Effect of Social Feedback on Emotions and Preferences in Music

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EFFECT OF SOCIAL FEEDBACK ON EMOTIONS AND PREFERENCES IN MUSIC

by

Megan Dillon

A thesis submitted to the Graduate College in partial fulfillment of the requirements for the degree of Master of Music
School of Music
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The purpose of this research project was to investigate whether social feedback had an effect on individuals’ emotional ratings of and preferences in music. The current study recruited 173 participants and was based on a study by Egermann, Grewe, Kopiez, and Altenmüller (2009a) that surveyed individuals on their reactions to music when presented with falsified social feedback. The research hypothesis was that participants who were exposed to manipulated social feedback would report emotional ratings and preferences more closely aligned with the social feedback than when not exposed to the feedback. Results showed significant differences in participants’ reported ratings of music on a scale of depressing vs. uplifting and a star rating scale when they were or were not exposed to manipulated feedback for one excerpt, which was “Main Titles” from the soundtrack for the film Chocolat. There were also non-significant trends aligned with the manipulated feedback in some of the other excerpts when participants were exposed to the feedback. Further research with a greater number of participants may have implications in the music therapy field by suggesting that members of music therapy groups are conforming to the opinions of other group members.
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Megan Dillon
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INTRODUCTION

It is difficult to fully wrap one’s mind around the extent to which social influence affects a human’s everyday life. In this technological age, nearly every aspect of human life comes with some sort of review. Whether it be an Amazon order, a Broadway play, a hotel or a professor, there are ample reviews to help the consumer make a decision. Some of these reviews are by so-called “experts”, while some are just from peers or other buyers. Certain sellers may even post fake positive reviews to attempt to increase their sales. These influences happen in many areas of life, such as fashion, art, and even dialects, which occur in different regions due to the population’s speech patterns and inflections affecting the speech patterns of others around them. Depending on their personality, some people are more likely to be strongly influenced by others. In particular, people who are shy and easily intimidated are much more easily influenced than people who are outgoing and confident. People who are introverted will be less assertive than those who are considered extroverted (John & Srivastava, 1999). Countless studies have been conducted to examine how and why social influence affects individuals. Social influence could have serious implications in the world of psychology if other’s opinions greatly affect an individual's decisions. Social influences may affect not only one’s decisions on what clothes to wear or what music to listen to, but also one’s emotions, future, and opinions. Peer pressure and social influence may take away from a person’s individuality, silence their thoughts, and even decrease confidence. If a few particularly vocal people in a group music therapy session voice their opinions and the quieter group members are influenced by that and perhaps alter their own voiced opinions, then that therapy could theoretically be rendered useless for those group members. Therefore, understanding the scope of social influence is important for having the
most beneficial therapy sessions, not only in music, but in many other aspects as well.

One of the earliest studies on conformity was in 1935 by Sherif. He used a visual optical illusion to test whether or not people would say that a light projected onto a screen was moving, even though it was not. He began by asking people individually how far they thought the light moved. He proceeded by putting two people with similar estimates in the same room as a single person with a very different estimate. Each person was asked to say out loud how far they thought the light had moved. Sherif found that the person whose estimate was different from the other two conformed to their majority opinion (Sherif, 1935). In 1951, Asch began his well-known series of experiments to study social influence. In his original experiment, a group of eight individuals (all male) were asked to match the length of one given line to one of three other lines. Each group member vocalized their answers. All but one of the group members were confederates in the experiment, and the non-confederate (critical subject) found himself in radical contradiction to the rest of the unanimous group members. His senses indicated one thing, but the unanimous group majority indicated another. At this point, the critical subject had to face the decision of whether to voice his own opinion, or agree with the group. The goal of the study was not only to see which decision the critical subjects made, but also to determine whether they were aware of the effect the group had on them, or if they truly abandoned their own judgments fully. For this, the author gave the critical subject an individual interview after the experimental period. The quantitative results indicated that approximately one-third of the answers by the critical subjects were errors that were consistent with the falsely created majority, and that 68% of the answers by the critical subjects were correct despite the social pressure. The author also found that there were two distinctly different types of individuals. There were those who were independent and confident of their own estimates throughout the experiment, and those who
quickly became disoriented and unsure, answering consistently with the majority for at least half of their estimates. From the interviews, Asch found that the confidence of the majority was a factor in the yielding subject’s answers. One such subject stated, “If they had been doubtful, I probably would have changed, but they answered with such confidence” (Asch, 1951, p. 228).

Upon further analysis, the experimenter identified three different types of independent subjects. There were those who had independence based on confidence in their own ability to determine the lengths of lines, those who were independent but withdrawn and responded independently because of their principle need to be an individual, and those who answered independently because of their need to do their task well. There were also three different reasons for yielding that were identified. Some subjects yielded because of a “distortion of perception under the stress of group pressure” (Asch, 1951 p. 229). These people were unaware that the majority had affected their opinions. The second reason was distortion of judgment, which was the category in which the most of the yielding subjects fell. They yielded primarily because of a lack of confidence, and felt that they must be incorrect if everyone else unanimously believed something different than they. The third reason was the distortion of action. These subjects knew they were answering incorrectly, but felt an overwhelming need to not appear different from or inferior to the rest of the group. In 2012, Song, Ma, Wu, and Li divided these types of conformity into two categories. Irrational conformity is also known as herd behavior. Rational conformity includes compliance and obedience. The type of procedures used in the experiment changes the type of conformity that results. These different types of conformity may be used to help analyze the results of Asch’s studies. Based on his first results, Asch proceeded with experimental variation, conducting more experiments that systematically changed one aspect of the group.
First, Asch studied how the results were affected if the group majority was not unanimous. To do this, there were four separate experiments. There was one using a true partner (two critical subjects rather than only one (variation a) or a confederate that always chooses correctly (variation b)). There was one that presented the withdrawal of a true partner (a confederate who agreed with the critical subject for half of the experimental period, but then agreed with the majority for the second half), and another that presented the late arrival of a true partner (one person who at first agreed with the majority, but then began answering the same as the critical subject). The final experiment used a compromise partner, who responded with answers that were intermediate between being correct and being the majority. It was discovered that each of these variations made the majority much less powerful, and often destroyed the effect of the majority entirely. With even one partner to give them confidence, most remained independent and chose correctly. With the presence of a true partner, the frequency of errors dropped to 10.4% for variation a, and to 5.5% for variation b, compared to 32% in the original experiment. What this demonstrates is that a unanimous majority has a much bigger effect on an individual than one that isn’t unanimous.

In his next variation, Asch (1951) explored the influence of majority size. In this experiment, the majorities were again unanimous, but varying in size. There were majority sizes of 16, 8, 4, 3, and 2, as well as a condition where the critical subject was opposed by one other person. An opposition of one or two people did not have a majority effect. However, once the majority size increased to three, the critical subjects began making more errors. Group sizes of 3, 4, 8, and 16 did not have significantly different effects from each other. This suggests that an opposition of as few as 3 people can affect one’s opinions just as drastically as an opposition of 16. The experimenters also did a variation on this experiment, making the majority of 16 all
subjects naïve to the experiment, with one confederate placed in opposition. The majority reacted to the individual in opposition with “amusement and disdain” (Asch, 1951, p. 234). The subjects were not aware that they were drawing strength from the majority, as the previous variations showed that their reaction would be quite different if they found themselves facing the opposition individually. When they reduced the group size to four, with three critical subjects and one in opposition, the mockery and laughter did not occur, but rather that individual was given respect and consideration.

In 2005, Bond completed a meta-analysis on group size and conformity. In the research, Bond found that more recent studies mostly disagreed with Asch’s findings that group size did not have an impact on the effect. How group size affects conformity is the main point of disagreement among the different models of social impact. Bond’s meta-analysis illustrates that this relationship is actually very complex due to all variables that exist in social influence. Some examples of these variables include what the task or question being influenced is, how individuals are presented with the social influence, and whether the group consists of friends, peers, strangers, experts, or unknowns. Asch’s research (1955) revealed that in order for social conformity to occur, there had to be a majority of at least three, or else the individuals would be dismissed as peculiar or atypical, and that the falsely created majority in his experiments had to present an alternate version of reality that was irrefutable and could be believed by the participants.

In order to understand conformity and its complexities, some theories have focused on the psychological processes that result in conforming to group opinions. Most of these theories draw from the dual process theory (Deutsch & Gerard, 1955 as cited in Bond pp. 332). Within this theory, there are two processes, one of which is normative influences. This reflects on the
tendency and power of a group to reward and punish according to an individual’s opinions. The second aspect of the dual process theory is informational influence, which reflects on the ability of a group to provide information about reality. Asch’s experiments focused mostly on informational influence. His studies varied the degree of informational influence by manipulating the group majority and changing whether or not the critical subject had a partner. Because normative influences involve the group’s ability to reward and punish, the greater the majority the greater the effect of the impact. More recent studies focus on normative influences, which may explain why Asch found no correlation between group majority size and degree of conformity but more recent ones have. However, this created a debate and prompted researchers to look at group size and degree of conformity, and some of these recent studies found that group size does, in fact, impact social influence (Bond 2005).

The 2005 Bond meta-analysis included 125 Asch-type studies on conformity to help determine whether or not there is any relationship between group size and conformity. These studies included some that focused on normative influences as well as informational influences. Bond outlines five different theories of group size and conformity. Asch’s theory proposes that a majority size of three is adequate for the full impact of the majority to be felt because any more than this only reinforces the already decided majority. Another theory, known as Social Impact Theory (Latané, 1981 and Latané & Wolf, 1981) argues that the larger the majority group the greater the impact, although this relationship is not thought to be linear. The impact may also change depending on the type of study and the social influences presented. Still another theory, presented by Tanford and Penrod (1984) is known as the Social Influence Model, or SIM. This theory suggest an S-shaped function between majority group size and impact. This proposes that increasing group size only has an effect up to a certain point. After this point, increasing the
majority does not have any additional impact.

The fourth theory, from Mullen (1983; 1987) suggests that the more attention placed on an individual, the more that person will try to match their own behavior to what are known to be significant behavioral standards. When majority size is increased, an individual will feel that there is more attention on them, and will therefore be more likely to conform to the majority norm. By dividing the number of the majority by the size of the majority +1 (the individual) and multiplying it by the influence constant that varies from task to task, you may determine the impact.

The fifth theory, proposed by Stasser and Davis (1981), is similar to that of Mullen in that it states that the relationship between conformity and group size is dependent upon the number of the majority. However, this theory focuses on normative and informational influences instead of self-attention. This theory argues that when the process involves primarily informational influences, the influences will be related to the number of people expressing a specific view in relation to the size of the group. When normative influences are also included the theory involves two stages, the first of which involves the act of receiving the message and the second which has to do with giving in to this message. The greater the proportion of people in a group that exhibit a particular opinion, the greater the chance that the individual will recognize that opinion and conform to it. Their theory describes how if the majority opinion is presented privately, then only the one-stage process is needed, whereas if the opinion is presented publicly, the two-stage equation is used. According to Bond’s 2005 meta-analysis, further research is needed to determine whether the number of people in the majority affect conformity. Only Asch’s (1951, 1955) studies used a majority of more than nine, and most used two to four (Bond, 2005).

In 1988, Furman and Duke studied the effect of the majority on preferences of orchestral
and popular music on music majors and non-music majors. They used recordings and asked one group of participants to “publicly” state their musical preferences in front of three confederates and the second group to respond “privately” in writing. Participants listened to excerpts of either orchestral music or popular music. The researchers altered the tempo, pitch, or both of these excerpts and presented both the unaltered and the altered versions to every participant. Some of the excerpts were presented as altered but were not actually changed. It was found that in popular music, there was no significant difference in conformity in either music majors or non-music majors when comparing altered to unaltered music. This suggests that both music majors and non-music majors heard the altered versions as being “wrong” and were not swayed by the majority. However, when comparing two identical excerpts, these subjects showed conformity with the confederates. In the experiment using orchestral music, the study suggests that non-music majors’ opinions were affected by a group consensus, whereas those of the music majors were not significantly affected. This study concluded that publicly expressed preferences for orchestral music were affected, but music majors and non-music majors were affected differently.

A study by Alpert in 1982 looked at the effect of teacher, peer, and disc jockey approval on classical, country and rock music on fifth grade students. There were three experimental groups. The first group was asked to listen to three teacher approved classical excerpts, three disc jockey approved country excerpts, and three peer approved rock excerpts. The second group listened to three teacher approved rock excerpts, three disc jockey approved classical excerpts, and three peer approved country excerpts. The third experimental group listened to three teacher approved country excerpts, three disc jockey approved rock excerpts, and three peer approved classical excerpts. There was also a fourth group for a control that listened to three non-approved
excerpts in each musical category. For this group, music was just presented using numbers such as “this is country song number 1” rather than with an approval such as “this song is truly fine” (Alpert, 1982, p. 177). All participants were asked to listen to these excerpts and then rate their preferences. These preferences were recorded in a variety of ways, including Likert scales, verbal reports, choosing one record that they would like to have, and being given the opportunity to choose how long to listen to each song. The machine that played the music also recorded which songs were listened to the longest by the students.

Results of this study showed that music teacher and disc jockey approval of classical music increased verbal classical music liking and how long the participants listened to the classical songs. Peer approval of classical music decreased classical music listening. For country music, the verbal responses indicated that students reported increased liking of country music with all of the approval, but this was not evidenced behaviorally in how long they listened. Behavioral measures showed closer correlation with the chosen records than they did with verbal responses. This may suggest that the participants adjusted their verbal answers according to the approval ratings, but the approval information was less effective in changing their minds behaviorally (Alpert, 1982).

In 2008, Droe surveyed 440 middle school band members on their musical preferences. Each group attended five rehearsals of one of two pieces of music. There were four treatment conditions: (a) rehearse one piece with teacher approval and one piece without comment; (b) rehearse one piece with disapproval from the teacher, and the other without comment; (c) rehearse only one piece with approval; and (d) rehearse one piece with disapproval. After the rehearsals the students were surveyed on their preferences for the two pieces. The student’s preferences for the pieces that were approved by their teacher were significantly higher than
those in the disapproval treatment conditions.

In all of these studies, what is agreed upon is that social conformity does exist, and a majority is effective in swaying an individual’s view. One study found that when students were asked to answer a question on an anonymous “clicker” system, there was greater variability in answers than when they were asked to raise their hands. This suggests that students were less likely to conform to the group’s opinion when their answers were anonymous (Stowell, Oldham & Bennett, 2010). However, Egermann et al. (2009a) completed an online study that asked 3315 participants to listen to five musical excerpts and rate them on a sliding scale for unpleasant/pleasant and calming/arousing. The participants in the experimental group were presented with social feedback that had been created by the researchers and manipulated to suggest that the majority of people who had previously taken the survey had answered in a specific way. Some of the answers were manipulated downward (more on the “negative” end of the sliding scale) and some had been manipulated upward (“positive” on the sliding scale). Results showed that significant differences were observed between the experimental group and the control group, which received no falsified social feedback. The experimental group answered more positively to those excerpts that the social feedback was manipulated upward and more negatively to the excerpts that had downward manipulated feedback. Although this survey was internet-based, participants still rated their emotions according to the social feedback that was presented to them. They conformed to what they believed to be their peers who had previously taken this survey despite the fact that the answers were anonymous and they were completing the survey in a private location.

In 2013, Egermann, Kopiez and Altenmüller published another research article of which the 2009 study had been a subset. This 2013 study also examined whether or not being presented
with the social feedback throughout the study (while they listened and while they rated) versus being shown the social feedback only when they were listening had any effect on their answers. Furthermore, the researchers later added another experimental group that was given informational feedback rather than social feedback. Informational feedback was presented as having a computer origin, rather than being the ratings of peers who had already taken the quiz. This informational feedback was presented only during listening. The results showed that social feedback had a greater influence on participant’s answers than informational feedback, and feedback presented during listening and rating had the greatest impact.

A study conducted in 2011 by Egermann, Sutherland, Grewe, Nagel, Kopiez, and Altenmüller investigated whether or not participant’s emotional reactions to music differed when they were in a social setting and when they were alone. In order to determine this, they measured skin conductance response as well as asking them to report, with the push of a button, when they experienced a “chill”, which was defined as a shiver up the spine or getting goose bumps. In particular, the researchers looked for self-reported chills that were accompanied with a corresponding physiological reaction in the form of a skin conductance response. They used a repeated-measures design and results indicated that the skin conductance responses accompanied by chills were found significantly more often when the participants were alone. This suggests that individuals have a greater emotional reaction to music when they are alone.

The current study was based on the 2009a Egermann et al. study that surveyed individuals on their reactions to music when presented with falsified majority results. In the current research, the musical preferences and reported emotional reactions of participants that were not exposed to any falsified group majority ratings were compared with those of the participants that were shown these falsified ratings for each excerpt. Like the Egermann et al.
(2009a) study, emotion was defined using the dimensional theory where emotions are rated on scales of valence (negative-positive) and activation (calm-aroused). This two-dimensional theory is reliable and is easily understood by participants because of its simplicity (Scherer 2004). In the current study, valence was described as depressing vs. uplifting and activation was described as boring vs. exciting. Seven excerpts (Appendix A) from a variety of different genres were presented to each participant, and when falsified social feedback was presented, it was shown throughout the listening and rating portions of the survey. The research hypothesis was that the individuals who were presented with social feedback would choose answers that more closely aligned with those of the falsified social feedback answers than those of the participants who were not shown social feedback.

METHODS

Participants

For this study, male and female participants were recruited online via e-mail and social media between October 19, 2017 and January 5, 2018. The age of participants ranged from 18-99 years old, and median age range was 42-47 years old. There were 173 total respondents, 5 of whom did not complete all of the questions. Participants included 118 females, 48 males, 2 who identified as “other” and 5 who did not select a gender. Out of 168 participants who responded to the demographics questions, 150 (89.29%) identified as white and 109 (64.88%) selected that they had four or more years of college education. The researchers did not set any restrictions in education level, gender, vocation, etc. for potential participants. Additionally, because the participants were primarily white females who have had at least four years of college education, the results of this study may not be generalized to a more diverse population. However, analyses
were still completed in order to investigate whether it may be useful for future researchers to conduct a similar study with better recruitment tactics or a longer recruitment period.

Instrumentation

Participants completed a survey online that was created by the researchers specifically for this experiment using the Egermann et al. (2009a) study as a guide. Participants were given the opportunity to review a consent form (Appendix B) and were presented with a Youtube video made by the researchers explaining the survey process and by continuing to complete the survey provided consent. A transcript of the opening and concluding Youtube videos may be found in Appendix C. Each survey included seven 30-second musical excerpts (Appendix A). These excerpts include multiple genres, and were chosen due to their use in another Egermann study that found that the use of an internet test is a valid way to determine emotional response to music (Egermann, Nagel, Altenmüller & Kopiez, 2009b). Because the results of participant’s self-reported reactions to music using an internet-based method were not significantly different from those of the participants in a lab setting, the validity of the online tool they developed for participants to rate the effect of a musical piece on their felt emotions was confirmed. The tool used in the study required participants to move their mouse over a two-dimensional space with two axes, where one represented valence (happiness) and one represented activation (excitement) (Egermann et al., 2009b). This is similar to the tool that was used in the current study, but the current study used two separate sliding semantic differential scales instead of the two axes. The two sliding semantic differential scales used in the current study were labeled with -50, 0, and 50. The scale for valence (happiness) was labeled with -50 being depressing and 50 being uplifting. The scale for activation (excitement) was labeled with -50 being boring and 50 being
exciting. The current study also asked participants to rate each excerpt on a scale of one to five stars for how much they enjoyed the excerpt in order to investigate whether falsified peer ratings had an effect on the participants’ reported enjoyment of the song unrelated to any specific emotion. The 5-star scale was chosen due to its prevalent use on internet-based retailers such as Amazon.com. Illustrations of these scales may be found in Appendix D.

Participants were asked to listen to a series of seven 30-second excerpts. Each of these excerpts had a set of falsified ratings, and for each excerpt participants were either presented with the false data or with a plain black screen. Illustrations of these screens can be seen in Appendix D. The falsified ratings were presented as being the average answers from people who had previously taken the quiz, and were shown to the participants throughout the listening period for each excerpt due to a study that showed that feedback presented throughout listening as well as rating had a greater impact than feedback presented only while listening and not while rating (Egermann et al., 2013).

Egermann et al; (2009a) used a pretest survey (n=11) to develop the manipulated feedback they presented to individuals in the control group. In the present study, the falsified data was created by the experimenters based on a separate test of seven people who were friends of the researchers and who would not be participating in the full thesis survey. These seven people were presented with the excerpts without any falsified data and asked to rate each excerpt using a 10-point Likert scales for exciting/boring and uplifting/depressing, and the 5-star scale. While Egermann et al. did not use Likert scales for their pretest, the researchers of the current study utilized Likert scales due to the fact that they may be easily reverse scored, and that a 10-point scale would produce a more extremely manipulated result when converted to a scale of 100. The Likert scale answers of the initial test survey participants were reverse scored and
then averaged together. The researchers then multiplied this number by 10 and subtracted 50 so that the number could be placed on the -50 to 50 sliding scale. The use of the 10-point Likert scale allowed for a more extreme false rating. The star ratings were similarly averaged and reverse scored. However, these numbers were not manipulated any further because both the pretest survey and the survey presentation used a 5-star rating scale. In the case of three of the excerpts, the pretest resulted in averages of 3 stars, which could not be reverse scored and were therefore presented as 3 stars during the survey. Results of the initial test used to create the falsified feedback can be found in Appendix E.

Immediately following the survey the participants were presented a short demographics questionnaire (Appendix F) that was based on the core questionnaire of the Behavioral Risk Factor Surveillance System (BRFSS) that was designed by a group of BRFSS state coordinators and the Centers for Disease Control (Centers for Disease Control, 2015).

**Procedures**

This study utilized an experimental, post-test only between-group study. Participants were recruited via online social media outlets including Twitter and Facebook, through personal contacts at Western Michigan University, and e-mail to take the survey. The first social media posting occurred on October 19th, 2017, and the data collection period closed on January 5th, 2018. Each of the seven excerpts used for the study were assigned falsified ratings. The false ratings were created by the experimenters based on a pre-test from seven acquaintances that were students or recent graduates of the Western Michigan University. These scores can be found in Appendix E. The list of seven music excerpts was chosen by the experimenters because it was used in the Eggermann et al. study (2009b). The researchers of the current study chose this list of
7 excerpts instead of the list of 23 excerpts from the other Egermann et al. study (2009a) due to its concision and its inclusion of a wide variety of genres. The list of excerpts used can be found in Appendix A. For each excerpt, half of the participants were presented with this falsified data, which was presented as being the average ratings from peers who also took the survey. The other half of the participants were not shown any such data, with the explanation that they were the first participant to listen to that particular song. This random assignment was done using online survey tool SurveyMonkey. With this software, researchers were able to select an option for SurveyMonkey to randomly assign half of the participants to an A or B version of each excerpt, with version A having no social feedback and version B having social feedback included on the screen. Screenshots of each type of excerpt (A and B) may be found in Appendix D. Each participant likely had some excerpts that were shown with false ratings and some that were not, with each excerpt being analyzed separately. No participant was given both the feedback condition and the no feedback condition for one single excerpt. Therefore, for every excerpt, participants’ answers were compared with other participant’s answers, making this a between-group study.

Upon opening the link for the survey, participants were presented with a short consent document as well as a Youtube video explaining the survey. Participants were told that beginning the survey served as their consent to take part in the research, but that they may exit the survey at any time with no consequence. Full transcripts of the introduction and conclusion Youtube videos can be found in Appendix C. The participants were presented with seven 30-second long musical excerpts. For each excerpt, half of the participants were shown falsified peer ratings and half were not. All participants were then asked to rate each of these excerpts on scales from boring to exciting, from depressing to uplifting, and from one to five stars. There
was no time limit on the survey. Following the excerpt section of the survey, participants were given a questionnaire (Appendix F) that included questions regarding age, gender, annual income, college experience, their health, and where they were born and raised. They were then asked to provide an e-mail address to which the researchers will send information about results of the survey (Appendix G). This document will be sent out to those who requested it after the thesis project is fully approved by the Graduate College at Western Michigan University. Altogether the experiment took approximately 12-15 minutes for participants to complete, but there was no time limit.

RESULTS

The purpose of this study was to determine whether manipulated social feedback had an effect on an individual’s emotional ratings of and/or preferences in music. The dependent variables in this experiment were the participants’ answers on each of the Semantic Differential sliding scales and on the star rating for each musical excerpt. The independent variable was the falsified ratings. For each excerpt, every participant was either shown falsified ratings (both the Semantic Differential and star ratings) while they listened to the excerpt (experimental condition) or they were shown a blank black screen (control condition). Illustrations of the two presented conditions can be found in Appendix D.

An independent samples t-test was used to determine whether, for each excerpt and scale, participants who were shown falsified peer feedback replied significantly differently from those who were not shown falsified peer feedback. This test was used because every participant was presented with some excerpts that included feedback and some excerpts that did not, but no one participant was shown both versions of a single excerpt. The significance level was set at $p < .05$
and analysis showed that there was no significant difference between the answers of the participants who were provided with falsified social feedback and those who were not provided with feedback for any of the excerpts or scales. There were, however, trends in the data overall for each scale that aligned with the manipulated social feedback.

Boring vs. Exciting

For the activation scale of boring vs. exciting, the participants’ answers on the pretest used to create the false data (Appendix E) resulted in the feedback for Excerpt 1 and Excerpt 2 being manipulated upward, and for the rest of the excerpts to be manipulated downward. This means that when the pretest results were reverse scored, the reversed averages were higher than the actual averages for Excerpts 1 and 2. Therefore, the research hypothesis was that the results for Excerpts 1 and 2 on the activation scale for those who were presented with falsified social feedback would be higher than the results of those who were not presented social feedback. As seen in Figure 1, this is only true for Excerpt 1, with the mean rating without feedback being 3.94 and the mean rating with feedback being 8.84 ($p > .05$). For excerpts 3-7, the research hypothesis was that the results on the activation scale would be lower for those presented with social feedback. As seen in Figure 1, this is only true for excerpt 3 ($M_{none}= 13.71, M_{fbdk} = 11.61, p > .05$) and excerpt 4 ($M_{none}= -1.01, M_{fbdk} = -3.35, p > .05$). Because these results were not significant, we fail to reject the null hypothesis.
Figure 1. Mean ratings for each excerpt on a scale of boring vs. exciting for participants who were presented with manipulated social feedback and those who were not.

Depressing vs. Uplifting

For the valence scale of depressing vs. uplifting, the participant’s answers on the pretest used to create the false data (Appendix E) resulted in the feedback for Excerpts 1, 2, 4, 5 and 6 to be manipulated upwards, and Excerpts 3 and 7 to be manipulated downward. Therefore, the research hypothesis was that the results for Excerpts 1, 2, 4, 5 and 6 on the valence scale for those who were presented with falsified social feedback would be higher than the results of those who were not presented social feedback. As shown in Figure 2, this is true for Excerpt 1
(M\text{none} = 4.47, M\text{fbk} = 5.32, p > .05), Excerpt 4 (M\text{none} = -14.41, M\text{fbk} = -11.39, p > .05) and Excerpt 5 M\text{none} = -19.52, M\text{fbk} = -15.92, p > .05). For Excerpts 3 and 7, the research hypothesis was that the results on the valence scale would be lower for those presented with social feedback. This occurred for both excerpts. Excerpt 3 (M\text{none} = 21.11, M\text{fbk} = 15.9, \( p = .049 \)) resulted in a more significant difference than Excerpt 7 (M\text{none} = 29.02, M\text{fbk} = 27.76, \( p > .05 \)) and because the significance level was set at \( p < .05 \), the results are significant for excerpt 3. The post hoc power analysis indicated a power level of \( \beta = .51 \). The researchers reject the null hypothesis for excerpt 3 on the valence scale of depressing vs. uplifting.

*Figure 2.* Mean ratings for each excerpt on a scale of depressing vs. uplifting for participants
who were presented with social feedback and those who were not.

Star Rating

The pretest results used to create the manipulated star ratings (Appendix E) resulted in Excerpt 5 being manipulated upwards, and Excerpts 3, 4 and 7 to be manipulated downwards. Excerpts 1, 2 and 6 were not manipulated because their average score from the pretest was three stars. Because the star scale consisted of one to five stars, three stars could not be reverse scored. While none of the other results were significantly different, the results of Excerpt 3 were in the direction expected from the manipulation ($M_{\text{none}} = 3.67$, $M_{\text{fbk}} = 3.25$, $p = .011$). Post hoc analysis indicated a power value of $\beta = .73$. Because the significance value was set at $p < .05$, we reject the null hypothesis for excerpt 3 for the star rating scale.

DISCUSSION

There has been previous research done regarding the effect of the majority opinion on the individual’s opinion. Additionally, research by Egermann et al. (2009a) looked at how falsified peer ratings affected the ratings by an individual regarding music presented to them online. The current study was based on that research, but used a smaller list of excerpts that were taken from a different Egermann et al. study (2009b) and also included a “star” rating, which the other Egermann et al. (2009a) study did not. Data from the current study allow us to reject the null hypothesis for two scales on excerpt 3 only. Because no significant differences in participant ratings were found between when participants were provided with manipulated social feedback and when they were not on any of the rating scales for any of the other excerpts, the researchers fail to reject the null hypothesis for any other excerpts.
Excerpt 3 was a clip of the Main Theme from Chocolat, by Rachel Portman. This was the only excerpt used for the study that was film music. Film music is used for a specific purpose within a scene of a film, such as to convey emotion, suggest a connection or theme, or simply increase the emotion already being portrayed by characters on-screen (Green, 2010). Speculating, it is possible that this particular type of music conveys a particular emotion more intensely than the other genres that were used for the study. This could possibly cause not only the results of participants’ ratings to be more extreme, but it would also cause the falsified data to be more radical in the opposite direction. For future studies, researchers may consider using more excerpts from the film music genre, or even use solely this genre.

The number of participants is the most notable difference between the current study and the study it was based on, as the Egermann et al. (2009a) had 3315 participants and found significant results. Although the results of the current study were not significant for any of the excerpts, many of the differences that were seen between participants were in the direction of the manipulation. It is possible that having more participants may have produced more significant results.

The 5-star scale was not used in any of the Egermann et al. studies, but was chosen for inclusion in this study for its popularity among online marketplaces such as Amazon and websites for businesses like hotels and restaurants. Because the star rating scale is used on this and similar websites, it was likely familiar to most participants as a way to measure how much they enjoyed the piece. However, in the case of this particular study, the 5-star rating scale caused the manipulation of the falsified feedback to be less extreme. This is because participants in both the pretest and the actual study were choosing 1 to 5 stars to indicate how much they enjoyed the piece. When the pretest results for the 5-star scale were reverse-scored, the 3 star
answers could not be reverse scored. One and 5 stars were reversed with each other, as were 2 and 4. Three of the excerpts were given 3 star ratings, so for those excerpts there was no manipulation of the social feedback. Even for those scores that could be reversed, the 5-star scale was not as extreme a manipulation as that of the semantic differential scales. Because the 5-star scale was included due to its popularity online and was not used in the Egermann studies, the researchers of the present study developed this method of manipulation. If this research study is reproduced in the future, it may be beneficial to develop a different way to measure music preferences, or a different way to create manipulated feedback using the 5-star scale. For this study, means from the pretest were rounded to the nearest whole number. A possible option for a future study would be to round to one or two decimal points, which would allow for greater manipulation. Another option would be to allow for a score of zero stars, which would eliminate the problem of not being able to reverse a 3 star score. A third option would be to use a specific calculation method to manipulate the stars in one direction only. For example, subtract 1.5 stars from the pretest mean scores, making the manipulated feedback indicate 1.5 stars lower than the pretest mean scores.

Another limitation to this study is that while it investigated the effects of social conformity in a private setting, it did not provide any insight into social conformity in a public setting. According to the Bond meta-analysis (2005) the studies that focused on private responses had mixed results depending on the presentation of the majority. The results were more significant if the majority was presented in person than if they were presented as a panel separate from the participant in the experiment. The 2010 study by Stowell, Oldham & Bennett found that students who answered questions using an anonymous “clicker” system provided a greater variety of answers than students who answered the same questions using hand-raising. The
results of the 2011 study by Egermann et al. suggested that emotional reactions to music are greater when alone. This suggests that a social setting effects one’s emotional reaction to music, even if it is just to lessen it. It is possible that individuals might feel pressured to agree to the emotional reaction to or preference of a song in a public setting, i.e. a music therapy group session. However, these individuals may not feel the same pressures of conformity answering anonymously while sitting in a private setting listening to the music alone. Due to the online nature of the current study, it is likely that many of the participants completed the survey in a private setting, although the researchers did not directly request this of them.

Because the researchers designed the song rating portion of the survey, its validity had not been tested. Additionally, there is no “magic number” for a size of majority that does or does not cause social conformity. There are many different theories of whether or not a greater majority size results in a greater effect (Bond, 2005). In the current study, the majority size would be a fabricated number of people who had previously responded to the music excerpt portion of the survey. Because this was an online survey where the number of supposed previous respondents for the falsified social feedback was not indicated in any way to the participants, it can not be determined whether a larger majority size may increase the effect of feedback on emotional response to and preference of the music excerpts. Because the social feedback is falsified and manipulated, if this study were replicated in the future, the researchers could report a very large majority size with the expectation that it may increase the effect of the social feedback. They may do this by including a supposed number of respondents along with the manipulated social feedback. For example, if the Excerpt 3 falsified social feedback indicated an average score of -19 on the boring vs. exciting scale, future researchers may also include that this was the average answer of 1,685 previous respondents.
Lastly, because of time constraints and copyright limitations on Youtube, the excerpts were cut down to 30 seconds. If the participant had been able to listen to longer excerpts of the song they may have had different or stronger reactions to the music. In the original 2009a Egermann study, the researchers also used 30-second excerpts of each song. The current researchers chose the 30-second excerpts from a part of each song that consisted of the chorus or a lot of musical movement and potential evocation of emotion, rather than choosing the introduction or conclusion of the song. However, because of the structure and flow of many pieces of music, it is possible that a longer excerpt could have been beneficial in order to elicit a more emotional reaction.

Despite these limitations, this study may have implications for song choices for music therapy groups. If participants’ answers indicate that they are conforming to the falsified data, then it may also suggest that actual “ratings” on the internet and on music streaming services may be affecting how listeners make their music choices. This also has a music therapy connection if a therapist is looking to find “popular” songs in a genre or a time period that they are not familiar with. It may suggest that music therapists either anonymously survey their clients for musical preferences (if the population allows it) or ask them verbally in a private setting. This way, the clients’ answers would be less likely to be affected by the other individuals in the group. While research-based music may have a greater effect on patients in certain areas of music therapy, such as relaxation and stress-reduction, patient-preferred music may be more effective in getting group members involved and motivated for the session (Pelletier, 2004).

The measures in the current study allowed for an analysis of whether reported excitement, happiness, or preference are affected by a falsified majority. In future research, further analysis of results of the demographics survey may be completed to determine if
demographic, socio-cultural background or music listening habits had any effect on individual’s emotional responses to music or their likelihood to conform to social feedback. This may also have implications for music therapy groups. If a therapist is bringing songs to a group that he or she believes they are all familiar with or prefer, and the less outspoken clients agree with the majority aloud even if they would not if the majority were not present, then those clients may not be receiving the full benefit of the therapy.

Results of this study showed significant differences between participants who were presented feedback and those who were not presented with feedback for excerpt 3 on scales of depressing vs. uplifting and the star scale. Results also indicated nonsignificant trends in data for some of the other excerpts. This suggests that it may be beneficial for the field of music therapy to conduct this study again in the future with more precisely defined recruitment tactics, a longer recruitment period, and a preference rating scale that allows for more robust presentation of falsified ratings potentially creating greater influence on participants’ perceptions.
REFERENCES


Scherer, K. (2004). Which emotions can be induced by music? What are the underlying mechanisms? And how can we measure them? *Journal of New Music Research 33*(3), 239-251.


# APPENDIX A

List of Music Excerpts

<table>
<thead>
<tr>
<th>Name of piece</th>
<th>Name of composer</th>
<th>Performer</th>
<th>Style</th>
<th>Length (min:sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Making Love Out of Nothing at All&quot;</td>
<td>Air Supply</td>
<td>Air Supply, 1997</td>
<td>Pop music</td>
<td>5:46</td>
</tr>
<tr>
<td>&quot;Tuba mirum&quot; - Requiem KV 628</td>
<td>Wolfgang Amadeus Mozart</td>
<td>Bostridge, 2005</td>
<td>Classical with vocal soloists</td>
<td>3:15</td>
</tr>
<tr>
<td>&quot;Main Titles&quot; - Soundtrack from the movie &quot;Chocolate&quot;</td>
<td>Rachel Portman</td>
<td>Portman, 2000</td>
<td>Film Music</td>
<td>3:10</td>
</tr>
<tr>
<td>&quot;Coma&quot;</td>
<td>Apocalyptica</td>
<td>Apocalyptica, 2004</td>
<td>Rock music on classical instruments</td>
<td>6:58</td>
</tr>
<tr>
<td>&quot;Skull Full of Maggots&quot;</td>
<td>Chris Barnes</td>
<td>Cannibal Corpse, 2002</td>
<td>Death metal</td>
<td>2:05</td>
</tr>
<tr>
<td>&quot;Toccata&quot; BWV 540</td>
<td>Johann Sebastian Bach</td>
<td>Bryndorf, 2000</td>
<td>Classical instrumental (organ)</td>
<td>8:29</td>
</tr>
<tr>
<td>&quot;Soul Bossa Nova&quot;</td>
<td>Quincy Jones</td>
<td>Jones, 1997</td>
<td>Dance music</td>
<td>2:47</td>
</tr>
</tbody>
</table>
APPENDIX B

Participant Consent Form

Please read this consent information before you begin the survey:

You are invited to participate in a research project designed to measure music preferences. The study is being conducted by Ed Roth, MM, MT-BC, Megan Dillon, and Kaitlin McKinley, MT-BC from Western Michigan University, Department of Music Therapy. This research is being conducted as part of the thesis requirements for Megan Dillon, and Kaitlin McKinley.

This survey is comprised of 7 musical excerpts and rating scales, and a brief questionnaire and will take approximately 10-15 minutes to complete.

Your replies will be completely anonymous. When you begin the survey, you are consenting to participate in the study. If you do not agree to participate in this research project simply exit now. If, after beginning the survey, you decide that you do not wish to continue, you may stop at any time. You may choose to not answer any question for any reason. If you have any questions prior to or during the study, you may contact Ed Roth at (269) 387-5415, Megan Dillon at (330)569-4909, or Kaitlin McKinley at (616)633-6841. Western Michigan University Department of Music Therapy, the Human Subjects Institutional Review Board (269-387-8293), or the vice president for research (269-387-8298).

This study was approved by the Western Michigan University Human Subjects Institutional review Board (HSIRB) on October, 5th, 2017. Please do not participate in this study after October 4th, 2018.

Participating in this survey online indicates your consent for use of the answers you supply.
APPENDIX C

Youtube Video Transcripts

Introduction: Hello, my name is Megan Dillon and this survey is part of the Masters thesis project for myself and for Kaitlin McKinley, of Western Michigan University. Simply put, we are looking at music preferences and what kind of music everybody likes. So you’ll be shown a series of seven different Youtube videos which contain 30-second excerpts of different songs, and then you’ll be asked a couple questions on each one. So first we’re going to ask you to rate each song on a scale of boring versus exciting, and then depressing versus uplifting, and then just a simple five star rating scale. So when you hit play on the Youtube video you’ll start to hear the music and then you’ll also see a screen that looks something like this so that you can see the average answers of the other people that have already taken this survey. If you don’t see a screen like this and it’s just black it is just because you are the first person that has listened to this particular song excerpt so we don’t have that information for that particular song just yet. Following the excerpts you’ll be asked to complete a short demographics survey and also be given the opportunity to enter your e-mail address. We use that e-mail address to contact you regarding information about the survey after we start getting some results in if you are interested in any of that. All of your answers will be kept anonymous but if at any point during the survey you do want to exit feel free to just close your browser. And if you have any questions or comments or concerns feel free to contact me, or Kaitlin, or Professor Ed Roth at these e-mail addresses. Thank you so much and keep in mind that by hitting the ‘next’ button you are consenting to take our survey. Thank you!

Conclusion: That concludes our survey, thank you so much for taking the time to help us
out. There are actually two purposes to this study. The first one was to see if you answered differently about your reactions to the music excerpts when you are provided with supposed feedback from your peers, and the second was to see if your sociocultural background or current situation had any effect on your music preferences. Now that you know the true nature of the study if you do not want your results to be used you may close your browser and all of your answers will be deleted with no consequence to you. If you feel comfortable with us using your data you may hit the button below to submit your answers in just a moment. You will also see a space below to leave your email address if you would like information regarding this study once we have analyzed all the results. Lastly the more people who take this survey the better so we ask that you please pass this on to friends, family, colleagues, acquaintances who may be willing to take part. You can simply copy and paste the email or social media paste that initially brought you to this survey. Once again thank you so much we really appreciate it and have a great day!
APPENDIX D

Screenshots of Example Survey Questions

* Thesis 2017

Song Preferences

* Figure D1. Screenshot of example survey questions with feedback.
Figure D2. Screenshot of example survey questions without feedback.
APPENDIX E

Pretest Results for Creation of Falsified Data After Reverse Scoring

<table>
<thead>
<tr>
<th>Excerpt/Scale</th>
<th>Averages Rounded to 100</th>
<th>Manipulation direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Love Exciting</td>
<td>60</td>
<td>Up</td>
</tr>
<tr>
<td>1. Love Uplifting</td>
<td>62.9</td>
<td>Up</td>
</tr>
<tr>
<td>1. Love Star</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>2. Tuba Exciting</td>
<td>62.9</td>
<td>Up</td>
</tr>
<tr>
<td>2. Tuba Uplifting</td>
<td>65.7</td>
<td>Up</td>
</tr>
<tr>
<td>2. Tuba Star</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>3. Chocolat Exciting</td>
<td>34.3</td>
<td>Down</td>
</tr>
<tr>
<td>3. Chocolat Uplifting</td>
<td>31.4</td>
<td>Down</td>
</tr>
<tr>
<td>3. Chocolat Star</td>
<td>2</td>
<td>Down</td>
</tr>
<tr>
<td>4. Apoc Exciting</td>
<td>54.3</td>
<td>Down</td>
</tr>
<tr>
<td>4. Apoc Uplifting</td>
<td>78.6</td>
<td>Up</td>
</tr>
<tr>
<td>4. Apoc Star</td>
<td>2</td>
<td>Down</td>
</tr>
<tr>
<td>5. Cannibal Exciting</td>
<td>44.3</td>
<td>Down</td>
</tr>
<tr>
<td>5. Cannibal Uplifting</td>
<td>88.6</td>
<td>Up</td>
</tr>
<tr>
<td>5. Cannibal Star</td>
<td>5</td>
<td>Up</td>
</tr>
<tr>
<td>6. Toccata Exciting</td>
<td>48.6</td>
<td>Down</td>
</tr>
<tr>
<td>6. Toccata Uplifting</td>
<td>70</td>
<td>Up</td>
</tr>
<tr>
<td>6. Toccata Star</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>7. Bossa Exciting</td>
<td>24.3</td>
<td>Down</td>
</tr>
<tr>
<td>7. Bossa Uplifting</td>
<td>24.3</td>
<td>Down</td>
</tr>
<tr>
<td>7. Bossa Star</td>
<td>2</td>
<td>Down</td>
</tr>
</tbody>
</table>

*Note.* For exciting and uplifting categories, researchers subtracted 50 from each average in order to put the scores on a scale of -50 to 50.
APPENDIX F

Sociocultural Demographics Questionnaire

1. a. On a typical day, how many hours do you spend listening to music; with music in the background?
   
   0-2 hours
   
   3-4 hours
   
   5-6 hours
   
   7-8 hours
   
   9-10 hours
   
   11-12 hours
   
   13 or more hours

   b. On a typical day, how many hours do you spend listening to music; with music listening as the primary activity?
   
   0-2 hours
   
   3-4 hours
   
   5-6 hours
   
   7-8 hours
   
   9-10 hours
   
   11-12 hours
   
   13 or more hours

2. Where do you most often listen to music? (choose all that apply)
During commute
Exercise
live concert
spending time with others
studying/during work
practicing instrument or singing
in the shower
only listening to music

3. What is your gender?
Male
Female
Other

4. What is your age?
18-25
26-33
34-41
42-49
50-57
58-65
66-73
74-81
82-89
5. Which of the following would you say is your race?

White or Caucasian
Hispanic or Latino
Black or African American
American Indian or Alaska Native
Asian
Pacific Islander
Other

6. What is the highest grade or year of school you completed?

Never attended school or only attended kindergarten
Grades 1 through 8 (Elementary)
Grades 9 through 11 (Some high school)
Grade 12 or GED (High school graduate)
College 1 year to 3 years (Some college or technical school)
College 4 years or more (College graduate)

7. What is the closest description to where you currently live?

Rural
Suburban
Urban
8. What is your annual household income from all sources?
   Less than $10,000
   Less than $15,000
   Less than $20,000
   Less than $25,000
   Less than $35,000
   Less than $50,000
   Less than $75,000
   $75,000 or more
   Don’t know / Not sure

9. During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?
   Yes
   No
   Not sure

10. Would you say that in general your health is:
    Excellent
    Very good
    Good
    Fair
    Poor
    Don’t know
11. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation? (Please answer in number of days)

0-30+ days
APPENDIX G

Post-Analysis Information for Participants

Thank you again for taking part in our survey regarding the effect of social feedback on emotions and preferences in music and the effect of socio-demographics on music preferences. 173 respondents participated in a brief online survey that consisted of the rating of seven music samples followed by 12 questions asking about one’s music listening habits, sociocultural demographics, and health status. The majority of participants identified as white, affluent, educated females in good health.

There were two separate analyses for this study. The first was for the purpose of investigating whether social feedback had an effect on individuals’ emotional reaction to and preferences in music. The research hypothesis was that participants who were exposed to manipulated social feedback would report emotional reactions and preferences more closely aligned with the social feedback than when not exposed to the feedback. Results showed no significant differences, but there were non-significant trends aligned with the manipulated feedback in some of the excerpts when participants were exposed to the feedback.

The second purpose of the study was to explore possible similarities between one’s music preferences and the sociocultural background, their use of music in daily life, and their health status. The findings indicate that one’s rating of music preferences show no significance between the music listening habits, sociocultural demographics, or the health ratings surveyed. This current research shows some agreeable results with previous studies that one’s music preferences are very specific and difficult to determine from outside factors.

If you have any questions regarding this research, feel free to contact the investigators using the contact information provided below.
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APPENDIX H

HSIRB Approval Letter

Date: October 5, 2017

To: Edward Roth, Principal Investigator
   Megan Dillon, Student Investigator for thesis
   Kaitlin McKinley, Student Investigator for thesis

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 17-09-51

This letter will serve as confirmation that your research project titled “Relationship among Sociocultural Demographics, Health Status, and Social Feedback on Music Preferences” has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may only be conducted exactly in the form it was approved. You must seek specific board approval for any changes in this project (e.g., you must request a post approval change to enroll subjects beyond the number stated in your application under “Number of subjects you want to complete the study”). Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: October 4, 2018