

Examining the Relationship between the Highly Sensitive Person Scale, Music Listening Strategies and Subjective Well-Being in India

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Highly Sensitive Person Scale (HSPS) is used to measure the degree to which individuals are affected by emotional, physical, and social stimuli. This study examines the association of HSPS factors that is, ease of excitation (EoE), aesthetic sensitivity (AES), and low sensory threshold (LST), with music strategies and psychological distress levels in the Indian population. Additionally, we investigate the link between trait empathy, life satisfaction, and perceived social support with unhealthy music listening strategies in the Indian population. 182 participants completed an online survey, including the Healthy Unhealthy Music Scale, the Highly Sensitive Person Scale, Kessler's psychological distress scale, the Interpersonal Reactivity Index, the Satisfaction with Life Scale, and the Social Support Questionnaire. Results showed that individuals with potential dysfunction in cognitive and affective load management, characterized by being overwhelmed by external or internal demands and deep empathic concern, are more likely to employ music as a coping mechanism, albeit in an unhealthy way. Contrary to previous studies, personal distress was negatively associated with psychological distress, potentially due to adaptation to the densely populated environment of India. Additionally, healthy music listening behavior is negatively associated with psychological distress of a person. The study suggests that music cognition research should consider environmental and socio-cultural factors in addition to personal traits.

Keywords: Mental health, Life satisfaction, Highly Sensitive Person Scale, Healthy Unhealthy Music Scale, Empathy

1. Introduction

Sensory processing sensitivity (SPS) refers to a personality trait that involves processing stimuli and information more strongly and deeply than others (Aron & Aron, 1997). This includes processing aesthetic experiences, other people's moods and feelings, loud noises, caffeine, and pain. Individuals who score high on factors underlying SPS tend to process information more deeply and thoroughly than others, which can lead to a rich and complex inner world. Highly sensitive individuals are hypothesized to constitute approximately one-fifth of the population (Aron, 2013). These people get easily affected by bright lights, loud noises, and strong smells. They may also be more empathetic, intuitive, and prone to feeling strong emotions. They often have a deep appreciation for music, art, nature, and beauty and may have a strong sense of social justice. However, due to having association with heightened sensitivity to various stimuli in their environment and getting easily overwhelmed and overstimulated, they have proneness to experiencing high-stress levels and depression. Research has also shown that SPS is a risk factor for anxiety, depression, and more frequent symptoms of ill health (Liss, 2005), and it is important to investigate the relationship between SPS and mental well-being.

Music is a powerful tool that can impact individuals' emotional and psychological well-being, especially when it comes to coping with high levels of sensory stimuli in their environment. The advent

of music streaming platforms has made music even more accessible, and many individuals rely on it to deal with the demands of their jobs. Music has been found to create positive emotional states, increase energy levels, and promote feelings of well-being, making it a popular coping mechanism for regulating emotions and as a form of escape from the stressors of daily life (Reybrouck, 2020). However, music's impact on mental health and well-being is a double-edged sword. While it can be beneficial in reducing stress and anxiety, enhancing mood, and promoting relaxation but, when used in maladaptive ways, music can become a source of addiction or dependency, leading to negative outcomes such as increased anxiety, avoidance of difficult emotions, and even anhedonia or a reduced ability to experience pleasure (Saarikallio, 2015).

Studying highly sensitive people (HSPs) in the context of music is quite interesting for several reasons. First, HSPs tend to be more attuned to sensory experiences, such as sound and music, and may have a more intense emotional response to music than non-HSPs (Aubry, 2022). This heightened sensitivity makes studying their perception and appreciation of music an essential avenue for better understanding how music affects us emotionally and how we can use music to enhance well-being in such individuals. Secondly, HSPs' sensitivity to sensory experiences and emotional cues may also influence their musical performance and creativity. For example, they may be more attuned to

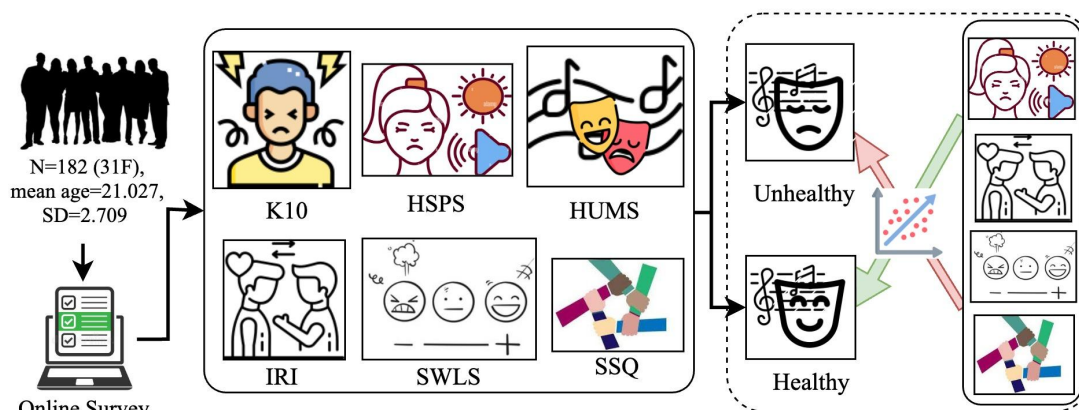


Figure 1. Method Flowchart: The process starts by collecting survey from the Indian citizens comprising of six questionnaires- Kessler's psychological distress scale (K10), Healthy Unhealthy Music Scale (HUMS), Highly Sensitive Person Scale (HSPS), Interpersonal Reactivity Index (IRI), Satisfaction with Life Scale (SWLS) and Social Support Questionnaire (SSQ). It is followed by examining the relationship between music listening strategies and other variables by using Spearman correlation and ridge regression.

nuances in sound and better able to express emotions more deeply through their music. By studying the experiences of HSP musicians, we can gain insights into the creative process and how it is influenced by individual differences. Lastly, music therapy is an effective intervention for various mental health conditions, and research suggests that HSPs may be particularly responsive to music therapy. By studying how HSPs respond to music therapy, we can better understand how to tailor music interventions to meet the needs of individuals with this trait.

It has also been seen that HSPs tend to score higher on measures of empathy, than non-HSPs (McQuarrie, 2023). This may be due to their heightened sensitivity to emotional cues and their ability to pick up on subtle emotional signals in their environment. HSPs may also be more likely to engage in perspective-taking and experience empathy for others due to their tendency towards introspection and reflection. Moreover, empathic predispositions are also known to modulate musical experiences and responses thereof (Clarke, 2015).

The intersection of music and HSPs offers a fascinating area of research that can lead to a deeper understanding of the complex interplay between individual differences, music, and well-being. The present study seeks to examine the relationship between HSPs factors with music strategies and psychological distress levels in the context of India. Additionally, we investigate the link between trait empathy, life satisfaction, and perceived social support with unhealthy music listening strategies in the Indian population. With a population of over 1.3 billion people, India is a densely populated country that can be overwhelming for individuals with high sensory-processing sensitivity. The collectivistic culture of India, which values interdependence and

social harmony, influence how individuals with high sensitivity and empathy navigate social situations. It also has a significant impact on how HSPs cope with their surroundings and the role that music plays in their lives. Furthermore, there has not been any research on the relationship between SPS and maladaptive use of music. Moreover, research examining relationship between SPS and well-being has predominantly been conducted in Western countries, which may not fully account for cultural and environmental factors that influence the way HSPs in India or similar culture cope with their sensory experiences. Therefore, investigating this relationship in the Indian context is important for providing a more comprehensive understanding of how sensory-processing sensitivity and music usage affect the well-being of HSPs in this unique cultural and environmental context. Additionally, understanding this relationship can help tailor music therapy interventions to meet the specific needs of individuals and improve their overall well-being.

2. Methods

The flowchart illustrating the method is shown in Figure 1. The process starts by data collection through online survey consisting of six standard questionnaires from Indian citizens. It is followed by checking internal consistency and analyzing correlations between the variables. Lastly, Unhealthy has been predicted using other considered variables by employing a regression technique. The subsections to follow give detailed description of the data and procedure.

2.1 Participants

Hundred and eight two individuals (31 females, mean age=21.027, SD=2.709 years) volunteered to participate in an online survey in exchange for

monetary compensation. For the study, a 'call for participation' was disseminated through various social media platforms, including Instagram, LinkedIn, and Twitter, as well as email. The individuals were required to be Indian citizens and residents to be eligible to participate in the study. The majority of participants were adult university students. Participation in the study was entirely voluntary, and the participants provided written informed consent before taking part. They were also informed that they could withdraw from the study at any time without providing any reason.

2.2 Survey

The online survey consisted of questions from six standard questionnaires - Kessler's psychological distress scale (K10), Healthy Unhealthy Music Scale (HUMS), Highly Sensitive Person Scale (HSPS), and Interpersonal Reactivity Index (IRI), Satisfaction with Life Scale (SWLS), and Social Support Questionnaire (SSQ).

To measure the differences between individuals in SPS, we have used the highly sensitive person scale (HSPS) (Aron and Aron, 1997). Initially, the HSPS was considered to reflect a one-dimensional construct of SPS. However, subsequent research (Smolewska, 2006) suggested that the HSPS suggested that it is composed of three factors. These factors were labeled as ease of excitation (EOE), low sensory threshold (LST), and aesthetic sensitivity (AES). EoE assesses feelings of becoming mentally overwhelmed by external or internal demands, AES evaluates aesthetic awareness, and LST gauges unpleasant sensory arousal. We have used three-dimensional construct for analysis in this study.

The psychological distress and symptoms of anxiety and depression in the individuals was assessed by the Kessler Psychological Distress Scale (K10) (Andrews, 2001). It is a self-report questionnaire that consists of ten questions which assess a person's emotional state over the past four weeks and cover symptoms such as nervousness, fatigue, sadness, and hopelessness. The scores on the K10 range from 10 to 50, with higher scores indicating greater levels of psychological distress.

The Healthy-Unhealthy Music Scale (HUMS) is a self-report questionnaire that measures the extent to which people use music in healthy and unhealthy ways. The scale was developed by researchers at the University of Melbourne in Australia. It consists of thirteen items that are divided into two subscales: Healthy Music Use (*Healthy*) and Unhealthy Music Use (*Unhealthy*). The Healthy subscale measures the extent to which people use music to cope with stress, relax, and improve their mood while the Unhealthy scale measures the extent to which people use music

to escape from problems, numb their emotions, and self-harm.

Interpersonal Reactivity Index (IRI) is a widely used self-report questionnaire that measures empathy, or the ability to understand and feel the emotions of others (Davis, 1980). IRI comprises four subscales Perspective Taking (PT), Fantasy Seeking (FS), Empathic Concern (EC), and Personal Distress (PD). PT measures the ability to imagine the point of view of others; EC measures the tendency to feel compassion for others; PD measures the tendency to feel discomfort or distress in response to others' negative emotions; and FS measures the tendency to get absorbed in imaginative and fictional situations.

Lastly, to measure the association of social factors with unhealthy music listening strategies, Satisfaction with Life Scale (SWLS) and Social Support Questionnaire (SSQ) were used. SWLS (Diener, 1985) is a widely used measure of overall life satisfaction, which consists of five items rated on a seven-point Likert scale. SSQ (Sarason, 1983) is a self-report measure of perceived social support, which assesses the extent to which individuals perceive that they have support available to them from family, friends, and significant others. It has 27 items rated on a six-point scale.

2.3 Procedure

First, the internal consistency of the data was checked. Specifically, we computed Cronbach's alpha for each of the scales. We then conducted a correlation analysis to investigate the bivariate relationships between the variables considered. Finally, regression analysis was done to predict Healthy and Unhealthy music usage using IRI, HSPS, SWLS and SSQ. We have not used K10 because its association with Unhealthy has already been studied well in the literature. We used ridge regression as it is less affected by multicollinearity among the variables.

3. Results

The Cronbach's alpha values for each of the scales were greater than 0.75, indicating acceptable reliability and consistency. Table 1 shows the Spearman correlation coefficients between the 12 variables. It can be seen that there are a number of significant correlations between the variables. Consistent with previous research (Surana et al., 2020; Saarikallio, 2015), a significant correlation was identified between the Unhealthy Score and K10. However, there was a significant negative correlation between Healthy and K10 scores in India as opposed to the studies done in Western cultures (Surana et al., 2020; Saarikallio, 2015, Alluri et al., 2022). The empathic concern (EC) showed a significant and high positive correlation while PD demonstrated a negative correlation with K10. Both these associations contradict the previous studies (Choi et al., 2016;

Table 1. Correlation analysis of the considered variables

Var	K10	H	U	PT	FS	EC	PD	EoE	AES	LST	SSQ
H	-0.17**	1.0									
U	0.58***	-0.05	1.0								
PT	0.06	-0.01	-0.07	1.0							
FS	-0.07	-0.02	0.0	0.66***	1.0						
EC	0.7***	0.15	0.62***	0.34***	0.29***	1.0					
PD	-0.16*	0.03	-0.14*	0.35***	0.37***	-0.003	1.0				
EoE	0.36***	0.06	0.17**	-0.03	-0.12	0.24**	-0.15*	1.0			
AES	-0.11	0.32 **	-0.04	-0.11*	-0.15*	-0.02	0.11	0.22*	1.0		
LST	0.16*	0.05	0.08	0.04	-0.05	0.18***	-0.15*	0.48***	0.24**	1.0	
SSQ	-0.38***	0.2**	-0.3***	-0.03	0.02	-0.23***	0.08	-0.01	0.21*	-0.04	1.0
SWLS	-0.54***	0.23***	-0.38***	-0.06	-0.03	-0.3***	0.05	-0.11	0.25**	0.07	0.47***

Note. N = 182. Spearman correlation. *p < .05, **p < 0.01, ***p < 0.001

K10: Kessler Psychological Distress Scale, H: Healthy, U: Unhealthy, PT: Perspective Taking, FS: Fantasy Seeking, EC: Empathic Concern, PD: Personal Distress, EoE: Ease of Excitation, AES: Aesthetic Sensitivity, LST: Low Sensory Threshold, SSQ: Perceived Social Support, SWLS: Satisfaction with Life Score

Morales-Rodríguez et al., 2020). K10 also exhibited a negative correlation with both life satisfaction and perceived social support, which is a logical and expected finding. Healthy music listening strategies are positively correlated with life satisfaction and perceived social support. On the other hand, life satisfaction and perceived social support correlated negatively with unhealthy listening strategies. It is noteworthy that Unhealthy correlated positively with EC and negatively with PD as it is in contradiction to previous studies conducted on non-Indian population (Choi et al. 2016, Salvarani et al. 2020, Alluri et al. 2022). We also found HSPS factors also have a significant impact in determining Unhealthy and Healthy music strategy adapted by an individual. There is a significant association of EOE with Unhealthy whereas AES is associated with Healthy.

The results of the ridge regression are shown in Table 2. A higher proportion of the variance can be explained for Unhealthy (56.78%) than Healthy (11.62%). Unhealthy music listening strategies appear to have a major contribution from the trait empathy and life satisfaction scale, while Healthy demonstrates a greater contribution from psychological distress, trait empathy, and sensitivity factor. Higher Unhealthy scores are associated with higher Fantasy Seeking ($\beta=0.03$, $p<0.001$) and lower personal distress ($\beta=-0.07$, $p<0.001$), and satisfaction with life ($\beta=-0.14$, $p<0.01$). On the other hand, higher Healthy scores are associated with higher Personal Distress ($\beta=0.01$, $p<0.001$) and Aesthetic Sensitivity ($\beta=0.16$, $p<0.01$) while being associated with lower Perspective Taking ($\beta=-0.01$,

$p<0.05$). Since the focus of this paper is on Unhealthy listening strategies and factors that determine such behavior, we focus on interpreting those results.

4. Discussion

Results suggest that individuals with potential dysfunction in cognitive and affective load management, characterized by being overwhelmed by external or internal demands employ music as a coping mechanism, albeit in an unhealthy way. This could be attributed to them having a hard time calming down after they have been feeling aroused by external stimuli, and as a result, they are likely to listen to music excessively. The positive association between healthy music strategies and aesthetic sensitivity suggests that people who are often drawn to beautiful things, such as art, music, nature, and fashion, tend to engage with music in a healthy way, potentially paying attention to the details of the music to be able to appreciate its beauty.

Contrary to findings from previous studies, personal distress was negatively associated with psychological distress and unhealthy music listening strategies. This interesting finding could be attributed to the collectivistic nature of Indian culture, where people are more interdependent and cooperative than in individualistic cultures. As a result, people with high personal distress are likely to suppress their own negative emotions to maintain social harmony. However, these people can have a very unpleasant

Table 2. Coefficients of Ridge Regression model that predicts Unhealthy and Healthy using HSPS factors, IRI factors and Satisfaction with life and perceived social support.

Ridge Regression (Adjusted R ²)	Social factors		Empathy				HSPS		
	SSQ	SWLS	PT	EC	PD	FS	EoE	AES	LST
Unhealthy (56.78%)	-0.01	-0.14**	-0.38	0.18	-0.07***	0.03***	-0.02	0.01	0.04
Healthy (11.62%)	0.02	0.12**	-0.01*	0.05	0.01***	-0.001	0.01	0.16**	-0.06

Note. *p < .05, **p < 0.01, ***p < 0.001

H: Healthy, U: Unhealthy, PT: Perspective Taking, FS: Fantasy Seeking, EC: Empathic Concern, PD: Personal Distress, EoE: Ease of Excitation, AES: Aesthetic Sensitivity, LST: Low Sensory Threshold, SSQ: Perceived Social Support, SWLS: Satisfaction with Life Score

experience when they see others experiencing negative emotions, and thus they are likely to use music in a unhealthy way to cope. This is also supported by the negative association of Healthy with K10, which is in contradiction to the previous studies conducted with the Western population. This could be because in western culture music has both positive and negative effect but in India, it could be either beneficial or not. This finding further highlights the need to situate music research taking into account environmental and cultural factors. It has also been observed that individuals with low satisfaction with life and perceived social support engage with music in an unhealthy way, whereas those with more satisfaction and social support use music in healthy ways. This could be because these people use music as a social surrogate when they don't feel supported enough in life. This could then result in avoiding social interactions, which can further result in feelings of isolation and loneliness, and in turn, lower their life satisfaction.

The study's findings indicate that people with high empathic concerns tend to use music in unhealthy ways suggesting that empathy can be a double-edged sword. On the one hand, it can be a valuable asset, allowing individuals to connect with others and understand their feelings. On the other hand, it can also be a source of stress and anxiety, as people may feel overwhelmed by the emotions of others. People who are highly empathetic may be more likely to use music as a way to cope with their emotions. Music can be a powerful tool for evoking and regulating emotions, and it can be a helpful way for people to process difficult feelings.

The regression results suggest that people who use unhealthy listening strategies are less likely to engage in activities that are associated with imagination and creativity and are more likely to experience negative emotions such as sadness,

anxiety, and depression. On the other hand, people who use healthy listening strategies are more likely to be aware of their own emotions and to be able to cope with negative emotions and are less likely to be easily overwhelmed by sensory stimuli.

It is important to consider the limitations of our study when interpreting our findings. One limitation is the small sample size, which consisted mostly of college students aged 18-22 years. Furthermore, the Indian sociocultural background stigmatizes the expression of emotional suffering and thus, there is a possibility that participants' psychological effects were underreported in this study. We are planning on expanding this study with more data so that these issues can be addressed well.

5. Conclusion

To the best of our knowledge, there have been no studies that have identified relationships between sensory sensitivity processing factors and maladaptive musical engagement, taking into account empathic dispositions and social factors in the Indian population. The findings indicated that people who struggle with managing cognitive and emotional load, experiencing a sense of being overwhelmed by external or internal pressures and displaying strong empathetic concern, tend to rely on music as a coping strategy, although in an unhealthy manner. In contrast to earlier research, personal distress was found to have a negative correlation with psychological distress, possibly because of adaptation to the densely populated conditions in India. The stark differences we observed in social and empathic predispositions reinforces the need for music cognition studies to account for environmental and socio-cultural factors alongside individual characteristics.

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References

- Alluri, V., Mittal, A., Sc, A., Vuoskoski, J. K., & Saarikallio, S. (2022). Maladaptive music listening strategies are modulated by individual traits. *Psychology of Music*, 50(6), 1779-1800.
- Andrews, G., & Slade, T. (2001). Interpreting scores on the Kessler psychological distress scale (K10). *Australian and New Zealand journal of public health*, 25(6), 494-497.
- Ansdell, G. (2016). *How music helps in music therapy and everyday life*. Routledge.
- Aron and Aron (1997). Sensory-processing sensitivity and its relation to introversion and emotionality. *Journal of personality and social psychology*, 73(2), p.345.
- Aron, E. N. (2013). *The highly sensitive person: How to thrive when the world overwhelms you*. Kensington Publishing Corp.
- Aubry, L., & Küssner, M. B. (2022). Music Performance Anxiety and Its Relation to Parenting Style and Sensory Processing Sensitivity. *Jahrbuch Musikpsychologie*, 31, 1-19.
- Clarke, E., DeNora, T., & Vuoskoski, J. (2015). Music, empathy and cultural understanding. *Physics of life reviews*, 15, 61-88.
- Choi, D., Minote, N., Sekiya, T., & Watanuki, S. (2016). Relationships between trait empathy and psychological well-being in Japanese university students. *Psychology*, 7(09), 1240.
- Davis, M. H. (1980). Interpersonal reactivity index.
- Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment*, 49(1), 71-75.
- Liss, M., Timmel, L., Baxley, K., & Killingsworth, P. (2005). Sensory processing sensitivity and its relation to parental bonding, anxiety, and depression. *Personality and individual differences*, 39(8), 1429-1439.
- McQuarrie, A. M., Smith, S. D., & Jakobson, L. S. (2023). Alexithymia and sensory processing sensitivity account for unique variance in the prediction of emotional contagion and empathy. *Frontiers in Psychology*, 14.
- Morales-Rodríguez, F. M., Espigares-López, I., Brown, T., & Pérez-Mármol, J. M. (2020). The relationship between psychological well-being and psychosocial factors in university students. *International journal of environmental research and public health*, 17(13), 4778.
- Reybrouck, M., Podlipniak, P., & Welch, D. (2020). Music listening as coping behavior: From reactive response to sense-making. *Behavioral Sciences*, 10(7), 119.
- Saarikallio, S., Gold, C., & McFerran, K. (2015). Development and validation of the Healthy-Unhealthy Music Scale. *Child and adolescent mental health*, 20(4), 210-217.
- Salvarani, V., Ardenghi, S., Rampoldi, G., Bani, M., Cannata, P., Ausili, D., & Strepparava, M. G. (2020). Predictors of psychological distress amongst nursing students: A multicenter cross-sectional study. *Nurse Education in Practice*, 44, 102758.
- Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: The social support questionnaire. *Journal of personality and social psychology*, 44(1), 127.
- Smolewska, K. A., McCabe, S. B., & Woody, E. Z. (2006). A psychometric evaluation of the Highly Sensitive Person Scale: The components of sensory-processing sensitivity and their relation to the BIS/BAS and "Big Five". *Personality and Individual Differences*, 40(6), 1269-1279.
- Surana, A., Goyal, Y., Shrivastava, M., Saarikallio, S., & Alluri, V. (2020). Tag2Risk: Harnessing social music tags for characterizing depression risk. *arXiv preprint arXiv:2007.13159*.