

The Effect of Repeated Listening on Pleasure and Boredom Responses

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ABSTRACT

This study investigates the way in which familiarity with a piece of music influences a listener's aesthetic response in terms of pleasure and boredom. Repeated listening, as well as helping to familiarize a listener with any given piece, can often also increase their appreciation for what they hear. However, appreciation begins to decrease once the novelty of the music has worn off, a trend that can be represented by an inverted-U line. We conducted a listening experiment in order to test the effect of the following four factors on a listener's pleasure and boredom responses: (1) repeated listening; (2) contextual listening; (3) exposure to a variety of performances of the same work, and; (4) musical structure. Our results demonstrated that listener pleasure does indeed increase and decrease in conformity with the inverted-U line, with boredom increasing beyond a threshold of repetitions. We also established that differences in performance and musical structure were factors that influenced the aesthetic responses of participants. Contextual listening, however, was found to have no effect on aesthetic response.

I. BACKGROUND

One of the biggest motivations for listening to music is surely the pleasure to be derived from this activity. Many of us are familiar with the experience of coming to take increasing pleasure in a piece of music as it becomes more familiar to us. On the other hand, we do not always take pleasure from hearing music – it is also a common experience to become bored with a piece with which we are overfamiliar. With this anecdotal evidence in mind, the purpose of this study was to examine in detail how repeated listening and familiarity with a piece of music affects our appreciation of it in terms of pleasure and boredom. In particular, we investigated how familiarity with a concert movement affects one's appreciation of the cadenza of that movement, and the difference in pleasure and boredom responses produced by different performances.

A. Repeated effect and an inverted-U line theory

It is known that repeated listening not only increases a listener's familiarity with a piece, but also often their positive feelings for it. Zajonc (1968) terms this the "mere repeated exposure" which is "a sufficient condition for the enhancement of [the subject's] attitude toward [some stimulus]". Some studies show that a preference for pieces in unfamiliar genres rise as listeners are exposed to musical stimuli more often (Krugman, 1943; Mull, 1957; Heingartner and Hall, 1974). However, once the amount of repetition reaches a critical point, positive feelings reach an optimum level and thereafter decline. This is illustrated by an inverted-U line, which describes the relationship between repetition/familiarity and positive responses (Wundt, 1874; Berlyne, 1971). Inverted-U line relationships have been observed between repetition of a piece and liking for it, as

well as between the complexity of a piece and liking for it (Hargreaves, 1984; Tan, Spackman and Peaslee, 2006).

B. Expectation

Repeated listening increases not only familiarity and positive feelings but also musical expectations. According to Huron (2006), events that occur most frequently (and by virtue of that fact the most familiar events) are preferred to those that are unfamiliar because they are predictable. An expectation is an ability to anticipate impending events in musical works, which is based on an individual's mental representation of structural characteristics of the music. An expectation is "a product of the habit responses developed in connection with particular musical styles and of the modes of human perception, cognition, and response – the psychological laws of mental life" (Meyer, 1956: 30). There are three types of expectations: *schematic expectation*, *veridical expectation* (Bharucha, 1994; Justus and Bharucha, 2001) and *dynamic expectation* (Huron, 2006). Schematic expectation is an expectation that stems from a mental representation of a particular style of music. Veridical expectation is related to a specific piece, and enables a listener to memorise, recognise and anticipate the coming events in that specific piece of music. While both schematic and veridical expectations are based on long-term memory, the third type of expectation, dynamic expectation, arises from short-term memory of musical events. Dynamic expectation occurs through exposure to current ongoing musical events over a short period, and can flexibly adjust according to the changing situation.

Expectations play an important role in influencing pleasure and boredom responses to music. On the one hand, positive responses such as satisfaction and pleasure may be evoked when musical events conform to the listener's expectations, thereby fulfilling his expectations. Equally, tension and negative arousal may be evoked when highly unpredictable musical events violate expectations. On the other hand, if a piece fulfills the listener's expectations too often or too readily, then this can lead to boredom (Bharucha, 1994). Aesthetic and satisfying experiences of music arise from a balanced interplay of violated and confirmed expectations (Meyer, 1956; Huron, 2006).

C. Cadenza

From these considerations, a question arises: how do expectations of the parent movement of a piece of music, gained through familiarity with it, influence the perception and appreciation of the cadenza from that same piece?

A cadenza can provide an interesting and ecological example to investigate listeners' responses to their fulfilled and violated expectations, either of which can lead to pleasure or boredom. A cadenza is an improvisational section inserted near the end of a movement in a concerto or aria to provide

embellishment that exhibits the soloist’s virtuosic and improvisational skill, and to lead to a final cadence. The performer should refer, repeat, imitate, and develop themes from a parent movement when he improvises. At the same time, the cadenza should be full of variety and surprise, invented and performed in a novel way such as with rhythmic modifications, changes in articulation or dynamics, or melodic variation. Consequently, a cadenza contains both predictable and unpredictable elements. Listeners become more familiar with the main thematic materials of the concerto the more they are exposed to the movement. This forms veridical expectations, and may also produce expectations in respect of the cadenza.

It is hypothesised that repeated listening to a parent movement builds veridical expectations that function also as expectations with regard to the movement’s cadenza, and raises listeners’ pleasure until the level of repetition reaches a certain point. We conducted a listening experiment to examine this hypothesis, and two other issues: the effect of different performances, and the effect of contextual listening. Since performers are afforded a great degree of freedom in how they play cadenzas, it is hypothesized that different styles of performance will also affect the inducing of pleasure and boredom. We investigated this by employing two performances by different musicians. We also compared listeners’ pleasure and boredom responses when they were played just a cadenza on its own, and when they were played a recapitulation and a cadenza (a cadenza within context) in order to examine the effect of context which, it is thought, should provide the listener a clearer idea of the piece’s coherence.

II. METHOD

A. Participants

Forty-eight adults (21 males and 27 females) participated in the experiment. Two of them were musically trained, but the only prerequisite for participation was that participants liked listening to classical music. Musical training was not required as a background variable. Participants were divided into six groups.

B. Material

Two recordings of the first movement of Mozart’s Piano Concert No 20 in D minor were used as musical stimuli. The recordings released on CD by Mitsuko Uchida, piano, Jeffrey Tate, conductor, English Chamber Orchestra (DECCA 468 540-2, 2001), and by Martha Argerich, piano, Alexandre Rabinovich, conductor, Orchestra di Padova e del Veneto (TELDEC 2564 695640-8, 1990). Both pianists played the cadenza written by Beethoven. Three parts were extracted from each performance : 1. The cadenza; 2. The exposition (bar 77 to 183); 3. Cadenza within context - the recapitulation and the cadenza (bar 254 to 366).

C. Procedure

Table 1 shows the presentation procedure for each group. Two performances and three presentation procedures made a total of six groups. In order to test the effect of repetition,

Table 1. The experiment Procedure

Performance/ Listening Pattern	Uchida	Argerich
Repeated Listening	RU 1. Cadenza 2. Exposition 3. Exposition 4. Cadenza	RA 1. Cadenza 2. Exposition 3. Exposition 4. Cadenza
Context	CtU 1. Cadenza 2. Cadenza within context	CtA 1. Cadenza 2. Cadenza within context
Control	CU 1. Cadenza 2. Cadenza	CA 1. Cadenza 2. Cadenza

Repeated Listening groups (RU and RA) listened to the cadenza, exposition, exposition, and cadenza. Context group (CtU and CtA) listened to the cadenza followed by the recapitulation and cadenza (cadenza within context). Control groups (CU and CA) listened only to the cadenza twice. To examine variations in responses to different performances, each listening pattern had two groups: those who listened to Uchida’s performance (RU, CtU, and CU) and those who listened to Argerich’s performance (RA, CtA, and CA).

All participants were asked to listen to the musical materials on headphones, and to press the button P for pleasure and/or B for boredom on a computer keyboard whenever they felt pleasure and/or boredom during listening. They did not have to press either of the buttons if they did not feel either, and they were also allowed to press both buttons at the same time if they felt both. After each listening, they rated how strongly they had experienced pleasure, boredom, interest, and annoyance, and how much they liked the excerpt on a 7-point scale (1 very weakly to 7 very strongly).

III. RESULTS

A. The Effect of Repeated Listening (Rating)

Figure 1 shows the mean of ratings from the Repeated Listening groups. A paired sample t-test compared the ratings given by both Repeated Listening groups in the first and second listening to the cadenza (the fourth trial). There was a significant difference in the means of ratings for the first and the second listening: Pleasure $t(15)=2.42, p<.05$: Interesting $t(15)=2.23, p<.05$: Boring $t(15)=-3.3, p<.05$: Liking $t(15)=4.43, p<.05$.

The ratings given by participants in all groups on both the first and second listening were compared using a mixed model ANOVA. The between-subjects variables were three listening conditions (Repeated Listening, Context and Control) and two performances (Uchida and Argerich), while repetition (the first and second listening) served as within-subjects variables. The dependent variable was a rating on the 7-point scale given by the participants. There was a significant effect of repetition

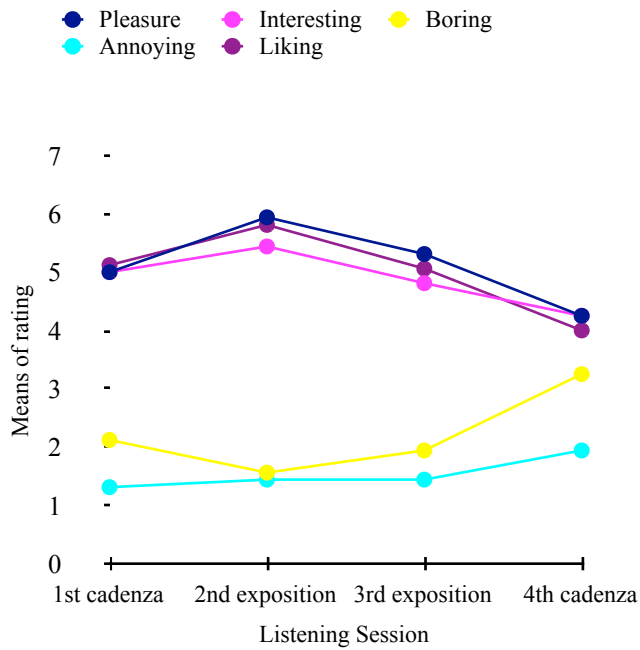


Figure 1. Mean rating per listening session from the repeated listening groups

and condition on the mean of ratings for Pleasure at the $p < .05$ level: $F(2,42)=5.18, p=.010$, Boring: $F(2,42)=6.24, p=.004$, Annoying: $F(2,42)=4.25, p=.021$, and for Liking: $F(2,42)=6.45, p=.004$.

A one-way within-subjects ANOVA was conducted to compare the effect of repetition on ratings by Repeated Listening Groups in the first (the cadenza), second (the exposition), third (the exposition) and fourth (the cadenza) listening sessions. There was a significant effect of the repetition on ratings for Pleasure, $F(3, 60)=6.81, p=.001$ and Boring $F(3, 60) = 5.52, p=.002$. Turkey post-hoc comparisons of the four listening trials indicate that in Pleasure, there was a significant difference between the second listening session (the exposure), which was the highest rating ($M=5.94, 95\% CI [5.31, 6.57]$), and the fourth listening session (the cadenza), which was the lowest ($M=4.25, 95\% CI [3.65, 4.85]$), $p=.001$. No statistically significant differences were found between the first listening and other listening sessions. In Boring, the fourth listening session was rated the most boring ($M=3.25, 95\% CI [2.37, 4.13]$), more than the second listening session ($M=1.56, 95\% CI [1.01, 2.11]$), $p=.002$, and the third listening session ($M=1.94, 95\% CI [1.44, 2.43]$), $p=.020$.

B. The Difference between Performances (Button Pressing)

As for the button pressing data, the cadenza was divided into fourteen sections according to its structure, and the numbers of responses to ‘P’ and/or ‘B’ button(s) per section were calculated. The distribution of each response over the cadenza and differences in response numbers between performances, the Uchida groups (RLU, CtU and CU) and the Argerich groups (RLA, CtA and CA) are presented in Figures 2 and 3. Generally, pleasure responses by both Uchida and Argerich groups display a similar trend, whereas boredom responses vary moderately. Additionally, pleasure and boredom responses tended to be evoked in faster and slower

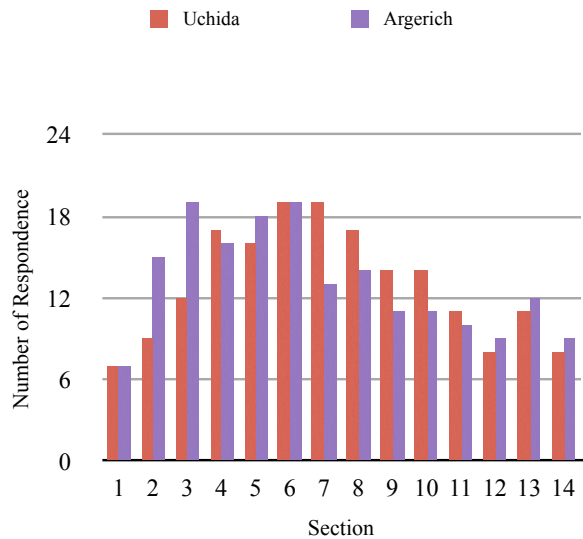


Figure 2. Distribution of pleasure responses by different performances

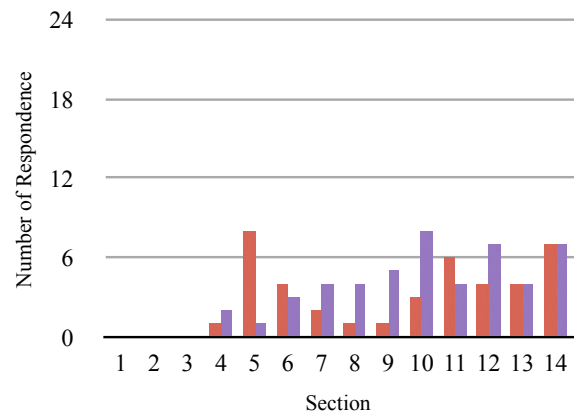


Figure 3. Distribution of boredom responses by different performances

tempi, respectively. In this cadenza, Uchida’s performance is soft and slow, while Argerich’s is energetic and fast. There were more distinct Pleasure or Boredom responses in places where the different styles of both pianists were clearly shown. There were more pleasure responses in the Argerich groups in which Argerich played repeated turn passages and b-flats in a lower register in accelerando with raising tension, than in the corresponding Uchida groups. Boredom responses were evoked more in the Uchida groups than the Argerich groups when Uchida slowed down the tempo and dynamics, while Argerich did not. Though it was not statistically proven, these differences in participants’ responses may be due to the different styles of performance between Uchida and Argerich.

An independent t-test was carried out to compare the responses of the Uchida groups with those of the Argerich groups. No significant differences were found in the overall numbers of pleasure and boredom responses between Uchida and Argerich performances. A mixed model ANOVA was run to compare the means of the numbers of the sections where participants responded with Pleasure and/or Boredom. Three

conditions (Repeated Listening, Context and Control) and two performances (Uchida and Argerich) served as the between-subjects variables, and repetition (the first listening and the second) served as within-subjects variables. The independent variable was the total number of sections in which participants responded with Pleasure and/or Boredom. There was a significant difference in the number of people who perceived Boredom between the first and the second listening: $F(1, 42)=10.8, p=.002$. A significant effect of repetition and condition was found in Boredom: $F(2, 42)=5.48, p=.008$. Participants were more bored in the second repetition, and in particular in the Repeated Listening condition.

In order to assess the relationship between the pleasure and boredom responses, t-test compared the numbers of pleasure responses with those of boredom. Pleasure prevailed over the cadenza, and there was a significant difference between the respective numbers of pleasure and boredom responses: $t(110)=13.84, p<.05$. A Pearson's product-moment correlation coefficient was computed to test whether pleasure and boredom are correlated. The response to pleasure was significantly and negatively correlated with boredom in both listenings. In the first listening: $r=-.35, p<.01$, and in the second: $r=-.36, p<.01$. The result statistically supports an inverse relationship between pleasure and boredom. However, having taken into account that several participants pressed P and B buttons at the same time, this data does not put it beyond doubt that pleasure and boredom are mutually exclusive aesthetic responses.

C. The Effect of Contextual Listening

The ratings given by Context groups and Control groups in the first and second listening sessions were compared using a related samples t-test. However, no significant differences were found in both Context and Control Groups.

IV. DISCUSSION

A. The Effect of Repeated Listening

The first research question is that of how familiarity with repeated listening to a movement changes our pleasure and boredom responses to a cadenza. If repeated listening helps a listener to build an expectation for the cadenza and increase their appreciation for the piece, the ratings on positive scales such as Pleasure, Interesting and Liking given by participants after each listening session should increase with repetition. However, if the inverted-U theory is applicable in this case, appreciation will begin to decrease after reaching a peak, and boredom will increase. The rating data from the Repeated Listening groups, who listened to the cadenza, the exposition twice and the cadenza, clearly showed an inverted-U shape. This result is consistent with Hargreaves' experiment (1984), in which the ratings of liking over repeated listening increased and decreased. On the other hand, the plot of Boring shaped a U line, not an inverted one. Positive scales marked the highest rating in the second listening and the lowest in the fourth listening, while negative scales such as Boring and Annoying were rated the highest in the fourth listening and the lowest in the second listening. This may demonstrate that the participants took pleasure in the first listening to the exposition (the second listening session) which included the

all-important themes of the movement, and that they enjoyed discovering musical materials that constituted the cadenza part to which they had just listened. However, it may be that the second listening to the cadenza, the fourth listening session, heavily fulfils the participants' expectations and so bores them. The result that the second listening session (the first listening to the exposition) was rated highest left the effect of veridical expectation on responses to a cadenza ambiguous. However, the data by Repeated Listening groups showed that repetition altered the degree of pleasure and boredom.

B. The Differences between Performances

The second question is whether pleasure and boredom responses are evoked by differences between performances, or whether instead they are intrinsic to musical structures. While statistical tests did not establish that there are significant differences between the two performances with regard to pleasure and boredom responses, the button-pressing data revealed that the Uchida and Argerich groups responded differently in the same parts of the movement. More participants in the Argerich groups pressed the 'P' button in Sections 2 and 3 - in which Argerich played with *accelerando* in the first listening - than did the Uchida groups. The performance by Uchida gave rise to more boredom ratings in Section 5 than did Argerich's (in Uchida's performance, the variations of the second solo theme in Section 5 were played in *calando*). These findings perhaps indicate that tempo and loudness influence a listener's responses of pleasure and boredom to music, and are consistent with the notion that fast tempo is usually associated with excitement, happiness or joy whereas slow tempo and soft loudness are often connected with tranquility or melancholy (Gabrielsson & Lindström, 2010).

The distribution of responses over the cadenza reveals that pleasure and boredom responses are deeply related to musical structure. The participants responded with pleasure more in the first half of the cadenza, which is full of thematic developments, whereas the latter part, which is an embellishment consisting mainly of arpeggios and trills, more commonly elicited the boredom response. This finding - that particular sections of the piece evoked more Pleasure and Boredom than other parts - is consistent with Mull's finding (1957). The participants in her study preferred melodic and more consonant parts to less melodic, dissonant parts. Melody and its logical consistency could be one of the factors affecting a listener's appreciation, although it remains difficult to affirm that here due to the different musical styles and characters of stimuli from this study. That the embellishment part induces boredom is perhaps a sad result for performers, because embellishment parts require a high level of performance skill.

C. The Effect of Contextual Listening

The last question to answer is whether musical context makes any difference to pleasure and boredom responses. The cadenza maintains coherence by borrowing and developing main themes from the parent movement, and is part of the structure of the movement in terms of its harmonic functions. From these two points, it was hypothesised that appreciation for the cadenza may vary according to whether the listener is

played the cadenza alone or within its musical context. This is because it is expected that listening in context should help to establish a more solid expectation for the cadenza, and should enable an increased experience of tension and resolution. However, contrary to this prediction, no differences in aesthetic responses were found in the experiment. Two possible reasons for this absence of an effect are the experimental procedure and aesthetic responses. Regarding experimental procedure, participants in the Context groups listened to the cadenza first, and the recapitulation and the cadenza in the second listening session. The two listening sessions were not sufficient to establish the effects of contextual listening, if indeed there are any. An alternative reason could be that the different aesthetic responses that may occur during contextual listening cannot be measured in terms of pleasure and boredom, but could instead be due to other variables. Regarding these two issues, experimental methods should be refined and further improved. Finally, it is possible that participants were sufficiently familiar with the music prior to the experiment that further exposure to the context in which the cadenza appeared had no influence on their aesthetic response.

D. General Discussion

This study investigated the effect of repeated listening to an exposition on appreciation for a cadenza in terms of pleasure and boredom. It also examined the effect of different performances, as well as the context in which the cadenza was presented. The main findings were: the cadenza evoked more pleasure than boredom; repeated listening altered the amount of pleasure and boredom listeners felt (i.e. less pleasure, more boredom); pleasure and boredom responses were negatively correlated; pleasure and boredom responses were related to the tempi and dynamics of the performances. The effect of repeated listening, which increases and decreases the level of pleasure in the pattern of an inverted-U line, is consistent with previous studies. The results also reveal a different aspect of inverted-U line theory, which is that boredom responses describe a U line shape as a musical stimulus is repeated. Boredom and pleasure are not necessarily mutually exclusive aesthetic responses, but as the analysis shows, pleasure and boredom evoked by listening to music are negatively correlated to some extent. It is interesting that local differences in tempo and dynamics led to different responses across performances, although overall the responses to the two performances were not significantly different from each other.

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