music had a beat that helped us move without bumping into each other. It really made me want to move and keep on going. And, those songs, oh, they were so much fun. I could have gone on and on."*

All the activities involved physical movement, sometimes in place, stretching and extending limbs, throwing and catching a ball, and shifting weight. Some activities involved dancing alone, with a partner and switching partners, all accompanied by music. These social and interactive elements of JDE make it distinctively more enjoyable than other forms of physical therapy that participants experienced:

> *In physical therapy, you just follow what the therapist tells you and it's boring. It's like going to the gym where you repeat the exercise over and over again. You know? And, that's not much fun. But, the dancing part with the music - - that made it so much fun and exciting. You just want to keep on moving. You can't stay still. I was always moving around. And you guys were too.*
>
> *See that's why this class is good because you're moving around and it's fun. You can go to physical therapy and they work with you, and they probably help you more directly. But it is not as much fun as this.*
>
> *Physical therapy is great, but that's not like the real world where you're running around. This class has us moving more like how we should be.*

It is relevant to note that laughter and other forms of social affirmations accompanied most of the above comments. For example, "*oh yeah*" was frequently expressed in various ways,

along with head-nodding, chuckles and broad laughing. Laughter was also a common expression during the JDE activities. According to Ekman (2007) these social cues are universal indicators of enjoyment.

Improved Health

All the participants reported having improved mobility, balance, and health as a result of being engaged in the programme. The oldest member who was 94 years old claimed that she did not walk much after suffering a fall two years earlier, mainly because she felt too insecure. "*Now, I feel more secure. I'm not as afraid as I used to be. I think it's done me a lot of good. Even if you never even walk a lot. But, I notice the difference. I'm moving more on my own."* She also claimed that the programme improved her mental health, "*It definitely improved my mental health too. I always feel better when I come out. And, I look forward to coming back every time."* Another older participant added, "*My balance is really bad and I'm over 80, so I have to keep working on that. This class is a big help so I can keep improving."*

Another person said, *"I love this programme because it is keeping me active and healthier. I know this programme has helped me because my balance is getting better and I feel better."* This kind of sentiment was repeated by another participant, *"I always knew exercise was important, but I was getting lazy and I could feel it. I'm glad I found this class because I'm starting to feel strong again."*

One of the youngest participants, a 64-year-old male, described his health as excellent. He participated in other activity programmes and claimed that JDE was his favorite because: "*It makes me more aware of what I can do and what I got to do to get healthier. You got to keep going or your body won't keep up. It all starts falling apart. I'm so grateful for this class because it helps me stay active. I really need it. We all do."* And, reinforcing the earlier theme of "fun," he added, "*For me, this programme just makes me feel better because it's fun and to keep on trying."*

When asked for examples of improved health in a follow-up question, the oldest person said*, "Well, when you know it you know it. I know my body and I feel better."* Another person added, *"I can stretch more than before. And, when I'm at home and feeling tense, I just do the exercises I learned here and I feel much better."* Another added, *"I'm losing weight, but still eating the same, so isn't that proof? I feel great and this class helps me because I'm moving more."*

Several participants claimed that the programme gave them greater confidence in mobility, inspiring more activity. As one person put it, "*I feel more confident now and less afraid, so I'm being more active and more independent than before."* While the term "confidence" was not used in other accounts, semantic variations reflected a sentiment of having less fear and more confidence in mobility. For example, one person claimed to feel more secure with her mobility after suffering a fall, "*I got hurt falling some time ago and that made me scared of falling again. It stays with you no matter what. But, this class showed me I can do it if I set my mind to it*." Another person expressed a similar view, "*I feel more secure. You know, not afraid to push myself. I hope you continue the class because it keeps me going."* Another added, "*I'm feeling much better about moving on my own."*

Several participants who suffered an injury about two years earlier claimed that JDE helped them recover and improved their balance and gait. Examples of their statements follow.

I had fallen so I had to recuperate. My balance was really bad but I came a long way. That's why I'm taking this class. I'm okay now because this class helps.

My chiropractor said that this was the best thing I could do for my back pain and leg pain. He said I could see improvement. Now, I haven't seen him in weeks because I really feel I'm getting much stronger with just this.

I was wearing a back brace, which I thankfully don't have to wear anymore. I definitely feel better now. It's a long road and this class is helping.

A long time ago I injured my shoulder from straining too hard. The kids in this class (student) showed us how to warm-up first and go slower. Now, when I'm going to do anything strenuous, I stretch first, and go slow and take my time.

I had knee surgery a year ago and I couldn't lean forward or turn, and this class made me more aware of how to move and I walk more easily.

Of the eight participants in the second focus group interview, all but one person indicated that the programme improved health. For him, the programme helped him maintain health: "*The quality of my health is already high, but it is necessary to keep a stable level. For maintenance, you have to do a minimal amount.*"

All the participants claimed that the programme helped them improve their memory abilities through greater awareness of their own memory capabilities, the processes involved in self-monitoring, and strategies to aid retention. The following conversation captures several participants' perceptions during the second focus group interview.

Interviewer: *You said something about memory exercises as being helpful. Would you please say more about that?*
Participant 1: *Yes, it helps memory.*
Participant 2: *It seems to me that if I'm able to do the exercises and remember them over time, I'm improving.*
Participant 3: *Well, would you say it prevents memory degeneration, just maintains it, or actually improves it?*
Participant 4: *It improves it.*
Participant 5: *Yes, it makes it better.*
Participant 2: *Yes, it improves.*

All eight participants from the second focus group, who participated for a full year, believed the programme improved their memory abilities. When asked for evidence, the following examples were offered.

It increases the focus and attention, for sure. You have to pay attention, and listen to the music, and we have to keep pace with it, slow down and sometimes go faster, and then watch where you're going. There's a lot you have to remember.

It's made me aware that I've got to pay closer attention to the sequence of things, not just go along without thinking about the next steps. Shoko has us moving every which way and there's lots of steps to remember on how to get there. I'm getting better at it I think.

Though pre- and post-memory tests could not show changes in abilities, anecdotal accounts reveal metamemory skills – that is, a heightened understanding of how memory operates.

Participants also expressed greater awareness of strategies for preventing a fall. One participant mentioned lateral and backward movements as potential actions that lead to a fall, which has been supported by research (Hilliard et al. 2008; Manckoundia et al. 2008), and strategies reinforced by JDE to be more effective in preventing a fall:

> *One of the most important things for seniors to be able to do is have lateral movement, to move sideways, to move backwards, because that's when it's most likely for falls or to break hips. And, Shoko's very careful about encouraging us to walk backwards or to sidestep. Now when I'm in the kitchen, if I want something behind me, instead of turning around, I back up and get what I was going to get and go forward again.*

Her perspective was repeated by another participant: "*Physical therapy helped me focus on muscles and strength-building, but the lateral movement we do is really good and I know I got to think about that more when I'm moving around, even with my walker."* Other comments that exemplify greater awareness include:

> *This class reinforces what I already knew but I didn't think enough about. I feel more aware of what we've got to do to be healthy. It's good to be reminded about being active and this class helped me do that.*
>
> *I didn't know about warm-ups and now I just can't do something without preparing first. At my age, I can get hurt if I don't go slow and take my time. And before doing anything rough, I got to work into it first.*

For one person, JDE was more than just being aware of physical activity, but a reminder that laughter and having fun contribute to health, "C*oming here keeps me thinking how important it is to stay active and to laugh and have fun."*

Individually-Tailored Engagement

A central feature of action research is to work in collaboration *with* stakeholders, not impose one-way directives *on* them. In designing the first round of activities, we recognised the need to serve a wide range of individual needs and interests. To achieve this goal, the JDE instructor closely monitored the older adults during preliminary activities and adjusted the pace so nobody would be left out. To compensate for different skill levels, those who were physically capable were encouraged to add their own steps to make the activity more challenging, and those who were less capable were encouraged to make appropriate adjustments. This phase of programme development required considerable repeating of activities and feedback from participants. Most saw this as a benefit, but a married couple in their mid-sixties who described their health as excellent expressed disappointment with this approach, as the husband expressed: *"It moved too slowly and there's not enough action."* In support of the individualized pace of the programmes, others disagreed with the couple:

> *You two are young and in good health, and you do lots of dancing. But me, I'm older and can't move any faster. The pace is really good for me.*

If I wanted it faster, I just added another spin in the middle of it or whatever to make it interesting and still keep pace with everyone, and I don't want it to get harder if other people can't do it. I like just the way it is.

I like the way it is too. Even if the steps are easy to do, there's plenty of variety to keep it fun.

The activities are really fine the way they are. They're enough and at the end of the day, I'm not ready to do more.

I can't do all this anymore like you, you know... …I like the pace and the challenge.

Although many of the activities were highly structured and were preceded with instructions, some required improvisation. Accordingly, participants were encouraged to explore ways to incorporate props (balls, hoops, etc.) in the activities, guided by their own imagination and without explicit instructions. The goal of these activities was to stimulate independent creativity, generate novel motor patterns, require social negotiation to accomplish tasks, memorize steps, calculate timing, and synchronise movements with improvised (familiar and unfamiliar) music. The participants expressed a variety of responses in favor of a flexible format.

I liked that we could add our own thing and not just follow the same pattern all the time. And, it was fun to see what other people were adding.

I always love dancing so I enjoyed being able to jump in and swing more without stopping.

I'm usually more comfortable with structure, but this was fun. And nobody was judgmental. We all laughed and just went with the flow. We did our own thing, but did it together. It was fun.

Challenges Associated with the Programme

Challenges that were identified in the first focus group session, reflecting the first year of programme implementation, included transportation, scheduling, and differences in skill levels among participants. Getting to and from the San Marcos Senior Activity Center was a challenge for some participants during the first semester of the programme because many did not drive, as described by one person, "*One of the problems is how do you get here if you don't drive. That' is a big, big process."* Although the city offered free van service to the Center for those going there for lunch, scheduling pick-up and drop-off service required reservations, advanced planning and paying for lunch. At least several individuals found this too challenging, as one person stated, "*The van is free, but it's for those who come here for lunch too. The meals are okay, but that's not what interests me here."* Some participants relied on a family member or friend for transportation, individuals who had their own scheduling constraints: *"Getting around is complicated. Sometimes I get a ride from my neighbour who's retired and she comes back for me later. But, she can't always do it."* For two of the participants, attending a class consumed a major part of the day's schedule, including dressing for a public event and arranging transportation.

It takes a while to get dressed, fix my hair, and so on because I still have my vanity. I don't just get up and go. It takes a lot of planning.

It still takes work to get here on time and by the time I get back, half the day's gone by. So I have to plan ahead and sometimes my plans don't work out because I have to rely on other people to get around.

By the third semester, the transportation problem was resolved for the existing participants with ride-sharing and better planning with drivers. As one person put it: *"Most of us worked out ride-sharing and got better routines for getting here."* Another challenge, as described earlier by the married couple, was that the programme was not challenging enough for them. They dropped from the programme after two sessions and described their concerns this way:

I think this would be a better if the dancing moved along more quickly and didn't slow down so much. And maybe Shoko could have added another ball [props to add complexity]. It could have been fun if she brought in two or three balls, not just one. And, all the things she did, I would like to see a little added progression to it.

Yeah, I want more dancing... …add more difficulty to get our hearts pumping. Sometimes it feels like we're just warming up.

The rest of the participants disagreed, saying they appreciated the individualised approach. For example, one of the least mobile participants thought some of the activities were too challenging, but appreciated the pace:

Some of the things we were participating in was challenging. Walking backwards would be "no way," even walking sideways because of the balance thing. Real hard for me to get to that point where I don't have the anxiety of not having my walker to hold on to. Shoko would have us do something then speed it up. That challenged me. But, it isn't a problem because everyone is understanding and there's no judgment. The pace is okay, but challenges me and I suppose that's good.

Recommendations for Making Improvements

The first-year focus group participants offered recommendations that related to improving public transportation options, such as *"get the bus to have more runs to give us more options… …and less stops" and "ask the bus people to make the system more focused on what's happening here at the Senior Center,"* yet these were ideas outside our authority. A ride-sharing system was eventually implemented to assist everyone during the third semester, so the transportation problem was resolved.

Another recommendation that was posed by one person was to have more classes throughout the week: *"If there were more classes, then there would be more opportunities to just drop-in on days when I don't have other things going on or when I'm feeling like I need it.*" Having more classes was not a workable option for the JDE instructor or other programme affiliates due to time constraints, plus the Center would not allocate more days for using the

large room. When pressed for more recommendations on how to improve the programme, a common recommendation was to continue the current practices:

> *I love it. Just keep doing what you're doing. The kids (students) are amazing and so caring. They're great, and Shoko (instructor) is great too, and it all comes together.*
>
> *Don't change a thing. I like how it's working now. I can't think of how it could be better. If anything, you should publicize this more so other folks could benefit from it too.*

Several participants recommended expanding the programme so more people could benefit from it:

> *So many could benefit from a programme like this. Promote it more so more people will hear about it. Put a notice in the free papers, for example… … People will come if they know about it.*
>
> *Don't bother to promote this class as strength building because there's lots of other classes like that. What's different about this class is: balance and memory. Don't spread yourself out too much. Just promote balance and memory and many people will be interested in that."*

In launching the programme, promotional materials were placed in local papers and posted at local venues, but enrollment was still a challenge. Over the next year, two student interns will be responsible to promoting the programme with Meals on Wheels, several physical therapy clinics, and local assisted living communities.

A final recommendation was associated with the $23 cost for participating in the programme. Most participants preferred no cost, one preferred a token cost, and everyone recommended getting outside funding to offset costs. If the cost were waived, older adults who are less financially secure could afford to attend. The cost was shared with San Marcos Senior Activity Center to account for expenses (reception, scheduling, etc.). At the time of this study, the programme was self-funded, but over the next phase of the programme, external funding will be sought to offset the participation cost.

Discussion and Implications

Designed as action research, the main goal of this pilot study was to plan, implement and evaluate an exercise programme for older adults in the community and seek ways to make improvements. To that end, we designed and delivered a programme that was shown from prior studies to be effective with European clients (Hars et al. 2014b; Trombetti et al. 2011). Our goal was to adopt and pilot a programme that has been ongoing in Geneva, Switzerland for over 40 years and introduced in the U.S. by Lisa Parker, then invite participants to engage with us in action research to tailor it to the needs of nonclinical community-based older adults. Feedback from the participants was applied through each session so refinements could be made, and what was learned from the focus group feedback will be applied in the next phase for making ongoing programme improvements.

A primary theme throughout the focus group interviews was the social value of the programme, including the formation of friendships with the other older adults and the stu-

dents who were at the Center for lab experience. Participants spoke at length, about the pleasure of working with the students and having fun with each other. While we expected friendships to be developed, we did not expect the health benefits of JDE to be discussed as a secondary topic. This finding about friendships fits the numerous sociological studies summarised by Umberson & Montez (2010) about the value of social relationships and its connection with health and wellbeing. Positive relationships are known to be beneficial for mental and physical health and this might partly explain why participants oriented to "friendships" and "fun" as the most important aspect of the programme. In the second year, eight participants who attended regularly repeatedly described themselves as newly established friends, and had long impromptu social periods before and after each JDE class to reinforce those friendships. Words such as "fun" and "social" were frequently used to describe their interaction and laughter was a prominent expression throughout the feedback sessions. JDE is unique in that it requires participants to interact with each other in multiple ways (talking, moving around each other, holding hands, switching partners, negotiating space, interacting in unexpected ways, etc.), adding to the intimacy. Laughter was also described as an ongoing dynamic, both reported and observed throughout the programme, contributing to the retention of the remaining eight participants, according to their own accounts. As research has shown, laughter has potential for improving health (Bennett & Lengache 2008; Martin 2001) and is an integral part of building relationships (Kurtz & Algoe 2015). Like the Hars et al. (2014b) study, enjoyment was a primary motivational factor for long-term participation in this programme. Because enjoyment is positively correlated with cognitive functioning as Theone and her colleagues found (2016), we assume JDE had a cognitive benefit for the participants in this study as confirmed by their own accounts.

Many of the participants described the programme as the most important social activity in their weekly routines. As one person put it, *"This is the most fun I have all week and I look forward to coming."* While none of the participants actually said they experienced loneliness, this kind of statement and the earlier comments about the social aspects of the programme suggest that the programme was an important antidote to loneliness and social isolation. Studies have shown that between 20-40% of older adults report moderate to severe loneliness (Newall et al. 2009; Pinquart & Sorensen 2001; Weeks 1994; Wenger & Burholt 2004), and social isolation rates could be as high as 20% for older community-dwelling adults (Lubben et al. 2006). Research by Donovan et al. (2017) has also shown that loneliness is associated with accelerated cognitive decline. Thus, even if this programme may not have actually improved cognitive functioning, it has implications for delaying it.

Unlike physical therapy treatments where strength-building is a main focus and is not interactive with other patients, JDE provides physical and cognitive benefits in a social setting that encourages creative expression, games, and physical interaction with others. Several participants in our study described physical therapy as boring and repetitive, but in contrast, they described JDE as being fun, socially engaging, friendly and mutually supportive. JDE is distinct because it incorporates cognitive tasks in the activities, not just physical therapy – a combined focus on mind and body. Other therapy programmes could potentially be more effective by adding socially interactive dynamics in the design and using action research to refine the activities.

Another goal associated with this study was to provide a laboratory setting for kinesiology students so they could learn how to assess physical mobility and gain experience in promoting fall prevention and injury recovery. Though they initially required considerable guidance, most quickly understood the basic concepts of JDE and actively contributed to refining the techniques. They made numerous suggestions for improving practice (e.g., tips for using a gait belt, strategies for building teamwork and making activities more fun, and guidelines for conducting safe and dignified physical/cognitive testing) and these will be presented in a follow-up article. At the onset of the present study we recognised the value of intergenerational engagement based on what research has shown (Skropeta et al. 2014), and the older adults repeatedly reported appreciation for "the kids." The fact that the students were mentioned as the first positive aspect of the programme, in response to the first open-ended question, reinforces the value of intergenerational interaction for programmes that serve older adults.

All the older adults in the programme reported improved mobility, balance and health as a result of participating in the programme. This finding is consistent with the earlier JDE studies by Hars et al. (2014b), however, the outcome of our pre-post measures were not statistically reliable (not presented) due to so few participants in the study and the inherent daily variability in function in older adults. In preparation for the next phase of research, the researchers will consult with the researchers from the Hars et al. (2014b) study for guidance on the testing approaches they used, and with more participants in the programme, we expect reliable data for making statistical comparisons.

Several participants claimed that JDE was more effective than conventional physical therapy or gym activities because it provided more *"real world"* movementand not repetitive exercise. We could not confirm any comparative benefits because we did not have comparison measures from other therapy programmes or a controlled group. Attrition and infrequent participation also made it impossible to have a significant number of participants to provide measurement data. With an expected increase in the number of participants in the next research phase, pre- and post-measures of physical mobility we will collect to determine physical changes in balance, task completion speed, frequency of repetition, and kinesthetic mobility.

Another benefit reported by participants was improved cognitive functioning and greater confidence in mobility, reflecting similar findings as the Hars et al. (2014a) JDE study. Without quantifiable evidence, however, actual progress in cognitive abilities was inconclusive in this study. For the next action research phase, the Montreal Cognitive Assessment (Nasreddine et al. 2005) will be applied as pre- and post-measures to assess several areas of cognitive functioning: memory recall, visuospacial abilities, phonemic fluency, two-item verbal abstraction, serial subtraction, trail-making. We expect to have enough observations in our data set to make a statistically reliable assessment over the next phase of research.

Because participants in this study were self-selected volunteers, the sample was not representative of the general population of adults aged 65 or older, and they were not all at elevated risk for falls as in the Hars et al. (2014a) study. All participants in this study were between the ages of 68 to 94, lived independently in their own home, and had not experienced a fall in the last two years. The next phase of this programme should include a broader sample of participants, and this was one of the recommendations made by participants in the second focus group. This recommendation reinforces the notion that different skill levels was not a concern for the participants, and testimonies about engaging at one's own comfort level also

supported this conclusion. During the first year of the programme, a married couple expressed concerned about the relative ease of the programme meand said they expected "*more lively dancing*." While they tailored their own participation with more vigour, the programme was not a good fit for their high level of mobility, so they dropped out from the programme. This mismatch was likely the result of our promoting the programme as "Brain and Body Fitness through Music and Movement" to highlight a positive message, rather than focus on falls or adverse outcomes, following recommendations by York et al. (2011). Students are now responsible for developing promotional materials with collaborative input, so we anticipate a more targeted recruitment outcome. Although the format encouraged participants to engage at their own comfort level, the programme is probably not appropriate for individuals who are physically active, in excellent health and expect continuous vigorous activities.

One challenge in recruiting older adults for this study involved getting their signature for a release of liability and for informed consent. While the language was kept to a simple format, potential participants left immediately after learning about the required signatures. And while all the participants who continued in the programme signed both forms, some refused to participate in pre- and post-measures of their physical and cognitive abilities. Following research ethics, participation in measurement testing was voluntary and not required for participating in the programme.

About 25% the participants dropped from the programme during the first semester, as described earlier, fitting similar dropout rates from other community-based programmes (Nyman & Victor 2012; Picorelli et al. 2014). Those who persisted but dropped after the second semester gave several reasons: wanting more challenging activities, severe health problems (e.g., terminal cancer, heart disease, dementia), scheduling problems, or transportation problems. Of those who persisted during the third semester, about half attended classes irregularly because of a health-related issue, such as not feeling well that day, having a problem with scheduling (e.g., medical appointment or competing event), or not having convenient transportation that day. While we were not able to resolve some of the issues, the transportation problem was addressed with free or public transportation options and ride-sharing. Perhaps retention would have been higher had we addressed transportation problems earlier in the programme.

The findings from this study added a qualitative layer of a collaborative understanding on what was beneficial and what was challenging in this pilot programme, plus it provided a setting for applying valuable recommendations for making improvements. More research is needed to understand how physical activities might offset the degenerative process of aging and improve health after an injury, and what kinds of activities are best for this purpose. The outcome of this action research serves as an important preliminary step for a larger study on JDE, and qualitative findings suggests the programme was effective for improving physical and mental functioning for older adults living in the community. It is a promising strategy for delaying decline in age-related mobility, preventing falls and enhancing recovery after a fall. The programme should be made widely available so the growing number of older adults can benefit from music-based multitask activities that are supported by social relationships. The programme would be especially valuable in residential care environments where older adults have physical mobility problems and fewer transportation options. Preventing falls will reduce unnecessary suffering, and reduce one of the greatest healthcare expenditures associated with older adults.

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Appendix A: Historical Steps in Developing Dalcroze Eurhythmics

FIRST SEMESTER	
Activity	**Summary of Activity Details**
Identified the Scope of the Program	Goal: Adapt Dalcroze Eurhythmics, a music-and-movement educational program with high efficacy for fall prevention as a community fall prevention program to North American older adults Audience. Develop an intergenerational program through involving [CSUSM] university students outreach to the community older adults. Develop dialogue among several parties: San Marcos Senior Activity Center and the City of San Marcos; Kinesiology and Human Development Departments and the School of Nursing at California State University San Marcos; Health and Human Services Aging and Independence Services at County of San Diego
Gathered Preliminary Information	Explored answers to these questions: • Human and material resources? • How to recruit older adult participants? • How to tailor Dalcroze music to fit physical and cognitive exercises? • How to prepare Kinesiology students and engage them in activities?
Reviewed Related Literature	• Swiss studies of Dalcroze Eurhythmics as a community intervention • Explore physical therapy and common U.S. fall prevention community programs for best practices
Developed an Initial Research Plan	Multipart plan included: publicity and recruitment; meeting venue, schedule and equipment; design of activities and instructions; training for Kinesiology students and developing their feedback system; engaging older adults in activities and feedback system; record-keeping and data collection.
Revised Planning and Data Collection	• Engaged older adults in planned Dalcroze Eurhythmics activities • Designed and implemented new activities and/or modified current ones with input from older adults and students • Implemented improvised activities driven by each participant • Collected data: observation, feedback after each activity, participatory dialogue, attendance records, physiometrics (balance, speed, frequency of repetition, kinesthetic mobility), Montreal Cognitive Assessment (memory recall, visuospatial abilities, phonemic fluency, two-item verbal abstraction, serial subtraction, trail-making), follow-up focus group discussions with older adults and students, and students' course evaluations.
Analyzed the Data	• Qualitative data from older adults and students: strengths of the program, challenges of the program, and participants' recommendations for making improvements. • Quantitative data for baseline indicators of health: physical measures, and psychometric measures • Member-checking and interjudge reliability assessment
SECOND SEMESTER	
Activity	**Summary of Activity Details**
Refined Plan for Next Action Research Phase	Used feedback to guide publicity and recruitment, therapy activities, training for Kinesiology students, feedback systems, and data collection methods.
Shared Results	Summarized main findings with stakeholders
Reflected on Process	Critically discussed the program with researchers, older adults and students.

Appendix A (cont'd): Historical Steps in Developing Dalcroze Eurhythmics

SECOND SEMESTER	
Activity	**Summary of Activity Details**
Continued Implementation and Data Collection	• Engaged older adults in Dalcroze Eurhythmics • Refined instructions for each activity • Older adults and students designed new activities and/or modified current ones • Participants developed new improvisational activities • Continued the feedback systems for each activity from older adults and students • Collected more data: observation, participatory dialogue, attendance records, physiometrics, Montreal Cognitive Assessment, focus groups with older adults and students, and students' course evaluations.
Analyzed the Data	Qualitative data: • Strengths of the program • Challenges of the program • Participants' recommendations for making improvements • Quantitative data for baseline indicators of health: • physical measures • psycho-metric measures • Member-checking and interjudge reliability assessment
Shared and Communicated the Results	Summarize main findings with stakeholders, and shared findings at the International Conference for Music Perception and Cognition. This was also feedback process for refining the program.
Reflected on the Process	Critically discussed the program with researchers, older adults and students.
THIRD SEMESTER	
Activity	**Summary of Activity Details**
Refined Plan for the Next Action Research Phase	Used feedback to guide publicity and recruitment, therapy activities, training for Kinesiology students, feedback systems, and data collection methods.
Shared Results	Summarized main findings with stakeholders; presented at GSA Conference
Reflected on Process	Critically discussed the program with researchers, older adults and students.
Continued Implementation and Data Collection	• Engaged older adults in Dalcroze Eurhythmics, refined instructions for each activity as needed, older adults and students designed new activities and/or modified current ones, participants developed new activities, continued the feedback systems from stakeholders, • Collected more data: observation, participatory dialogue, attendance records, physiometrics, Montreal Cognitive Assessment, focus groups with older adults and students, and students' course evaluations.
Analyzed the Data	Qualitative data: • Strengths of the program • Challenges of the program • Participants' recommendations for making improvements • Quantitative data for baseline indicators of health: • physical measures • psycho-metric measures • Member-checking and interjudge reliability assessment
Shared and Communicated the Results	Summarize main findings with stakeholders, and drafted journal article for Innovation on Aging. This was also a feedback process for refining the program.
Reflected on Process	Critically discussed the program among researchers, older adults and students.

About the authors

Rodney Beaulieu earned a PhD in Educational Psychology from the University of California, Santa Barbara, and is an assistant professor in the Human Development Department in the College of Education, Health and Human Services at California State University, San Marcos. His research interests include health disparities, American Indian education, microaggression, community engagement, and applying action research to improve human services.

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Shoko Hino is a lecturer in the Kinesiology Department at California State University San Marcos. She holds a DMA in Piano Performance from University of Missouri-Kansas City and a license in Jaques-Dalcroze Eurhythmics from Longy School of Music and studied under Lisa Parker. She has taught eurhythmics classes to older adults in community settings for the past 6 years.

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