

PROJECT ISTANBUL: THE USAGE OF ORIENTAL ELEMENTS  
IN WESTERN ELECTRONIC MUSIC

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by  
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**Introduction**

In this paper, it is intended to accomplish a systematic presentation of the goals, method and findings of the final project “The Usage of Oriental Elements in Western Electronic Music”, which is also referred as “Project Istanbul”. In its modest attempt, Project Istanbul strives to study music perception differences of individuals with diverse cultural backgrounds to answer the question regarding whether cultural background manipulates music perception of individuals. This paper consists of the assessment of the overall process including the method, technical matters, phases of the study, details of the hypothesis which constitutes the foundation of the research, results and discussion.

**Music Perception and Culture**

It is a common fact that the popularity of a song or a music genre varies in different regions. As culture is described as the act of developing the intellectual and moral faculties especially by education ("Merriam Dictionary"), one may claim that culture can be accepted as combination of different developments. As the developments in question vary dramatically in different parts of the world depending on many variables including wealth, religion, language or politics, disciplines such as sociology, anthropology, history and psychology focus on the motives that cause differences in culture.

Culture

By knowing that the cultural backgrounds of different societies are very different, we may automatically accept that each society reacts to the same piece of music differently. Not only the music charts of similar genres in different countries, but also the popularity of different contemporary music genres in different regions show great diversity ("Billboard International Charts"), as Paul D. Lopes (1992, 70) claims that the contemporary popular music industry

demonstrates that large culture industries provide a significant level of innovation and diversity. It is widely accepted that the number of the albums sold differ dramatically in different regions of the world; people with a distinct cultural background may love a specific album which may not be favored by other cultures.

Even though some fields of scholarship such as musicology, ethnomusicology, sociomusicology, and music psychology focus on understanding the grounds for the diversity of musical preferences in different cultures in more detail, one may claim that there is not enough research which links the factors in question with other disciplines such as psychoacoustics.

### Human

The brain processes the electrical signals from the cochlea using vastly complicated networks of specialized neurons and the way the sound is analyzed depends on individual personal experiences to a certain extent; the strengths of the connections between neurons change as we experience sounds, particularly during early infancy when the brain is growing rapidly (Plack 2005). Studies in neuroscience suggest that a neurotransmitter, the chemical released by the axon of a neuron, may be excitatory or inhibitory; it may excite or inhibit the receiving neuron from firing in human auditory systems ("Psychoacoustics"). Though, we are unaware to what extent the inhibitory input originates from outside the central auditory system or to what extent it conveys an auditory input (Rubsamen, Rudolf, Kopp, Cornelia, Dorrscheidt, Gerd-Joachim 1999, 15). Accordingly, one may consider that it is scientifically proven that personal experience likely shapes the physiology of the perception system.

*“The picture about neural organization for music was becoming clearer. All sound begins at the eardrum. Right away, sounds get segregated by pitch. Not much later, speech and music probably diverge into separate processing circuits. The speech circuits decompose the signal in order to identify individual phonemes— the consonants and vowels that make up our alphabet and our phonetic system. The music circuits start to decompose the signal and separately*

*analyze pitch, timbre, contour, and rhythm. The output of the neurons performing these tasks connects to regions in the frontal lobe that put all of it together and try to figure out if there is any structure or order to the temporal patterning of it all. The frontal lobes access our hippocampus and regions in the interior of the temporal lobe and ask if there is anything in our memory banks that can help to understand this signal. Have I heard this particular pattern before? If so, when? What does it mean? Is it part of a larger sequence whose meaning is unfolding right now in front of me?" (Levitin, Daniel J. 2006, 128)*

### The Intersection

By combining all of the information gained from various disciplines, one may argue that cultural background of an individual affects not only on the brain's process of the perceived information, but also how an individual's auditory system transmits the stimuli to the brain.

### **Measuring the Effects of Culture**

Understanding, measuring and evaluating the effects of cultures on any phenomenon with the help of empirical material is challenging; disciplines such as musicology, psychology and sociology which explore the aspects of human society typically do not use the same scientific methods of natural science disciplines such as physics, biology and chemistry. In natural sciences, we come to the law of nature with the help of inductive reasoning. Furthermore, natural sciences endeavor to explain aspects of a reality with formulas, laws and definitions. Formal sciences such as mathematics, information theory and logic are based on rules and definitions, while social sciences such as sociology, anthropology and musicology use methods which are analytical, critical, or speculative.

### Approaches from Various Disciplines

Theories such as gestalt psychology, the predisposition to see the whole before the parts, support the argument that music perception can be handled as a psychological matter. It may be

claimed that music perception characteristics can be understood and explained via analysis of personal psychological attributes. Moreover, the theory in question provides enough information to claim that music perception can also be handled as a sociological matter, as the idea of “whole” can be manipulated by not only psychological and physiological, but also social factors.

Diana Deutsch (1999, 300) claims that any individual who is exposed to a set of musical stimuli tends to manipulate or frame them to fit what he or she acknowledges as a gestalt and shapes his or her perception to fit those expectations in the light of his or her previous experiences. Deutsch’s argument claims that music perception is not only a matter of personal psychological and physiological systems, but also influenced by social variables as well.

In the view of gestalt theory, one may assume that the relationships that an individual develops between the perceived qualities of music, such as scale, under the influence of a specific culture, can cause him or her to exclude, manipulate, or ignore some of the components of the whole. The components of a musical piece may not be registered as candidates to create the intended whole in the lexicon of the individual as a result of the effect of the culture in question on expected perception. Therefore, an individual from a cultural group may perceive a melody differently because he/she is not able to register qualities such as melody and rhythm as they lay in the original version. This may be due to the lack of information and expectation regarding qualities provided by the culture in question.

Many psychoacoustic phenomena are widely used in many practical approaches in the professional audio world; MPEG-1 or MPEG-2 Audio Layer III and digital audio workstation plug-in applications such as Waves’ MaxxBass (Ben-Tzur and Colloms) are some of the many examples. Missing fundamental, masking and Deutsch’s octave illusion (“Deutsch’s Musical Illusions”) reveal that what we hear physiologically is not what we necessarily perceive and vice versa. Based on this fact, one may claim that a combination of specific sounds may make us ignore some or all of the sounds under certain conditions; moreover, these conditions can be accepted to be formed by psychological, physiological and social variables.

Studies in neuroscience improved our understanding considerably in neural organization and perception process for music. Stefan Koelsch and Angela Friederici's experiments show that electrical activity in the brain associated with musical structure is observed within 150– 400 milliseconds, activity associated with musical meaning about 100– 150 ms later, the structural processing - musical syntax - has been localized to the frontal lobes of both hemispheres and the regions involved in musical semantics - associating a tonal sequence with meaning - appear to be in the back portions of the temporal lobe on both sides. (Levitin, Daniel J. 2006, 129) One may suggest that Koelsch and Friederici's method can be used to analyze how brains of individuals from different cultures act when exposed to the same program material from West and East.

Diana Deutsch (1974) has proved in one study, that playing a scale simultaneously in both ascending and descending form, (tone from the ascending scale is in the right ear, tone from descending scale is in the left ear, and vice versa) can cause a listener with headphones to hear the higher tones coming from one earphone (in right-handers, it is generally the right ear) and the melody corresponding to the lower tones coming from the other one. She also remarked that some listeners do not hear all the tones. Her research proves that a person can perceive a melody differently under specific circumstances. Consequently, one may suggest that differences between cultures may cause perception circumstances to be unique for each culture, which may cause the members of the same cultural group to have similar perception expectancies.

To develop a way to measure music perception characteristics, we must incorporate many disciplines including psychoacoustics, psychophysiology, psychophysics, neuroscience, cognitive musicology, ethnomusicology, cognitive anthropology, cognitive sociology, statistics, biology and biomedical sciences. Perception is an important subject in many disciplines.

### **Analytical Methodology**

One has to develop a hybrid methodology that combines various approaches from natural formal and social sciences in order to study, measure, analyze and evaluate music perception, as it relates to these disciplines. To achieve that, "Project Istanbul" makes an effort to not only apply methods from statistics, but also benefit from other disciplines such as music, musicology,

and psychoacoustics to form the foundation of feasible research, by consulting the evaluation skills of an evaluation committee which is formed by distinguished scholars from various disciplines.

“Project Istanbul” investigates the hypothesis that different cultural backgrounds influence an individual’s music perception and therefore analyzes the impacts of culture on perception of music, in order to form and explore a theory that may exert whether there is a global effect of shared social values on perception of music or not.

Ad hoc, Project Istanbul analyzes production approaches of different individuals with diverse cultural backgrounds to the same beginning program materials, while trying to minimize the influence of factors such as musical interest, tendency for the genre, socio-economic status, age and musical knowledge.

#### Procedure

Two electronic dance music songs which included both Western and Eastern elements were specially produced to be remixed for the project. Many music schools, associations and institutions from various countries were contacted in order to let musicians from different cultural groups know about the project. The remixers were then asked to remix their versions and upload them to the project website, [www.projectistanbul.org](http://www.projectistanbul.org), to be later evaluated by committee.

#### *Why Electronic Dance Music?*

According to Narmour (1999, 441), style is simply repetition in terms of cognition, even though musicians tend to think of style in terms of chronological period, provenance, nationality, genre, composer, and work. Narmour also states that listeners construct stylistic expectations that are remarkably specific, surprisingly complex and incredibly detailed. Based on these arguments, one may claim that using a specific source for a music perception experiment could provide a reasonably accurate method of measuring perception differences between individuals from different cultures, as the stylistic expectations would probably be similar for the musical genre in question.

Electronic dance music songs are expected to meet a set of standards such as simple time signatures, relatively fast tempo and repetitive melodies as it is produced mainly to make people dance, depending on the musical intent and style. Therefore, electronic dance music producers have a distinct, well-defined and similar set of expectations. Electronic dance music is the preferred genre for the project as it helps to optimize the efficiency while minimizing the complexity of production analysis. For the purpose of this project, it was more efficient and effective to analyze production choices for electronic dance music, compared to other genres.

### *Production*

It was intended to include as many tracks and instruments as possible in the mixes in order to offer a wide range of production choices to the remixer. Many instruments including drums, darbuka, synthesizer and double bass were recorded in real-time, in addition to the programmed material, to broaden the range of production choices even more. Western and Eastern elements were included in every aspect of the composition including rhythmic elements, melodies and song structure in order to ensure that there is enough representation for both cultural groups. Moreover, both of the songs were composed so that they have the same tempo (130 bpm), key (D) and scale (Arabic) to give the participants the chance to use tracks from both songs to remix one of them, or even better, to create a hybrid remix. The stems (stereo sub-mixes of separate sections such as drum stem, vocal stem and darbuka stem) of the tracks were made available to download on the project website, in addition to the original reference mixes. Western and Eastern elements were placed in separate stems intentionally in order to give the remixers the option of using both set of elements independently.

### *Evaluation*

To be able to evaluate the production approaches of participants, scholars with a variety of backgrounds were contacted to form an evaluation committee. Alex U. Case (associate professor of sound recording technology at the University of Massachusetts), Dr. Erdem Helvacioğlu (producer, electronic musician), Dr. Evangelos Himonides (professor of music

technology education at the University of London), Ryan Jackson (assistant professor of music technology at the Minnesota State University), George Massenburg (producer, associate professor at McGill University), Dr. Fred Rees (chair of Department of Music and Arts Technology at IUPUI), Mark Rubel (producer, director of Eastern Illinois University Recording Studio), Dan Rudin (producer), Dr. Robert Rumbolz (music technology director at Northwest College), Bill Schulenburg (producer), Dr. John Thompson (director of music technology at Georgia Southern University), Dr. Adam Ockelford (professor at Roehampton University), Jonathan P. Orose (professor at EDMC), Ufuk Önen (assistant professor at Bilkent University) and Dr. Kenyon Williams (associate professor of music at the Minnesota State University) agreed to become a member of Project Istanbul Evaluation Committee, which provided diversity of academic backgrounds in many disciplines related to music, including audio engineering, musicology, music production, music perception, music education and music psychology.

Remixes were sent to committee members to be evaluated, which consisted of listening to the original version and a remix version of a song, and filling out a review form of rating scale questions regarding the similarity of the remix to the original reference mix, comparison of Western and Eastern elements and prediction of the cultural origin of the remixer. The grading scale questions used in the evaluation forms had five choices from 1 to 5, 1 representing “strongly disagree”, 3 representing “agree” and 5 representing “strongly agree”.

The song assignments to evaluation committee members were done randomly and each participating committee member evaluated at least one song by comparing the remix version with the original reference mix. Committee members did not receive any information regarding the remixers; they only received remixes. Thirteen evaluations from eleven committee members were used for the research as evaluations from other members were not received at the time the results were analyzed. Table one shows how many evaluations were used to analyze each remix approach. Some of the members evaluated more than one song.

## Results

Three remixes which were uploaded by remixers from three different countries: Austria, Germany and Turkey were used in the research. The outcome of the evaluations is summarized in Table 3. The first column shows the question on the evaluation form and the numbers under the headings Remix 1, Remix 2 and Remix 3 show the mean value of evaluators' grading. The key for the grading system is given below Table 3.

### Similarity

From the results for the first question, we may understand that all three remix versions were evaluated as “fairly different” by evaluators. For Remix 1 and Remix 3, evaluators almost agreed that those versions sounded more “Western” than the original, while they were not that sure about Remix 2. According to the members of the evaluation committee, the scale used in Remix 1 sounded a lot more “Western” than the original. They agreed that the scale used in Remix 3 sounded more “Western” as well, while the one used in Remix 2 was somewhat accepted as less “Western”. However, the difference in between the evaluations of the rhythmical content is very similar; Remix 1 being the most “Western” and Remix 2 being “less Western”. Finally, the selection of the focal elements were fairly similar according to the committee; they all sounded practically more Western while the focal element choice for Remix 1 sounded “pretty Western” and the one for Remix 3 sounded “somewhat Western”.

### Cultural Background Prediction

Table 4, Table 5 and Table 6 indicate the prediction of participants' backgrounds by the evaluation committee members, based on the musical content of the remixes. Table 7 through Table 14 analyze the prediction of cultural background based on the location of the evaluators. The locations of the evaluators do not necessarily represent the cultural background of them. Table 15, Table 16 and Table 17 demonstrates the vote distribution of evaluators for cultural background prediction. The terms “European”, “Turkish” and “North American” are used to

describe the location of the evaluators, not necessarily the cultural origin. Turkey is not classified under “European” or “Middle Eastern”, as defining where Turkey belongs culturally is beyond the aims of this study. Evaluators were able to vote for more than one choice.

### **Discussion**

The evaluation committee members agreed that all of the remix versions sounded fairly different than the original version, as understood from the first question of the evaluation for as seen on Table 3. This fact may be accepted as an approval for the validity of the questionnaire, as the first question acted as a control question. The results show that the remix which was produced by the Turkish musician was evaluated as the “least Western” sounding in almost all cases by the evaluation committee. This outcome supports the hypothesis which claims that music perception of an individual is influenced by the cultural background of him or her.

Another question of interest was the recognition of the cultural background of the remixers. As the choices European, North American, and even Australian in the evaluation questions substantially represented “the West”, evaluators were right on target on Remix 1 and Remix 3 regarding the cultural origin prediction; the majority of the votes pointed “the West”, as seen on Table 4 and Table 6. For Remix 2, approximately 70% of the evaluators’ votes told us that the producer of that remix was either from Europe or Middle East, as seen on Table 5. As it acts as a bridge between Europe and Middle East, Turkey meets both identifications. Therefore, we may accept that the cultural background prediction of the evaluation committee was generally pretty accurate, which also supports the hypothesis mentioned earlier.

Tables 7 through 14 show the relationship between the accuracy of the prediction of cultural background and the location of the evaluator. For Remix 1, European evaluators thought the remixer was from Europe, Turkish evaluators thought that the remixer was from either

Middle East or Europe, and the North American evaluators thought that the remixer was from North America, as seen on Tables 7, 8, 9 and 15. The cultural background of the producer of Remix 2 was also predicted precisely by the Western evaluators with tendency toward “the West”, as seen on Tables 10, 12, and 16. Tables 11 and 16 show that Turkish evaluators predicted the origin of the producer of Remix 2 with a bias toward “the East”. According to Tables 13, 14 and 17, Turkish evaluators recognized European approach in Remix 3 easily, while North Americans were not that accurate.

Interestingly, the majority the evaluators identified the remixer who produced Remix 1 as “Western”, while all of them associated the remixer with their own location and/or origin. We may also observe similar reactions from evaluators for Remix 2 and Remix 3, which may be interpreted as a sign of sympathy for familiar parts of the musical content being highlighted. The fact that evaluators were disposed to identify the origin of a recognized production approach as being from their own location may be accepted as an indicator of our tendency to evaluate something familiar as “known”. Thus, it may be reasonable to consider that expectations which are influenced by personal and social experiences also influence our perception of a given piece of music.

#### Feedback from Evaluators

Several evaluators remarked that the original reference mix was already influenced by the “Western” sound and aesthetics excessively. Early introduction of Middle Eastern elements and incidental addition of rhythmical elements such as zil and darbuka to the mix were accepted as cues which make the listener to think the remix in question is “less Western” subconsciously, according to some of the evaluators. Similarly, addition of “bluesy” lines and the usage of “auto-tune” was defined as potential reasons to be classified as North American. Some of the

evaluators remarked that it was difficult to discover the background of a remixer just by listening to his or her work, as they found the process of remixing more of a global artform. It was also suggested to use a different grading scale such as a 3-point Likert scale, to achieve a more realistic result.

### **Conclusion**

Despite the limited sample size of the available material, the findings of this research support the hypothesis that cultural background influences music perception of individuals. The results may also be considered to be proving that the affect of culture on music perception depends on many factors including location, environment and musical background, which may be very complicated as one factor may influence the other.

This study may be used as a stepping stone for more sophisticated research which would provide the foundation to develop custom virtual instruments, intelligent music design systems, interactive music performance environments, and music production approach suggestions that would appeal to specific social groups or result in specific outcomes.

As discussed, the effects of culture on music perception should be investigated in collaboration with many other disciplines including sociology, psychoacoustics, psychophysiology and neuroscience by conducting multidisciplinary research in which not only the musical qualities of the production approaches and the objective structures of each culture's harmony, scale, rhythm, time signature, arrangement, instrumentation, dynamic range, timbre and temperament, but also various social, psychological and physiological expectations of the participants are being investigated. New approaches such as using different and more neutral reference materials may also be a useful method to be more open to the participants' interpretation.

What we perceive is what we know. However, what we express is not necessarily what is perceived by others. As the world is getting smaller every single day with ongoing developments in technology, politics and economy, knowledge becomes more valuable. Any progress in understanding music perception will help us to have more universal knowledge about how music will affect a specific listener. In order to find a way to express our musical ideas as well as to understand others' ideas better, we must understand music perception and the ways that culture influences it for the members of that culture.

The study of sound perception led to the development of the MP3 codec: an influential development in the music history. Understanding how social groups perceive music may evoke key developments similarly in the near future or beyond.

**Table 1. Evaluation Distribution by Remix Version**

	Remix 1	Remix 2	Remix 3
<b>Number of Evaluations</b>	4	4	5

**Table 2. Personal Information of the Remixers**

	Remix 1	Remix 2	Remix 3
<b>Country of Origin</b>	Austria	Turkey	Germany
<b>Ethnicity</b>	Bavarian	Turkish	German
<b>Age</b>	21	34	28
<b>Native Language</b>	German	Turkish	German
<b>Sex</b>	Male	Male	Male
<b>Musical Ability Level*</b>	5	8	5

\*Declared musical ability level out of 10; 1 being the weakest, 10 being the strongest.

**Table 3. Evaluation Grades of Remix Versions by Question**

	Remix 1*	Remix 2*	Remix 3*
<b>The remix version sounds very similar to the original one</b>	1.5	1.75	1.6
<b>The remix version sounds more “Western” than the original</b>	2.5	1.5	2.6
<b>The scale of the remix version sounds more “Western”</b>	4	1.75	2.8

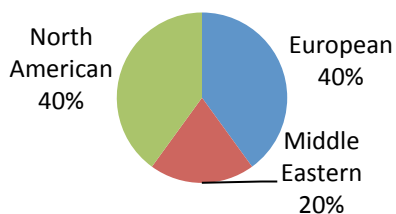
<b>Rhythmical structure of the remix version sounds more “Western”</b>	3	2	2.4
<b>The focal element chosen for the remix version sounds more “Western”</b>	3.5	2.75	2.4

\*Scale: 1= Strongly Disagree

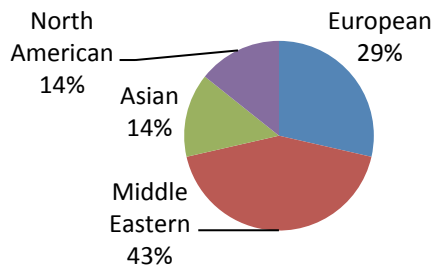
3=Agree

5=Strongly Agree

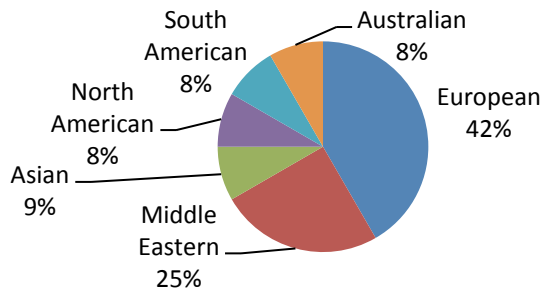
**Table 4. Prediction of the Cultural Background of the Remixer of Remix 1**



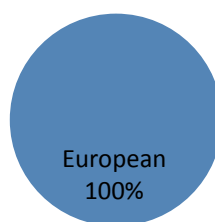
**Table 5. Prediction of the Cultural Background of the Remixer of Remix 2**



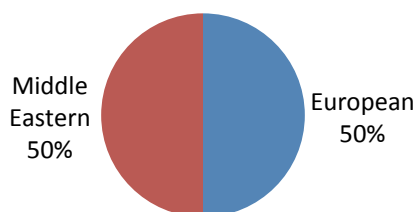
**Table 6. Prediction of the Cultural Background of the Remixer of Remix 3**



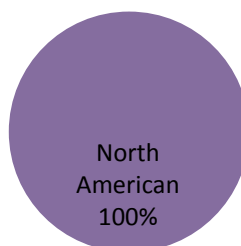
**Table 7. Prediction of the Cultural Background of the Remixer of Remix 1 by Evaluators from Europe**



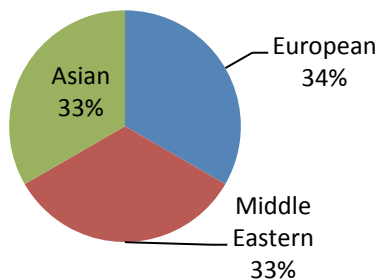
**Table 8. Prediction of the Cultural Background of the Remixer of Remix 1 by Evaluators from Turkey**



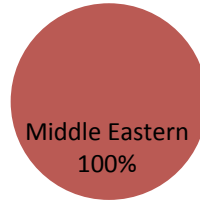
**Table 9. Prediction of the Cultural Background of the Remixer of Remix 1 by Evaluators from North America**



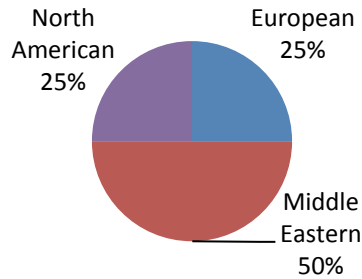
**Table 10. Prediction of the Cultural Background of the Remixer of Remix 2 by Evaluators from Europe**



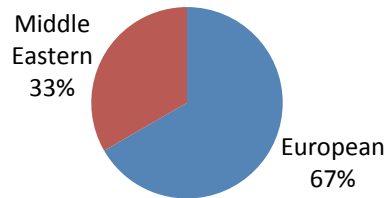
**Table 11. Prediction of the Cultural Background of the Remixer of Remix 2 by Evaluators from Turkey**



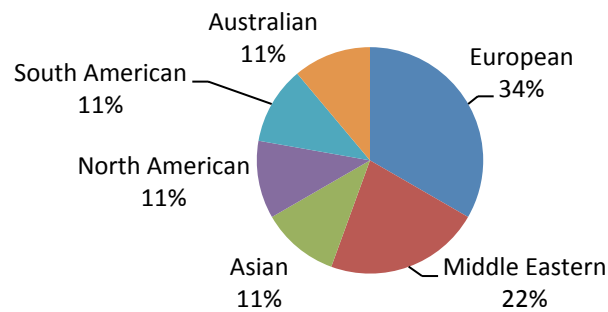
**Table 12. Prediction of the Cultural Background of the Remixer of Remix 2 by Evaluators from North America**



**Table 13. Prediction of the Cultural Background of the Remixer of Remix 3 by Evaluators from Turkey**



**Table 14. Prediction of the Cultural Background of the Remixer of Remix 3 by Evaluators from North America**



**Table 15. Vote Distribution for Cultural Background Prediction of the Remixer of Remix 1**

	European	Middle Eastern	North American	South American
<b>European Evaluators</b>	1	0	0	0
<b>Turkish Evaluators</b>	1	1	0	0
<b>North American Evaluators</b>	0	0	2	0

**Table 16. Vote Distribution for Cultural Background Prediction of the Remixer of Remix 2**

	European	Middle Eastern	Asian	North American
<b>European Evaluators</b>	1	1	1	0
<b>Turkish Evaluators</b>	0	1	0	0
<b>North American Evaluators</b>	1	2	0	1

**Table 17. Vote Distribution for Cultural Background Prediction of the Remixer of Remix 3**

	European	Middle Eastern	Asian	African	North American	South American	Australian	Other
<b>European Evaluators</b>	0	0	0	0	0	0	0	0
<b>Turkish Evaluators</b>	2	1	0	0	0	0	0	0
<b>North American Evaluators</b>	3	2	1	1	1	1	1	1

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