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**FREQUENCY OF IRRATIONAL BELIEFS IN POPULAR MUSIC
GENRES AND THE RELATIONSHIP BETWEEN IRRATIONAL BELIEF
CONCEPTS IN MUSICAL LYRICS AND MENTAL HEALTH
OUTCOMES**

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FREQUENCY OF IRRATIONAL BELIEFS IN POPULAR MUSIC GENRES AND
THE RELATIONSHIP BETWEEN IRRATIONAL BELIEF CONCEPTS IN MUSICAL
LYRICS AND MENTAL HEALTH OUTCOMES

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by

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ABSTRACT

FREQUENCY OF IRRATIONAL BELIEFS IN POPULAR MUSIC GENRES AND THE RELATIONSHIP BETWEEN IRRATIONAL BELIEF CONCEPTS IN MUSICAL LYRICS AND MENTAL HEALTH OUTCOMES

Nadia Kemp

A popular type of media that Americans consume across ages is music. Today's youth and adults can easily search for and listen to music. Given the increased availability of streaming music and its potential impact on people's emotional states, this study examined the irrationality of contemporary musical lyrics. The sample consisted of the most frequently streamed songs from the years 2006-2022. A total of 1700 "Hot 100" songs from Billboard.com were collected and analyzed for Irrational Belief (IB) concepts. Genre-specific data was collected from Billboard's "Year End Charts" for Country (n=1197), R&B/Hip Hop (n=1223), and Alternative (n=656) music for a total of 3076 genre-specific songs. All 4776 songs were analyzed for total irrational belief score content using modern REBT definitions. Results revealed that all genres contained irrational belief language each year from 2006(7)-2019. The genre with the highest degree of irrationality was R&B/Hip music, not Country music, as predicted. There was no significant correlation between the frequency of music played, as represented by ordinal song ranking, and irrational belief concepts. Findings failed to support a significant correlation between the presence of irrational beliefs in popular music, specifically the average number of IB concepts per song in the "Hot 100," and suicide

completion in children, adolescents, and young adults and drug overdose deaths across the lifespan. However, there was a significant correlation between the Frustration Intolerance total score in the “Hot 100” songs and suicide completion/substance drug overdose statistics from 2006-2016(8) for select age groupings. There was also a significant difference between the average number of irrational concepts per song in the overall “Hot 100,” but the opposite of what was predicted was supported, with there being more irrational concepts present in the years prior to the pandemic (2017-2019), not during the pandemic years (2020-2022). These results add to the REBT research on music and have important implications for how clinicians, parents, and educators conceptualize music.

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INTRODUCTION

Statement of Problem

Student exposure to popular media and mental health outcomes, such as aggression, substance use, and suicide, are concerns in the United States (Fitzpatrick et al., 2012). Music is a popular type of media consumed across ages (Rideout & Robb, 2019). Miranda and Blais-Rochette (2020) conducted a meta-analysis of 13 correlational studies to examine the relationship between emotional instability and the use of music to regulate emotions. These findings support a positive correlation between emotional instability, neuroticism, and listening to music to regulate emotions (Miranda & Blais-Rochette, 2020). In other words, some people intentionally listen to music to feel better or gain control over their emotions.

Researchers have supported the idea that certain attitudes and irrational beliefs identified by Ellis (1977) lead to undesirable mental health outcomes like anxiety, depression, substance use, and suicide (Vîslă et al., 2016). Ellis (1977) proposed that "Demandingness," characterized by absolutistic thinking and rigidity, represented the core cognitive processes underlying psychopathology. Demandingness is represented linguistically in English words such as "Must," "Should," "Demand," or "Ought" to do something, think something, or feel something. Ellis proposed that three other irrational beliefs, Awfulizing, Low Frustration Tolerance (now called Frustration Intolerance), and Global Evaluations of Human Worth, were derivatives of Demandingness (DiGiuseppe et al., 2014). These four irrational cognitive processes have been associated with negative mental health outcomes (Vîslă et al., 2016).

The current researcher examined the presence of Demandingness, Awfulizing, Low Frustration Tolerance, and Global Evaluations of Human Worth language in 21st-century popular music lyrics across musical genres from 2006-2022.

Irrational beliefs are strongly associated with emotional and behavioral problems (Bernard et al., 2006). Recent findings suggest that one in three adolescents in the United States between the ages of 13 and 18 years old will experience an anxiety disorder (American Academy of Pediatrics, 2019). The prevalence of anxiety disorders in teenagers has increased by twenty percent from 2007 to 2012 (American Academy of Pediatrics, 2019). During the COVID-19 pandemic, approximately 2.9 million, or 12% of the United States population, ages 12 to 17, experienced one instance of a major depressive episode with severe impairment in the past year (National Institute of Mental Health, 2022). Further, rates of hospital admissions for suicidal teenagers have doubled over the past ten years (American Academy of Pediatrics, 2019). It is necessary to examine the degree of irrational content in popular music, as the more frequently streamed songs with irrational content will be heard more and may relate to trends in mental health.

The existing literature indicates that it is challenging for children and teens to find rational mental health promoting lyrics centered on the healing process (Gladding et al., 2008). However, it is easy for Americans to select and find lyrics with themes that focus on hurt or emotional pain (Gladding et al., 2008). These researchers did not examine how musical lyrics relate to mental health problems in modern society but highlighted the ways that musical lyrics may be used in therapy to deal with pain, hurt, and grief

(Gladding et al., 2008). However, when the content of popular music lyrics was analyzed back in 1970, the lyrics were associated with Ellis's irrational belief content (Protinsky & Popp, 1977). The researchers examined the language in popular music using an earlier version of Ellis' irrational beliefs, which were correlated with negative psychological outcomes like anxiety and depression (Ellis, 1977).

Ellis proposed that endorsing rational beliefs is critical to maintaining and developing mental health (Ellis, 1977). Rational beliefs are linked to lower levels of psychological distress (Višlă et al., 2016). According to Ellis and his theory of Rational Emotive Behavior Therapy (REBT), challenging or disputing irrational thinking and replacing them with more rational attitudes is one remedy for psychological dysfunction (Raskin, 2019). In 1976, Ellis wrote a songbook called *A Garland of Rational Songs* to promote rewriting musical lyrics with rational language (Gladding et al., 2008). In Ellis' songbook, clients could locate new words that were rational ways to describe their situations (Gladding et al., 2008). Musical lyrics can still be used as a tool today, and clients can practice rewriting lyrics to convey a different, more rational message (Gladding et al., 2008).

Review of Literature

The Degree of Music Consumption

With the introduction of the internet, portable smartphone devices, and streaming technology, one can listen to music almost anywhere at any time. Research supports the steady growth of streaming services. The frequency of on-demand music streams was 872.6 billion in 2020, compared to 106.1 billion in 2013 (Nielson, 2021). Given the

availability of music, it is crucial to attend to the messages and content of music lyrics.

On average, children and adolescents listen to two hours and thirty minutes of music daily (American Academy of Child and Adolescent Psychiatry, 2017). A recent study revealed that most adults, ages 18 to 34, also listen to music daily (Götting, 2019). In today's society, American children and parents listen to music using the radio, cell phones, computers, and app streaming services. Studying the language used in music is important because adolescents can use music to explore their identity and express their feelings, thoughts, and behaviors (American Academy of Child and Adolescent Psychiatry, 2017). Listening to music is an active exercise that requires the listener to perceive and make sense of the sounds (Reybrouck et al., 2020). Listening to music is not a passive activity but a complex process that requires children to use several cognitive abilities (Reybrouck et al., 2020).

According to the Common Sense Census: Media Use by Tweens and Teens (2019), boys and girls ages 8 to 18 report having distinct tastes in media. In particular, results revealed that 73% of tween and teen girls reported that listening to music was their favorite media activity, compared to 59% of boys (Rideout & Robb, 2019). Most boys reported that video gaming was their favorite media activity (Rideout & Robb, 2019). Preferences in media exist; according to the survey, teen girls may seek out music more than boys. Nonetheless, adults, teens, and children across genders are exposed to musical lyrics.

Cognitive Theories of Emotional Disturbance

Cognitive Behavioral Therapy (CBT) represents a class of evidence-based treatment often used to treat children with depression and anxiety (Dobson & Dozois, 2019). CBT supports the idea that present, dysfunctional, conscious beliefs, attitudes, and thoughts are related to maladaptive behaviors, and emotions are interconnected (Dobson & Dozois, 2019). In the various types of CBT, clinicians work with clients to help identify negative dysfunctional thoughts and cognitive distortions and then replace them with more functional, realistic, and empirically accurate thoughts. Clinicians collaborate with clients to replace these unhelpful thoughts to improve functioning. In addition, clients participate in psychoeducation, role plays, identify coping strategies, learn skills, and deliberately practice skills (Newman & Kaplan, 2016). Analyzing lyrics is a valuable tool that can be used in CBT therapy sessions to facilitate a discussion about a client's feelings and thoughts (Miller, 2019). Clinicians can ask clients to talk or write about song lyrics and how the words and thoughts of a song relate to their situation (Gladding et al., 2008). This relates to the current study because some song lyrics can model dysfunctional thought patterns and beliefs, and listening to a song can engage people to rehearse unhealthy ideas.

REBT

One of the original forms of CBT is Ellis' REBT, which proposes that certain types of thoughts are more important in producing psychological distress and that their counterparts-promote coping and adaptive emotions (Ellis, 1977). This model of psychotherapy suggests that messages that contain rational statements help reduce

emotional disturbance. Ellis based his classification of irrational beliefs on clinical observations of his clients. He categorized these beliefs into 11 prototypes (Ellis, 1962; see David et al., 2009). The beliefs included factual errors, demands, catastrophizing statements, condemnations of the self and others, and a lack of endurance and perseverance. Ellis (1977) later proposed that Demandingness, characterized by absolutistic thinking and rigidity, represented the core cognitive processes underlying psychopathology. Demandingness is represented linguistically in English words such as “Must,” “Should,” “Demand,” or “Ought” to do something, think something, or feel something. Ellis proposed three other irrational beliefs: Awfulizing, Low Frustration Tolerance (now called Frustration Intolerance), and Global Evaluations of Human Worth. These are derivatives of Demandingness. DiGiuseppe et al. (2014) provide definitions for these four irrational cognitive processes.

1. Demandingness (DEM) is an unrealistic and absolute expectation of events or individuals being the way a person desires them to be.
2. Awfulizing (AWF) is an exaggeration of the negative consequences of a situation to an extreme degree, so that an unfortunate occurrence becomes “terrible.”
3. Frustration Intolerance (FI) stems from demands for ease and comfort and reflects an intolerance of discomfort.
4. Global evaluation of human worth, either of the self (SC) or others (OC), implies that human beings can be rated and that some people are

worthless or at least less valuable than others.

Two meta-analytic reviews have found support for the REBT theory concerning the association between irrational and rational beliefs with psychological distress. Results from the first meta-analysis of 26 studies indicate a negative association between rational beliefs and distress ($r = -0.31$) (Oltean & David, 2016). The more rational beliefs one endorses, the less likely one will endorse psychological distress and emotional disturbance. Related, Vişlă and colleagues reviewed 83 primary studies and 100 independent samples and found that the endorsement of irrational beliefs was positively associated with the endorsement of psychological distress ($r = 0.38$) (Vişlă et al., 2016). There is substantial evidence that endorsement of irrational beliefs is moderately associated with psychological distress.

Data from a recent study show that people with major depressive disorder (MDD) engage in unhelpful behaviors such as listening to sad or upsetting music (Yoon et al., 2020). Clinically depressed participants are more likely to choose ineffective emotion-regulation strategies, like listening to music, to maintain or increase feelings of sadness (Milgram et al., 2015). Since the endorsement of certain beliefs is associated with psychological distress, it is important to know the degree to which irrational messages are contained in the messages heard in popular music because it is common for people to seek out messages that are consistent with what they think.

Rational Messages in Popular Music

In an early effort to explore the prevalence of irrational beliefs in popular music, Protinsky and Popp (1978) analyzed 194 Country-Western songs and 166 Rock songs to

detect the presence of irrational beliefs. Songs were selected from popular magazines that published a list of the most popular Country-Western and Rock lyrics. Country and Western songs were selected from the *Country Songs Roundup Annual Hits of the 70s*, and the rock songs were from the Hit Parade and *Song Hits of the Super 70s*. The authors had two raters independently rate each song using a coding system developed by Maultsby to assess the presence of Ellis' original 11 irrational beliefs (Maultsby, 1972). They had 89% agreement for the lyrics of Country-Western songs and 87% agreement for the lyrics of Rock songs. Results from the study indicate that rock songs contained 202 references to occurrences of 166 possible songs, and in Country-Western, there were 284 occurrences of 194 possible songs. Specifically, 83% (161/194) of the Country-Western songs and 81% (135/166) of the Rock Songs contained irrational belief content. This suggests that both Rock and Country-Western songs have detected irrational belief language. This provides evidence that irrational beliefs were prevalent in 20th-century popular music.

Present Study

Protinsky and Popp (1978) coded for irrational beliefs according to an older set of definitions provided by Ellis (1962) and not by the definitions and categories used today in REBT Theory and research to define the types of irrational thoughts (David et al., 2019; DiGiuseppe et al., 2014). Some popular kinds of today's music did not exist then. Also, the popularity of music was not as easy to determine as it is today with the various reporting services concerning the popularity of songs. Given these changes and the increased availability of streaming music and its potential impact on people's emotional

states, it is important to study irrationality in the lyrics in contemporary music. Although research has appeared on the presence of irrational beliefs in 20th-century music, no research has appeared since then on the degree of irrational lyrics in 21st-century popular music.

It was predicted that using the newer set of definitions for irrational beliefs would result in a similar number of songs with irrational lyrics as appeared in the 1970s study, with around 80% of songs in the “Hot 100” per year containing irrational belief concepts. This study coded for the presence of irrational beliefs using more modern definitions across different genres of 21st-century music.

The genres that were examined were Country, Alternative, and R&B/Hip Hop. This study included three musical genres and one additional genre than Protinsky and Popp’s study to reflect the years of interest and current culture. Billboard does not publish an end-of-year chart for just the “Rock” genre. As a result of the Rock genre not being published and to best reflect the years of interest and culture, the current researcher only analyzed the Alternative genre, not the Rock genre. For part 1 of the current study, testing hypotheses 1-5, the researcher focused on the years 2006-2019 because it was before the COVID-19 pandemic lockdown when there was a significant shift in society.

For part 2, testing hypothesis 6, the researcher focused on the years 2017-2022. Data was collected on the years 2017-2019 and 2020-2022. The data was examined to see if there was a significant difference between the average irrational belief word count per year before the COVID-19 pandemic and then during the pandemic.

Data on individuals was not collected during this study. Therefore, this is not

human subjects research. Only population data was collected and reported. The researcher examined whether the presence of irrational beliefs differed by genre, ranking, and year from 2006-2019. This study then explored if there was an association between irrational beliefs in song lyrics and child, teen, and adult mental health outcomes, specifically, suicide completions and incidences of drug overdose. This association does not indicate causation. In other words, results from this study do not demonstrate that listening to music with more irrational belief content may increase the risk of suicide or drug overdose. As prior findings suggest, it is common for individuals who are feeling depressed to seek out songs with sad messages (Yoon et al., 2019). The purpose of this research is not to identify that listening to music is a risk factor for child and adult mental health disorders but to gain knowledge on the presence of irrational belief language and exposure to such language in popular music today.

This research provides further information on the popular music and type of language that is commonly streamed across genres in the United States. It is necessary to collect this data because it provides insight into the messages that children hear in music, as school-aged children are exposed to music across multiple settings, such as on the school bus, in the car, in the classroom, at sports events, at home, and in public while shopping with their parents for clothes or food. Significant findings from the current study are valuable for parents, educators, and mental health providers to consider when working with clients or students, especially when facilitating discussion about musical lyrics that are brought into a therapy session or school.

HYPOTHESES

Hypothesis 1. All three genres of music would contain irrational belief language each year from 2006-2019. That is, the average number of occurrences mentioning irrational concepts per song in each genre is significantly different than 0. This was hypothesized based on prior findings, with previous researchers detecting irrational philosophies across musical genres (Protinsky & Popp, 1978). It was hypothesized that irrational belief lyrics are composed by and listened to by people with various tastes and backgrounds (Country, R&B/Hip Hop, and Alternative).

Hypothesis 2. Among the various genres of music studied, the genre with the most song lyrics with irrational beliefs would be Country-Western music. Based on prior findings, this was hypothesized, with Country-Western songs containing the largest percentage of irrational belief language (Protinsky & Popp, 1978). We examined the average number of irrational content coded per song in each genre to test this hypothesis.

Hypothesis 3. We hypothesized that there would be a significant correlation between the frequency of music played, as represented by song ranking (ordinal ranking 1-100), and the degree of irrationality in the top “Hot 100” songs from 2006-2019. I hypothesized that the more frequently played songs would have a high degree of irrationality. This was hypothesized because it is challenging for Americans to find rational mental health promoting lyrics centered on the healing process, and it is more common to locate lyrics that focus on hurt or emotional pain (Gladding et al., 2008).

Hypothesis 4. The degree of irrationality in music would correlate with the rates of suicide completion. That is the average number of irrational concepts per song in the

overall “Hot 100” would correlate with the health statistic among children and adolescents ages 10 to 24 years old in the United States from 2006-2018 in the national database provided by the Center for Disease Control and Prevention Website, National Vital Statistics Reports. The researcher used young adult and child data because this is the age range published by the National Vital Statistics Report. The data is published with the age grouping from 10-24. It is not possible to narrow the age distribution. For this reason, additional data on suicide completion in children and adolescents was collected from KidsData.org at <https://www.kidsdata.org/topic/211/suicides/age/table#fmt=123&loc=1&tf=110,124,79,9&ch=1309,446,1308,787&sortColumnId=0&sortType=asc>.

Kidsdata.org splits child, adolescent, and young adult suicide statistics into narrower age groupings: 5 to 14, 15 to 19, and 20 to 24. The data from the CDC and kidsdata.org were included in the study. I predicted that the years with a large presence of irrational beliefs in popular music (e.g., the year 2018) would also have the highest rates of suicide completion (in the year 2018) compared to years with less presence of irrational beliefs in music. This was hypothesized because individuals who are feeling depressed seek out songs with sad messages (Yoon et al., 2020).

Hypothesis 5. The degree of irrationality in music would correlate with rates of substance drug overdose deaths. That is the average number of irrational concepts per song in the overall “Hot 100,” which would correlate with the health statistic of drug overdose in adolescents and young adults ages 15 to 24 from 2006-2016 in the national database published by the Center for Disease Control and Prevention Website, National

Vital Statistics Report. The researcher used adult and child data because this is the age range published by the National Vital Statistics Report. It is not possible to aggregate or narrow the age distribution. These ages are included in a 10-year age grouping. It was predicted that a year that contains a large presence of irrational beliefs in popular music would also have higher rates of substance drug overdose deaths compared to years with less presence of irrational beliefs in music. It was predicted that the year that contains the least irrational content in popular music would also have the lowest rates of substance drug overdose deaths. It was also predicted that there would be a significant effect on age (by 10-year age groupings). That is, the correlation between irrational lyrics in music and the health statistic outcomes would differ by age. We predicted that the correlation would decrease with age (stronger correlation with the 15-24-year-old group compared to the 25-34, 35-44, 45-54, 55-64, and 65+ groups). This was predicted because the youngest age group consists of adolescents, and prior findings support that this population uses music to explore their identity and to express their feelings, thoughts, and behaviors (American Academy of Child and Adolescent Psychiatry, 2017).

Hypothesis 6. The average number of irrational concepts per song in the overall “Hot 100” would be significantly greater during the pandemic years 2020-2022 compared to before the pandemic 2017-2019. As a result of the pandemic, there was a significant shift in society, and many Americans' routines were disrupted. I hypothesized that music listeners were coping with the societal change during the years 2020-2022, and popular musical lyrics would reflect that. Recent findings support a positive correlation between emotional instability, neuroticism, and listening to music as a way to regulate emotions

(Miranda & Blais-Rochette, 2020). In other words, some people intentionally listen to music to feel better or gain control over their emotions.

METHOD

Sample of Musical Lyrics

Musical lyrics of popular songs were included in the analysis. Popular songs were operationally defined as the songs that were streamed and purchased the most frequently (Billboard, 2021). The sample consisted of the most frequently streamed songs from the years 2006-2019. The frequency was defined as the song's rank in Billboard's rating. Popular lyrical data were retrieved from Billboard, the music industry's standard song popularity chart in the United States. Popular song data were retrieved from Billboard.com. At the end of each year, Billboard publishes charts of the most popular 100 songs across all genres (i.e., "Hot 100"). Billboard also publishes separate charts with the most popular 100 songs specific to genre (Country, Alternative, etc.) Popularity on the Billboard chart is defined by overall sales, airplay, and streaming of the musical lyrics. "Hot 100" data from 2006-2022 were collected from <https://www.billboard.com/charts/year-end/hot-100-songs>. A total of 1700 "Hot 100" songs were collected. Genre-specific data were collected from the "Year End Charts" for Country, R&B/Hip Hop, and Alternative music. Genre-specific data was collected from the websites below:

1. Country: <https://www.billboard.com/charts/year-end/hot-country-songs/>
2. Alternative: <https://www.billboard.com/charts/year-end/alternative-songs/>
3. R&B/Hip Hop: <https://www.billboard.com/charts/year-end/hot-r-and-and-b-hip-hop-songs/>

The filter feature on Billboard's website was used to collect data on the years of interest, 2006-2019. The researcher focused on the years 2006-2019 because all songs were released prior to the start of the COVID-19 pandemic. All of the data was published and could be retrieved from the years 2006-2019 for the Country and Alternative genres. However, this is not the case for the R&B/Hip Hop genre. Since the R&B/Hip Hop data for the year 2006 is not listed, the years 2007-2019 were included in the analysis.

Country and Alternative data for each of the 14 years was included in the analysis. Although the researcher preferred to include the top 100 songs for each genre in the analysis (top 100 per year), this was impossible for all years because Billboard did not consistently list the top 100 songs across genres. A total of 1197 Country, 656 Alternative, and 1223 R&B/Hip Hop songs were analyzed for a total of 3076 songs. These 3076 songs were analyzed for total irrational belief score content. This means that the top overall songs per genre were reported. When a song was duplicated on the popularity charts, meaning it appeared in ranking 1-100 for multiple years, the song data was included in the analysis for both years. For example, if a song appeared on the top 100 charts in 2012 and 2013, it was coded for both years. Lyrical data was collected from the *Lyrics on Demand* online database. The *Lyrics on Demand* online database was selected for the following reasons:

- (1) the website includes relevant lyrical data on 21st-century popular songs,
- (2) the website is well-organized,
- (3) this researcher could easily view/read the lyrical data,
- (4) the lyrical data was easily accessible and can be collected quickly,

(5) the database is free, and

(6) the database provided each song's written text and audible version for the research years of interest: 2006-2022.

The lyrical data was aggregated by year. A sum irrationality belief language score for the top 100 songs (when all 100 songs are listed) was calculated for each year, from the years 2006-2019, and then 2020-2022. This was done by summing the frequency of irrational language in the top 100 songs by year. The total sum irrationality score was reported for each year. When differentiating between genres of music, a sum score was calculated for each genre, and then that value was divided by the number of songs in that genre. The average number of irrational concepts per song was calculated.

Measures

Criterion Measures

Data was collected on two mental health statistics in the United States for the years of interest. The two dependent variables that were reported are suicide completion rates among children, adolescents, and young adults and drug overdose deaths in adolescents and adults.

Suicide Rates in Children, Adolescents, and Young Adults. The data on suicide rates in children and adolescents ages 10 to 24 from 2006-2018 was retrieved from the United States Department of Health and Human Services, Centers for Disease Control (CDC) and Prevention Website. This data was collected online through the National Vital Statistics Reports at <https://www.cdc.gov/nchs/data/nvsr/nvsr69/nvsr-69-11-508.pdf>.

Substance Use. The data on substance use, specifically drug overdose deaths

across ages from 2006-2016, was retrieved from the United States Department of Health and Human Services Centers for Disease Control (CDC) and Prevention Website.

This data was collected online at

https://www.cdc.gov/nchs/data/databriefs/db294_table.pdf#page=1.

Measure of Irrationality in Lyrics. Popular song data was collected from Billboard.com, and lyrics were collected from the *Lyrics on Demand* online. The Lyrics on Demand database was accessed through the internet at <https://www.lyricsondemand.com/>. The Linguistic Inquiry and Word Count (LIWC) program was used to analyze the lyrics. The LIWC is an automated text analysis program used for psychological and social evaluations of language (Pennebaker, Booth, & Francis, 2007). The LIWC program calculates the relative frequency of words using an internal dictionary of concepts associated with psychological, social, and cognitive dynamics (Pennebaker et al., 2007). The plan was to use the LIWC program to reduce the likelihood of human error when coding the lyrical data. The LIWC was purchased and downloaded from <https://www.liwc.app/>.

The irrational belief word count was also calculated by hand scoring to ensure the accuracy of the LIWC. The researcher decided to hand score because, on several occasions, the LIWC system incorrectly detected irrational belief language, which resulted in inflated irrational belief scores. For example, when the LIWC searched for “Must,” “Should,” and “Loser” the words “Mustard,” “Shoulder” and “Closer” were incorrectly coded and included in the total Irrational Belief scores. As a result, the researcher hand-scored all song lyrics. To reduce the chance of

human error, the “Find” (Control F) feature in Microsoft Word was used two times per song to ensure the IB frequency count was accurate. If and when the frequency of IB concepts was not recorded as the same during rounds one and two of coding, the researcher coded the song a third time to ensure agreement. On average, it took the researcher approximately three minutes to search for and record the frequency of irrational belief concepts for each song (per coding round).

The LIWC program was used to create a dictionary to help code lyrics into the five irrational belief categories scores: (1) Demandingness, (2) Awfulizing, (3) Frustration Intolerance, (4) Self-Condensation, and (5) Other-Condensation (DiGiuseppe et al., 2014). Five total scores for each of the five categories were calculated.

Demandingness is an unrealistic and/or absolute expectation of events or individuals being the way a person desires them to be. To measure Demandingness, we searched for these keywords, “should,” “must,” “have to,” “has to,” “supposed to,” “ought to,” “need to,” and “got to.” To get a total demandingness score, we counted all these words.

Awfulizing is an exaggeration of the negative consequences of a situation to an extreme so that the unfortunate occurrence is “terrible.” To measure Awfulizing, we searched for these keywords, “awful,” “terrible,” “miserable,” “catastrophic,” “catastrophe,” “end of the world,” and “horrible.” To get a total awfulizing score, we counted all these words.

Frustration Intolerance stems from demands of ease or comfort and an intolerance for discomfort. To measure Frustration Intolerance, we searched for these keywords, “can’t stand it,” “too much,” “can’t deal,” “cannot stand,” “intolerable,” and “unbearable.” To get a total frustration intolerance score, we counted all these words.

Self-Condensation and Other-Condensation are global evaluations of human worth. To imply that human beings can be rated and that some people are worthless or at least less valuable than others.

To measure Self-Condensation, we searched for these keywords, “I am a failure,” “I am worthless,” “I am a loser,” “I am no good,” and “I am a rotten person.” To get a total self-condensation score, we counted all these words.

To measure Other-Condensation, we searched for these keywords, “They are bad,” “They are losers,” “They are no good,” “They are worthless,” and “They are rotten people.” To get a total other-condensation score, we counted all these words.

Procedure

Statistical Analysis

We first tested Hypotheses 1-3, then Hypotheses 4-5, and lastly Hypothesis 6. It was predicted that global (not genre-specific) irrational belief scores would be associated with behavioral and mental health outcomes (suicide and drug overdose deaths).

Analyses were conducted using the Statistical Package for Social Sciences (SPSS) Version 27. An alpha value (α) of .05 was used (level of significance). A mixed-model approach was used.

Hypothesis 1. Hypothesis 1 stated that all three genres of music would contain irrational belief language each year from 2006-2019. To test this hypothesis, all music data was aggregated across genres by year, and the data was examined. A visual analysis of the data was conducted across the years, and the irrational belief values were reported. A *t*-test was used to determine if the average number of irrational concepts per song in each genre was significantly different than 0.

Hypothesis 2. To test hypothesis 2, the genre of music that contains the most song lyrics with irrational beliefs is Country music. An Analysis of Variance (ANOVA) was conducted to see if there was a statistical difference between the irrational belief scores across music genres. If there was overlap and a song appeared in more than one genre category, then the song was included in the category that aligns with the primary identity of the singer. The song was not included in the other (secondary) genre category. This rule was used to ensure that the genre groups were independent of the analysis. Billboard does not publish the songs that did not make the Top 100 for each genre, so data was not substituted (i.e., the 101st ranked song is not published on the Billboard “Year End Charts” and cannot be substituted for the duplicate song).

Hypothesis 3. Hypothesis 3 states there would be a significant correlation between the frequency of music played, as represented by song ranking (ordinal ranking 1-100), and the degree of irrationality in the top “Hot 100” songs from 2006 - 2019. To see if the frequency of music played by song ranking (and when the data is available, the frequency of streams/airplay) was correlated with irrational belief concepts, the correlation matrix was examined, and the strength of the relationship was reported.

Hypothesis 4. To test hypothesis 4, the presence of irrational beliefs in music lyrics will be associated with suicide completion, the correlation matrix will be examined, and the strength of the relationship was reported. That is, we tested if the average number of irrational concepts per song in the overall “Hot 100” was correlated with the health statistics among children, adolescents, and young adults, ages 10 to 24 from 2006-2018 in the national database provided by the Center for Disease Control and Prevention Website, National Vital Statistics Reports. The correlation between the total scores for the five subscales of irrational beliefs and suicide completion was also examined. Lastly, the correlation between the average number of irrational concepts per song in the “Hot 100” and the five subscales of IBs and suicide statistics in the narrower age groupings, ages 5 to 14, 15 to 19, and 20 to 24, was also reported.

Hypothesis 5. Hypothesis 5 stated that the degree of irrationality in music would be associated with substance drug overdose deaths across ages from 2006-2016 in the national database published by the Center for Disease Control and Prevention Website, National Vital Statistics Report. We predicted that the strength of the relationship would decrease with age. It was also predicted that there would be a significant effect for age (by 10-year age groupings). That is, the correlation between irrational lyrics in music and the health statistic outcomes would differ by age. We predicted that the correlation would decrease with age (stronger correlation with the 15 -24-year-old group compared to the 25-34, 35-44, 45-54, 55-64, and 65+ groups). To test this hypothesis, the correlation between the two variables was calculated for all of the age groups and the relationship was reported. The correlation between the total scores for the five subscales of irrational

beliefs and drug overdose deaths across ages was also reported.

Hypothesis 6. To test hypothesis 6, the average number of irrational concepts per song in the overall “Hot 100” would be significantly greater during the pandemic years 2020-2022 compared to before the pandemic 2017-2019, a *t*-test was used to see if there was a significant difference between the groups.

RESULTS

Hypothesis 1:

A *t*-test was used to determine if the average number of irrational concepts per song in each genre differed significantly from 0.

H₀: The average number of irrational concepts per song in each genre is not significantly different than 0.

H₁: The average number of irrational concepts per song in each genre would be significantly different from 0. $\mu > 0$.

We predicted that the average number of irrational concepts per song in each genre from 2006-2019 would be significantly different than 0, and this hypothesis was supported. A one-sample *t*-test revealed that for Country $t(1198) = 14.96, p < .001$, Alternative $t(657) = 10.58, p < .001$, and R&B/Hip Hop $t(1224) = 15.89, p < .001$. Therefore, Hypothesis 1 was supported, with all three genres' average number of irrational belief concepts being significantly different from 0. A visual analysis of the data supported that all three genres of music contained irrational belief language each year from 2006(7)-2019. Therefore, the null hypothesis was rejected because the means for all three genres were significantly different than 0.

Table 1One Sample T-Test: **Country Genre**

		Statistic	df	p
Total IB Score	Student's t	14.960	1198.000	< .001

Note. $H_a \mu > 0$ **Table 2**One Sample T-Test: **Alternative Genre**

		Statistic	df	p
Total IB Score	Student's t	10.582	657.000	< .001

Note. $H_a \mu > 0$ **Table 3**One Sample T-Test: **R&B/Hip Hop Genre**

		Statistic	df	p
Total IB Score	Student's t	15.892	1224.000	< .001

Note. $H_a \mu > 0$

For the country genre, the frequency of irrational belief language ranged from 0 to 24 occurrences, and the mean total irrationality score per song was 0.794 (SD=1.838).

366/1197 of the Country songs coded contained at least 1 occurrence of Irrational belief language. 831/1197 of the Country songs that were coded contained 0 instances of Irrational Belief (IB) language. For the Alternative genre, the frequency of Irrational Belief language ranged from 0-24 occurrences, and the mean Total Irrationality score per song was 0.970 (SD=2.350). 218/656 of the Alternative songs coded contained at least 1 occurrence of Irrational Belief language. 438/656 of the Alternative songs that were coded contained 0 instances of Irrational Belief language. Lastly, for the R&B/Hip Hop genre, the frequency of irrational belief language ranged from 1 to 38 occurrences, and the mean total irrationality score per song was 1.274 (SD=2.806). 555/1223 of the R&B/Hip Hop songs that were coded, contained at least 1 instance of Irrational Belief language. 668/1223 of the R&B/Hip Hop songs that were coded, contained 0 instances of Irrational Belief language.

Table 4
Frequency of Total Irrational Belief Occurrences per Song in Country Music

Frequency of Irrational Beliefs	Number of Songs that Contained Frequency of IBs
0	831
1	169
2	66
3	47
4	36
5	10
6	10
8	7
9	6
7	5
10	4
11	2
12	2
14	1
24	1

Table 5*Frequency of Total Irrational Belief Occurrences per Song in Alternative Music*

Frequency of Irrational Beliefs	Number of Songs that Contained Frequency of IBs
0	438
1	98
2	33
3	29
4	19
5	14
6	11
7	4
9	3
24	2
20	1
19	1
8	1
11	1
13	1

Table 6*Frequency of Total Irrational Belief Occurrences per Song in R&B/Hip Hop Music*

Frequency of Irrational Beliefs	Number of Songs that Contained Frequency of IBs
0	668
1	257
2	111
3	67
4	43
5	24
6	10
8	9
9	8
7	5
11	4
15	4
10	4
16	2
24	2
38	2
13	1
20	1
14	1

Hypothesis 2:

Six ANOVAs were conducted to see if there was a statistical difference between the Irrational Belief (IB) scores across genres, one for the total irrationality score and one for the subscales of Demandingness, Awfulizing, Frustration Intolerance, Self-Condensation, and Other Condensation.

H₀: There will not be a significant difference between IB scores for total irrationality score and the subscales of Demandingness, Awfulizing, Frustration Intolerance, Self-Condensation, and Other Condensation across genres.

H₁: There will be a significant difference between the IB scores for total irrationality score and the subscales of Demandingness, Awfulizing, Frustration Intolerance, Self-Condensation, and Other Condensation across genres.

It was predicted that there would be a statistical difference between the IB scores across music genres and that the Country genre would contain the most song lyrics with irrational beliefs (i.e., the Country genre would have the highest mean).

An ANOVA revealed that there was a significant difference between the mean irrational belief scores across genres at the $p < 0.05$ level, $[F(2, 3079) = 12.00, p < .001]$. However, the effect size was small, with $\eta^2 = 0.008$. An ANOVA also revealed a significant difference between the irrational belief scores for the Demandingness subscale across genres at the $p < 0.05$ level, $[F(2, 3079) = 7.83, p < 0.001]$ and the Frustration Intolerance subscale across genres at the $p < 0.05$ level, $[F(2, 3079) = 5.01, p = 0.007]$. However, the effect size for the Demandingness subscale was small, with $\eta^2 = 0.005$. The

effect size for the Frustration Intolerance subscale was also small, with $\eta^2 = 0.003$. There was not a significant difference between the IB scores for the subscales Awfulizing [$F(2, 3079) = 2.47, p = 0.084$], Self-Condensation [$F(2, 3079) = .41, p = 0.666$] and Other-Condensation, [$F(2, 3079) = 0.63, p = 0.531$], with all p values > 0.05 . Therefore, the null hypothesis was partially rejected because there was a significant difference between the mean IB scores across genres and the Demandingness and Frustration Intolerance subscales. However, the effect sizes were small. Part of Hypothesis 2 was not supported because the average number of total irrational content coded per song was highest for the R&B/Hip Hop genre, not the Country genre as predicted.

Hypothesis 3:

The correlation matrix was examined to determine if there was a significant correlation between the frequency of music played, as represented by song ranking (ordinal ranking 1-100), and the degree of irrationality in the top “Hot 100” songs from 2006-2019. The correlation coefficient was not significant, as the p-value = 0.687 was above the alpha level of .05. Therefore, the null hypothesis was not rejected. Hypothesis 3 was not supported because there was no significant correlation between the frequency of music played, as represented by song ranking and irrational belief concepts.

Table 7
Correlation Matrix for Song Ranking and Total IB Score

		Ranking
Total Score	Pearson’s r	-0.010
	p-value	0.687
	N	1700

Hypothesis 4:

The correlation matrix was examined, and the presence of irrational beliefs in music lyrics was not associated with suicide completion. That is, the average number of irrational concepts per song in the overall “Hot 100” did not correlate with the health statistics among children, adolescents, and young adults ages 10 to 24 from 2006-2018 in the national database provided by the Center for Disease Control and Prevention Website, National Vital Statistics Reports or the suicide completion statistics in the narrower age groupings (published by Kidsdata.org), ages 5 to 14, 15 to 19, and 20 to 24. The correlation coefficient was not significant for the 10-24 CDC grouping ($p = 0.894$), 5-14 Kidsdata.org grouping ($p = 0.607$), 15-19 Kidsdata.org grouping ($p=0.997$), or the 20-24 Kidsdata.org grouping ($p=0.906$), as the p-values were above the alpha level of .05. Therefore, the null hypothesis was not rejected. Hypothesis 4 was not supported because there was not a significant correlation between the presence of irrational beliefs and suicide completion in children, adolescents, and young adults ages 5 to 24.

However, when the correlation matrix was examined for the total scores for the five types of irrational beliefs and suicide rate/completion, there was a significant correlation for the Frustration Intolerance subscale for two age groupings. The correlation coefficient was significant at the $p < .05$ level for the 10-24 CDC grouping ($p=0.045$) and the 20-24 Kidsdata.org grouping ($p = 0.037$). Therefore, the total Frustration Intolerance IB score and the suicide rate/completion for these age groups were positively correlated,

with $r = 0.564$ and $r = 0.582$, respectively. There was not a significant correlation between the total Demandingness, Awfulizing, Self-Condensation, or Other-Condensation scores in the “Hot 100” and suicide completion.

Table 8
Correlation Matrix for Suicide Rate/Completion, Average Number of IB Concepts per Song in the Hot 100

		Average Number of IB Concepts per Song in Hot 100
Suicide Rate 10-24 (CDC)	Pearson Correlation	-0.041
	p-value	0.894
	N	13
Suicide Completion Kidsdata.org Ages 5-14	Pearson Correlation	-0.158
	p-value	0.607
	N	13
Suicide Completion Kidsdata.org Ages 15-19	Pearson Correlation	0.001
	p-value	0.997
	N	13
Suicide Completion Kidsdata.org Ages 20-24	Pearson Correlation	-0.037
	p-value	0.906
	N	13

Table 9*Correlation Matrix for Suicide Rate/Completion and Demandingness Subscale*

		Total Demandingness Score in Hot 100
Suicide Rate 10-24 (CDC)	Pearson Correlation	-0.162
	p-value	0.597
Suicide Completion Kidsdata.org Ages 5-14	Pearson Correlation	-0.281
	p-value	0.352
Suicide Completion Kidsdata.org Ages 15-19	Pearson Correlation	-0.107
	p-value	0.729
Suicide Completion Kidsdata.org Ages 20-24	Pearson Correlation	-0.163
	p-value	0.594

Table 10*Correlation Matrix for Suicide Rate/Completion and Awfulizing subscale*

		Total Awfulizing Score in Hot 100
Suicide Rate 10-24 (CDC)	Pearson Correlation	0.127
	p-value	0.680
Suicide Completion Kidsdata.org Ages 5-14	Pearson Correlation	0.253
	p-value	0.404
Suicide Completion Kidsdata.org Ages 15-19	Pearson Correlation	0.044
	p-value	0.886
Suicide Completion Kidsdata.org Ages 20-24	Pearson Correlation	0.150
	p-value	0.624

Table 11*Correlation Matrix for Suicide Rate/Completion and Frustration Intolerance subscale*

		Total Frustration Intolerance Score in Hot 100
Suicide Rate 10-24 (CDC)	Pearson Correlation	0.564
	p-value	0.045
Suicide Completion Kidsdata.org Ages 5-14	Pearson Correlation	0.523
	p-value	0.067
Suicide Completion Kidsdata.org Ages 15-19	Pearson Correlation	0.533
	p-value	0.061
Suicide Completion Kidsdata.org Ages 20-24	Pearson Correlation	0.582
	p-value	0.037

Table 12*Correlation Matrix for Suicide Rate/Completion and Self-Condensation subscale*

		Total Self-Condensation Score in Hot 100
Suicide Rate 10-24 (CDC)	Pearson Correlation	0.259
	p-value	0.393
Suicide Completion Kidsdata.org Ages 5-14	Pearson Correlation	0.158
	p-value	0.607
Suicide Completion Kidsdata.org Ages 15-19	Pearson Correlation	0.277
	p-value	0.360
Suicide Completion Kidsdata.org Ages 20-24	Pearson Correlation	0.268
	p-value	0.376

Table 13*Correlation Matrix for Suicide Rate/Completion and Other-Condensation subscale*

		Total Other-Condensation Score in Hot 100
Suicide Rate 10-24 (CDC)	Pearson Correlation	-0.166
	p-value	0.587
Suicide Completion Kidsdata.org Ages 5-14	Pearson Correlation	-0.102
	p-value	0.741
Suicide Completion Kidsdata.org Ages 15-19	Pearson Correlation	-0.203
	p-value	0.505
Suicide Completion Kidsdata.org Ages 20-24	Pearson Correlation	-0.154
	p-value	0.615

Hypothesis 5:

The correlation matrix was examined, and the presence of irrational beliefs in music lyrics was not associated with substance drug overdose deaths across ages from 2006-2016 in the national database published by the Center for Disease Control and Prevention Website, National Vital Statistics Report. That is, the average number of irrational concepts per song in the overall “Hot 100” was not correlated with substance drug overdose deaths. There was no significant effect for age (by 10-year age groupings). The correlation coefficient was not significant for the 15-24 CDC grouping ($p = 0.115$), 25-34 grouping ($p = 0.369$), 35-44 grouping ($p = 0.107$), 45-54 ($p = 0.332$), 55-64 ($p = 0.808$) or the 65+ grouping ($p = .819$), as the p-values were above the alpha level of .05. Therefore, the null hypothesis was not rejected. Hypothesis 5 was not supported because there was not a significant correlation between the presence of irrational beliefs and drug

overdose deaths across the lifespan.

However, when the correlation matrix was examined for the total scores for the five types of irrational beliefs and substance drug overdose deaths, there was a significant correlation for the Frustration Intolerance subscale. The correlation coefficient was significant at the $p < .05$ level for the 15-24 CDC age grouping ($r = 0.812, p = 0.002$), 25-34 age grouping ($r = 0.713, p = 0.014$), 35-44 age grouping ($r = 0.768, p = 0.006$) and the 45-54 age grouping ($r = 0.731, p = 0.011$). Therefore, the total Frustration Intolerance IB score and substance drug overdose deaths for these age groups were positively correlated. There was not a significant correlation for the 55-64 or 65+ age grouping, and there was not a significant correlation between the total Demandingness, Awfulizing, Self-Condernation, or Other-Condernation scores in the “Hot 100” and drug overdose deaths.

Table 14*Correlation Matrix for Drug Overdose Deaths and Average Number of IB Concepts per song in the Hot 100*

		Average Number of IB Concepts per Song in Hot 100
Overdose Rate 15-24 (CDC)	Pearson Correlation	0.502
	p-value	0.115
	N	11
Overdose Rate 25-34	Pearson Correlation	0.300
	p-value	0.369
	N	11
Overdose Rate 35-44	Pearson Correlation	0.513
	p-value	0.107
	N	11
Overdose Rate 45-54	Pearson Correlation	0.323
	p-value	0.332
	N	11
Overdose Rate 55-64	Pearson Correlation	0.083
	p-value	0.808
	N	11
Overdose Rate 65+	Pearson Correlation	0.078
	p-value	0.819
	N	11

Table 15*Correlation Matrix for Drug Overdose Deaths and Total Scores for 5 IB subscales in the Hot 100*

		DEM OC	AWF	FI	SC
Overdose Rate 15-24 (CDC)	Pearson Correlation	0.398 -0.221	-0.051	0.812	-0.035
	p-value	0.225 0.513	0.881	0.002	0.919
Overdose Rate 25-34	Pearson Correlation	0.185 -0.116	0.021	0.713	0.129
	p-value	0.587 0.734	0.951	0.014	0.706
Overdose Rate 35-44	Pearson Correlation	0.419 -0.206	-0.127	0.768	0.003
	p-value	0.199 0.543	0.711	0.006	0.994
Overdose Rate 45-54	Pearson Correlation	0.203 -0.074	0.028	0.731	0.129
	p-value	0.549 0.828	0.934	0.011	0.705
Overdose Rate 55-64	Pearson Correlation	-0.033 -0.031	0.166	0.560	0.186
	p-value	0.924 0.928	0.625	0.073	0.584
Overdose Rate 65+	Pearson Correlation	-0.033 -0.008	0.123	0.532	0.219
	p-value	0.923 0.980	0.718	0.092	0.518

Hypothesis 6:

An independent samples *t*-test was conducted to determine if there was a statistically significant difference in the average number of irrational concepts per song in

the overall “Hot 100” during the pandemic years 2020-2022 compared to before the pandemic in 2017-2019. It was predicted that the average number of irrational concepts per song would be significantly greater during the pandemic years.

H₀: There is no significant difference in Group 1 (pre-pandemic, 2017-2019) and Group 2 (pandemic, 2020-2022) irrational concepts per song means. $\mu_1 = \mu_2$.

H₁: There is a significant difference in means of irrational concepts per song between Group 1 (pre-pandemic, 2017-2019) and Group 2 (pandemic, 2020-2022) means. $\mu_1 \neq \mu_2$.

The *t*-test revealed that there was a significant difference between the means for Group 1 (M = 1.08, SD = 2.17) and Group 2 (M = 0.70, SD = 1.66); $t(561) = 2.41$, $p = 0.016$, $d = 0.20$. It was predicted that the average number of irrational concepts per song in the overall “Hot 100” would be significantly greater during the pandemic years 2020-2022 compared to before the pandemic 2017-2019. However, this was not supported because the mean was higher for the years prior to the pandemic (2017-2019). Therefore, the null hypothesis can be rejected because there was a significant difference between the means. However, these results are to be viewed critically because the effect size was small.

Table 16

Independent Samples T-Test for Pre-Pandemic (2017-2019) and Pandemic (2020-2022) Years

		Statistic	df	p
Total IB Score	Student's t	2.411 ^a	598.000	0.016
	Welch's t	2.411	560.725	0.016

^a Levene's test is significant ($p < .05$), suggesting a violation of the assumption of equal variances

Table 17*Group Descriptives, Mean IB Scores for Hot 100 2017-2019 and 2020-2022*

	Group	N	Mean	SD	SE
Total IB Score	Hot 100 2017-2019	300	1.083	2.165	0.125
	Hot 100 2020-2022	300	0.703	1.663	0.096

DISCUSSION

Discussion of Hypotheses and Existing Research

The current study aimed to gain knowledge on the presence of irrational belief language and exposure to such language in popular music in America. Researchers have supported the idea that certain attitudes and irrational beliefs identified by Ellis (1977) lead to undesirable mental health outcomes like anxiety, depression, substance use, and suicide (Vîslă et al., 2016). Ellis (1977) proposed that "Demandingness," characterized by absolutistic thinking and rigidity, represented the core cognitive processes underlying psychopathology. Protinsky and Popp (1978) coded for irrational beliefs according to an older set of definitions provided by Ellis (1962) and found that both Country and Rock music contained irrational belief language. However, the current study is the first to use an updated, modern set of REBT definitions to examine 2000s music. It was hypothesized that (1) all genres of music (Country, Alternative and R&B/Hip Hop) would contain irrational belief language each year from 2006-2019, (2) the genre of music with the most song lyrics with irrational beliefs would be Country music, (3) the more frequently played songs would have a high degree of irrationality, (4) the average number of irrational concepts per song in the overall "Hot 100" would correlate with suicide statistics among children, adolescents, and young adults from 2006-2018, (5) the average number of irrational concepts per song in the overall "Hot 100" would correlate with drug overdose deaths in adolescents and young adults from 2006-2016, and (6) the average number of irrational concepts per song in the overall "Hot 100" would be significantly greater during the pandemic years 2020-2022 compared to before the

pandemic 2017-2019.

Results from this study were consistent with previous literature, with all the genres of music examined containing irrational belief language. In the current study, the average number of irrational belief concepts in all three genres was significantly greater than 0. All three music genres contained irrational belief language each year from 2006(7)-2019. However, findings from the current study failed to support Hypothesis 2 because the R&B/Hip Hop genre had the highest average number of irrational content per song, not the Country genre as predicted. There was only a significant difference between the IB subscale scores across genres for two out of the five subscales, Demandingness and Frustration Intolerance.

Results also failed to support a significant correlation between the frequency of music played, as represented by ordinal song ranking, and irrational belief concepts. It is possible that Americans seek out songs for reasons other than irrational concepts. In addition, Hypotheses 4 and 5 were not supported. There was not a significant correlation between the presence of total irrational beliefs in popular music and suicide completion in children, adolescents, and young adults. There was not a significant correlation between the presence of total irrational beliefs and drug overdose deaths across the lifespan. However, there was a positive correlation between one of the IB subscales, the total Frustration Intolerance score, and the suicide rate/completion for select age groupings from 2006-2018. The correlation coefficient was significant at the $p < .05$ level for the 10-24 (CDC) age grouping and the 20-24 Kidsdata.org age grouping. When the correlation matrix was examined for the total scores for the five types of irrational beliefs

and substance drug overdose deaths, there was also a significant correlation for the Frustration Intolerance subscale. The correlation coefficient was significant at the $p < .05$ level for the 15-24 CDC age grouping, 25-34 age grouping, 35-44 age grouping, and the 45-54 age grouping. It is important to review these results with caution, as correlation does not equal causation. Lastly, there was a significant difference between the average number of irrational concepts per song in the overall “Hot 100” during the pre-pandemic versus pandemic years. However, the opposite of what was predicted was supported, with there being more irrational concepts present in the years prior to the pandemic, not during the pandemic years.

LIMITATIONS OF THE CURRENT STUDY

Findings from this study are limited because only three of the most popular music genres were examined. Also, the Rap genre was not included in this study because of there being consistent overlap between the R&B/Hip Hop and Rap genres and because Rap had a significantly lower n size (i.e. limited song data was published for Rap). To ensure that the genre groups were independent for analysis, Rap was not included in the analysis. Future research in this area is needed.

DIRECTIONS FOR FUTURE RESEARCH

It is imperative for future researchers to continue studying the language used in popular media, as our society is continuously evolving, and Americans' behavior and mental health statistics change over time. The findings from this study suggest that Americans may seek out music and songs for other reasons than irrational concepts, since the most popular songs, by ordinal ranking, did not contain significantly more irrational concepts. Since it is challenging to locate songs focused on the healing process, future research can focus on creating a dictionary to code for rational lyrics in popular 21st music across musical genres. This research can help identify popular songs that contain rational lyrics. Furthermore, the current results are based on population data, not on individual data. Future studies may also wish to explore children's and adolescents' experiences while listening to popular music and various genres of music. For example, ask participants to report their experience and subjective level of distress before and after listening to songs that contain a larger presence of irrational belief concepts versus songs that do not contain irrational belief concepts. Future research can also focus on instrumental music versus songs with lyrics. Future research will add insight into how Americans feel when being exposed to music that contains irrational concepts.

IMPLICATIONS FOR THE PROFESSION OF SCHOOL PSYCHOLOGY

The current study adds to the current literature on REBT and supports prior findings. In particular, how popular music in the 1970s contained irrational concepts and how popular music today contains irrational concepts. School psychologists, clinicians, parents, and educators need to view these results through a critical lens because only population data was used, and the results are not based on individual cases. Nonetheless, there was not a significant correlation between the presence of irrational beliefs in music and suicide completion in children, teens, and young adults in America. There was also not a significant correlation between the presence of irrational beliefs and drug overdose deaths across the lifespan. Findings from the current study challenge the notion that at a population level, listening to music, particularly popular music, which contains songs across musical genres, will result in behavioral concerns, drug overdose, or suicide. Results did support a positive correlation between total Frustration Intolerance scores in popular music and suicide rate/completion and drug overdose deaths for select age groupings. This is correlation data, and the findings do not suggest that listening to songs that contain statements related to Frustration Intolerance will cause suicide or substance drug overdose deaths. Nonetheless, it is worthy to consider parental consent for downloading music and the feasibility of parents reviewing music lyrics before approving it for their children.

These findings also support the concept that there is not just one musical genre or artist that may express distress through musical lyrics. An argument can be made that music listeners may seek out songs with irrational concepts because they may feel a sense

of validation because someone else feels similar to them or someone else has experienced a similar situation. However, it is possible that Americans seek out songs for other reasons than the language that is used in the song. Listeners may seek out songs for the instrumentals or rhythmic patterns. Future research must be done to learn more. At the end of the day, music is a form of media, but also a form of culture, art and self-expression that will continue to be a relevant topic to study over the years.

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