Introduction

Mental health and stress are common obstacles to happiness for many Americans. According to the National Institute of Mental Health, almost 1 in 5 US adults are living with a mental illness of varying categories and levels of severity. The recent public struggles with mental health by elite athletes Simone Biles and Naomi Osaka have raised the issue of performance-based mental health concerns within the public consciousness. Research into the alleviation of stress caused by performance anxiety may therefore prove beneficial to those coping with similar struggles.

Excessive stress has a negative impact on human physical and psychological health, and musicians are no exception. A widely quoted survey initiated and funded by The International Conference of Symphony and Opera Musicians in 1986 raised researchers’ awareness about the impact of stress upon professional musicians. This survey had more than 2,000 respondents, with 24% of musicians reporting they experienced stage fright, 13% reporting experiences of acute anxiety, and 17% experiencing depression. Since then, studies have addressed multiple components of musicians’ performance anxiety (MPA). Researchers have explored the physical manifestations of performance anxiety and the factors that contribute to it, exploring such topics as variations in heart rate and blood pressure varying degrees of anxiety before, during, and after a performance; higher levels of the stress hormones cortisol and cortisone in singers performing in public compared to singing without an audience; the relation between a musician’s attitude before a performance (perceived as either a threat or a challenge); and the degree of success of the performance.

In a parallel line of research, music therapists have investigated the impact of interventions with relaxing music to induce relaxation for general populations, including high-anxiety populations, such as parents of children receiving hospital treatment. Establishing the criteria for the compilation of lists of music pieces that induce relaxation in listeners has subsequently become an important line of research. Such studies have focused on determining structural features that bestow a “relaxing” quality on a piece of classical music (defined here as notated music composed between 1700 and 1900 meant for performance in concert settings). One of the most thorough studies, which explores different common musical properties found in relaxing music pieces, is “The Interplay of Preference, Familiarity and Psychophysical Properties in Defining Relaxation Music.” This research has concluded that the most relaxing pieces are those that are familiar, slow, soft, with minimal changes. The author even determines specific descriptions and values for relaxing properties (e.g., the melodic contour must be homogeneous, gentle, or the tempo must be between 60 to 80 bpm).

Building on the successes of music therapy for the general population, music therapists developed complex pre-performance therapy sessions for professional musicians with high levels of MPA. Therapeutic techniques used include listening to classical music along with breathing and muscle relaxation exercises. In view of the fact that musicians’ relationship with music is different than the one experienced by non-musicians, it seems likely that the music they may find relaxing may not always be the same as that for general audiences. For example, Tan et al. found there was a significant positive correlation between familiarity of a piece...
and its relaxation effect for non-musicians, while this was not the case with the music therapists participating in their study. They proposed this might be due to the therapists associating the music with their work and thus finding it less relaxing. A similar effect might be expected for classical musicians, for whom playing familiar music is their work. However, Tan et al. note that no previous studies have explicitly explored the relationship between professional musicians’ relaxation and familiarity. Further, to the best of our knowledge, no study has looked into whether the ability of a particular performance of a familiar piece to induce relaxation is affected by whether it meets the musician’s prior, personal expectations of it.

The objective of this study based on music-assisted surveys is to obtain information narrowly focused on professional, classically trained musicians’ reactions to pieces that are considered to be relaxing (according to Tan et al. criteria) in order to tailor the lists of classical music compositions used in music therapy sessions for such musicians.

The present survey tests the hypothesis that the relaxation level experienced by a classically trained musician while listening to a familiar piece may depend as much on how its particular performance conforms to a musician’s expectations as on its composition features. Musicians’ expectations regarding the performance of a given piece may be higher when it is familiar. They may harbor strong opinions about the “correct” tempo, dynamics, phrasing, instrumentation, etc. for a piece with which they are familiar. Consequently, listening to an interpretation that does not fulfill these expectations may interfere with feelings of relaxation. Conversely, musicians may have reduced expectations regarding the interpretation of an unknown or lesser-known piece that conforms to the criteria established for “relaxing music,” so such a piece may have a greater likelihood of inducing a higher degree of relaxation.

This survey contributes to the field of music therapy by addressing the need for guiding principles in the selection of classical music pieces meant specifically for the relaxation of professional, classically trained musicians. It may recommend narrowing the listening selections meant for musicians whose preferences are not known by the therapist to pieces that are less likely to be familiar, while still possessing the general qualities known to induce relaxation.

### Methods

#### Participants:

The study recruited two groups of respondents with IRB approval. All participants were aged 30 and up and recruited largely from New York and New Jersey, where this study was based. The first group consisted of classically trained professional musicians (mostly area teachers and performers). The second group was a control group of non-musicians (defined as persons who have not had formal music instruction, nor participated in band, orchestra, or choir past middle school).

Potential participants were approached by email or verbally with an invitation to participate in this survey. They were asked to provide consent in writing or verbally.

Of 46 prospective participants, 20 musicians and 18 non-musicians returned surveys for at least two of the pieces and were included in the study analysis. The demographics of these two groups were largely similar in terms of gender (60% female musicians and 76% female non-musicians) and age (median age range was 50-59 for both groups). There was some difference in distribution across race-ethnicity, with the musicians being majority Caucasian (85%), while non-musicians were a more diverse group with the largest groups being Asian (43.75%) and Caucasian (37.5%).

#### Choice of Pieces:

All respondents were asked to listen to the same three orchestral pieces. The first two pieces were chosen for their general familiarity and the third for its general unfamiliarity. All pieces were selected in conformity to the principles laid down by Tan et al. (i.e., slow tempo, no abrupt changes in dynamics or rhythm, gentle melodic contour). Care has been taken that these pieces be performed by reputable ensembles. The titles and performers were not made known to the participants.

- **Piece #1,** Johann Sebastian Bach’s *Air from Orchestra Suite #3, BWV 1068,* is a widely known composition that appears on the majority of compiled lists of relaxing pieces. It is performed by an early music ensemble with period instruments. It will henceforth be referred to as “Familiar 1.”
- **Piece #2** is the same piece as the above but performed in a more modern interpretation by a symphonic orchestra with a harpsichord. Thus, it is more likely to conform to modern musicians’ expectations of this piece. It will henceforth be referred to as “Familiar 2.”
- **Piece #3,** Ignatius Pleyel’s *Andante grazioso* from the *Symphony in F Minor, Ben. 138,* is a classical piece that is not frequently performed and not studied in music history classes, therefore likely to be unknown to most participants. It will henceforth be referred to as “Unfamiliar.”

#### Survey Questions:

Participants were emailed a cover letter including the objective, detailed instructions, a consent form, and links to three surveys. For each one, participants were asked to listen to a piece of classical music and answer questions about how relaxing the piece felt to them. Optional demographic questions appeared at the beginning of the first survey. Each survey took approximately 15 minutes to complete. Each respondent completed all three within a week, at least one day apart from each other at about the same time of day.

The surveys are available for review at the following links as of August 2021.

- **Survey 1:** [https://083qbvhq080.typeform.com/to/oPqR1f7M](https://083qbvhq080.typeform.com/to/oPqR1f7M)
- **Survey 2:** [https://083qbvhq080.typeform.com/to/e5FqwJX6](https://083qbvhq080.typeform.com/to/e5FqwJX6)
- **Survey 3:** [https://083qbvhq080.typeform.com/to/kBjrVtKf](https://083qbvhq080.typeform.com/to/kBjrVtKf)

Two of the major metrics for this study concern level of relaxation and types of emotion evoked by the music listened to. The scale used to measure the participant’s relaxation is commonly used in music therapy studies. The list of emotions possibly elicited by the music comes from the widely accepted “Thayer’s model.”
Results and Discussion

Validation of Relaxation and Familiarity:

As expected, all three pieces had a positive relaxation effect on the majority of participants (27/35 for Familiar 1, 24/35 for Familiar 2, and 25/33 for Unfamiliar). This was true for both musicians and non-musicians (Figure 1).

![Figure 1: All three pieces most commonly had a positive effect on both musicians and non-musicians. However, the non-musicians had a greater positive response to the familiar pieces than the unfamiliar piece while the musicians had a greater positive response to the unfamiliar piece. (Primarily Positive): selected words included at least one of happy, pleased, relaxed, peaceful, and calm. Primarily Negative: selected words included at least one of annoying, angry, nervous, and bored. Mixed: selected words included at least one positive and one negative term. Other: the options included exclusively excited, sad, sleepy, and none of the above.)

Notably, however, proportionally more non-musicians found the Familiar pieces to be relaxing, while proportionally more musicians found the Unfamiliar piece relaxing. This difference will be explored more quantitatively in the next section.

100% (20/20) of musicians and 83.33% (15/18) of non-musicians confirmed that they were familiar with the well-known baroque piece presented in two different interpretations (Familiar 1 and Familiar 2). In contrast, the less well-known classical piece (Unfamiliar) was known to only 5.3% (1/19) of musicians and 6.25% (1/16) of the non-musicians. Because the central hypothesis of this study is that familiar music is less relaxing to musicians than unfamiliar music, in all subsequent analysis, the small number (8/111) of responses where there was a mismatch between a respondent's actual familiarity with a piece and the intended familiarity have been excluded (i.e., responses about the Familiar pieces from respondents who were unfamiliar with them and about the Unfamiliar pieces from respondents who were familiar with them).

Musicians Found Familiar Pieces Less Relaxing:

The hypothesis of this study proposed that musicians might be more relaxed when they listen to unfamiliar music as opposed to familiar music due to their expertise in music and inclination to critique the music they hear against their expectations of it. In order to test whether or not the familiarity of music did in fact have an effect on musicians' relaxation responses, we asked all participants to score their relaxation response to the Unfamiliar and Familiar pieces on a scale of 0 to 10. As hypothesized, the musicians ranked the Unfamiliar piece as significantly more relaxing (Figure 2: mean Familiar = 7.1, SEM = 0.29; mean Unfamiliar = 8.2, SEM = 0.42; p = 0.026), while the non-musicians did not have a statistically significant difference in their relaxation ratings for the Unfamiliar versus Familiar pieces (mean Familiar = 7.9, SEM = 0.38; Unfamiliar = 8.1, SEM = 0.44; p = 0.75).

![Figure 2: Both musicians and non-musicians gave their relaxation response to familiar and unfamiliar music on a scale of 0 to 10. Musicians' relaxation levels were significantly higher for the unfamiliar piece compared to the familiar piece, while the relaxation levels for the non-musicians were not. (Student's T-Test, p < .05. Error bars represent 2 SEMs)

Musicians Engaged More Critically With Familiar Pieces:

To explore whether the musicians were more critical of familiar than unfamiliar music, surveys asked musicians to select positive musical characteristics (from a choice of 6) they agreed with and did not agree with for each of the three pieces after listening to each piece.

Remarkably, for the Unfamiliar piece, almost half (8 out of 17, 47.1%, SEp = 24%) agreed with all the positive aspects of the performance and only 3 participants (18%, SEp = 19%) disagreed with at least one of them (Figure 3, note that these percentages do not add up to 100% because participants were allowed to neither disagree nor agree). In contrast, for the Familiar pieces, these numbers were essentially flipped, with few musicians agreeing with all positive aspects and many disagreeing. Only 6 out of 40 (15%, SEp = 11%) responses agreed with all aspects of the performance for the Familiar pieces, while more than half disagreed (27 participants, 67.5%, SEp = 15%).

Across all three pieces, musicians most commonly criticized dynamics. Of the musician survey responses for this question, 14/44 responses disagreed with the Familiar pieces' dynamics. For the Unfamiliar piece, 2/18 people disagreed with dynamics.

These results demonstrate that professional, classically trained musicians are more likely to be lenient in judging the performance of a piece they do not know than a piece that they do. This finding that musicians were less critical of the Unfamiliar piece is interesting given the previous findings that musicians had more relaxed feelings and a higher relaxation level associated with the Unfamiliar piece (Figures 1 and 2 respectively). The less critical approach to less familiar music may explain why these musicians found the unfamiliar piece more relaxing. It furthermore raises the question of whether when a familiar piece does meet a musician's expectations it can be as relaxing as an Unfamiliar piece despite being subjected to higher expectations. This possibility is addressed in the next section.
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that when a familiar piece was experienced to be as relaxing as the each of these cases, the open-ended comments suggested that piece relaxing if it meets their performance expectations. In of relaxation). This demonstrates that musicians may find a familiar piece (Familiar 1 or Familiar 2) as for the Unfamiliar same level of relaxation for one of the two performances of the piece. (Error bars represent 2 SEp).

**Critical Analysis by Musicians Interferes with Relaxation:**

The idea that a critical approach to familiar music interferes with relaxation was supported by responses to the open-ended question that allowed musicians to comment on any aspect of a piece that influenced their level of relaxation. Several participants indicated that the act of analyzing classical music can make it difficult to relax. One participant stated, “It is also hard to truly relax when you’re critiquing the performance.” Another explained, “As an experienced classical musician I find it hard to relax to classical music. I find myself analyzing it, trying to figure out who might have written it, what the form is, how it might have been a more effective performance.”

Furthermore, they suggested that within the broader category of familiar music, musicians found their relaxation was particularly reduced if the piece did not conform to their particular expectations for it. Because the Familiar 1 piece is a marginal style, for most musicians it conforms less to their expectations than the Familiar 2 piece. As such, one participant observed about the Familiar 1 piece, “The phrasing felt choppy and the articulations a bit strange. It negatively affected my relaxation and made me feel a bit anxious.” Likewise, another participant commented on this same piece about the trade-off between analysis and relaxation: “The interpretation was not very familiar but after listening a bit (not relaxing but analyzing) it felt alright.” In contrast, this same participant wrote about the Unfamiliar piece, “Because I did not know this particular piece and also this period of musical style is not my main focus at work, I didn't find any strong interpretational issues that would bother me (i.e., intonation, bad recording quality, exaggerate tempi) and I could just enjoy listening to it.”

Overall, while the Unfamiliar piece was found to be the most relaxing, nevertheless 8/20 musicians actually indicated the same level of relaxation for one of the two performances of the familiar piece (Familiar 1 or Familiar 2) as for the Unfamiliar piece (with the other Familiar piece having the lowest level of relaxation). This demonstrates that musicians may find a piece relaxing if it meets their performance expectations. In each of these cases, the open-ended comments suggested that when a familiar piece was experienced to be as relaxing as the Unfamiliar piece, it also conformed to the listener's particular critical expectations of that piece. For example, a musician who indicated level 10 of relaxation for both Familiar 1 and Unfamiliar pieces stated for Familiar 1: “The performance … met the stylistic performance practice of the Baroque period. The interchange of inner voice’ melodic lines and motifs was tastefully done. … Overall, it was a pleasant performance.” And about the Unfamiliar piece “very enjoyable performance … [technical details listed] … Excellent performance overall.”

The musicians posit through these responses that for familiar pieces, a mismatch between their expectation and reality causes a decrease in their relaxation. Indeed, this possibility was borne out quantitatively as well. We found a negative correlation between the number of aspects of performance that a musician disagreed with for a given Familiar piece and the relaxation score they gave to it (Pearson's Correlation, R = -0.5443, p =0.00029).

Taken together, these results demonstrate that when listening to Familiar pieces, participants were more inclined to critique the performance. When the performance didn’t conform with their expectations, this interfered with their relaxation. However, for the Unfamiliar piece, because it was something that was previously unknown to the musicians, they did not automatically have a need to critique it and were able to just listen to it and relax.

**Conclusion**

Music affects non-musicians and professional musicians differently. Professional musicians have a more trained ear in comparison to non-musicians and a more specific idea of what they look for in the performance of classical music pieces, especially when it comes to pieces they have heard multiple times. The hypothesis that musicians would be more relaxed when they listen to a piece that is unfamiliar to them rather than a piece that is familiar to them was tested.

In order to test this, participants listened to three pieces (Familiar 1, Familiar 2 and Unfamiliar) and rated their relaxation levels, as well as answered questions that could give insight about them, such as degree of familiarity and observance of positive musical characteristics.

Musicians on average had a higher relaxation response to the Unfamiliar piece than the Familiar pieces. This was in contrast to the non-musicians, whose relaxation response did not significantly differ for the Unfamiliar and Familiar pieces. This finding aligns with the supposition of Tan et al. that for people with professional musical training - in their case, music therapists - familiarity might not correspond to greater relaxation. However, in their study, Tan et al. found only a lack of positive correlation between relaxation and familiarity. On the other hand, in our study, the professional musicians’ relaxation level significantly decreased when they listened to familiar music. This strong effect could be due to the fact that musicians, who may actually have played these pieces, are likely to have a deeper familiarity with familiar pieces than music therapists.

These results showed that the professional musicians – many of them performers – are in general more critical of familiar pieces. This was supported by their comments that the act of trying to critique a familiar piece made it more difficult for them to relax. This strongly suggests that there is a causal relationship between their increased criticalness and

**Figure 3:** Musicians selected the criteria they agreed with and disagreed with (out of a list of 6 different musical characteristics) for each of the three pieces they listened to. For the Unfamiliar piece, substantially more musicians agreed with all the criteria and fewer musicians disagreed with at least one of the criteria, indicating that musicians were less critical with the Unfamiliar piece.
the decrease in relaxation when listening to familiar pieces. Comments that described how the particular performance style of Familiar 1 made it harder to relax because it was not what the participants expected to hear further suggested that the decrease in relaxation may be greatest when a familiar piece does not meet a musician's expectations. This was supported quantitatively by a correlation between the number of ways in which a familiar piece failed to meet a musician's expectations and the relaxation level they experienced listening to it. This shows that musicians are indeed able to relax while listening to familiar pieces, but on the condition that they meet their particular personal performance expectations.

These findings lend strong support to the hypothesis that familiar music is more likely to be less relaxing for musicians than unfamiliar music. Additional testing, involving a larger group of participants and a more diverse set of classical pieces, can be done in the future in order to provide a broader foundation for the generalization of these conclusions. It would also be interesting to explore whether classical music is most effective for relaxing classical musicians or if other genres that are not their working medium might be more effective.

Furthermore, researchers may be interested in detailing our observations by breaking down the familiarity aspect into two categories: familiarity acquired through listening and familiarity acquired through playing a piece and determine whether this difference in the degree of familiarity affects the relaxation level.

The conclusions of this study are relevant to the design of therapy sessions dedicated to professional classically trained musicians who experience performance anxiety. Given the strong connection of musicians to music, music therapy would seem to have the potential to be particularly powerful in helping them but could also require more nuance in how it is delivered. The results contribute to a better understanding of the mechanisms involved in musicians’ reactions to familiar versus unfamiliar music. Moreover, they provide a guiding principle in assembling lists of suitable classical music pieces for relaxation-oriented listening. In settings where the musician’s preferences are not known to the therapist, the safer approach is to have a selection of pieces that, while displaying the necessary features to make them relax, are less likely to be familiar. It is a narrowly focused yet meaningful contribution to the field of music therapy and through that to the wider field of mental health.

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References


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