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Maud Hickey[a], Kimberly Ankney[ab], Daniel Healy[a] & Donna Gallo[ac]
[a] Bienen School of Music, Northwestern University, Evanston, IL, USA
[b] Christopher Newport University, Newport News, VA, USA
[c] Westminster Choir College of Rider University, Princeton, NJ, USA
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The effects of group free improvisation instruction on improvisation achievement and improvisation confidence

Maud Hickey[a]*, Kimberly Ankney[a,b], Daniel Healy[a] and Donna Gallo[a,c]

[a]*Bienen School of Music, Northwestern University, Evanston, IL, USA;* [b]*Christopher Newport University, Newport News, VA, USA;* [c]*Westminster Choir College of Rider University, Princeton, NJ, USA*

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While improvisation in K-12 schools in the USA has gained some traction since the inception of the US National Standards in 1994, there is still a dearth of improvisation activities in schools because of the lack of music teacher preparation in improvisation. The purpose of this study was to determine if providing group free improvisation instruction and activities to collegiate non-music majors would help them become better and more confident improvisers. An additional purpose was to examine the relationship between improvisation achievement and selected variables. A repeated measures design was utilised to test improvisation achievement through solo improvisations of college non-music majors enrolled in a free improvisation class. There was no statistical difference in improvisation achievement by time of solo recording; however, improvisation confidence improved over time. Improvisation confidence was correlated with risk-taking personality as well as a pretest self-assessment of improvisation comfort. The findings are discussed in relation to improving improvisation confidence among future music teachers in order to expand more improvisation activities in US K-12 schools.

Keywords: improvisation; music teacher education; improvisation achievement; free improvisation

Music improvisation in K-12 schools in the USA has gained greater prominence in research and practice since it was included as one of the nine National music standards in 1994 (Byo 1999; Consortium of National Arts Education Associations 1994). However several recent studies on the status of music improvisation in school music point to its relative dearth (Bell 2003; Fairfield 2010; Niknafs 2013; Orman 2002; Schopp 2006; Strand 2006; Whitcomb 2005). A reason often cited for the lack of improvisation activities in school music includes limited (if any) improvisation theory and/or practice for pre-service music teachers in their teacher training programmes (Ward-Steinman 2007; West 2011). Programmes that *do* exist are more often than not focused solely on jazz. Yet music educators continue to believe in its importance as a skill integral to becoming a whole musician (Campbell 2010; Reimer 2003; Sarath 2002). There is a need to help music teacher educators break this cycle of the absence of skill and confidence in improvisation, so that it becomes a more common activity in school music programmes. The present study is one small

*Corresponding author. Email: mhickey@northwestern.edu

attempt to learn more about the impact of teaching improvisation to students in order to inform music teacher education. As researchers concerned with the education of future music educators, we explored whether providing instruction in free improvisation might help college students become better and more confident improvisers. Therefore, the purpose of this study was to determine if providing group free improvisation instruction and activities to collegiate non-music majors would help them become better and more confident at improvising.

Before delving into the extant literature, it is important to define what we mean by the term improvisation. While improvisation, especially in schools, is often associated with jazz, in the case of this study we are examining improvisation within a broader definition more closely related to free improvisation. The most relevant definition of free improvisation for the purposes of this study is:

> improvised music without any rules beyond the logic or inclination of the musician(s) involved. The term can refer to both a technique (employed by any musician in any genre) and as a recognizable genre in its own right. (Free improvisation, n.d.)

For this study, 'music improvisation' is music performed extemporaneously; and in the case of teaching within a class setting, this extemporaneous music making is set within frameworks provided by the instructors. For the class that was examined in the current study, the instructors did not follow a prescribed genre such as jazz, but borrowed techniques from free improvisation literature and pedagogues. More of the course instruction techniques will be described later in the article.

Literature

There are two areas of literature that will be presented here. The first has to do with the relatively small but growing number of articles that examine jazz, as well as free improvisation instruction in schools – particularly related to achievement. The second area relates more generally to the issue of teaching improvisation and its relationship to personality and risk-taking.

Jazz improvisation achievement and other variables

Several studies have examined the relationship between success at jazz improvisation and other variables. Madura (1996) examined 101 improvisations by college vocalists who improvised over two common jazz chord progressions. She isolated three predictors of improvisation achievement: jazz theory knowledge, imitative ability and jazz experience. General creativity, instrument lessons, classical voice lessons and gender were not related to improvisation achievement. In a subsequent study, Madura (Ward-Steinman 2008) utilised a slightly refined measure of vocal jazz improvisation from her previous study (Madura 1996) to isolate specific factors related to improvisation achievement. College-level jazz vocalists (n = 102) performed four vocal improvisation tasks (three based on jazz chord changes and one free improvisation task). The three jazz tasks were examined for rhythmic, tonal and creative activity, while the free improvisation task was examined for creativity only. Results showed a significant correlation between musical experience and improvisation achievement; however, no correlation was exhibited between

improvisation achievement and classical instrumental lessons. Furthermore, specific jazz experiences such as jazz listening, jazz voice lessons, improvisation lessons and duration of interest in jazz were correlated with improvisation achievement. There was a significant negative correlation found between free improvisation and classical voice lessons. It seems, not surprisingly, that jazz experience is most related to improvisation success.

The purpose of May's study (2003) was to determine the factors underlying achievement in jazz improvisation of 85 collegiate jazz wind players. To measure achievement, the participants improvised over two different chord progressions that were rated on seven categories by three independent judges using a 7-point Likert scale. May found high positive correlation among many of the variables, suggesting that a 'global rating might be as reliable as multiple rating criteria' (2003, 254). She found that self-evaluation of improvisation was the overall best predictor of achievement in instrumental jazz improvisation and suggested that educators consider including self-evaluation in improvisation assessment models.

McPherson ([1993] 1994) examined the relationship between improvisation abilities and several variables, including performance proficiency, gender and instrument (trumpet or clarinet). High school level participants (n = 101) improvised to seven improvisation prompts; six of which were 'stylistically conceived' and one freely structured. McPherson found no relationship between improvisation achievement with gender or instrument proficiency with the 'upper beginner' group, but did with the older 'lower developing' group. Mcpherson found significant correlations between improvisation achievement and the type of instrument played with younger students (not older students), and signification correlations between improvisation achievement and singing experience, mental rehearsal and frequency of improvisation practice with the older students. McPherson also found that learning additional instruments, particularly piano, was significantly correlated with improvisation achievement of the advanced subjects.

Improvisation achievement and psychological constructs

While several studies link risk-taking personalities to creativity (e.g. Davis 2004; Smith, Ward, and Finke 1995), there are few that show direct connections between non-musical factors such as self-efficacy or self-assessment and music improvisation. Kenny and Gellrich (2002) performed a meta-analysis on the research examining the cognitive processes of jazz improvisation. Among other conclusions, the researchers found that risk-taking, making mistakes and adopting the ideas of fellow improvisers are critical skills, equally important to learning the cultural 'hardware' of an improvising genre (130). Ciorba (2009) utilised a path-analytical model to test the effect of seven independent variables on jazz improvisation achievement of 102 high school students. Self-assessment had a large effect on jazz improvisation achievement and self-efficacy had an effect on motivation to improvise. This aligns with May's finding (2003) that the best predictor of improvisation success is the self-assessment of improvisation ability.

Wehr-Flowers (2006) modified the Fennema–Sherman Mathematics Attitude scale (Fennema and Sherman 1976) to measure the social-psychological differences between male and female improvisers, namely confidence, anxiety and attitude towards jazz improvisation. She found that females scored lower than males on all

three variables, pointing to the influence of psychological issues related to improvisation success. Alexander (2012) used the same scales developed by Wehr-Flowers (2006) with 121 middle and high school string players with no prior improvisation experience. The participants completed a four-month improvisation curriculum designed by the author. Confidence and attitude levels were not significantly different between the males and females of the study; however, the males were significantly lower than the females on improvisation anxiety. Others have also reported jazz improvisation to be a sex-typed genre with a predominantly male gender bias (May 2003; North, Colley, and Hargreaves 2003). However both McPherson ([1993] 1994) and Ward-Steinman (2008) found no connection between improvisation achievement and gender.

Improvisation teaching and achievement

Watson's study (2010) is perhaps most similar to the current study in that his purpose was twofold: first to determine the effect of instruction (aural or notated) on jazz improvisation achievement and second to determine the relationship between self-efficacy and selected achievement variables. Music majors with limited or no jazz experience (n = 62), enrolled at six different Universities, were selected for the study. Participants were assigned to one of two groups: instruction primarily through aural means and instruction primarily through notation. The lessons were otherwise identical. Participants recorded improvisation solos over a pre-recorded accompaniment track, before and after the lessons. Improvisation achievement was measured using the author-designed 24-item 'Jazz Expression Evaluation Measure', grouped into four larger subscales: (1) rhythm, (2) melody, (3) harmony and (4) style/expression. Watson's 'Jazz Improvisation Self-Efficacy Scale' was used to measure participants' improvisation confidence. Watson found that post-instruction improvisation achievement increased significantly for both groups, with the aurally instructed group showing significantly greater gains. Watson concluded 'the ability to improvise is not an inherent talent but, rather, a skill that can be developed through training' (p. 250). In addition Watson found that self-efficacy for jazz improvisation increased significantly after the instruction and did not differ according to type of instruction.

Improvisation is a complex activity and several variables likely lead to student success and confidence as improvisers, including improvisation instruction. Hickey (2009) challenged the belief that improvisation can be taught at all, but suggested that success is based more on setting up a safe and risk-free environment for improvisers. In her challenge to the notion that successful improvisation can be taught, Hickey (2009) asked 'How might schools and music educators capture this *proclivity* [to improvise] and encourage and nurture the disposition?' (296, emphasis ours). Free improvisation situates educators as facilitators and not as 'experts' as is often expected in other genres of music such as jazz. Therefore, achievement in free improvisation may be more dependent upon the combination of student personality and environment as opposed to some inherent musical skill or teacher technique. In other words, does teaching improvisation have as great an impact on improvisation achievement and confidence as the function of student personality or environment?

As music teacher educators, we hope to help our pre-service teachers develop improvisation skills as well as confidence as improvisers so that they will teach their

future students. What variables in this complex phenomenon most likely point to success in improvisation achievement as a result of group instruction?

Purpose and research questions

The purpose of this study was to evaluate the effectiveness of group free improvisation instruction on improvisation achievement and improvisation confidence, as well as the relationship between improvisation achievement and selected variables. The specific research questions are:

(1) What is the effect of group free improvisation instruction on individual improvisation achievement?
(2) What is the effect of group free improvisation instruction on improvisation confidence?
(3) What are the relationships between improvisation achievement, improvisation confidence and risk-taking personality?

Method

This quasi-experimental study utilised a repeated measures design. Participants were 19 (13 male and 6 female) undergraduate non-music majors enrolled in a collegiate class titled 'Free Music Improvisation'. They were recruited to sign up for a 'Free Improvisation' course through flyers posted around campus. By virtue of enrolling in the music improvisation course, they became participants in the study. However, they were given the option of being in the course without participating in the study. Those who agreed to be in the study did so by signing assent forms approved by the Northwestern University IRB.

There were no prerequisites for joining the class outside of simply being interested in the subject and, therefore, the musical and improvisation experiences were quite varied among the participants. Participants included six pianists, four percussionists, three string players, two vocalists, two wind players and two guitarists (many played multiple instruments). Formal study on the instruments ranged from 0 to 10 years. Eleven participants reported no experience with improvisation, and eight reported varied experiences as improvisers in school and community settings.

The class met two days per week, 80 minutes per meeting, for 10 weeks. The culminating experience was a free improvisation concert given in a public venue on campus. The instructors for the course were two Ph.D. students in music education[1] who consulted with a free improvisation pedagogue[2] and used improvisation texts (Agrell 2007; Stevens 2007) to develop the course curriculum. The course curriculum was flexible, as the instructors took a responsive approach to their teaching, choosing activities for each week based on individual and group learning needs based on previous class experiences.

Procedures and instruments

On the first day of class, students completed an online form that included questions about their musical background, experience as improvisers and their comfort level with improvising. This form asked students to provide information about their musical background, experience as improvisers, as well as their comfort level

improvising ('On a scale from 1 to 5, overall how comfortable are you improvising on the instrument you will play on in this class?'). On the second day of class, participants completed a modified version of the Wehr-Flowers (2006) Confidence in Learning Improvisation scale and a modified version of the Calvert (1993) Risk Attitudes Inventory. The Confidence in Learning Improvisation was administered again on the last day of class. Both scales took approximately 10 minutes to complete and were administered by one of the researchers for this study who was not an instructor. In every class the students then participated in different forms of improvisation activities led by the teachers (See Table 1).

The Confidence in Learning Improvisation scale was developed by Wehr-Flowers based on the Fennema–Sherman Mathematics Attitude scales (Fennema and Sherman 1976). This particular scale was one of three (along with measurements of anxiety and attitude towards jazz improvisation) that Wehr-Flowers modified for her study (2006). The scale provides 10 statements about confidence in improvisation that are rated on a 5-point Likert-like scale with anchors 'Strongly agree' to 'Strongly Disagree'. Because our study used free improvisation rather than jazz improvisation, we altered the Wehr-Flowers Confidence in Learning Improvisation scale by removing the word 'jazz' (e.g. 'I am sure that I could learn jazz improvisation' was changed to 'I am sure that I could learn improvisation').

Table 1. Improvisation class curriculum.

Week	Improvisation activities
1	Space in relation to time, creating musical statements, experiencing group improvisation
2[a]	Imitation, solo improvisation, drone pieces, pieces that fill space, layered and multi-timbre pieces Deep listening, soundscape pieces, pieces that fill space, layered and multi-timbre pieces
3	Building leadership and accompaniment skills, imitation, rock/popular music riff-based improvisation Expressing musical ideas with limited resources,
4	Building pieces with form, initiating structural changes in group dynamic, improvisations inspired by visual art
5[a]	Developing a melody, playing in minor tonalities, scalar-based improvisations inspired by Middle Eastern taqsim
6	Development of rhythm within and without meter, feeling macro- and micro-senses of time
7[a]	Development of rhythm in melody, shifts in time and improvisations inspired by Hindustani Raga
8	Hearing within instrumental sections, and across ensemble, responding musically to others
9[a]	Exercises emphasising contrast between free and organised improvisations, improvisation inspired by poetry No meter/pulse sustained improvisations, improvisation inspired by poetry
10	Preparation for class performance; Class performance in public venue which features improvisation activities from entire quarter

[a]Solo recording date.

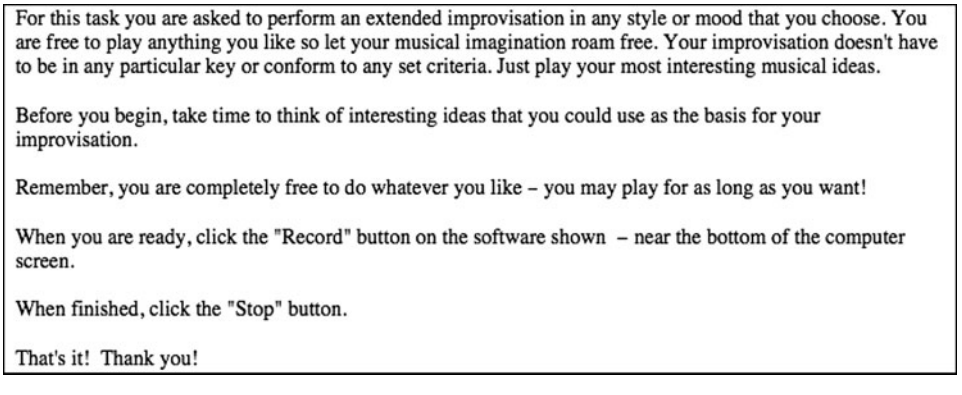
The modified Risk Attitudes Inventory (Calvert 1993) contains 14 statements related to risk-taking opinions to which the user agrees or disagrees. This scale was developed as a leadership tool to assess risk-taking traits as well as assumptions about the consequences of risk-taking. It was modified for the purposes of this study by removing one of the items from the original scale because it was too specific to business management.

During weeks 2, 4, 7 and 9 participants recorded solo improvisations that were used to assess their improvisation achievement. During these solo recording days, individuals took turns leaving class to record their improvisations into a microphone connected to *Garageband* software in a small room where they were by themselves. The instructions for the solo improvisation task were set up in the recording room for the participants to read (see Figure 1). In addition, an assistant was available to help with technical setup and answer any questions before the participants recorded their solos.

The improvisation instructions and assessment procedures were based on an item from McPherson's Test of Ability to Improvise (TAI; 1993, [1993] 1994). The TAI consists of seven items prompting students to improvise in a variety of styles and with a variety of prompts. The instructions for the final item, 'freely conceived' improvisation, were used for the current study, as it does not set any parameters or expectations. The instructions, as shown in Figure 1, are nearly identical to the instructions from the TAI, except for information about the 'Record' and 'Stop' button.

Solo ratings

Because of the large number of solo recordings to be assessed (N = 76), they were split into two groups of four and three (respectively) independent judges, with each group rating half of the solos (randomly assigned). Each group of judges listened to the four solo recordings of the participants in a random order so they were not aware of the time at which the recording was made. They used the same procedures that McPherson outlined for assessing the TAI (McPherson 1993). First they were trained to become familiar with the judging instructions and descriptions of the categories, and then they assessed practice files to insure understanding of the terms and procedures and to check reliability. The scoring rubric (see Figure 2) was also taken


For this task you are asked to perform an extended improvisation in any style or mood that you choose. You are free to play anything you like so let your musical imagination roam free. Your improvisation doesn't have to be in any particular key or conform to any set criteria. Just play your most interesting musical ideas.

Before you begin, take time to think of interesting ideas that you could use as the basis for your improvisation.

Remember, you are completely free to do whatever you like – you may play for as long as you want!

When you are ready, click the "Record" button on the software shown – near the bottom of the computer screen.

When finished, click the "Stop" button.

That's it! Thank you!

Figure 1. Solo recording instructions.

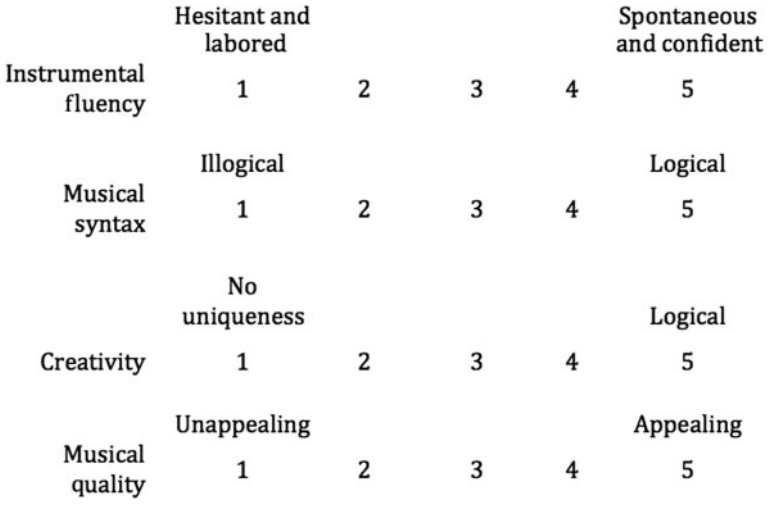


Figure 2. McPherson's TAI scoring rubric (1993).

directly from McPherson's TAI measure (1993). Average composite scores for each recording session were calculated for each participant (range of 4 to 20).

Reliability

The inter-judge reliability of the composite solo rating scores ranged from .38 to .78. Cronbach's alpha for internal consistency was .92 and .88 for the two groups of judges, respectively.

Results

Descriptive statistics for all of the measures are provided in Table 2. In order to determine if participants' achievement improved with time, a repeated measures ANOVA was calculated using the average composite scores for each of the four recordings. There was no statistical difference in improvisation achievement by time

Table 2. Descriptive statistics.

Measure	Range	Mean	SD
Overall improvisation achievement (Average composite scores across all 4 tests)	8.50–17.33	11.36	2.23
Improvisation achievement test 1	8.25–18.33	11.42	2.37
Improvisation achievement test 2	5.67–17.67	11.48	2.79
Improvisation achievement test 3	5.67–16.75	11.78	2.96
Improvisation achievement test 4	7.50–17.67	10.78	2.68
Improvisation comfort (1 = low; 5 = high)	1–5	2.5	1.17
Improvisation confidence (Wehr-Flowers pre-test)	1.6–4.8	3.32	.89
Improvisation sonfidence (Wehr-Flowers post-test)	3.4–4.9	4.21	.48
Risk-taking personality (Calvert)	3–12	7.3	2.66

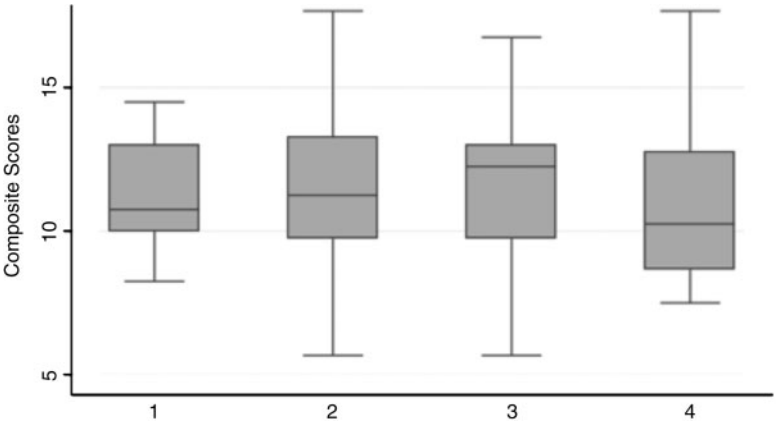


Figure 3. Improvisation composite scores by time.

of solo recording (F = 1.09, p = .369). While scores remained stable within participants (low achievers were always low and the high achievers were always high), the standard deviation and range fluctuated with each test as can be seen in Figure 3.

Improvisation confidence, as measured by the Wehr-Flowers (2006) measure, increased from the pre-treatment survey (M = 3.32) to the post-treatment survey (M = 4.21). A paired t-test showed that the difference between pre and post-survey scores was statistically significant (t = −6.64, p < .001). In addition, this improvement in confidence was equally effective for those with improvisation experience (n = 8) as well as those without improvisation experience (n = 11; see Figure 4).

The relationships between the variables of improvisation achievement, improvisation confidence, improvisation comfort and risk-taking personality are shown in Table 3. There were significant correlations between the Wehr-Flowers pre- and

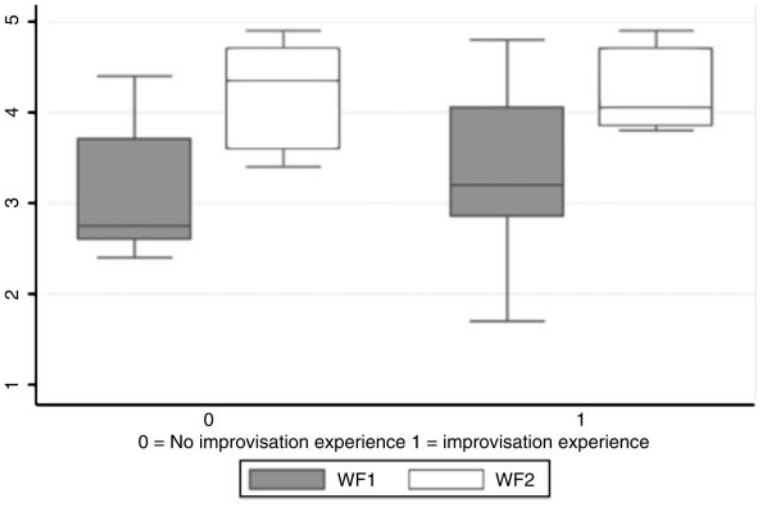


Figure 4. Confidence test scores by time and improvisation experience.

Table 3. Correlations between selected variables.

Measure	1	2	3	4
1. Improvisation achievement	–			
2. Improvisation comfort (self-assessment pre-survey)	.21	–		
3. Improvisation confidence (Wehr-Flowers pre-test)	.14	.71**	–	
4. Improvisation confidence (Wehr-Flowers post-test)	−.02	.31	.69**	–
5. Risk-Taking Personality (Calvert)	.16	.46*	.50*	.32

*$p < .05$; **$p < .01$.

post-test confidence measures and the Wehr-Flowers pre-test with the Calvert *Risk-Taking* measure and the self-assessment of improvisation. The strongest correlation was between the students' initial self-assessment of improvisation comfort and the confidence pre-test measure. Self-assessed improvisation comfort was also significantly correlated to participants' risk-taking personality. Confidence post-test scores were significantly correlated to risk-taking personality.

Discussion

At first glance, group improvisation instruction does not seem to influence solo improvisation achievement. Results of a repeated measures ANOVA showed that individual improvisation achievement did not significantly improve despite continued group improvisation practice and instruction (see Table 2). The average composite score of the fourth recording was the lowest ($M = 10.78$), followed by the first recording ($M = 11.42$). The third recording had the highest composite mean (11.78). However, these results should be interpreted with caution due to the varied tasks and musical structures introduced and practised each week. Time learning and practising did not matter, perhaps, as much as the activity being taught in class the week that the solo recordings were made. For instance, during the week of the final recording, the emphasis was on free, no meter, sustained improvisations, whereas during the week of the third recording (highest composite score), the emphasis was on the development of rhythm in melody, shifts in time and improvisations inspired by Hindustani Raga. The solo recordings for the last recording may have been more free than previous recordings and possibly rated lower by judges because of a perceived lack of structure. Further research should more carefully control for the types of instruction over time measuring for achievement growth.

Another potential reason for the lack of improvisation achievement over time may be due to the difference participants felt while in group activities compared to making solo recordings. Improvisation experts such as Bailey (1993) and Lewis (2007) emphasised that solo free improvisation is a very different construct than group free improvisation. Pedagogues note substantial musical difficulties of solo free improvisation, including the absence of collaborative musical teamwork, the frequent rapid exhaustion of individual musical material knowledge and the lack of any musical blueprint or starting point (Bailey 1993; Lewis 2007; McPherson 1993). Pedagogically, the course only dealt with group free improvisation. However, Watson (2010) also measured solo improvisation after group based instruction and found that scores did improve based on method of instruction (aural instruction was

better than written instruction). School music teachers may not have the luxury of offering solo improvisation lessons, but hopefully can provide students with experiences in group improvisation so that they gain confidence as improvisers. Additional research should examine the relationship between group and solo improvisation achievement.

While time improvising in a group situation did not improve achievement scores, it did raise improvisation confidence. Scores from the Wehr-Flowers (2006) Confidence in Learning Improvisation scale increased significantly from the pre-test to post-test. In addition, while the pretest confidence score correlated with students' initial self-assessment of their improvisation comfort, the post-test confidence scale did not, also pointing to increased confidence (no relationship between low initial comfort and higher post-test confidence). It is difficult to know whether the length of time or the specific activities in which students engaged during the class contributed to their increase in this confidence. The increase in confidence may have come as a result of the instructors constantly re-designing the class in response to the improvisational needs of students. This constructivist approach allowed students of different abilities to improvise according to their skill level and more than likely contributed to the increase in confidence scores both for the students who had previous improvisation experience as well as those students who had no improvisation experience.

Improvisation achievement, as measured in this study, showed no significant relation to the variables of improvisation confidence and comfort or risk-taking personality. The self-assessed improvisation comfort rating was significantly related to the Wehr-Flowers confidence measures and the Calvert *Risk-Taking* measure. The strongest correlation was between the self-assessment of improvisation comfort and the Wehr-Flowers pre-test confidence measure. Results that the initial self-assessment rating was correlated more highly with the pre-test confidence rating than the post-test and highest yet with the risk-taking measure point to the construct validity of these three measures to assess confidence and/or comfort towards improvisation. May (2003), Ciorba (2009) and Watson (2010) discovered that one of the best predictors of improvisation achievement was improvisation self-assessment. Perhaps the first step towards developing future music teachers' confidence in teaching improvisation to their students is to develop confidence and self-efficacy in their own improvisation abilities. Time and experience with improvisation activities in a constructivist environment has shown to do this in the current study.

Music teacher education

For our study, we purposefully chose free improvisation because it is an aurally based method (Watson 2010) and spans all abilities and genres – something we expect our future music teachers to be able to do. For all intents and purposes, our non-major participants were quite similar to current music education majors who, when faced with improvising the first time, may face anxiety. We would conjecture, in fact, that among a pool of classically trained music education majors, the anxiety might be even higher than among a group of non-music majors at the collegiate level because of their relatively strict notationn-based training. Giving our music education students the opportunity to experience group free improvisation activities

could help lower their anxieties so they may feel more comfortable teaching improvisation in school music.

We offer several suggestions for research follow up. One is to examine the link between curricular materials and 'achievement' in improvisation pedagogy. Our study showed an interesting (and at times inverse) relationship between achievement scores and curriculum material. Future researchers might examine what is meant by 'achievement' within the free improvisation paradigm, how it is measured, and consequently, the effects of different instructional strategies and curricular materials on such achievement. Several authors (Madura 1996; May 2003; Smith 2009; Ward-Steinman 2008) have studied and honed improvisation achievement measures for *jazz* improvisation, but there are no systematic studies looking at free improvisation achievement. It might be worth examining Ward-Steinman's (2008) scale for free vocal improvisation as a tool for free improvisation achievement. It is telling that she found differences between jazz and free improvisation in relation to other variables. Because of the characteristic lack of structure and rules in free improvisation, the study of the effects of curricular materials poses particular issues for systematic research. As mentioned previously, the instructors in this study went with a loosely structured outline for their class and often changed based on the needs of the students. Additional study might hone in on specific pedagogical prompts to examine the effects on improvisation achievement or confidence.

The value of free improvisation as a musical activity has been touted by several scholars (e.g. Bailey 1993; Borgo 2007; Lewis 2004, 2007), but there is a need for more systematic inquiry in order to guide K-12 music teachers and their students. While the current study focused specifically on quantitative relationships between achievement, personality and risk-taking of college non-music major students' free improvisation, additional work in music teacher education and K-12 schools needs to examine the reasons why music teachers are reluctant to use improvisation in their teaching. Related research might explore the qualitative values inherent in free improvisation in order to support its inclusion in music education. Furthermore what does free improvisation 'achievement' look like for educators in the classroom? Additional investigations will warrant more qualitative and long-term study in order to better understand the very rich and complex musical activity of free improvisation.

A suggested next step towards helping music educators is to replicate this study with collegiate music education majors. Earlier studies by Delia-Pietra and Campbell (1995) and Wright and Kanellopoulos (2010) provide glimpses of understanding into how music teacher education might successfully introduce free improvisation into music teacher development activities. Hickey's (2015) study of collegiate free improvisation pedagogues offers successful models for teaching free improvisation that might provide useful for music teacher education as well. Would infusion of non-genre specific improvisation activities throughout a music education curriculum help to develop confidence and skills for music teachers to implement improvisation in their future jobs? Would a one-time course suffice? In either case there is a need for more careful research and practice if we hope to break the cycle of music education majors graduating into music jobs with neither confidence nor skills to bring improvisation into their classrooms.

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Notes

1. Authors Ankney and Healy.
2. Matt Turner is a lecturer of music at Lawrence University in Appleton. He is widely known as an outstanding improvising cellist and pedagogue.

Notes on contributors

Maud Hickey is Coordinator and Associate Professor of Music Education at Northwestern University.

Kimberly Ankney is Assistant Professor and Director of Music Education at Christopher Newport University.

Daniel Healy is a PhD student at Northwestern University.

Donna Gallo is Assistant Professor of Music Education at Westminster Choir College.

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