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MOOD CHANGES DEPENDING ON PIANO AND HUMAN VOICE

Piyano ve İnsan Seslerine Bağli Duygusal Değişiklikler

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ABSTRACT

This study examined the mood changes created by Soprano-Alto-Tenor and Bass voices on people. A quasi-experimental design with a post-test control group was used as the research model. The study group consisted of a total of 155 students studying in the preparatory classes of a state university located in the Western Black Sea region. The participants in the study were randomly assigned to listen to 2 (piano: with piano and without piano) x 4 (voice types: soprano, alto, tenor and bass) voice types. Data were obtained using the 'Mood Scale' developed by Coşkun and Gültepe (2014). The data obtained were analyzed using the Mann-Whitney U test in pairwise comparisons and the Kruskal Wallis H test in more than 2 cases. As a result of the study, it was concluded that the alto voice type among different human voice types created a significant difference on mood. The findings showed that (a) the piano sound reduced anger and anxiety, (b) the alto voice type made people less angry and calmer, relaxed and joyful with the piano, and (c) the bass voice type accompanied by the piano provided the highest relaxation. These findings were discussed in the light of new approaches.

Keywords: Voice Types, Music, Mood, Soprano, Alto, Tenor, Bas.

ÖZ

Bu araştırmada, Soprano-Alto-Tenor ve Bas seslerinin, insanlar üzerinde yarattığı duygudurum değişimi incelenmiştir. Araştırma modeli olarak son test kontrol gruplu yarı deneysel desen kullanılmıştır. Araştırmanın çalışma grubunu, Batı Karadeniz bölgesinde bulunan bir devlet üniversitenin hazırlık sınıflarında öğrenim görmekte olan toplam 155 öğrenci oluşturmaktadır. Çalışmada yer alan katılımcılar, 2 (piyano: piyano ve piyanosuz) x 4 (ses türleri: soprano, alto, tenor ve bas) ses türlerini dinleme durumuna rastgele atanmıştır. Veriler, Coşkun ve Gültepe (2014) tarafından geliştirilen 'Duygudurum Ölçeği' aracılığı ile elde edilmiştir. Elde edilen veriler, ikili karşılaştırmalarda Mann-Whitney U, 2'den fazla durumlarda ise Kruskal Wallis H testi ile analiz edilmiştir. Araştırma sonucunda, farklı insan seslerinden Alto ses türünün, duygudurum üzerinde anlamlı bir farklılık oluşturduğu sonucu elde edilmiştir. Bulgular, (a) piyano sesinin öfke ve kaygıyı azalttığını, (b) alto sesinin insanları piyanoyla daha az öfkeli, daha sakin, rahat ve neşeli yaptığını ve (c) piyano durumundaki bas sesinin en yüksek rahatlamayı sağladığını göstermiştir. Bu bulgular yeni yaklaşımlar ışığında tartışılmıştır.

Anahtar Kelimeler: Ses Türleri, Müzik, Duygu Durum, Soprano, Alto, Tenor, Bas.

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GENİŞLETİLMİŞ ÖZET

İnsanın sosyal bir varlık olarak hayatını sürdürme ihtiyacından doğan iletişim kurma yetisi, önceleri sadece sesler çıkarıp beden dilini kullanmasını sağlamış, zamanla ise çıkardığı sesleri hecelere, kelimelere ve cümlelere dökerek konuşmayı keşfetmesine katkıda bulunmuştur. Bu ve benzeri birçok durum, ilk çağlardan itibaren müzik için seslerini kullanan insanoğlunun kendi sesini keşfetmesini ve daha güzel kullanma çabasını bir gereklilik olmaktan çıkarıp, adeta bir zorunluluk haline dönüştürmüştür. Bu dönüşüm, insanları yeni yöntemler için arayışa yöneltmiş ve bu yönelim de gelişmeyi paralelinde getirmiştir. Sesin kontrol altına alınması ile birlikte gelen gelişme; sesin daha doğru, etkili ve güzel kullanılmasını sağlamıştır (İleri ve yiğit, 2016).

Gerek görsel sanatlar, gerekse sinema ve televizyonlarda öteden beri insan duygudurumlarında değişiklik yaratmak istendiğinde sıklıkla insan sesi tercih edilmektedir. Nitekim yapılan bu seçimler tamamen tecrübeye dayalı olup, konuyla ilgili literatürde ses türlerinin duygudurum üzerindeki etkisine ilişkin bilimsel bir çalışmaya rastlanmamıştır. Bugüne kadar yapılan çalışmalar, büyük oranda müzik dinamiklerinden ses, ses çekiciliği, ritim, tempo ve hız değişimleri gibi birçok etmeni kapsamaktadır. Bu doğrultuda müzik ve müziğin birçok dinamiğinin; beynin sağ ve sol lobları, pozitif ve negatif etkiler ile yaratıcılığa katkısı, motive etme özelliği, kaygıda azalma, insan beyni, psikoloji, duygu ve duygudurum üzerinde ne derece etkili olduğu üzerine konuları kapsamaktadır (Cameron, Baker, Peterson ve Braunsberger, 2003; Sloboda ve Juslin, 2001; Trowbridge ve Juricevic, 2015; Van der Zwaag ve diğerleri, 2012). Bu çalışmalarda, enstrümantal müziklerin farklı yapısal özellikleri (tempo, ritim, hız değişimlerinin duygudurumlar etkisi) ele alınmıştır. Nitekim enstrümanlarla insan sesi arasında fark bulunduğundan dolayı kesin bir çıkarımda bulunmak mümkün değildir. Oysa böyle bir çalışmanın gerçekleştirilmesi, politikacıların halkla olan yakın ilişkilerinde savunduğu düşünceyi daha kolay kabul ettirebilmesine ya da anlatabilmesine; işletme, turizm, çağrı merkezleri ve halkla ilişkiler gibi çalışma alanlarında yaşanılan iletişim problemlerinin daha az seviyeye indirgenmesine ya da yok olmasına, hemşire ve doktorların hasta ile ilişkisinde tedavi sürecinin hızlandırılmasına, *ceo* ya da yönetici konumunda bulunanların karar verme süreçlerine katkı sağlamasına ve en önemlisi öğrenci-öğretmen iletişiminde öğrencinin derse odaklanma problemi, derse katılma isteği, anlatılan konunun daha iyi anlaşılması, öğrencinin bilgiyi alma-hazır hale getirilmesi sırasında yaşanan problem durumlarının çözümüne yönelik önemli katkılar sağlayabilir.

Yukarıda yapılan açıklamalar, insan sesinin bir kimlik gibi kişiliğe ait izler taşıdığını ve bu izlerin insan hayatının tamamına yakın bir kısmında varlığını sürdürdüğünü göstermektedir. İnsan sesinin kişilik üzerindeki etki boyutu ve insan üzerinde yarattığı olumlu/olumsuz etkilere rağmen, ses ve duygudurum perspektifinde eksikliklerin olduğu gözlemlenmektedir. Dolayısıyla insan ses türlerinin duygudurum üzerindeki etkisinin detaylı bir biçimde ortaya çıkarılması, insan hayatını şekillendiren ses olgusunun araştırılmasını ve duygular üzerinde nasıl bir etki gösterdiğinin anlaşılmasını gerekli kılmaktadır. Söz konusu çerçeve şartlar bütüncül bir bakış açısıyla düşünüldüğünde, ses türlerinin insanlar üzerinde yarattığı duygudurum değişiminin şimdiye kadar herhangi bir araştırma sonucu ile desteklenmemesi bu konuda ciddi bir boşluk yaratmaktadır. Bu yönüyle diğer çalışmalardan farklılık gösteren bu araştırma, insan sesinin tek bir vokal (harf) seslendirme ya da konuşmasını değil, birbirinden farklı 4 ses türüne ait şarkı söyleme sesinin, katılımcılara dinletilmesini ve duygudurum üzerinde nasıl bir değişim yarattığının gözlemlenmesini araştırmaktadır. Bu araştırma ile literatürde ilk kez, insan sesi türlerinin (Soprano, Alto, Tenor ve Bas) duygudurum (kızgın, endişe, üzgün, rahat, sevinç vb.) üzerindeki etkisi incelenmeye çalışılmıştır. Söz konusu ses türleri piyano eşlikli ve piyano eşliksiz olarak stüdyo ortamında kaydedilmiş olup,

uygulama sırasında katılımcılara dinletilmiştir. Bu araştırmanın psikoloji ve müzik alanında birçok önemli doğurguları bulunmaktadır. Araştırmanın sonuçlarını tartışmadan önce insan sesi, ses türleri ve duygu durum alanında kuramsal yaklaşımları, ilgili literatürü incelemek öncelik taşımaktadır.

Gerçekleştirilen analizler sonucunda elde edilen bulgular, farklı insan ses türlerinin duygudurum üzerinde yarattığı etkinin anlamlı olduğunu ve duygudurum üzerinde yarattığı etkinin farklılaştığını ortaya koymuştur. Ses türleri arasındaki farklılık incelendiğinde; sadece alto ses türünde kızgın, sakin ve rahat duygudurumları arasında anlamlı farklılıklar olduğu görülmüştür. Ortaya çıkan bu sonuç, alto ses türünün diğer seslere göre insanlar üzerinde daha fazla kızgın, sakin ve rahat hissettirdiğini göstermiştir. Araştırmanın bu bağlamda elde edilen birinci ve ikinci bulgusu, ses türleri arasında kızgın ve sakin duygudurumuna yol açan seslerin sırasıyla "Alto-soprano-bas ve tenor", rahat hissettiren seslerin ise "Alto-bas-soprano ve tenor" olduğunu göstermiştir. Araştırma bulguları daha önce yapılan araştırmalardan elde edilen sonuçlarla karşılaştırıldığında; bas ve alto ses türüne sahip kişilerin, sert karakterli kişiler ile üst düzey yöneticiler olduğu (Collins, 2000), yüksek mevkileri elde etme konusunda daha başarılı olduğu (Klofstad, Anderson ve Peters, 2012; Tigue, Borak, O'Connor, Schandl ve Feinberg, 2012), ikna ve motive etme becerisine sahip olduğu, daha baskın (Borkowska ve Pawlowski, 2011; Gregory Jr. ve Gallagher 2002; Jones ve diğerleri, 2010), daha yetkin ve daha güçlü (Klofstad, Anderson ve Peters, 2012) olduğu sonucuna ulaşılmıştır. Bu noktada, alto ses türünün kızgın duygudurumunu daha fazla hissettirmesinin, bu sesin karakteristik yapısında var olan baskın ve güçlü hissinden kaynaklı olduğu düşünülmektedir. Ayrıca politik yaşam içerisinde bu seslerin daha iyi performans gösterdikleri (Gregory Jr. ve Gallagher, 2002) ve kalın sesli CEO'ların şirketlerine daha fazla para kazandırdığı (Mayew, Parsons ve Venkatachalam, 2013) gibi faktörler düşünüldüğünde, bu mevkide bulunanların konumları gereği; kızgın, sakin ve rahat duygusunu daha fazla hissettirmesinin nedenleri daha anlamlı bir hale gelmektedir. Bununla birlikte, ülkemizde alto seslerin seslendirdiği eserler daha çok göğüs rejistırında ve alışılagelmiş tını neticesinde kalın bir yapıya sahiptir. Ayrıca kadınların popüler kültür adına soprano ses türüne sahip olsa bile alto ses aralığında şarkı söylemeyi tercih etme durumu, alto ses türünün diğer ses türlerine göre daha çok sakin ve rahatlatıcı bir etki ortaya çıkarmasını sağlamış olabilir.

Bu doğrultuda karar verici konumda bulunan meslek gruplarına (şirket yöneticileri, finans kurumları, işletme, halkla ilişkiler, turizm, müşteri hizmetleri, sekreterler, ses sanatçıları, radyo / tv / haber spikerliği, sunucular, sinema ve tiyatro oyuncuları, politika, politik liderler, avukatlar, doktorlar ve öğretmenler vb.) yönelik etkili öğretim programları ile etkin öğretim yöntemlerinin geliştirilmesi, eğitim programları hazırlanması ve bu konuda hizmet içi eğitim verilmesine katkı sağlama potansiyeli yanında, bu alanlara yönelik daha verimli sonuçlar elde edilebileceğini göstermektedir. Dolayısıyla etkili öğretim programlarının geliştirilmesi aynı zamanda eğitim ortamlarındaki öğretmen davranışlarına yeterli desteğin yanında, politikacıların halk ile ilişkisi ve savunduğu düşünceyi kabul ettirebilmesinde, ya da ticaret alanında farklı ülkelerle yapılan sözleşmelerde, insan sesinin önemini bir kez daha bütün boyutuyla ortaya çıkarmaktadır.

Human voice types, which vary from men to women, have different effects on people's perceptions and emotions. Although human voices are the subjects studied in the field of music, empirical studies examining the relationship between human voice types and emotions are not yet available in literature. In this study, for the first time in the literature, the effects of human voice types (Soprano, Alto, Tenor, and Bass) on mood (angry, anxiety, sadness, calmness, joyful, and enthusiasm) were studied. These types of voices were recorded in the studio environment with or without piano accompaniment, and the participants listened to each of these sounds during the experiment. Before discussing the experimental design of the study, it would be appropriate to present the theoretical approaches and the literature about the human voice, voice types, and mood.

The ability to communicate arises from the need to maintain life as a social being. This ability enables individuals to produce speech due to the conversion of the voices they produce into syllables, words, and sentences (Hays and Minichiello, 2005). Developing vocal control allows for more accurate, effective, and expressive use of the voice. (Forward and Valiant, 2016). For instance, the study by Collins (2000) indicated that women preferred men with a lower pitched voice and men preferred women with a higher pitched voice. Other studies also demonstrated that women predicted men with large or hairy breasts as having a lower pitched voice (Feinberg, Jones, Little, Burt, and Perrett, 2005; Olericonnor, Fraccaro, and Feinberg, 2012).

Type or color of the voice is one of the influences of the fine art of speech, even though it has the quality that comes with its nature (Gürhan, 2014). Also, the color and tone of voice used in marketing studies and the general communication skills are highly effective at the sale (Pace, 1962). In addition, the audience preferred to vote for politicians with a lower pitched voice (Klofstad et al. 2012; Tigue et al., 2012). Moreover, the fact that teachers do not use the tone and accent in the desired way together with the gestures and facial expressions has very serious detrimental effects on the students during learning processes (Görgen, 2003; Kasım, 2009). The above-mentioned studies implicitly indicate that human voice is effective in mood and interpersonal relationship. However, there is no direct research on this subject.

Emotion and Mood

Emotions are seen as sensations that result in physical and psychological changes affecting behavior (Barsade and Gibson, 2007; Lohan, 2016; Plutchik, 1982) and defined as short, circumferential, and specific environmental events (Pergher, Oliveira, Ávila, and Stein, 2006). Emotions are classified under 6 universal headings (happiness, surprise, disgust, sadness, anger, and fear) and expressed with various behaviors such as facial and voice expressions, gestures, and posture (Ekman, 1992).

Moods are distinguished from emotions in terms of not only by their duration but also by physiology and later effects (Ekman, 1992; Lohan, 2016). The mood is defined as being more permanent (Gross, 1998) and more stable character, not related to specific situations (Bronner, 2007; Gendolla, 2000; Gross, 1998; Morris, 1989; Pergher, Oliveira, Ávila, and Stein, 2006). Given the considerations that when positive or negative factors are influential on human life, it is not surprising to see that positive mood enhances creativity (Biss, Hasher, and Thomas, 2010; Forgas, 2000; Hirt, 1999; Isen, Daubman and Nowicki, 1987; Rowe, Hirsh and Anderson 2007). Besides, positive mood is beneficial in problem-solving, reasoning, and decision making (Pham, 2007; Van der Zwaag, Janssen, and Westerink, 2013). On the other hand, a negative mood can also increase creativity (Davis, 2009; George and Zhou, 2002; Kaufmann and Vosburg, 2002). The inconsistent findings of the above-mentioned studies may be due

to the fact that these studies involve different manipulations used by the mood researchers to bring the participants to the certain type of moods (Gültepe and Coskun, 2016).

One of the intriguing areas of research is the effect of the human voice on mood. In this respect, music, and psychology, in particular, interdisciplinary fields of study, such as human voice and emotion, are in an educational point about the flexible structure of human voice (Waaramaa and Kulmala, 2009).

Importance of the Research

The studies on human voice include a lot of factors, such as sound, sound attractiveness, rhythm, tempo, and

speed variations from music dynamics. In this respect, it covers topics such as how many dynamics of music are effective in the right and left lobes of the brain, in creativity, motivation, anxiety, emotion, and mood (Cameron, Baker, Peterson and Braunsberger, 2003; Sloboda and Juslin, 2001; Trowbridge and Juricevic, 2015; Van der Zwaag et al., 2013).

In these studies, the effects of different structural features of the instrumental music (tempo, rhythm, and speed changes) on the mood were investigated. Despite these advancements, the fact that the mood change created by the human voice types has not been examined so far creates a serious gap in the literature. This research, which differed from other studies in this respect, consisted of examining the effect of 4 human voice types on the mood rather than a single vocalization.

In this study, we tried to investigate which voice type with piano accompaniment or without piano accompaniment was effective in the mood. In other words, the four different voice types (Soprano-Alto-Tenor-Bass) were used in the study, and the correct tone and intonation (sound in tone) were achieved. In another condition, these voice types were accompanied by the piano. In this way, we examined whether piano accompaniment had an impact on the mood of the participants. The aim of this study was to investigate the effect of different human voice types (Soprano-Alto-Tenor-Bass) with or without piano on the mood. For this purpose, the following questions were sought:

1. Is the effect of the different types of voice sounds on the mood significant?

2. Is there a difference in mood between the different types of human voice and the human voice accompanied by the piano?

In addition to these questions, in the light of the literature discussed above, it would be hypothesized that the expected types of human voices would positively affect the mood of the individuals and on the other hand, the unexpected type of voice (alto) would have a negative effect on the mood. Testing the validity of this hypothesis is a unique contribution of this research to the literature.

METHODS

Research Model

The model of this research is a quasi-experimental design with the post-test control group. In this design, the participants' feelings were neutralized at the beginning of the study and in this way, the differences in the mood of

the participants were controlled before the pre-test. A 2(piano: piano and without piano) x 4(human voice types: soprano-alto-tenor-bass) ANOVA showed that all participants had an average value of mood (3.02) at the beginning of the study (or before listening to human sound and piano) without any difference across the experimental conditions (all p's >.14).

Participants

The participants consisted of a total of 155 students studying in the preparatory class of a state University in the Western Black Sea Region. 82 (52.9%) were female and 73 (47.1%) were male. The participants were the students who did not have music education and did not have the ability to play any instruments. In addition, related information regarding the use of the piano, gender, and the total number of participants were illustrated in Table 1.

Table 1. Design of the Study

Group	Treatment	Post Test	Female	Male	Total
Experimental Gr.	No Piano	Mood Scale	48	43	91
Control Gr.	Piano	Mood Scale	34	30	64
Total					155

Instruments

The participants filled out the demographic information form including gender, age, class, insomnia status, hunger state during the study and the place where they spent most of their life. The neutralization text, described as below, was given before the mood scale. The mood scale was used as a data collection tool for the dependent variable.

The text of neutralization. This text, which was applied before filling the form and mood scale, consisted of a text of 84 words and 8 lines, representing a student's daily life, including shopping. The text of neutralization was used to neutralize the mood of participants before the study. The participants were asked to rewrite the same text at the bottom of the page within 2 minutes.

Mood scale. A scale developed by Coskun and Gültepe (2013) is a seven-item Likert type scale with a range between 0-10, including angry, anxious, sad, calm, relaxed, joyful, and enthusiastic items. It consisted of two factors, namely negative mood (angry, anxious, sad) and positive mood (calm, relaxed, joyful, enthusiastic), accounted for 68.20 % of the total variance.

The Cronbach alpha for this scale was 0.94. In addition, this was a scale that showed the extent to which voice types were effective on participants after listening to 4 different voice types (Soprano, Alto, Tenor, and Bass) without piano and with piano accompaniment.

Voice Types;

• Soprano: The highest female voice type. It is the most common type of voice in female voices.

• Alto: The lowest female voice type, generally associated with a darker and fuller timbre and a stronger chest register.

• Tenor: The highest male voice type.

• Bass: The lowest male voice type, less commonly encountered than other male voice types.

Procedure

The procedure of the study was evaluated by the Human Research Ethical Committee and then the necessary permission was taken from the Vocational School of Foreign Languages at the university. At the onset of the research, the participants were asked to fill in and sign the Informed Consent Form that provided general information about the research and their participation was based on a voluntary basis. Then, the demographic information form, the text of neutralization and the mood scale were distributed to the students.

The treatment was carried out in an isolated room specially prepared for groups of 4 or 5 people with the help of two instructors in addition to the researcher. In the study, the different types of voice were recorded with piano and without piano accompaniment. Thus, a total of eight records were completed. Before the treatment, the participants' feelings were neutralized through the text of neutralization. Then, the participants were randomly assigned to the relevant conditions. Here, the voice types were played to the participants through the audio booths (studio speakers) in the room. All participants were exposed to the same output/effect through the sound booths of the work in a professional manner since a slight loss of sound might show the possibility of having a different effect on students' mood. On the other hand, to prevent differences in average amplitude values among certain voice types from affecting the research results, all sound recordings were played to the participants at 65 decibels, as measured using a decibel meter. The results of the musical analysis revealed that the sound did not have any effect.

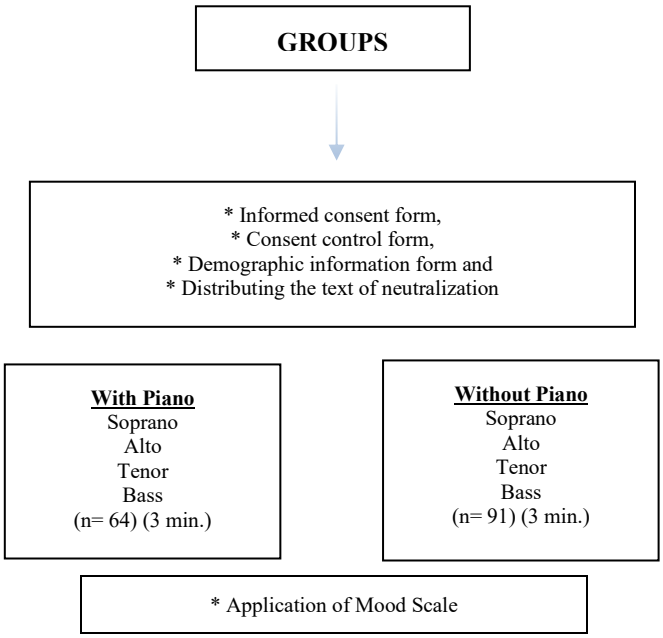

Figure 1. *Procedure of the Experiment*

Shortly after listening to the musical pieces, they were asked to rate themselves on the mood scale. All stages of the application lasted approximately 15 minutes. At the end of study, the participants were given detailed information about the research and thanked for their participation.

Musical Type Determination Process

The selected work, the Neapolitan song of Rodolfo Falvo (1873-1937) was 'Dicitencello vuie'. All musical

dynamics (tempo, rhythm, accelerando, rubato, ritardando and fermata etc.) of four voice types (soprano-alto-tenor, and bass) were similar in the musical work. In the examination of the similarity situation, the opinions of 4 instructors in the field of music education were taken. In this study, musical pieces in a foreign language were preferred to avoid potential associations between the lyrics of Turkish works and participants' mood. For this reason, selecting a work from the classical music repertoire was found to be appropriate. Since the arias (the song in the opera) were written for each voice type, aria *antiche*s (small or old songs independent of the opera) were not preferred because they did not have a nuance, expression, and wide rhythmic integrity. Factors such as the fact that the lyrics were non-comprehensible, that the work could be performed easily by 4 voice types, and that they contained the elements of integrity with large rhythmic patterns were among the reasons why the work called Dicitencello vuie was preferred. In addition, the song Dicitencello vuie was performed in both high and low registers, allowing all voice types to demonstrate their full vocal range. To ensure that timbral characteristics and vocal color could be clearly perceived within the vocal ranges, the piece was performed in C minor for the soprano and tenor voices, and in A minor for the alto and bass voices. In determining the key of the piece, the key preferences of singers with the same voice type were taken into account.

Data Analysis

Since the distribution exhibited normal distribution characteristics, a two-way ANOVA was used for comparison of all types of sound. Since instance mood was correlated with some dependent variables, two-way ANCOVA analyses were also run.

The recording phase of the work was transferred to the computer via the iTunes program and then with the software prepared in Matlab (software program) and .m4a extension audio files, .wav extension files can be processed. The record performance, spectrograms, and amplitude analysis concerning the four voice types were performed with Matlab supported analysis program. The time frame of the audio file of each audio type was plotted through these programs. Comparing the parts corresponding to the same words in the recordings, it was seen that the Tenor was performed at a higher basic frequency than the Bass and the Soprano was performed at a higher basic frequency than the Alto. This means that the selected voice ranges were suitable for the specified voice types.

FINDINGS AND DISCUSSION

As can be seen in Table 2, data were normally distributed since all values were less than -2.00 or 2.00. Thus, we run 2 (piano: with piano and without piano) x 4 (voice types: soprano, alto, tenor, and bass) ANOVA analyses for the data. Only were significant findings reported.

Table 2. *Normality Test Results for Scale Items Used in the Study*

Variable	Kurtosis	Skewness
Angry	1.98	1.66
Anxious	1.21	1.26
Sad	-.70	.63
Calm	-1.13	.13
Relaxed	-1.12	.22
Joyful	-.34	.72
Enthuastic	-.62	.67

The effect of the piano condition was significant on angry mood, F (1, 147) = 9.94, P = .002, η^2 =.07. The participants in the piano condition (M = 2.21) were less angry than those in the no piano condition (M = 3.18). Albeit there being no interaction effect, as can be seen Table 2, a planned comparison showed that the participants who listened to alto voice type in the piano condition (M= 1.70) were less angry than those in the no piano condition (M = 3.46). Also, we also conducted 2 X 4 ANCOVA analysis since general mood (How do you feel today?) before the treatment was negatively but weakly correlated with angry mood (r =-.15, p = .06). This analysis showed that this mood had a significant effect on angry mood, F (1, 146) = 4.17, p = .04, indicating that those who felt good today were less angry.

The general mood before the treatment was negatively correlated with sad mood (r =-.34, p = .0001). The

ANCOVA analysis showed that this mood had a significant effect on sad mood, F (1, 146) = 19.33, p = .0001, indicating that those who felt good today were less sad.

The effect of piano situation was significant on anxious mood, F (1, 147) = 5.47, P = .02, η^2 =.04. The

participants in the piano condition (M = 2.37) were less anxious than those in the no piano condition (M = 3.12). The effect of piano situation was also significant on calm mood, F (1, 147) = 7.78, p = .006, η^2 =.05. The participants in the piano condition (M = 5.87) were calmer than those in the no piano condition (M = 4.07). Albeit there being no interaction effect, a planned comparison showed that the participants who listened to alto voice type in the piano condition (M= 6.47) were the highest calmness over those in the no piano condition (M = 4.80).

This analysis showed that the effect of piano situation was significant on relaxed mood, F (1, 147) = 5.98,

p = .02, η^2 =.04. The participants in the piano condition (M = 5.82) were more relaxed than those in the no piano condition (M = 4.76).

Albeit being no interaction effect, a planned comparison showed that the participants who listened to alto voice type in the piano condition (M= 6.47) had the highest relaxation over those in the no piano condition (M = 4.38). Also, the participants who listened to bass voice type in the piano condition (M= 6.10) had the highest relaxation over those in the no piano condition (M = 4.76). The general mood before the treatment was positively correlated with relaxed mood (r = .16, p = .05). The covariance analysis showed that this mood had a significant effect on relaxed mood, F (1, 146) = 6.01, p = .01, indicating that those who felt good today were much more relaxed.

Albeit there being no interaction effect (3, 147) = 1.69, p = .17), a planned comparison showed that the participants who listened to alto voice type in the piano condition (M= 4.12) reported more joyfulness than those in the no piano condition (M = 3.03). On the other hand, the participants who listened to tenor voice type in the no piano condition (M= 3.61) were more joyful than those in the piano condition (M = 2.54). The covariance analysis was conducted since general mood before the treatment was positively correlated with joyful mood (r = .32, p = .05) and showed that this mood had a significant effect on relaxed mood, F (1, 146) = 18.69, p = .0001, indicating that those who felt good today were much more joyful.

Albeit there being no interaction effect (3, 147) = 1.69, p = .17), a planned comparison showed that the participants who listened to alto voice type in the piano condition (M= 4.05) reported being more enthusiastic than those in the no piano condition (M = 3.26). On the other hand, the participants who listened to tenor voice type in the no piano condition (M= 3.43) were more enthusiastic than those in the piano condition (M = 2.18). The

covariance analysis was conducted since general mood before the treatment was positively correlated with relaxed mood ($r = .27$, $p = .001$) and showed that this mood had a significant effect on relaxed mood, $F (1, 146) = 11.52$, $p = .001$, indicating that those who felt good that day were much more enthuastic.

Table 3. *Mood Changes Depending on Piano and Human Sounds*

	Without Piano				With Piano			
Voice Types	Soprano	Tenor	Alto	Bass	Soprano	Tenor	Alto	Bass
Mood Types	**3.83**	**2.57**	**3.46**	**2.86**	**2.65**	**1.91**	**1.71**	**2.58**
Anger	(2.64)	0.98	2.19	1.93	1.80	1.80	1.53	0.90
Anxious	**2.87**	**2.95**	**3.23**	**3.43**	**2.53**	**2.00**	**2.59**	**2.37**
	(2.03)	(2.24)	1.80	2.42	1.46	2.03	1.69	1.34
Sad	**4.22**	**3.57**	**4.15**	**4.24**	**4.06**	**4.82**	**3.82**	**4.47**
	(2.69)	(2.59)	2.46	2.93	2.46	3.34	2.67	2.48
Calm	**4.48**	**4.90**	**4.81**	**4.62**	**5.47**	**5.91**	**6.47**	**5.63**
	(2.66)	(2.84)	2.55	2.15	2.27	2.59	2.50	2.56
Relaxed	**4.52**	**5.38**	**4.38**	**4.76**	**4.82**	**5.91**	**6.47**	**6.11**
	(2.78)	(2.54)	2.55	2.36	2.56	3.11	2.98	2.35
Joyful	**3.13**	**3.62**	**3.04**	**3.29**	**2.88**	**2.55**	**4.12**	**3.74**
	(2.22)	(2.03)	1.89	2.28	1.83	1.57	2.52	2.02
Enthusiastic	**3.65**	**3.43**	**3.27**	**3.62**	**2.94**	**2.18**	**4.06**	**3.11**
	(2.60)	(2.15)	2.05	2.41	2.19	2.09	2.73	2.13

*Standard deviations were shown in parentheses. Means were shown in bolds.

DISCUSSION

The first question of the research was what the effect of different human voice types was on the mood. The current findings support the effect of different human voice types on the mood. Clearly speaking, we found significant differences between angry, calm, relaxed, and joyful moods only in alto voice type. This result shows that alto voice makes people less angry, more calm, relaxed and joyful to the accompaniment of the piano. Also, the participants who listened to bass voice type in the piano condition had the highest relaxation than those in the no piano condition. Taken together, these findings were in line with the research findings in the literature. Previous studies have demonstrated that people with bass and alto voice types are perceived as hardcore and senior executives (Collins, 2000), more successful in achieving higher positions (Klofstad, Anderson and Peters, 2012; Tigue et.al., 2012), more persuasive, dominant (Borkowska and Pawlowski, 2011; Gregory Jr. and Gallagher 2002; Jones et al., 2010), competent and stronger (Klofstad et.al., 2012). At this point, it seems that the alto voice type may enhance the angry mood due to its dominant and strong sensation characteristics. On the other hand, this voice type combined with a piano makes the individuals relieved and relaxed. This is also consistent with the findings that these voices perform better in political life (Gregory Jr. and Gallagher, 2002) and companies (Mayew, Parsons and Venkatachalam, 2013).

However, in our country, works performed by alto singers are predominantly sung in the chest register, resulting in a darker and fuller timbral quality. In addition, within the context of popular culture, some women prefer to sing in the alto range despite having a soprano voice type. This tendency may have contributed to the perception of the alto voice as having a calmer and more relaxing effect than other voice types.

Another finding of this study was the effect of the piano sound on negative emotions. Findings showed that

the sound of piano reduced angry and anxious mood. This finding was not consistent with recent research indicating no significant differences among string, piano, and marimba music in reducing anxiety (Matney, 2017). This difference may be due to the fact that the current research used only piano sound, the latter research used orchestra Suite No. 3 in D. Major, BWV 1068, from Bach. On the other hand, the current research has demonstrated that piano sound does not affect positive moods such as calmness, relaxation, joyfulness, and enthusiasm. Despite the fact that piano sound has some degree of relaxation effect compared to natural white noise and natural soundscape (Yu, Hu, Funk, & Feijs, 2016), there is no explanation in the literature about this effect of piano sound.

This may be a possible explanation for it. Negative mood is the emotions that people want to get rid of. In this sense, the piano can be a means of getting rid of these feelings. Piano sound has a relaxing effect. On the other hand, the piano sound has no effect on a positive mood because people with a positive mood are already in a positive mood and there is no external neutral or positive stimulation for these people. The fact that piano sound is effective on the negative mood and not effective on the positive mood reveals a selective processing hypothesis or model. According to the selective processing model, the piano sound, which is a neutral sound, has the effect of diminishing negative emotions, but it does not increase the positive emotions.

A new finding of the current research was that the participants who listened to tenor voice type in the no piano

condition were more joyful and enthusiastic than those in the piano condition. In line with the above explanation, the piano sound did not improve positive moods. But tenor voice's having an increasing value for positive moods needs an explanation. In the literature, there was no single study that addresses this issue except for the current study. One research has examined the effect of the choir including the traditional soprano, alto, tenor and bass voice types and evaluated the effect as a whole rather than on an atomic level, especially the role of conductor as well (Kirrane, O'Connor, Dunne, & Moriarty, 2017).

Tenor voice type is a low-frequency sound having positive emotion evoking value (Karageorghis, 2016). This may be related to culture. In Turkey, younger generations are more frequently exposed to tenor-voiced songs associated with themes of love, longing, heartbreak, and romantic imagery. (Akben and Coskun, 2019). In our culture, tenor-voiced music is frequently used in wedding ceremonies. Future studies, therefore, should investigate why tenor voice type produces joyfulness and enthusiasm across different generations and cultures.

This research has important implications for education. Voice is an important factor in student teacher communication. In this context, in terms of teachers' interaction with the classroom and the orientation of the students' attention to the lesson, a teacher who uses his or her voice effectively is more advantageous than a teacher who cannot use his or her voice effectively (Terzi, 2002). In sum, the most important reason for students to have difficulty in understanding and perceiving different courses (language, mathematics, and etc.) is the use of the teacher's voice.

Therefore, the development of effective teaching programs will also provide adequate support for teachers'

behavior in educational settings. Moreover, the decision makers in various areas (company managers, financial institutions, business, public relations, tourism, customer service, secretaries, voice artists, radio / TV / newscaster, presenters, film and theater actors, etc.) should develop effective teaching methods, prepare training programs, and provide in-service training. Appropriate use of sound colors in these areas is an important factor.

The findings also have implications for social behaviors. Findings from a significant portion of previous research have shown that people with lower pitched voices have more attractive, persuasive and leadership qualities and thus have motivating characteristics (Collins, 2000; Collins and Missing, 2003; Feinberg et al., 2005; Perrett, 2005). In addition, people perceived women with a lower pitched voice as more competent and stronger compared to women with a higher pitched voice (Klofstad et. al., 2012). In this respect, teachers' ability to motivate and persuade students in certain subjects by using bass, alto and tenor voice type qualities, depending on the situation, will contribute to the potential of educators to make a more reliable impression on the students.

The participants of the study consisted of university students. Preparing future research to cover a broad working group from primary level to university may increase more generalizable results. Also, in future research, other than the mood scale, physical scales such as EEG, fMRI, facial screening can be used. These measurements may provide further additional support for the research results. In addition, different forms of expression, dynamics, nuances, rhythmic elements, tonality, and tempo diversity should be examined in future research. Thus, the change created by the musical work on the mood can be examined systematically.

In sum, the findings of the current study indicated that (a) piano sound reduced anger and anxiety, (b) the alto voice type makes people less angry, calmer, relaxed, and joyful to the accompaniment of the piano, and (c) bass voice type in the piano condition produced the highest relaxation, and (d) the participants who listened to tenor voice type in the no piano condition were more joyful and enthusiastic than those in the piano condition, and (e) general mood was related to some instant moods such as anger, sad, relaxed, joyful, and enthusiastic ones. Taken together, these findings have suggested that human voice types, as well as piano sound, should be taken into consideration in various applications of educational settings concerning mood.

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