

Examination of previously published data to identify patterns in the social representation of ‘loud music’ in young adults across countries

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Abstract

Purpose: The current study was aimed at understanding the patterns in the social representation of loud music reported by young adults in different countries.

Materials and Methods: The study included a sample of 534 young adults (18-25 years) from India, Iran, Portugal, United Kingdom and United States. Participants were recruited using a convince sampling and data was collected using the free association task. Participants were asked to provide up to five words or phrases that comes to mind when think about “loud music”. The data were first analyzed using the qualitative content analysis. This was followed by quantitative cluster analysis and Chi square analysis.

Results: The content analysis suggested 19 main categories of responses related to loud music. The cluster analysis resulted in for main clusters, namely: (1) emotional oriented perception; (2) problem oriented perception; (3) music and enjoyment oriented perception; and (4) Positive emotional and recreation-oriented perception. Country of origin was associated with the likelihood of participants being in each of these clusters.

Conclusion: The current study highlights the differences and similarities in young adults’ perception of loud music. These results may have implications to hearing health education to facilitate healthy listening habits.

Key Words

Loud music, Music listening, Noise induced hearing loss, Attitudes, Social representation

Introduction

Research has identified that music-induced hearing loss (MIHL) is not only a concern for those working within music related industries but also the general public.^[1] According to World Health Organization (WHO) estimates some 1.1 billion teenagers and young adults are at risk of hearing loss due to the unsafe use of personal audio devices, including smartphones, and exposure to damaging levels of sound at noisy entertainment venues such as nightclubs, bars and sporting events.^[2] Therefore, music listening in adolescents and young adults considered is one of the recent public health hazards.

For example, the increasing ownership of Personal Listening Devices (PLDs) at high volumes means that young people in particular are at risk of music-induced hearing loss. A recent systematic review by Jiang et al. (2016)^[3] showed that up to 58.2% of participants exceeded the 100% daily noise dose, particularly in the presence of background noise. Moreover, significantly worse hearing thresholds were found in PLD users using conventional and extended high-frequency audiometry, and significantly poor results in Otoacoustic Emission (OAE), even in the participants with self-reported 'normal hearing'. Because the consequences of exceeding safe levels may be not immediate, meaning the extent of damage does not present itself for many years. It is therefore of vital importance that this group are made aware of the immediate and long-term dangers, and also how the changes in listening behaviour may not necessarily lower their enjoyment.^[4]

Adolescence is a critical time of learning, growth, and development; learning and adopting a healthy lifestyle at this stage has shown to be a strong determinant for future

health. Considering the ever-decreasing age of acquired MIHL, hearing health awareness and education should be deemed of equal importance to other health related issues in schools (e.g., dental health, eyes & vision and personal hygiene, as well as smoking, drugs and sexual health). This is because hearing loss or hearing damage developed by young adults has potentially devastating consequences for physical and mental health, education and employment.^{[5],[6],[7]} However, a lack of promotion, information and an overly broad scope within provided materials have hampered success of implementing hearing health education. Furthermore, WHO reported that the other key barrier to the promotion of health programmes to adolescents fails to involve young people in any promotional activities. Moreover, a raised awareness of hearing health does not, in itself, change the behaviour. Therefore, the key to successful hearing health awareness and education in relation to music exposure appear to be through attitude change, rather than solely through information provision.

Previous studies have identified some important influencing factors associated with attitudes towards loud music exposure and use of hearing, such as age, gender, school level, ethnicity, music preference, physical activity, socioeconomic factors, and cultural perspectives protection.^{[8],[9],[10]} Of those, cultural factor has considerable influence on listening behaviour, and thus it is crucial for determining an effective health listening education program. A previous study by Widén et al. (2006)^[11] is the first study of its kind to compare cultural differences in attitudes towards loud music and use of hearing protection between the American and Swedish young adults. Their study showed that the attitudes were more positive towards loud music in the American sample in comparison

to the Swedish sample. In addition, the use of hearing protection was found to be much lower within the American sample in comparison to the Swedish.^[11] Their explanation for the attitude differences between these two western countries is deemed mainly to be due to increased awareness and an acceptance of earplugs in Sweden, because of their campaigns on environmental noise and loud music, which in turn leads to a change in listening habits. Because the diverse cultural value influenced individuals' perceiving and interpreting situations related to hearing loss, there is a need for cross-culture research in hearing healthcare and education.^{[12],[13],[14]}

Furthermore, Manchaiah et al.^{[15],[16]} explored the social representations of young adults towards 'music' and 'loud music' across different countries, and their results suggested that loud music could be perceived in both positive and negative aspects when using co-occurrence analysis (such as party and alcohol vs. ear and hearing problems). This indicates the presence of cultural differences in social representations towards loud music. Therefore, the health promotion strategies should consider different cultural context, and possibly focus on changing societal norms and regulations in order to be more effective in decreasing the noise induced auditory symptoms among young adults.^[4]

Although the previously published reports highlights the common perceptions among young adults about 'music' and 'loud music' across different countries,^{[15],[16]} it is still unclear about any variations in some specific groups (such as the groups characterized by demographic factors). In addition, there is a lack of understanding of any similarity in terms of patterns in perception of 'music' and 'loud music' in these groups. Therefore,

the aim of the present cross-cultural comparative study was to re-examine the previously published data and explore the patterns in the social representation of loud music reported by young adults in different countries using cluster analysis.^[16] The significant outcomes could provide better understanding of knowledge and attitude towards music exposure and related listening behaviours in young adults who may have opinions that have previously eluded professionals when devising health education, and consequently it may provide essential information on what motivates themselves and their peers in attitude change, and have bearing on actions.

Method

Study design and participants

The study involved cross-sectional survey design. The study sample included 534 young adults (18-25 years) from five countries (i.e., India, Iran, Portugal, United Kingdom and United States). The average age of the participants was 21.04 years (SD 2.5). 56.6% of the participants were females. 27.5%, 62.2%, and 10.3% of the participants had compulsory, secondary and tertiary education respectively. The mean listening hours of the participants per week was 14.47 hours (SD 19.7). Some important country specific demographic details can be found in Table 2 of the previously published report.^[16]

Data collection

Data were collected using a questionnaire. In each country researcher approached young adults via university and city center shopping malls requesting them to take part in the study. All those who showed interested were provided with detailed information about

the study and they had opportunity to ask questions. Those who agreed to participate completed the questionnaires and return of the questionnaire was taken as consent. Participation in the study was voluntary and questionnaire completion anonymous as the participants did not provide any personal information that will compromise their identity. The questionnaire was completed anonymously. The participants provided some demographic information (i.e., age, gender, education, profession and music listening), followed by reporting up to five words or phrases that immediately come to mind while thinking about loud music. They were then asked to indicate whether each word or phrase they had reported had positive, neutral, or negative connotations. This method is known as the *free association task* method, which is frequently used to access the semantic content of social representation. This is a well-established method and has been used in several studies.^{[12],[13],[17],[18]} The object of representation (i.e., loud music exposure) was used to help prompting associations. Due to the spontaneous nature of eliciting these responses, they are considered less controlled; hence, they provide better understanding of what constitutes the semantic universe of the term or subject being studied.^[19]

The original version of the questionnaire was used in the UK and USA. It is important that the questionnaire should be conceptually valid across different languages to be able to use it in different countries. The questionnaires were thus translated into the required different languages. The process of translating involved (a) forward translation; (b) expert back translation; (c) review and resolution of any discrepancies and (d) pre-testing with five participants each, in different countries. The questionnaires were translated into Kannada, Farsi and Portuguese languages, to be used in India, Iran and Portugal

respectively. The well-accepted methods of forward and back-translation were incorporated.^[20]

Data analysis

The data were analyzed using various qualitative and quantitative analyses. For the purpose of this manuscript data from all the four countries were analyzed together treating it as one dataset. However, analysis of individual country data, which presents some similarities and differences in responses across countries, has been presented in our recent publication.^[16]

In the first instance, the responses from free association task were analyzed using the qualitative content analysis.^[21] This was followed by cluster analysis made with the Reinert's method used for textual data analysis.^{[22], [23], [24]} This method is a hierarchical divisive clustering and groups the respondents based on similarities in participant's responses characteristics. Finally, Chi square analysis is done to look at which of the primary (i.e., main categories identified from content analysis) and secondary (i.e., demographic details) variables had significant association with each of the clusters. The computation of these Chi square results follows the same logic as in the lexical analyzes: one evaluates the over- or under-representation of categories in the clusters versus the rest of the sample. The presence of a category in the profile of a cluster thus indicates a proportion of individuals carrying this category in the cluster significantly higher than the proportion found in the rest of the sample. Iramuteq software was used to perform both cluster analysis and Chi square analysis.^[25]

Ethical Considerations

Ethical approval was obtained for each country from local institutional ethical boards, which include: *All India Institute of Speech and Hearing*, Mysore, India; *Department of Audiology, University of Social Welfare and Rehabilitation Sciences*, Tehran, Iran; *School of Allied Health Sciences, Polytechnic Institute of Porto*, Porto, Portugal; *Research Ethics Committee, Anglia Ruskin University*, Cambridge, the United Kingdom; and *Institutional Review Board, Lamar University*, Beaumont, the United States.

Results

The free association responses from the respondents were analyzed using the content analysis and the results have been presented in detail in our recent publication.^[16] Table 1 presents the main categories that were reported by young adults when asked about “loud music”.

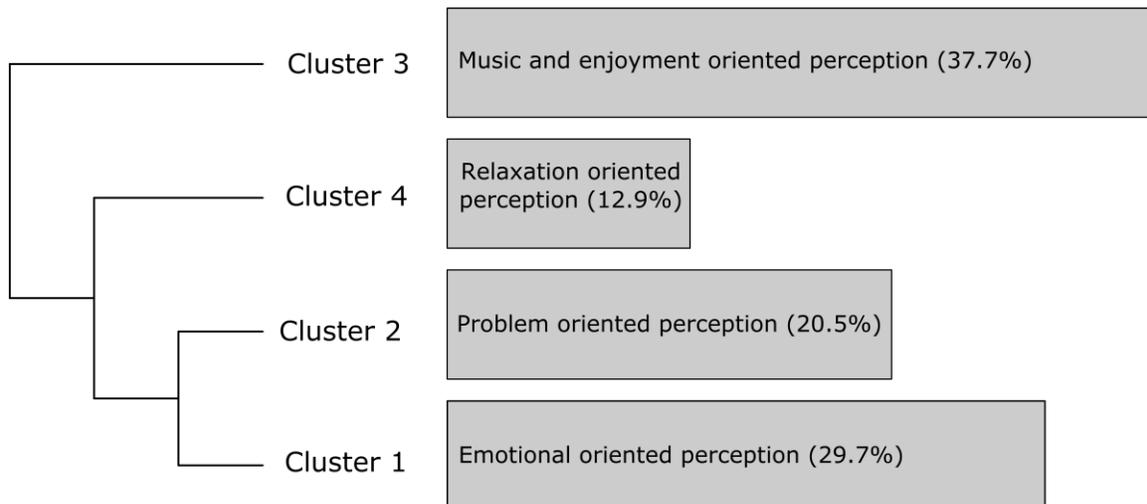
Table 1: Percentage of categories reported in different countries and the percentage of respondents mentioning individual categories*

Categories	% responses	% respondents mentioning this category
Acoustics (e.g., sound, decibel, noise, loudness, intensity)	8.0	34
Body Structure (e.g., ear, vocal cords)	0.9	4
Ear and Hearing Problems (e.g., hearing loss, tinnitus, otalgia)	8.9	36
Entertainment (e.g., MTV, radio)	0.3	2
Form of Escape (e.g., freedom, distraction, isolation, dream)	1.6	7

Friends and Family (e.g., neighbors, friends, family)	1.9	9
Location (e.g., festivals, work, concerts, bar)	7.6	29
Music Genre (e.g.: disco, jazz, rock, heavy metal)	3.6	14
Music Terminology (e.g., rhythm, melody, music, song)	1.2	6
Musical Artists, Groups, or Bands (e.g., specific artist name, band)	1.1	4
Musical Instruments (e.g., piano, flute, guitar)	0.8	3
Nature (e.g., sea, mountains, rain...)	1.1	6
Negative Emotions or Actions (e.g., sadness, uncomfortable, unpleasant, confusion, irritation)	28.2	67
Party and Alcohol (e.g., nightlife, DJ, drunk, night...)	5.4	24
Personal Listening Devices and Transducers (e.g., earphones, phones, mp3, speakers)	3.6	16
Physical Ailment (e.g., pain, sick, headache...)	7.3	31
Positive Emotions or Actions (e.g., joy, happiness, singing, dancing, fun)	17.1	47
Public Awareness (e.g., being aware of adverse effects of loud music)	1.1	5
Hearing Protection	0.3	1

** These results were obtained by re-examining previously published data by Manchaiah et al.^[16]*

The cluster analysis included 448 respondents out of 534 (83.9%) and resulted in four clusters (see Figure 1). The remaining 16.1% of the respondents were discarded from the analysis as they were found to be deviant (i.e., outliers) by the Iramuteq software. This step of discarding the outliers was necessary to form homogenous cluster groups.

Figure 1: Cluster analysis of loud music social representations

The cluster one consisted of 29.7% of respondents (129 out of 448) and based on its characteristics it can be named as “*emotional oriented perception*” (see Table 2). The categories that were common in this group were: negative emotions and actions, positive emotions and actions, and physical ailment. The respondents in this cluster tend to be those from India ($\chi^2=17.87$, $p<0.0001$) and those with tertiary education ($\chi^2=5.5$, $p<0.005$).

Table 2: Emotional oriented perception (Cluster 1)

Variables	Frequency in the cluster	Total frequency	% of variable within this cluster	Chi square	P
Negative emotions and actions	125	338	36.98	45.01	<0.0001
Physical ailment	62	141	43.97	23.12	<0.0001
Positive emotions and actions	127	415	30.60	8.98	<0.005

The cluster two consisted of 20.5% of respondents (92 out of 448) and based on its characteristics it can be named as “*problem oriented perception*” (see Table 3). The categories that were common in this group were: ear and hearing problems, physical ailment and negative emotions and actions. The respondents in this cluster tend to be those from India ($\chi^2=4.09$, $p<0.005$).

Table 3: Problem oriented perception (Cluster 2)

Variables	Frequency in the cluster	Total frequency	% of variable within this cluster	Chi square	P
Ear and hearing problems	92	166	55.42	196.68	<0.0001
Physical ailment	44	141	31.21	14.35	<0.0005
Negative emotions or actions	80	338	23.67	8.28	<0.005

The cluster three consisted of 37.7% of respondents (169 out of 448) and based on its characteristics it can be named as “*music and enjoyment oriented perception*” (see Table 4). The categories that were common in this group were: location, personal listening device and transducers, music genre, party and alcohol, family and friends, musical instruments, body structure, music terminology, musical artists, groups, or bands, and entertainment. The respondents in this cluster tend to be those from Portugal ($\chi^2=22.91$, $p<0.0001$), those from United Kingdom ($\chi^2=12.64$, $p<0.0005$), and also tend to be students ($\chi^2=9.05$, $p<0.005$).

Table 4: Music and enjoyment oriented perception (Cluster 3)

Variables	Frequency in the cluster	Total frequency	% of variable within this cluster	Chi square	P
Location	107	151	70.86	106.47	<0.0001
Personal listening devices and transducers	76	92	82.61	99.29	<0.0001
Music genre	74	96	77.08	80.57	<0.0001
Party and alcohol	91	132	68.94	77.62	<0.0001
Family and friends	46	68	67.65	30.56	<0.0001
Musical instruments	42	62	67.74	27.6	<0.0001
Body structure	22	26	84.62	25.83	<0.0001
Music terminology	68	121	56.2	24.09	<0.0001
Musical artists, groups, or bands	39	65	60.0	16.06	<0.0001
Entertainment	28	51	54.9	7.23	<0.005

The cluster four is the smallest of all that consisted of 12.95% of respondents (58 out of 448) and based on its characteristics it can be named as “*positive emotional and recreational oriented perception*” (see Table 5). The categories that were common in this group were: nature, form of escape, public awareness, and positive emotions and actions. The respondents in this cluster tend to be those from Iran ($\chi^2=13.66, p<0.0005$).

Table 5: Relaxation oriented perception (Cluster 4)

Variables	Frequency in the cluster	Total frequency	% of variable within this cluster	Chi square	p
Nature	30	46	65.22	124.28	<0.0001
Form of escape	38	73	52.05	118.35	<0.0001
Public awareness	4	4	100	27.14	<0.0001
Positive emotions or	58	415	13.98	5.3	<0.005

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Discussion

It is noteworthy that social representation is a fundamental aspect of society that influences people's attitude and behavior. It takes into account broader social dialogues as it explores the socially constructed reality based on the common understanding of a phenomenon in any given social group. ^[26] By exploring the patterns in social representations, we have been able to understand cultural view and broader perspective of young adults on loud music. In the current study comparing data from different parts of the world, have enabled us to investigate cross-cultural differences in social representations of loud music. The patterns show some quantitative way of classifying the respondents based on similar response characteristics.

The cluster analysis method used in the present study is an exploratory tool for better understanding of cultural view and wider perspective in young adults about loud music, and consequently they are classified and assigned to their distinctive group or cluster based on similar characteristics. Observations in the same cluster are more similar to one another and different from those in different clusters. In the present study, using the cluster analysis method, the responses derived from participants were divided into four clusters based on their social representation of loud music, namely, the emotional oriented perception (Cluster 1), problem oriented perception (Cluster 2), relaxation oriented perception (Cluster 3) and music/enjoyment oriented perception (Cluster 4). Further Chi-square analysis was employed to illustrate significant associations between countries and the different clusters. In general, the Indians were observed to be in

Clusters 1 and 2 (i.e., have emotional and problem oriented perception) to loud music as opposed to the Iranians with relaxation oriented perception (Cluster 4) while those with music and enjoyment orientation to loud music (Cluster 3) were the Portuguese and Britons.

The cluster ‘music and enjoyment orientation perception’ was identified as the largest form of orientation perspective with frequently occurring categories like personal listening devices, location, music genre, party/alcohol. According to the literature there has been a progressive rise over the years in attendance of nightclub and discotheques by young adults in the UK with about 61% reported to be attending discotheques.^{[27],[28]} Meyer-Bisch (1996)^[29] reported that the sound level at a rock concert is always around 100-115 dBA, while Park (2003)^[30] found an average of 95dBA measured in Karaoke rooms. Smith affirmed that the sound level in these environments was outside the control of the listener.^[31]

A high proportion of students (82%) own PLD^[32] and they also prefer to listen to music at a loud volume level^[3]. The recent technological advancement in PLDs has enabled many of these devices to be able to store thousands of tracks of music and have greater battery longevity^[33] and an output that could reach up to 110dBA^[3]. It can be inferred that the young adults in Europe are accustomed to visiting places with loud music like concerts, discotheques and listening to music at high volume. Therefore, it is not surprising that loud music is widely accepted and associated with enjoyment and an acceptable way of accessing pleasure.

The Cluster 4 is the recreational /relaxation oriented perception associating loud music with nature (i.e. sounds from sea, mountains rains) and form of escape (e.g. isolation, distraction freedom). The significance of this cluster in Iran can be understood by exploring the culture of evolution of music and other geographical peculiarities of the nation. Before Islamic revolution in 1978, music was diverse as all the genres had right to perform. Iranian women could sing, dance and have video recordings of their performance.^[34] The Iranian traditional and classic music, western music like cabaret music and pop music were popular at this time. Concerts and international classic music orchestras was commonly performed in Iran.^[35] Post Islamic revolution, there was a complete change in social, economic and political conditions of the country, with the government having complete control over the public and private spaces. Thereby, every piece of music or musical work had receive approval from the government of Islamic republic of Iran and every kind of dancing by women was forbidden.^[35]

Furthermore, the main musical genre became traditional music, religious music, revolutionary music and war music.^{[34],[36]} These changes birthed the unofficial ‘underground culture of music and bands’ whereby the youths could access different styles of music for instance, rap, rock, pop, metal and other musical genre which was opposite to the accepted values of the government of Islamic Republic of Iran ^{[36],[37]}. It was after 1995 that the government allowed some form of Persian rap music done under the supervision of the ministry.^[36] It is noteworthy that in the last two decades, Iran has experienced several natural disasters, including three major earthquakes, devastating

flood and severe drought ^[38]. Therefore, we can understand the stance of the Iranian young adult in associating loud music with nature and isolation.

According to Nevada and Davar (2004),^[39] in a study done in Dehli, India with 150 respondents, 83% of the participants attributed noise pollution to use of loud speakers at social (e.g., wedding ceremonies) and religious events (i.e., temple prayers). They also referred to it as the cause of different problems in the society: cause annoyance (77%), affect hearing (71%), interfere with communication (94%), and disturb sleep (88%), deafness (35%) and mental breakdown (32%). Hence, proposing that the government should embark on public education programmes to control noise level. Several other studies also reported that the noise level in the India metropolis exceeds specified standard limits.^{[40],[41]}

Interestingly, India has been significantly associated with Clusters 1 and 2 (i.e., the problem orientation and emotional orientation perception). It can be inferred that the Indians associate loud music with mixed emotions. Alternatively, it is more appropriate to interpret that some individuals associate loud music with emotions, whereas others see it as a problem. In other words, on one hand they see it as a cause of pain and other health problems, while on the other hand it can be associated with worship and social events like marriage ceremonies.

Overall, the current study highlights the differences and similarities in young adults' perception of loud music across different countries. These results allow a better

understanding of cultural differences in social representations toward loud music, and thus further facilitate hearing health education programs by having diverse approaches for healthy listening habits in the context of different cultural domains.

Although the study gathered data from five countries making this one of the very few cross-cultural international studies in this area, it is noteworthy that the current study had a few limitations. First, the sampling method (i.e., convenience sampling) may have resulted in some sampling bias. Second, during the cluster analysis the data of 16% respondents was discarded from the analysis as it was too deviant and no pattern could be arrived. While this was necessary for producing good clusters with homogeneous properties, the loss of information is one major limitation of this study. Third, it is noteworthy that “loud music” may not be related to poor hearing health, whereas, “hazardously loud music” can cause hearing loss. In the present study, because we examined the perceptions towards “loud” music”, it is unknown whether the perceptions of young adults would be different if they were asked about perceptions towards the term “very loud music”. For these reasons, caution should be taken while interpreting and generalizing the results due to some of the limitations.

Conclusions

The current study highlights important patterns of cultural influence on the perception about loud music and related listening behaviours in young adults. The content analysis suggested 19 main categories of responses related to loud music. The cluster analysis resulted in four main clusters, namely: (1) emotional oriented perception; (2) problem

oriented perception; (3) music and enjoyment oriented perception; and (4) Positive emotional and recreation-oriented perception. Country of origin was associated with the likelihood of participants being in each of these clusters. The current study highlights the differences and similarities in young adults' perception of loud music. Therefore, the views and opinions towards loud music noise exposure obtained from young adults in different countries may reflect real-life experiences associated with their listening culture, which will bring forward positive and influential ways to raise awareness and disseminate hearing health education. Better understanding of the attitudes and listening behaviours influenced by cultural factors between Western and Eastern countries provide important information to help in further development of effective guidance for intervention, and recommendations for appropriate policies and strategies of the hearing health education programme for adolescents and young adults.

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