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**THE INFLUENCE OF ADVERTISEMENT MUSIC ON GENDER
IDENTITY AND SEX STEREOTYPING IN YOUNG GIRLS**

by

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**SUBMITTED TO SCRIPPS COLLEGE IN PARTIAL FULFILLMENT
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Abstract

This paper proposes a study that investigates whether manipulating pitch and tempo in children's toy advertisement music has an effect on gender identity and sex stereotyping in preschool-aged girls. This particular intersection between advertisement, persuasion, gender identity, and sex stereotyping scholarship has not yet been explored. However, past research does suggest that high pitch and fast tempo have a significant positive impact on mood and arousal, two factors associated with more susceptibility to persuasive messages. The 3- to 4-year-old female participants will be randomly assigned to one of the nine advertisement conditions. The music in the ads for each condition will contain a combination of pitch variation (high, medium, or low pitch) as well as a tempo variation (fast, medium, or slow tempo) to create a fully-crossed design. The dependent variables, gender identity and sex stereotyping, will be measured in the lab before and after a 2-week period in which the the advertisement stimuli will be presented in the children's homes. Based on previous research, higher pitch and faster tempo are expected to be associated with more stereotypical gender identity and more sex stereotyping in participants.

The influence of advertisement music on gender identity and sex stereotyping in young girls

“The average child watches about four hours of television a day and sees more than 20,000 commercials each year...by the time American children finish high school, they have spent nearly twice as many hours in front of the television set as in the classroom” (American Academy of Child and Adolescent Psychiatry, 2011). Visual media, such as television, are becoming increasingly present in everyday life, especially for children. In addition to viewing cartoons and other regular programming, children are continually exposed to advertisements, about 55 each day (Herr, 2007). Multiple studies have revealed that children’s toy advertisements contain gendered messages that could reinforce sex stereotypes and contribute to gender identity formation (Neto & Furnham, 2005; Rajecki et al., 1993; Schwartz & Markham, 1985). If young children are spending more time in front of a television than they are in classrooms and these viewing sessions feature stereotypical gendered messages, it is important and pertinent to examine how advertisements are affecting gender identity as well as sex-typed views in order to fully understand the scope of gender identity development.

Because advertisements are ever-present in children’s lives, they could be major influencing factors on how gender schemas and early gender identities develop. Research has revealed that gendered messages are not only present in children’s toy advertisements, but are actually very common in both print and television media (Rajecki et al., 1993; Schwartz & Markham, 1985). Gendered messages in advertisements are stereotypical representations of gender that appeal to boys or girls and reinforce a gender-binary belief system through images, themes, language, and even music. A previously unexplored element that could be linked to processing gendered messages in

advertisements is music. Studies have found that musical features, such as tempo and pitch, lead to altered emotional states (Bruner, 1990; Bohner et al., 1992; Craton & Lantos, 2011; Dalla Bella et al., 2001; Fraser & Bradford, 2013; Goshen & Ziv, 2006; Jaquet et al., 2014; Roulston, 2006), which could be contributing to how children process advertisement messages. Because certain musical features have positive influences on emotion in listeners and heightened mood could increase the effectiveness of persuasive messages, exploring how certain musical features in advertisements affect gendered message processing is a logical next step in studying gender identity formation. One of the guiding research questions that will be addressed through the present study is the following: do pitch and tempo moderate the relationship between gendered advertisement messages and gender identity and sex-typed attitudes in preschool-aged girls?

Reviewing the literature on gender identity is essential to understanding its relationship with advertisement music. Gender identity is made up of many different factors that develop over time, and children do not reach the point of gender constancy until about 6 or 7 years old (Egan & Perry, 2001). Gender constancy is the stage at which children develop a stable concept of gender categories. For example, children in a pre-gender constancy stage sometimes believe that wearing “boy” clothes or “girl” clothes actually changes one’s gender. This concept assumes that gender is permanent and that it exists within a binary structure, which is not necessarily the case. However, psychologists still use traditional gendered terms and definitions in their studies, so for the purposes of this paper, a gender binary will be assumed. Egan & Perry (2001) examined three main components of gender identity: psychological compatibility with gender, how much children felt pressure to conform to gender-appropriate behaviors, and bias for one’s own

gender. Their most crucial finding was that the pressure children felt to conform to gender stereotypes was negatively correlated with global self-worth. Additionally, the negative influence of this relationship on self-perceived social competence was significantly stronger for girls compared to boys.

These findings could be related to children's advertisements and especially the strong gendered content associated with toy commercials. Repeatedly presenting children with stereotypical gender messages through advertisements could increase the pressure they feel to conform to typical gender behaviors and occupations (Egan & Perry, 2001), and these traditional norms could therefore become incorporated into their gender identity. These findings are consistent with the confirmation-deployment model of gender identity proposed by Welch-Ross & Schmidt (1996), which identifies preschool-aged children as being in the information-gathering stage of gender identity development. Advertisements could be particularly influential for children in this stage, since they are primed for learning about societal expectations for their gender group. Researchers have also found links between gendered advertisements and increased development of highly gendered attitudes and beliefs (Neto & Furnham, 2005), which supports the claim that advertisements do have an effect on gender identity development in children.

Researchers have proposed several theories that explain the possible mechanisms that underlie gender identity development. Some of these theories include the gender schema theory, the schema confirmation-deployment model, the self-socialization theory, and the social-cognitive theory (Bem, 1981; Martin & Ruble, 2010; Welch-Ross & Schmidt, 1996; Zosuls et al., 2009). These theories, along with corresponding empirical

evidence, are crucial to understanding how gendered advertisement messages affect both gender identity and sex stereotyping in young girls.

According to the gender schema theory, proposed by Bem (1981), gender-based schematic processing influences sex-typing because people are primed to process information in terms of associations with sex-linked traits. Sex-typing is defined as the process through which certain behaviors are inextricably linked with being male or female, and people are categorized accordingly as masculine or feminine (Bem, 1981). Bem tested this theory empirically and found that, in a word categorization task, sex-typed participants were significantly more likely to group words according to their gender associations when compared to the other groups. She also found that sex-typed people rated themselves higher on sex-congruent traits compared to sex-incongruent traits. Because the phenomenon of sex-typing results from the increased readiness to process stimuli based on gendered attributes as either “male” or “female”, perhaps repeated exposure to gendered messages in advertisements enhances the viewer’s gender schema and enables them to more quickly categorize objects and people in their daily lives. This theory also has implications for how children self-identify as one gender or the other, and they could be more prepared to link stereotypical traits to themselves and others if they are exposed to traditional representations of boys and girls in children’s advertisements.

Miller et al. (2009) discovered that children develop gender stereotypes as early as preschool, around 3-4 years of age. Stereotypes about girls commonly concern physical appearance, whereas stereotypes about boys are usually about activities and traits (Miller et al., 2009). Their study investigated how children use stereotypes in different domains and the number of stereotypes used in their statements. They predicted

that girls would have higher stereotype knowledge than boys, which was supported by their finding that girls provided a significantly higher proportion of stereotypes in their statements compared to boys. The researchers discovered that stereotypes about appearance, such as clothing, jewelry, long hair, and being pretty, were expressed significantly more often for girls than for boys. On the other hand, stereotypes about activities, such as sports, fighting, and playing, were significantly more accessible in relation to boys compared to girls. These results are not particularly surprising given how males and females are differentially portrayed in media directed at children. However, they provide evidence in support of Bem's gender schema theory and suggest that appearance and activity are relevant schemas used by preschool-aged through elementary-aged children in determining masculinity versus femininity.

Edelbrock & Sugawara (1978) conducted another study that provides empirical evidence for the gender schema theory. They measured sex role discrimination, preference, and confirmation in preschool children and found different trends in boys versus girls. The researchers found that girls were more familiar with adult female sex role expectations and boys were more familiar with child male sex role expectations. These data suggest that although both boys and girls are aware of existing sex stereotypes, consistently with the gender schema theory, they categorize and identify with expectations differently. The researchers posit that this difference could be influenced by the contrasting toys and play styles in boys and girls. For example, the toys available to girls are mostly associated with adult activities such as cooking, cleaning, childcare, and "playing house". Children could be partially learning these gender distinctions through toy advertisements, which usually present stereotypical play styles and expectations

(Rajecki et al., 1993; Schwartz & Markham, 1985). Another possible explanation is that girls experience more socialization from adult women in their lives and boys experience more socialization from their same-age peer group (Edelbrock & Sugawara, 1978). However, this reasoning assumes that teachers and primary caregivers are usually women, which is not necessarily accurate anymore, given that 40% of U.S. households have a female primary breadwinner (Wang et al., 2013). There are a multitude of explanations for this difference between how boys and girls perceive and adhere to gender expectations. The current study will add to this literature by exploring how exposure to gendered messages in television advertisements could influence sex stereotyping and gender identity.

The second theory of gender identity development is the schema confirmation-deployment model posited by Welch-Ross & Schmidt (1996). This theory states that schema development is related to children's memory for gender information. It contains three phases of gender schema processing that require remembering and encoding information related to the schema: the information-gathering phase, schema confirmation, and schema deployment. The researchers claim that due to remembering schema-relevant information, schema-typical information will be processed more quickly than schema-atypical information, and children will be more likely to mistake atypical information as schema-relevant. They found that 4-year-old children were still in the information-gathering stage of the model because they had significantly lower schema knowledge scores compared to the 6-year-olds. However, by age 6, children had higher schema knowledge scores and appeared to have a solid grasp of gender-role stereotypes that allowed them to quickly access and confirm their existing gender schema. The

confirmation-deployment model was supported by these results, which indicate that children under the age of 6 are gathering gender information that will later be used to further define their own gender identity and determine what items and activities are sex-appropriate and sex-inappropriate (Welch-Ross & Schmidt, 1996). Because preschool children operate within the information-gathering stage of this model, advertisement messages could be especially influential on the content of their developing gender schemas.

The last two theories pertaining to gender identity development are self-socialization theory and social-cognitive theory (Zosuls et al., 2009). According to self-socialization theory, once children realize that there are two options, male or female, and that they belong to one of these categories, they begin to develop more gender-typed behaviors. These sex-typed behaviors occur in direct response to the development of a basic gender identity, or ability to self-label as one gender or the other. On the other hand, social-cognitive theory claims that children develop sex-typed behavior from observing the behavior of others and receiving feedback from people around them, which reinforces and rewards gender-consistent actions. Researchers who adhere to this school of thought do not believe basic gender identity is an important part in how children develop gender-typed behaviors.

In their study, Zosuls et al. (2009) found that basic gender identity in 17- to 21-month-old children was correlated with more gender-typed playing, which provides empirical support for the self-socialization theory. This finding could indicate a link between children self-identifying as a certain gender and adjusting play behavior to match or conform to their respective gender identification. According to Welch-Ross &

Schmidt (1996), this age group of children is still in the information-gathering stage of gender identity development, but they could conceivably be testing preliminary gender information and matching their perceived gender identification with playing behavior. Once the children are using gender-consistent playing styles, perhaps they receive praise from adults and peers and their identity is further reinforced, similar to how the social-cognitive theory conceptualizes gender identity development, essentially combining elements of both the self-socialization and social-cognitive theories. One of the most critical findings of this study was that by 21 months of age, 68% of the participants were able to categorize others as belonging to one gender or the other by using flexible gender labels, mostly “boy” and “girl” (Zosuls et al., 2009). Additionally, the researchers found that 17% of the children were able to self-label their gender by 21 months old.

Overall, the researchers were able to find a link between the development of early gender categorization and gender-typed behavior in children under 2 years old (Zosuls et al., 2009). These results provide support for the self-socialization theory of gender identity development, which claims that being able to categorize people according to their gender influences the development of early gender-typed behaviors in children. The four different theories of gender identity development all agree that children develop some sort of gender schema that influences how they perceive their own gender as well as the gendered categories that objects and activities fit into. There are several implications of gender identity development that must be discussed in order to further understand how messages in children’s advertisements could be influencing the development and deployment of gender schemas.

Some researchers have attempted to link gendered advertisement messages to gendered attitudes and stereotypes, and others have proposed a cultivation model to explain the effects of stereotypical gender portrayals on television on how people develop beliefs and attitudes about gender (Gunter, 1995 as cited in Neto & Furnham, 2005). This model is partially based in social learning theory, and it posits that when people are regularly exposed to stereotypical gender portrayals on television, they can more easily interpret these beliefs as reality in society. Additionally, Kimball (1986, as cited in Neto & Furnham, 2005) found a cause-effect relationship between television viewing and the development of gender-role stereotypes. These results support the cultivation model and give further evidence that advertisement messages could be crucial contributing factors to how young viewers develop stereotype-consistent attitudes and behaviors. Not only are toy advertisements presenting gendered material for children to learn from, but also reinforcing stereotypical behavior, similarly to how the social-cognitive theory describes gender identity development. The precise gendered content of toy advertisements will be discussed in more detail later on.

As children get older and begin entering preschool, they are better equipped to provide gendered reasons as to why others choose to play with “boy” toys or “girl” toys. Eisenberg, Murray, & Hite (1982) conducted a study in which 3- and 4-year-old children were interviewed about their real and hypothetical preferences for masculine, feminine, and neutral toys. In phase 1, children were observed during play time and researchers approached them with questions about their toy preferences. In phase 2, the children were interviewed about their own preferences as well as which toys other children prefer. The results showed that the children did not use any gendered reasoning to explain their own

toy preferences, yet used sex-typed reasoning to explain the toy preferences of other children. They tended to explain their own toy choices in terms of what the toy can do rather than its perceived gender context (Eisenberg et al., 1982). However, even though the children did not explicitly provide sex-typed reasoning for their toy choices, the researchers still found that significantly more girls responded to questions about feminine toys and significantly more boys responded to questions about masculine toys during phase 1 of the study. This observation indicates that even if children weren't consciously aware of or able to explain their preferences with gendered reasoning, they were still playing with sex-appropriate toys according to societal expectations and stereotypes. Maybe they were not using gender schema knowledge, as Bem would argue, but their preference for gender-appropriate toys could have been reinforced through social observation, rewards, and gendered messages in media.

A few researchers conducted content analyses on children's advertisements in terms of gendered stereotypes and messages. Schwartz & Markham (1985) performed a content analysis of print toy advertisements as well as images presented on toy packages. They found that sex-related stereotypes associated with the toys themselves were also correlated with the sex of the children featured in the pictures on the packages. Essentially, toys that were categorized as strongly sex-typed in terms of maleness or femaleness tended to have pictures of the appropriately gendered children on the packaging. This research was motivated in part by the belief that toys, as well as media representations of toys, familiarize children with adult gender roles and prepare them for masculine and feminine occupations (Chafetz, 1974, and Liss, 1977, as cited in Schwartz & Markham, 1985). Although this study did not determine if using imagery as an

indicator for sex-appropriateness of each toy actually influences how children develop gender identity and toy preferences, these results are consistent with previous research that suggest media could be a main contributing factor to the socialization of gender.

Another team of researchers performed a content analysis of 856 television toy advertisements in which they examined and categorized advertisements based on multiple factors, including gender of actors and message (Rajecki et al., 1993). They observed that a majority of ads actually featured boy and girl actors, but that there were some ads that featured all-boy actors and all-girl actors as well. The researchers found that children's toy advertisements were highly segregated in terms of the target gender audience, significantly more than the other advertisement categories in the study. The results revealed that boy-directed ads are practical in nature and girl-directed ads are emotional in nature (Rajecki et al., 1993). In addition to their overall finding that advertisements directed at girls had more emotional content, they determined that the all-boy commercials predominantly featured action figures, machines, and costume products, whereas the all-girl commercials featured "glamour" dolls and costumes. These results go hand in hand with the previous finding that stereotypes about girls are primarily about physical appearance and stereotypes about boys are about activities (Miller et al., 2009). Together, these two content analyses show that toy advertisements are heavily segregated based on gender and are correlated with gender stereotypes that children develop about male and female attributes and expectations in society.

One concern about the two content analyses above is that they are older studies and could be construed as not relevant to the current state of television and advertisements in society. However, researchers Neto & Furnham (2005) conducted a

more recent study and found that advertisements geared towards children still contain stereotypical gender portrayals 15 years later. Consistent with previous research, they found that advertisements directed at boys contained significantly more activity and aggression compared to advertisements for girls. The researchers also found that advertisements for girls tended to be quieter than advertisements for boys. These findings seem to reflect the societal stereotype that men are more aggressive and take more action than women. Given that past researchers found a link between gendered advertisements and the development of stereotypical behavior, it is concerning that toy advertisements were still just as segregated and gendered in 2005, 15 years after the content analysis research was done. Because previous research has shown that gendered messages in advertisements are connected to the development of sex-typing and gendered behavior in children as young as 3-4 years old, it is important to investigate music, as it could be a central influence on how children interpret persuasive messages. In particular, pitch and tempo may be important factors in advertisement persuasion, which has been shown to affect how viewers absorb and process persuasive messages, such as traditional gender expectations and pressures in toy commercials.

The persuasive process is an integral piece to how music could be affecting gender identity and sex stereotyping. Before examining how pitch and tempo may influence how children process advertising messages, it is important to address how music may moderate the relationship between gendered messages and both gender identity and sex stereotyping through the process of persuasion. Persuasion is a complex process that is crucial to the success of advertisements, especially for grabbing viewers' attention initially as well as taking advantage of how viewers are attending to the

messages. Mood is a key factor in how viewers develop opinions about the advertisement message and product (Bohner et al., 1992). Past researchers determined that positive feelings actually encourage viewers to use lower-level, heuristic processing strategies consistent with the peripheral route and negative moods cause people to use more detailed and analytic processing strategies consistent with the central route (Schwarz, 1990, as cited in Bohner et al., 1992). Explanations for these differences include the idea that negative moods are associated with being in an unsafe or problematic situation, and therefore encourage people to pay more attention to their surroundings and use a stricter, more analytical approach to processing information. On the other hand, positive moods are linked to feeling safe in one's current environment, so people are more likely to use simplified processing, which requires less energy and focus.

In Experiment 2 of their study, Bohner et al. (1992) first exposed participants to an aptitude task and provided randomized bogus negative or positive feedback. After this priming task, participants were approached by a confederate who attempted to solicit donations from the participants using either a weak or strong argument and a weak or strong consensus cue to indicate how many others had donated to the cause. The researchers found that when participants were in a negative mood, they were significantly less likely to donate money when presented with both a weak argument and weak consensus cue. On the other hand, participants in a positive mood showed no significant differences between the argument and consensus cue conditions, but were more likely to donate to the cause in general compared to the participants in a negative mood (Bohner et al., 1992). These results provide evidence that people in a bad mood are more likely to engage in critical analysis of the messages presented to them and are less likely to be

swayed by weak persuasive arguments whereas people in a good mood may be more susceptible to persuasive messages (Bohner et al., 1992). Therefore, mood seems to be a key factor in persuasion, and people who are in a positive mood are more susceptible to persuasive messages due to their increased use of peripheral processing and heuristic mechanisms.

Along with mood, arousal is also an important factor that affects persuasion. Mano (1997) examined how arousal affects persuasion outcomes within advertisements. He found that higher arousal levels increased positive thinking and reduced message elaboration in participants. These results imply that when viewers experience high levels of arousal, they are more easily persuaded, similar to how happier moods affect persuasion. These discoveries about mood and arousal are crucial for analyzing how music could be associated with children's development of gender attitudes through advertisements. Researchers have found that music has more general effects on advertisement viewers, in addition to pitch and tempo, and these effects merit some discussion.

Although many people believe that music is just an extra, unnecessary stimulus, the literature points to exactly the opposite conclusion. One study that relates to children's advertisements was done by Fraser & Bradford (2013). They examined if complex or simple background music had more of an effect on viewers' ability to recall the advertisement messages in two different experiments. They posited that background music in general may interfere with message processing since the brain is wired to process unexpected sound changes first, which could divert focus away from the message and reduce ability to recall. In Experiment 1, the researchers compared backgrounds that

varied in harmonic, textural, and temporal elements across advertisements for six different brands. They found that simpler advertisement music samples with fewer background music changes were significantly associated with higher message recall. In Experiment 2, the researchers presented 2 advertisements with fewer background music changes, and this also improved message recall. Fraser & Bradford (2013) showed that music has an effect on how well viewers remember advertisement messages, and that simple background music is more effective than complex background music. Children's advertisements commonly have simple background music with a consistent, strong beat, so that could be increasing children's ability to remember gendered messages. Although complexity and simplicity of music will not be directly measured in the current study, it is still important to realize that advertisers are already using music to enhance persuasion.

Advertisement music can also influence how successful an advertisement is, specifically through affecting viewers' attitudes. Craton & Lantos (2011) investigated the connection between attitude towards advertising music and attitude towards the advertisement itself. They found that music influences how viewers form positive and negative perceptions of the product being advertised. The researchers defined attitude towards the advertisement as when consumer responds in either a favorable or unfavorable manner to an advertisement stimulus. Craton & Lantos (2011) found a significant relationship between attitude towards the music and attitude towards the product in that a favorable attitude towards the advertising music was necessary for a favorable attitude towards the advertisement product. In addition, they discovered that a negative attitude towards the music could actually induce a negative attitude towards the advertisement. This study shows that music has an effect on how participants perceive

advertisements, and therefore the products portrayed in them. Their results indicate that music is even influential enough to make advertisements less effective and produce negative feelings in viewers.

In addition to affecting message recall and attitudes, music is also connected to mood and emotional processing. Dalla Bella et al. (2001) explored whether or not children and adults use the same cues to determine if music sounds happy or sad. The researchers modified the tempi and modes of a subset of musical examples in order to measure how these changes affected happy and sad judgments in their participants. They found that adults and 6-8-year-old children were affected by mode and tempo manipulations. 5-year-olds were affected by changes in tempo, but not changes in mode. The youngest group of participants were 3-4-year-old children, and they could not distinguish between happy and sad music. Although the youngest children did not seem to be sensitive to mood in advertisements, this result could be due to weaknesses in the methodology. The same stimuli were presented to all age groups of children during this study, and 3-4-year-olds are less able to sit still and focus on the same material that older children may have no difficulties with. The task of identifying mood required participants to point to illustrations of faces representing different emotional reactions, which could be a more analytically advanced skill than most 3-4-year-old children possess. Additionally, the music presented during the study was classical music that may not have been as accessible to the younger participants. Therefore, these results could be misrepresenting the actual ability of 3-4-year-olds to perceive emotional qualities in advertising music and should be tested more thoroughly in the future. Other researchers have found that children as young as 4 are cognitively proficient at processing musical

sounds and attempt to make sense of the sounds around them in terms of a tonal hierarchy (Lamont & Cross, 1994). This provides further support that young children may still be able to understand musical stimuli but only when it is presented in a simpler melodic structure consistent with their processing ability.

Another study about children's emotional reactions to music explored the connections between music and story interpretations, which gives insight into how music could affect interpretations of advertisements. Goshen & Ziv (2006) investigated how 5- and 6-year-old children processed and interpreted the same story when accompanied by one of three background music conditions: sad, happy, or no music. The researchers created musical stimuli to match sad and happy emotions based on previous findings about how mode and tempo influence mood. The sad music was slow, soft, and in a minor key, whereas the happy music was transposed into a major key and played at a faster tempo. After the participants were exposed to their randomly-selected condition along with the same children's story, they were asked to match the happy, neutral, and sad faces to different events in the story. The researchers found that that music actually affected how the children interpreted the story: happy music resulted in positive interpretations and sad music resulted in more negative interpretations. Additionally, they discovered that children in the happy music condition chose a happy face as an appropriate response to the story significantly more often than children in the sad music condition chose the sad face. Participants in the sad music condition chose more of an even distribution among happy, sad, and neutral faces to describe the events throughout the story. One explanation that the researchers provided was that happy music usually has a stronger effect on interpretation of events compared to sad music. This finding is

crucial for analyzing children's advertisements, since advertisers could artificially create more positive responses to the message and product by using happy-sounding music and therefore induce more susceptibility to persuasion, as suggested by Bohner et al. (1992).

Two of the key elements in producing this happy-sounding music are tempo and pitch. Based on previous research, these musical elements could be crucial components to how preschool-aged girls process and respond to gendered messages in advertisements, specifically through enhancing mood and arousal (Bruner, 1990; Fancourt et al., 2013; Husain et al., 2002; Jaquet et al., 2014). Musical pitch is a subjective experience that is related to frequency, which is measured in number of sound vibrations per second, or hertz (Baines & Temperley, 2015). It is usually perceived as being on a continuum of high to low registers, and individual judgments of pitch can be influenced by other factors such as timbre, volume, and duration. Musical tempo relates to how fast or slow a piece of music is played, and is usually measured in beats per minute (bpm). Although choosing pitch and tempo for music may seem arbitrary, research on both persuasion and music support the claim that tempo and pitch can influence how people process advertising messages, specifically by manipulating mood and arousal, which are both important factors in how susceptible viewers will be to persuasive messages (Bohner et al., 1992). People who are in a positive mood are more likely to use low-level processing and are therefore more susceptible to persuasion. If advertising music positively influences mood through pitch and tempo, viewers might use simpler processing mechanisms and be more easily persuaded by gendered messages, which could in turn lead to more traditional gender identity and sex stereotyping trends.

Researchers have made specific discoveries about how tempo and pitch could be influencing listeners' mood or suggesting certain emotions. Jaquet et al. (2014) investigated the effect of pitch variations on self-reported arousal and pleasant feelings in adult participants. They presented 1-minute piano piece excerpts to participants at 3 different pitch levels: an octave lower than the original piece, the original piece, and an octave higher than the original piece. They found that music in the higher range was rated as more pleasant than music in the lower range, but was not associated with higher levels of arousal. Because higher pitch was associated with more pleasantness, higher-pitched advertising music could effectively induce pleasant, positive feelings about the product.

Another researcher, Bruner (1990), investigated how music influences mood within marketing through a survey study on relevant research. He noticed that higher pitch was considered happier than lower pitch. Higher-pitched music was rated as happier and more exciting than lower-pitched music, which was consistently interpreted as sad and mysterious by listeners (Bruner, 1990). This finding is important for how pitch could be affecting the persuasive process and therefore how young girls react to gendered messages. Because high-pitched advertising music is associated with happier moods, which are known to increase susceptibility to persuasion (Bohner et al., 1992), pitch may be a central factor to how gendered messages influence gender identity and sex stereotyping.

Although these two studies show that pitch can affect mood in adults, the ability to detect changes in pitch is an important precursor to experiencing mood shifts in response to higher and lower pitch. Young children process pitch differently, so it is crucial to determine whether they can detect pitch changes before making predictions

about how pitch could affect their mood. Fancourt et al. (2013) explored the thresholds at which different age groups can detect changes in pitch and also pitch directional changes. Their study used a two-alternative forced-choice procedure to track the threshold of detection for pitch changes, and their results indicate that the ability to perceive pitch-direction changes becomes more sophisticated by age 11. On the other hand, the ability to detect minute pitch changes was fully developed in 6-year-old children, the youngest age group they tested. More specifically, these researchers found that detecting small directional changes in pitch develops more slowly than detecting the same degree of general changes in pitch. So, younger children are still able to recognize when pitches are changing slightly, but they cannot always perceive the directional shift as easily as older children. The pitch change data are centered around half of a semitone, which indicates that Fancourt et al.'s (2013) participants were able to detect very small changes in pitch. In Western music, the semitone is usually the smallest unit of pitch change, so the fact that children as young as 6 were sometimes able to detect changes smaller than a semitone is notable. This research supports the prediction that pitch changes in advertisement music could be affecting how children attend to persuasive messages because they are able to notice pitch change. Although the youngest children in this study were 6-years-old, there is a good chance that 3-4-year-old children are also able to detect pitch changes since this ability is almost fully developed by age 6. These researchers found that pitch is an important factor in the emotional quality of music, but tempo is also a key element in listeners' mood and arousal levels. In his survey study, Bruner (1990) found that tempo was associated with mood in that music with a fast tempo was considered happier than music with a slow tempo (Bruner, 1990).

More recent research has revealed that musical tempo influences mood as well as arousal, which both influence how susceptible viewers are to persuasion within advertisement stimuli (Bohner et al., 1992; Mano, 1997). Husain et al. (2002) investigated if musical tempo and mode manipulations had an effect on mood and arousal. They were inspired by previous research, which showed that fast tempo was associated with activity, excitement, and surprise (Gabrielsson & Lindström, 2001, as cited in Husain et al., 2002) as well as happiness (Balkwill & Thompson, 1999, as cited in Husain et al., 2002). In their study, Husain et al. found that faster tempo significantly increased mood and arousal levels in participants, while major modes induced happier moods. This finding shows that musical tempo manipulations have a significant effect on mood and arousal levels, so tempo may affect persuasion even more than pitch.

There is a significant disparity of psychological studies dedicated to exploring children's advertisements, especially in terms of music and its possible influence on gender identity formation as well as sex stereotyping. Although researchers have found significant associations between media exposure and identity formation, as well as evidence that music may be a contributing factor to mood, no studies have actually bridged the gap between these areas in music and psychology. The current study proposes a moderating relationship in which tempo and pitch enhance the effect of gendered advertisement messages on gender identity and sex stereotyping. If the moderating relationship is supported, music could be a main factor in how children develop stereotypical attitudes and even build their own gender identities. Empirical studies have revealed that higher pitch and faster tempo both lead to heightened mood (Bruner, 1990;

Jaquet et al., 2014), and researchers have also found that faster tempo increases both mood and arousal (Husain et al., 2002).

Based on these findings, the current study proposes a model in which high pitch and fast tempo enhance the effects of gendered advertising messages on the development of gender identity and sex stereotyping in preschool-aged girls. It will explore if manipulating tempo and pitch in children's toy advertisements is associated with changes in gender identity and sex stereotyping through an experimental design in which 3- to 4-year-old girls will be exposed to the same visual toy advertisement stimuli under 9 different manipulated pitch and tempo conditions. Gender identity and sex stereotyping are expected to change in response to the pitch and tempo manipulations.

There are several hypotheses that will be tested during this study. First, the researcher predicts that both pitch and tempo will have a significant main effect on gender identity and sex stereotyping. The specific hypothesis about pitch main effects states that participants exposed to the high-pitched music condition will demonstrate a more traditional gender identity and more sex stereotyping as compared to participants exposed to the medium-pitched music condition, who will in turn demonstrate more sex stereotyping than participants exposed to the lower-pitched music condition. This pattern of results is also expected for the fast, medium, and slow tempo conditions. The researcher also predicts that there will be a significant interaction between pitch and tempo in that participants exposed to the fast-tempo condition will have high gender identity and sex stereotyping scores even when the pitch is medium or low. Tempo is expected to have more of an influence on gender identity and sex stereotyping compared

to pitch because it has an effect on both mood and arousal, whereas pitch only affects mood (Bruner, 1990; Husain et al., 2002; Jaquet et al., 2014).

Proposed Method

Participants

The participants in this study will be 3- and 4-year-old girls. The population of interest is preschool-aged girls, and the sample will ideally have a combination of children from different cultural, racial, and socioeconomic backgrounds. There will be approximately 495 participants in this study, so each of the nine experimental conditions will receive 55 participants. The researcher conducted a power analysis, which recommended 52 participants per cell. However, in order to account for possible attrition issues within this study as well as ensure an adequate sample size, the researcher added three participants to each condition.

Recruitment will be done through local elementary schools, putting up flyers at pediatrician offices, music schools, day care centers, and family-friendly associations, such as the YWCA. A wide variety of different recruiting sources will be used to reduce the effects of self-selection biases or unbalanced samples. The sample is predicted to be representative of the general population in terms of race, socioeconomic status, and education. However, the sample will not represent all geographical areas in the U.S. because participants will be recruited locally. All parents will receive \$20 to compensate for time and transportation, and participants will be compensated in the form of stickers or small toys at the end of each lab session.

Materials

Gender identity. This dependent variable will be measured using the Gender Identity Scale (Patterson, 2012). It presents 36 gender identity questions with the response options of 4-really true, 3-sort of true, 2-sort of not true, or 1-really not true. These items will be presented to children verbally in the form of a conversation about what is true or untrue about their attitudes and behaviors compared to other children of the same gender. There are three different subsections within the 36 questions that pertain to various facets of gender identity. The first part measures how the participant feels in comparison to other children of the same gender. For example, the researcher would state: "I like to dress the same way as most girls," and the participant would rate her agreement with the statement. Part 2 asks participants how much they like being their gender versus the other gender. The third section of this measure determines if the participant thinks other people may be upset if they do things that are associated with the opposite gender. Patterson (2012) did not give any information about the reliability and validity of the measure. The Gender Identity Scale has high face validity, but further analyses will be conducted after data collection.

Sex stereotyping. This dependent variable will be assessed using a slightly modified version of the Sex Stereotype Measure developed by Williams et al. (1975). It contains 24 items that are each associated with a gender stereotype. Children are told stories about characters and asked which person "is gentle" or "talks loudly," for instance. They are instructed to point to a picture of a boy or girl in response to these questions. Each of the 24 character descriptions presented to the participants has a stereotypical adult adjective that maps onto either men or women. If the participant gives

a stereotype-consistent answer, such as pointing to the girl picture when asked “which person is gentle,” they receive a score of 1. If the participant gives a stereotype-inconsistent answer, such as pointing to the girl picture when asked “which person is the messy person,” they receive a score of 0. The scores across items are added up, and scores that are closer to 24 represent more stereotype-consistent attitudes, while scores that are closer to 0 represent more stereotype-inconsistent attitudes. The original measure had participants point to pictures of either a boy or a girl of the same race, as determined by the experimenters. In the present study, children will choose a paper doll that they identify with and think looks the most like they do to determine race. The researcher will select a boy and girl doll that match each participant’s self-conception so when they are asked to point to the girl or boy doll, the options will be more closely matched to how the children identify themselves. This adjustment is intended to reduce biases in the data that may arise from inconsistent racial or ethnic identification, and will hopefully lead to more accurate results. Williams et al. (1975) did not give any information about the reliability and validity. Similar to the Gender Identity Scale, this measure has high face validity, but further analyses will be conducted after data collection.

Advertisement stimuli. There will be nine different advertisement stimuli conditions in this study that manipulate pitch and tempo. The researcher will select six existing toy advertisements to be shown in each condition so participants are not being exposed to newly-invented advertisement stimuli that they are not already in contact with. The researcher will systematically choose these six advertisements by watching Saturday morning cartoons for a month and selecting the six most commonly-appearing ads. Before using these advertisements for the current study, the experimenter would first

contact the relevant companies to request permission for their use. These six video stimuli will be paired with various musical stimuli depending on which condition the participant is selected into. The musical portion of the stimuli will differ across the nine groups, and the researcher will manipulate tempo and pitch using a computer program, such as *Adobe Audition*, to create the following conditions: fast tempo/medium pitch, medium tempo/medium pitch, slow tempo/medium pitch, high pitch/medium tempo, low pitch/medium tempo, fast tempo/high pitch, fast tempo/low pitch, slow tempo/high pitch, and slow tempo/low pitch. All other musical features will be held constant. The visual stimulus of the advertisement will also be the same for all conditions, and there will not be any singing during the advertisement in order to minimize other auditory factors aside from the musical stimuli. The researcher will manipulate the musical pitch by five whole tones in either direction from the original. This will ensure that the conditions are different enough to be noticeable by children (Fancourt et al., 2013), even though they will not be exposed to more than one condition during the experiment. Fancourt et al. found that adjusting pitch by even a semitone is sufficient for preschoolers to detect a change, but in order to create more drastic pitch differences, the researcher will manipulate the pitch five whole tones in each direction. The tempo manipulations will be adjusted to 60 beats per minute for the slow condition, 110 beats per minute for the medium condition, and 160 beats per minute for the fast condition. This decision is based on previous tempo research in which the experimenters determined limits at which tempo was still perceived as believable to participants (Husain et al., 2002).

Procedure

Participants and parents will come into the lab for initial measurements of the dependent variables, sex stereotyping and gender identity, before the advertisement stimulus exposure. Before gathering these measurements, the researcher will play a game with participants for 5-10 minutes to allow time for familiarization. After the parents give informed consent and the participants give verbal assent, the tests will be administered to all participants. At this time, participants will be randomly assigned to one of the nine advertisement conditions. Parents will also receive a brief form for demographic information, which they will fill out while their child is receiving the two dependent measures. They will stay in the same room, out of their child's sight line, throughout the dependent measurements so children will be more comfortable. After the initial dependent variable measurements are complete, parents will receive a flash drive or DVD that contains a series of advertisements to present to their children over the next 2 weeks, which should allow enough time for the advertisements to have an effect on the participants. These advertisements will correspond to the condition each child was randomly assigned to, and parents will be instructed to show them during television-watching sessions every day for the next 2 weeks. The researcher will encourage parents not to drastically change television-watching habits throughout the week because the researcher is attempting to create a natural environment for the manipulations to occur in. Parents also will be encouraged to show the advertisements when their children are alone rather than watching with other children in order to minimize any confounding factors. The DVD or flash drive will contain two sets of three advertisements that parents will alternate every day, and the viewing instructions will be marked clearly to indicate which

advertisements to show on every Monday, Wednesday, and Friday versus every Tuesday, Thursday, Saturday, and Sunday. Parents also will be provided with a log so that they can record the time and place of each advertisement-viewing session, any strange occurrences that may have interrupted the sessions, and if their child watched television with another child. After the two weeks have passed, parents and children will return to the lab for another session in which gender identity and sex stereotyping will be measured. Then, parents will receive a full debriefing and will be reimbursed for their time and transportation costs.

Ethics

The results of this study could have potentially beneficial findings for both the scientific community and society at large. As mentioned earlier, the crossover between music and gendered messages in children advertisements has not been explored before. If musical features do affect how young girls develop gendered attitudes and behaviors, a new area of study will be opened up for psychologists and music researchers to investigate. This study could also have beneficial societal impacts. The general public, especially parents, will gain awareness about how young children could be more susceptible to persuasion and gendered attitudes and behaviors based on the type of music used in toy advertisements. The results of this study could help advocates demand more regulations on toy advertisements directed at young children and give precise evidence in their arguments.

Although this study has notable societal benefits, as mentioned above, there are no direct benefits to participants other than gaining knowledge about the effects of

advertisement messages after the debriefing. This knowledge may be especially helpful to parents of participants because they will then be more aware of how gendered messages may be affecting their children and could spread that information to other parents as well. All of these possible benefits of the study outweigh the potential risks that participants face, especially because the study is below the level of minimal risk. The participants will not be exposed to anything they would not regularly experience in everyday life. The experimental stimuli will be drawn from real advertisements seen on children's television, which most children are already viewing regularly. Additionally, these stimuli will be the most common advertisements aired on children's television, so the researcher does not anticipate any ethical issues with advertisement selection. The gendered messages within these advertisements are also widespread and commonly presented to children through television programming, so they are not anticipated to add any more risk or negative influences on children that they do not already encounter in daily life.

Because this study involves children participants, there are additional precautions that need to be taken given that children are a protected population. The decision to use children participants is absolutely necessary to learn more about how strong, stereotypical gender messages may be affecting this segment of the population. The participants will not undergo any risks beyond those of everyday life experiences. The dependent variable measures are also simple and low-risk, and parents will be allowed to stay in the room with their children to increase comfort and decrease the possibility of any unexpected trauma. Parents will also receive a full debriefing after the study has ended, so they will be able to know about and explain what their children experienced and answer any of their children's questions. The children will also be debriefed, but not to the same,

detailed extent as parents. The participant information will be kept confidential as well. It is impossible to have participants retain anonymity during this study because they will be directly interacting with researchers in the lab. However, participants will receive a special number associated with their data that will protect their identities to be used during data analysis. The study will also be double-blind, so the researchers measuring the dependent variables will not be aware of what condition the children are in or which number is associated with each participant. To ensure that research assistants give the correct materials to each participant, the materials will be marked with letters to indicate the condition, and the random assignment list will indicate which letter should be given to each participant. Only the lead researcher will know which letters correspond to which conditions.

The researcher will also protect participants by not collecting any sensitive information, making participation voluntary, and not involving deception. This study does not involve any sensitive information from participants, so there are not any extra considerations to take into account in that regard. To ensure voluntary participation, parents will be required to give informed consent for their children, and children will be required to give verbal assent. If either of these conditions is not fulfilled, the child will not participate in the study. Overall, the potential scientific and societal benefits outweigh the potential risks of this study, and extra precautions will be taken given that the participants come from a protected population.

Proposed Results

The researcher will begin by assessing the reliability of the Gender Identity Scale and the Sex Stereotype Measure. The measures will be established as reliable if Cronbach's α is greater than .70, but it ideally would be higher than .80. Descriptive analyses will be carried out before each statistical test in order to determine measures of central tendency and spread of the dependent variables involved in the analysis: gender identity and sex stereotyping. The researcher expects that the dependent variables will be positively correlated with each other, and will run a simple correlation to test this prediction.

A 2-way Analysis of Covariance (ANCOVA) will be used to examine the main effects and interactions of tempo and pitch on both gender identity and sex stereotyping while accounting for the first dependent variable measures as a baseline score. An ANCOVA was selected because the dependent variable scores are expected to change between the first and second measurements, and this test gives a cleaner look at the effects of the advertisement intervention. The researcher will calculate a difference score for the first and second dependent variable measurements to determine if there is a significant difference between them. Through the ANCOVA, the researcher will be able to determine if the musical manipulations of tempo and pitch within the advertisements had a significant effect on participants' gender identity and sex stereotyping. To analyze the effects of pitch, the researcher will determine if there is a main effect of pitch on sex stereotyping and gender identity. The main effect of pitch on the dependent variables is expected to be significant, and the specific pattern of significance is predicted through the following hypotheses. First, participants exposed to the high-pitched music condition will

demonstrate more sex stereotyping as compared to participants exposed to the medium-pitched music condition, who will in turn demonstrate more sex stereotyping than participants exposed to the low-pitched music condition (see Figure 1). In other words, the main effect of pitch is expected to form a pattern in which the high-pitched music condition will show the most significance and the low-pitched condition will show the least. This result is predicted because previous research indicates that higher-pitched music induces a more positive mood, which increases receptiveness to persuasive messages (Bohner et al., 1992; Bruner, 1990; Jaquet et al., 2014), which correspond to gendered messages in this study. The gendered messages will contain specific stereotypical information corresponding to either male or female expectations, which are expected to directly relate to the dependent variables.

The researcher also expects to see the same pattern of results for pitch and sex stereotyping. Similar to the first hypothesis, this prediction is expected because higher-pitched music has been found to increase mood, which enhances the persuasiveness of advertisement messages. Because participants in the high-pitched music condition will be essentially primed for heightened persuasion in response to stereotypical gender messages in the advertisement stimuli, the researcher expects to find gender identity and sex stereotyping data that correspond.

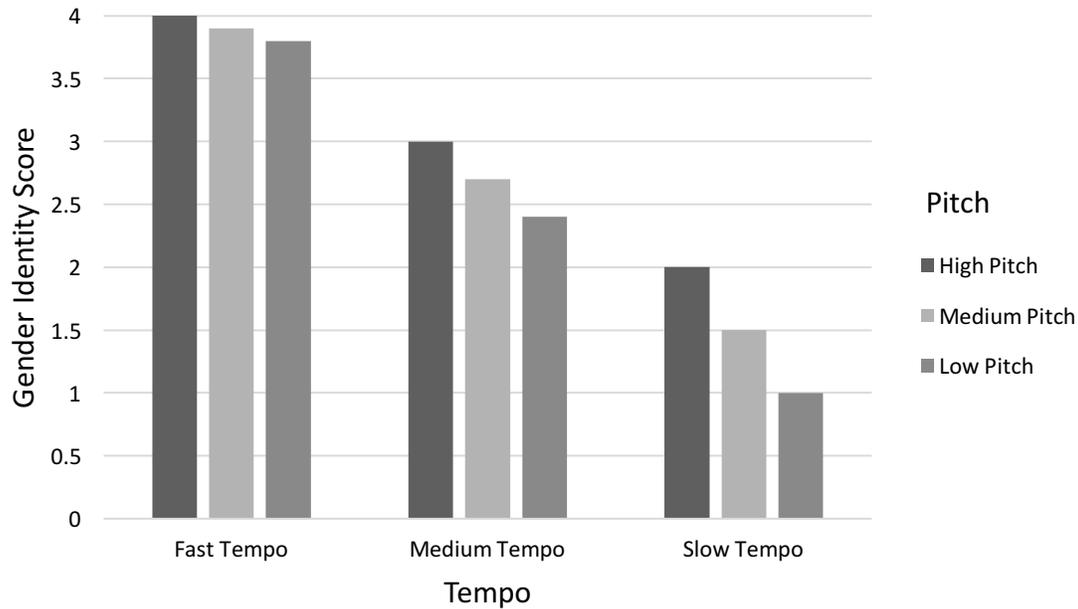


Figure 1: The effects of tempo and pitch on gender identity score. A similar pattern is predicted for sex stereotyping.

In order to analyze the effects of the second independent variable, tempo, the researcher will use the same 2-way ANCOVA to determine if there is a main effect of tempo on sex stereotyping and gender identity. The main effect of tempo is expected to be significant for both of the dependent variables. First, the researcher predicts that participants exposed to the faster-tempo music condition will demonstrate more sex stereotyping compared to participants exposed to the medium-tempo music condition, who will in turn demonstrate more sex stereotyping than participants exposed to the slower-tempo music condition (See Figure 1). Previous research about tempo reveals similar findings as pitch in that faster tempi are associated with more positive moods (Bohner et al., 1992; Bruner, 1990; Jaquet et al., 2014). Because of these findings, the faster-tempo music condition is expected to lead to more susceptibility to persuasion and therefore greater adoption of sex stereotyping attitudes in response to the stimuli. Tempo is also expected to have the same effect on the gender identity results. Again, this result is

expected for similar reasons as the previous prediction, namely because of how tempo influences mood and therefore persuasion.

Although the researcher expects that both tempo and pitch will have significant effects on the dependent variables while the other is held constant, these musical factors are also expected to interact with each other and influence gender identity and sex stereotyping. The researcher predicts that there will be a significant interaction between pitch and tempo in that participants exposed to the fast-tempo condition will have high gender identity and sex stereotyping scores even when the pitch is medium or low (See Figure 1). Essentially, the researcher expects that participants will always be more susceptible to the gendered messages in the fast-tempo condition, but this does not hold true for the high-pitch condition. Within the medium-tempo and slow-tempo conditions, pitch will have an increasing effect on the gender identity scores. This pattern is also expected for sex stereotyping scores. The reasoning behind this hypothesis is that researchers discovered that fast tempo increases arousal as well as mood (Husain et al., 2002) while pitch only increases mood (Jaquet et al., 2014). Therefore, tempo has the capacity to initially attract viewers' attention as well as induce a positive mood, and the researcher expects to see this difference reflected in the results.

Conclusion

The results of the present study could be revolutionary for the field of music psychology, as no researchers have examined the possible moderating effects of musical pitch and tempo on advertisement messages. If the predictions about tempo and pitch are supported and music is found to have a significant moderating effect on the relationship

between gendered messages, sex stereotyping, and gender identity, then a whole new area of research will be opened for psychologists and music researchers to explore. Previous research has found a link between music and emotional processing, and some studies have shown that music can induce different moods and arousal levels (Bruner, 1990; Bohner et al., 1992; Craton & Lantos, 2011; Dalla Bella et al., 2001; Fraser, 2014; Fraser & Bradford, 2013; Goshen & Ziv, 2006; Jaquet et al., 2014; Roulston, 2006). This evidence suggests that music has a powerful influence on how listeners process and experience emotions, and in turn how susceptible they are to persuasive messages (Bohner et al., 1992), which is a crucial missing piece in the research on children's advertising. Although researchers have found that most toy advertisements contain strong gendered messages (Rajecki et al., 1993; Schwartz & Markham, 1985), they have yet to fully explore the potentially harmful link between these messages and gender identity as well as sex stereotyping. The results of this study could reveal fundamental information about this link and point out how music may be a key influencing factor.

Although this study will address a wide gap in the existing literature, there are a few limitations to be discussed. First, because the advertisement stimuli will be administered in the field, there is less experimental control. Parents will be responsible for administering the experimental stimuli, so there could be potential errors that skew the data such as skipping a day or administering the same 3 every day rather than alternating. The researcher is aiming to create a natural advertisement-viewing environment for the participants, so for the purposes of this study, exposure to the manipulations within the children's homes is most appropriate. Additionally, having participants come into the lab every day for 2 weeks could create more attrition problems

because it is unlikely that all parents will show up to the lab every day. Administering the manipulations in the home is more convenient for the parents and will hopefully reduce attrition problems. However, future researchers could design another study that addresses this issue by having participants come to the lab for each advertisement stimulus session. Another limitation is that the experimental conditions will be drawn from existing toy advertisements, so they may contain some inherent biases that further limit experimental control such as previous exposure to the advertisements or preexisting opinions about them. Future researchers could try creating new advertisement stimuli that are not based on already-existing ones in order to remove any possible confounding variables.

The last noteworthy limitation of the current study is that the researcher chose to explore only pitch and tempo. There are other musical features that could also affect how children process advertisement messages, such as timbre, rhythm, and dynamics. There are many musical elements that could be contributing to the possible moderating relationship at hand, but they could not all realistically fit within the scope of one study. This limitation could be addressed by future research, especially focusing on musical timbre, which can vary greatly within music and lends distinct emotional qualities. Timbre is defined as the tone quality of music, and is usually associated with different instrumental sounds. Although the research on timbre and emotion is not as extensive as that of pitch and tempo, there are still some indications that timbre could be crucial to understanding the emotional quality of music. Hailstone et al. (2009) examined how people perceive emotions within music depending on the instrument being used within the excerpt. They manipulated the instrumental quality of the musical examples while holding all other elements constant to ensure that the results would not be confounded

with pitch or loudness, for example. They found that listeners associated timbres with different emotions within the music, and this phenomenon was the same across young adults and older adults as well as people with or without musical training.

Another possible link between timbre and gender identity or sex stereotyping is the gender stereotypes associated with specific instruments. Surprisingly, certain instruments are actually associated with males or females and researchers have found that children as young as 9 have stereotypes about which instruments are appropriate for girls to play and which are appropriate for boys to play (O'Neill & Boulton, 1996). These researchers found that girls had stronger preferences for instruments such as piano, flute, and violin, whereas boys had stronger preferences for instruments such as guitar, drums, and trumpet. This study provides empirical support for a common stereotype within music schools, and future research could explore how these instrumental stereotypes could be involved in advertising music perception. It would be especially interesting to examine if instruments associated with girls are more common within toy advertisements intended for a female audience, and vice versa for boys. Additionally, future researchers could create a study similar to the one presented in this paper, but manipulate timbre in terms of instrumental sounds that are stereotypically associated with boys or girls. The participants could be a broader age range of girls and boys, and could include children who are enrolled in music school and children who are not. The experimenter could use a more gender-neutral visual advertisement stimulus that could potentially appeal to both boys and girls, and then examine if the different timbral conditions affect ratings of arousal, mood, pleasantness, and preference for the product. There are many ways that researchers could continue to explore timbre within children's advertisements, and it

would be a logical next step for psychologists seeking to expand the scope of this research.

Another future direction for researchers in this field would be to include a broader sample of different age groups and genders. Perhaps similar moderating effects happen within toy advertisements aimed towards a young male audience. How would music within each traditionally-gendered advertisement category affect children of the opposite gender? Maybe young female viewers are affected differently by watching advertisements aimed towards boys, and vice versa because of the different kinds of gendered messages presented in each. Finally, the present study will use the original advertisement music as the “medium” condition for pitch manipulations, but it would be interesting to examine if there is some sort of threshold at extremely high or low pitches at which the music no longer affects how participants perceive gendered messages. If there is a threshold effect, are there age or gender differences in perception? Because this area of study is relatively unexplored, there are numerous possibilities for future researchers. Even if the results of the present study are not significant, that would not exclude the possibility that some musical features could be affecting how children process gendered messages. The proposed moderating relationship could be faulty, but this study is only the first step towards a greater understanding of how music and persuasion interact within the realm of children’s advertising.

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