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Avicii's S.O.S.: A psychobiographical approach and corpus-based discourse analysis on suicidal ideation

This study explored the linguistic patterns and discourse on suicide of the Swedish artist Avicii. Focusing on key events in his life, career, and compositions, a triangulation of data sources was employed grounded on psychobiographical research framework and corpus-based discourse analysis. Texts with reference to suicidal risk factors were then evaluated based on the interpersonal-psychological theory of suicide to establish linguistic representations of emotional distress and suicidal ideation. The findings suggest that lexical features associated with mental health struggles, that is, high volume of first-person deixis and death-themed linguistic references, were evident in his writing. There were substantial implications of his predisposition to mental stress and his call for help, his S.O.S. This study helps in further understanding the language and discourse of artists like Avicii on the immense dislocation of emotions and the complexities of navigating (inter)personal relationships.

Key words: suicide, corpus discourse analysis, interpersonal theory, mental health, psychobiographical

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"One should not be afraid or ashamed to talk about mental health problems or troublesome thoughts; one should not carry them alone and keep them locked inside." These were the words of Klas Bergling, the father of the famous disc jockey (DJ) and electronic dance music (EDM) artist Tim Bergling, also known as Avicii. They were given during the inauguration of The Tim Bergling Foundation, which helps address mental health issues among musicians, especially those in the electronic music industry (Shortlidge, 2019, para. 13). Avicii struggled with depression and anxiety, and he was in and out of psychotherapy (Tsikurishvili, 2017). A few years before his death, he seemed to be coping and was on his way to recovery. Hence, the news of Avicii's death by suicide in 2018 came as a shock to his family, the people who worked with him, and his fans (Hutt, 2019).

Mental disorders and poor mental health are believed to be the fundamental cause of suicide, and the rate of suicide-related deaths worldwide seems to be increasing. According to the latest report released by the World Health Organization (WHO, 2021), "more than 700,000 people die due to suicide every year" (para. 1). Notably, research also shows an existing correlation between the arts and suicide. In the United States, the arts and related industries ranked third in the occupations with the highest rate of deaths by suicide (Peterson et al., 2020). With easy access to drugs and alcohol, artists in high income countries tend to be more vulnerable to substance abuse, more prone to anxiety disorders, and are at high risk of committing suicide (Tikkanen et al., 2020). Were there any signs that Avicii was expressing his depression and suicidal thoughts in his work? The answer could be resting beneath the lyrics in the songs he wrote prior to his untimely death.

The use of written language has been widely studied, especially in research on mental health and its psychological and cognitive implications (Boyd et al., 2015). It has also been connected with psychiatric disorders, emotional distress, and suicide attempts by writers, poets (Pennebaker & Ireland, 2011), and musicians (Rafflis, 2019). A qualitative, exploratory psychobiographical paradigm is sometimes taken to (re)construct the lived experiences of a (famous) person who had died (Mayer et al., 2021), in some cases by suicide (Schultz & Lawrence, 2017). Using a wide network of information from various resources, for example, the person's own work and writings (poems, songs, books, etc.) and public domain sources (memoirs, documentaries, newspaper articles, social media, press interviews, etc.), researchers can explore one's life story and examine any suicidal patterns, discover any risk factors in their environment, and establish the contributions of their discourse to understanding the fragility of life —why people die by suicide. In the field of cognitive science and psycholinguistics, text analysis is applied to detect suicidal predictors through suicide notes (Egnoto & Griffin, 2016), social media posts (Chadha & Kaushik, 2019), written reflections (Miller-Lewis et al., 2021), and song lyrics (Markowitz & Hancock, 2017). Critical discourse analysis is also used to understand the discursive nature of talking about suicide (Marsh, 2010) and how (in)direct language can shape (mis)representations of negative emotions, suicide, and suicidal behaviors (Fitzpatrick, 2014). In computational

(digital) text analysis, new methods are now being used which can objectively identify various cognitive and affective facets of suicidal ideation in text (Rosen et al., 2019). Various types of literature such as books, poems, lyrics, and so forth can be examined by applying quantitative (computational, corpus-based) approaches (Boyd, 2017; Pennebaker & Ireland, 2011). Nevertheless, studies on suicidal ideation in lyrics of famous musicians using combined corpus-based discourse analysis and psychobiography within the interpersonal theory of suicide are still relatively limited. The current study fills the gap in literature by analyzing Avicii's songs to see what and how language could disclose patterns of suicidal ideation and behaviors. The analysis involved interpolating various documents, and triangulating the findings gives cogency to the evidence, that is, how suicidal factors were presented and expressed in the text.

Literature Review

Durkheim (1951, qtd. in Joiner, 2005) laid down the theoretical foundation for sociological studies on suicide. His disengagement theory focused more on social detachment and lack of integration, which are antecedents of suicide (Stirman & Pennebaker, 2001). Studies show that an individual's social interactions and relationships (or lack thereof) can influence emotions, thoughts, and behavior, which could push them to commit suicide (Marroquin, 2011). There are other factors that affect an individual's risk of suicide which could manifest at any time, such as mental disorders and social isolation. Van Orden et al. (2010) compiled a list of risk factors that are highly linked with lethal suicidal behavior (pp. 578–579). Ermakova and Ermakov (2014, p. 144) also provided a list of emotional indicators that are associated with risk factors of suicide. They are given in Table 1. Finally, the American Association of Suicidology (2020) published a list of several warning signs that can indicate an acute risk of suicide. These are given in Table 1.

Although some studies on suicide still refer to Durkheim's theoretical contributions (e.g., Clegg et al., 2016; Kang, 2017), contemporary analytical frameworks have since emerged, providing substantial empirical-based findings on suicide behavior (Joiner & Silva, 2012; Klonsky & May, 2014; Van Orden et al., 2008). Modern theoretical developments such as Joiner's (2005) interpersonal-psychological theory propose that the desire to commit suicide combined with the capability to perform it aggregate its likelihood. The desire for suicide is developed and compounded in time through exposure to various painful experiences, hopelessness, and heightened psychological states of perceived burdensomeness and a sense of low belongingness/social alienation (thwarted belongingness). The capability to commit suicide shows one's fearlessness to pain, injury, and death (Joiner, 2019). Van Orden et al (2010) have improved Joiner's interpersonal theory by including the desire for suicide construct as part of a Venn diagram, interlocking with perceived burdensomeness, thwarted belongingness, and the capability for suicide. The overlapping circle that contains all the constructs

Table 1. Emotional Indicators Associated with Risk Factors of Suicide

Van Orden et al (2010):	
Mental disorders	Hopelessness
Previous suicide attempts	Agitation or sleep
Social Isolation	Childhood abuse
Physical illness	Exposure to suicide
Unemployment	Homelessness
Family conflict	Openness to experience
Family history of suicide	Pulling together
Impulsivity	Self-esteem
Incarceration	Shame
Ermakova and Ermakov (2014):	
Emotional indicators	Risk factors
Sadness; loss of interest or pleasure	History of previous suicide attempts family history of suicide
Disturbance in sleep and appetite	Family violence
Difficulty in concentrating	History of depression or
Thoughts and talks of suicide (ideation)	Other mental illness
Isolation	Alcohol or drug abuse
Looking for a way to kill oneself	Stressful life event or loss
Talking about being trapped or in unbearable pain, being a burden to the others	Exposure to the suicidal behavior of others
Talking about having no reason to live	Incarceration
Feeling hopeless	
Displaying extreme mood swings	
Extreme behavior	
Exposure to suicidal behavior of others, such as family members or peers	
The American Association of Suicidology (2020)	
Threatening or talking about wanting to hurt or kill oneself	
Identifying ways to kill oneself by seeking access to firearms, pills, or other means	
Talking or writing about death, dying or suicide	
Increased substance use	
No reason for living or no sense of purpose in life	
Dramatic mood changes	

suggests a critical fusion that signifies (near-)lethal suicide attempts.

The (self-)perceived burdensomeness is a misperception of being a liability and/or burden on others (e.g., family). Such self-perceptions (cf. Wetherall et al. 2019) imply self-hate, agitation, low self-esteem, and shame caused by an intense distress from desperate situations, for example, homelessness, incarceration, unemployment, or physical illness, which are risk factors highly linked with suicide (Van Orden et al, 2010).

Thwarted belongingness is the lack of social connection with others (Van Orden et al, 2010). The need to belong is a basic human trait that allows social

integration, which makes living more meaningful (Baumeister et al., 2000). People who lack this social connectivity tend to be isolated, alienated, and lonely. Such social withdrawal is oftentimes the effect of a painful divorce, loss through death, abuse, family conflict, and so forth. Van Orden et al (2010) posit that "loneliness and the absence of reciprocally caring relationships" (p. 582) can make an individual feel rejected, alone, and that no one cares.

Unmet interpersonal needs can trigger and intensify suicidal ideation or the desire to end one's life. Prolonged exposure to abuse and pain can exacerbate their tolerance to these events, thus diminishing their fear towards them in the end. Van Orden et al. (2010) postulated that suicidal ideation can be passive – where thoughts such as wishing to be dead come to mind but are not acted upon. The threshold lies between desire, intent, and attempt. Given the capability to commit suicide, an attempt can be lethal (Willoughby et al., 2015).

Language of Suicidal Ideation

Language is a powerful tool not only for describing people, things, and situations, but also for reflecting attitudes and feelings toward them. Pennebaker and Smyth (2016) asserted that language is a good indicator of people's emotional, psychological, and behavioral states. It can likewise describe a person's traits, and changes in behavior patterns can be detected from the way they express themselves (Boyd & Pennebaker, 2017). According to Boyd and Schwartz (2021), "theories that connect language to our thoughts, feelings, and behaviors have largely co-evolved with psychological language analysis methods—the practice of extracting psychological insights from a person's verbal behavioral data" (p. 22). Edwards (2005) described the discursive psychology of emotions, that is, asserting/confessing them or attributing them to others. He added that emotion discourse is used to construct thoughts and actions and can be categorized to ascribe causes and motives to those actions, for example, blaming, making excuses, and so forth. Linguistic markers of emotions, signs of depression, anxiety, and suicidal ideation can be identified. For example, Reni (2019) classified verbal expressions such as "I cannot stand it anymore," "I am not good," or "They will be better without me" as indicators of suicide risk. Jashinsky, Burton, Hanson, West, Giraud-Carrier, Barnes, and Argyle (2014) also provided other examples of terms and statements that people posted on Twitter, which they also categorized as suicide risk factors i.e., comments expressing depressive feelings and symptoms e.g., I feel hopeless, I feel sad, I'm depressed, I'm worthless, etc. or admission of self-harm (cutting), drug abuse (dependency on pills), suicide ideation (thinking of/about suicide), previous suicide attempts, and disclosure of psychological disorders (I was diagnosed with panic disorder, social anxiety disorder, etc.).

Deixis in Suicide Discourse

Levinson (1983) defines discourse deixis as "the encoding of reference to portions of the unfolding discourse in which the utterance is located" (p. 62). Simply put, it is "pointing via language" (Yule, 1996, p. 6). Table 2 shows the different types and functions of deictic expressions. Previous studies on death by suicide suggest that prior to ending their lives, people who have committed suicide used more self-references (first person pronouns I, me, my, mine) instead of references to others (second and third person pronouns; Tausczik & Pennebaker, 2010). For instance, Stirman and Pennebaker (2001) found that a high percentage of first-person singular words (I, me, my) and a decline in the use of first-person plural (we, us, our) towards the end of their life was discernible in the works of suicidal poets. Leavitt et al. (2021) also claimed that first person pronouns are identified more in suicide notes, which could be used as indicators of intent to commit suicide (Handelman & Lester, 2007). Other signs include strong emphasis on future tense orientation, for example, "I will kill myself" (Egnoto & Griffin, 2016).

Speech Acts in Suicide Discourse

Jaworski (2010) stated that the act of suicide is relational, always within its context, and a part of discourse. The intention to perform/commit suicide is most often expressed before actually doing it. A speech act is an action performed by saying something, for example, making a (positive/negative, true/false) statement or claim (assertive), making an apology or expressing emotions (expressive), saying greetings, requests, or orders (directive), complaints, promises/offers (commissive), refusals, or confirmations (declarative; Geis, 1998; Searle, 1965). Speech acts serve

Table 2. Types of Deixis

Type of Deixis	Function	Examples and their variants
Person Deixis	Roles of participants; personal pronouns	1st person: I (me, my, myself); We 2nd: You (your, yourself) 3rd: He, she, it, they (him, his, himself) (her, hers, herself) (itself, its) (their, them, themselves)
Time (temporal) Deixis	Time when the utterance is spoken	Now, today, yesterday, tomorrow, day, moment, time, last year, next year
Place (spatial) Deixis	Where the speaker is; location in relation to speech event	Here, there
Discourse Deixis	Often found in written text	At this point, This, that Next, next week, last
Social deixis	Establish social relations, kinship	Honorifics, titles (Mr. President, Mrs., Ms.) Referent: my love, my wife

a communicative function. For instance, by saying "sorry," the utterance performs an act of apology (Searle et al., 1980). When analyzing suicide discourse, it would be helpful to investigate the intention to commit suicide and how many times this intention was repeated by the writer (or whoever wrote/said the intention). Saying "I will take my own life" is an example of a commissive speech act, as it states a promise or a commitment. Making an assertion can generally be direct and explicit, and it can be done using negative/negations (no, nobody, can't, won't) and affirmative words (want, can, etc.). In suicide discourse, high-risk individuals tend to use negative words (Dean & Boyd, 2020; Hargitai et al., 2007).

Corpus-based Discourse Analysis

The main aim of corpus-based methodologies (Biber, 2010) and discourse analysis is to point out areas of interest and allow for more in-depth analysis, as "the context plays a part in determining what we say; and what we say plays a part in determining the context" (Halliday 1978, p. 3). In other words, it is an examination that involves searching for specific patterns of occurrences within contextual structures (Van Dijk, 2008). These measures include the compilation of corpora, frequency lists of words and word clusters, comparisons of keyword lists and, most importantly, analyses of concordances (Egbert & Baker, 2019). The corpus output can give clues to semantic references and lexicogrammatical patterns in the text. A semantic reference is the linguistic expression (word/lexicon) used to point out or allude to an object or subject in context (Frawley, 2013). Lexicogrammar, introduced by Halliday and Matthiessen (2013), is a combination of lexical and grammar patterns, that is, lexical patterns in a grammatical structure, for example, use of past or future word forms. Understanding these patterns in people's expressions can facilitate comprehension and interpretation in what is being said (Sinclair 2004). Hence, semantic references and lexicogrammatical patterns are critical parts of comprehending language (Paltridge, 1995) and how people express their thoughts and feelings in various social and cultural contexts (Gledhill, 2011). In a nutshell, corpus discourse analysis can shed light on linguistic applications and the pragmatic intentions of language users, in this case, individuals with suicidal ideation. Using new digital text analytical tools and strategies can help researchers examine word choices as indicators or predictors of suicidal behaviors. Digital text analysis software programs which utilize artificial intelligence can also be used in analyzing the syntactic and semantic elements of emotional expressions linked with suicide ideation (D'Alfonso, 2020). For instance, Stirman and Pennebaker's study (2001) investigated around 300 poems of 18 poets (9 suicidal and 9 nonsuicidal) to determine if there were any distinctive linguistic features used that suggest social integration (or lack thereof). Using Linguistic Inquiry and Word Count (LIWC), they found that the "writings of suicidal poets contained more words pertaining to the individual self and fewer words pertaining to the collective than did those of nonsuicidal poets" (p. 517).

Psychobiographical Approach

As stated in the introduction, the psychobiographical approach reconstructs the deceased individuals' life, work, and contributions using psychological and biographical methods. Van Niekerk (2007, 2021) outlines the methodological application of the psychobiographical paradigm (pp. 1–2):

- It uses contributions and perspectives from several scientific disciplines
- It typically approaches life stories from a longitudinal perspective
- It comprises in-depth studies of extraordinary individuals in the contexts in which they made their contributions.
- It employs indirect methods to analyze the development or characteristics of individuals. Usually, extensive use is made of biographical material available in the public domain and originally compiled by biographers, journalists, or researchers.
- It often focuses on completed lives

Using a wide network of information from various resources that is, a person's own work and writings (poems, songs, books, etc.) and public information (memoirs/documentaries, newspaper articles, social media, press interviews, etc.), psychobiographical researchers can explore one's life story, examine any suicidal patterns (Schultz, 2005; Schultz & Lawrence, 2017), and provide a cogent argument by presenting what and how discourse(s) can contribute to understanding one's life experiences and struggles.

Many psychobiographical studies of suicide focused more on the psychological and biographical presentation of data (Schultz, 2005). Some studies were on artists, writers, and musicians, such as Smith's (2014) study on Virginia Woolf's attempted suicide in 1913 and her recuperation from mental illness which triggered it. Heindel III's (1986) article concerned James Douglas Morrison's rock music, self-destruction, and poetry. However, papers on combining psychobiography with corpus-based methods are limited (cf. Peltz, 2009; Schultz & Lawrence, 2017). By integrating corpus-based discourse analysis and psychobiography within the framework of the interpersonal theory of suicide, the current study on Avicii and his songs fills the gap in literature.

Method

The psychobiographical part of this study aimed to formulate a timeline of Avicii's life and career history, and the corpus-based discourse analysis aims to analyze the linguistic patterns in his songs. The triangulation of data was then interpreted based on the interpersonal theory of suicide (Joiner, 2005; Van Orden et al, 2010) to establish what and when the suicidal risk factors were noted in various stages of his career.

Research Questions

- What linguistic patterns can be found in Avicii's songs based on his career timeline that is, early, middle, and late career?
- Were there any evidence of first-person pronoun usage and linguistic indicators of negative emotions which suggest suicidal risk factors?
- Could linguistic evidence reveal suicidal ideation prior to his untimely death?

Research Design

Both the psychobiographical approach and discourse analysis are situated within the qualitative research framework (Levitt et al., 2017). However, the corpus-based method is quantitative since it makes use of computational tools for data mining, word count, frequency, and word trend (distributional) pattern analyses across discourse contexts (Friginal & Hardy, 2013; Upton & Cohen, 2009). Thus, corpus-based discourse analysis is a mixed approach combining quantitative and qualitative data (Baker et al., 2008, Flowerdew, 2013). Since the psychobiographical framing presents a single-case design describing one's life history (Van Niekerk, 2021), we focused on Avicii's music career history within his real-life settings, creativity, and musical ingenuity (lyrical writing), which added to his complexity.

Psychobiographical Subject: Avicii

Avicii was purposively sampled as our subject on the basis of four factors: he was considered to be one of the most iconic EDM artists; his career lifespan was suffused with popularity, success, controversy, and a multitude of problems with mental issues and drug abuse; his life and career were documented on social media, and a psychobiography and his compositions have not yet been fully studied. Avicii was a Grammy-nominated Swedish DJ, songwriter, and record producer. He earned a reputation as a young star on the rise before his tragic death at the age of 28. Producing many collaborations with a number of leading artists such as Madonna, Nile Rodgers, and Coldplay, he was venerated for his natural melodic ability, and his music is acclaimed as having set a new direction in extended plays (EPs) and DJ mixes (Martin, 2019).

Data Collection, Processing, and Analysis

Psychobiographical data collected for this study were freely available online and categorized into two types: primary (from Avicii's music, self-produced media, his official website, and official Twitter and Instagram accounts) and secondary sources (interviews, articles written about him, and documentaries available online). The objectivity of these materials is often challenged. Nonetheless, there are advantages such as availability and accessibility (Yin, 2009). By bringing

together information from a myriad of sources, we can perform data triangulation and cross-referencing to gain a better understanding of Avicii's life story (Brown, 2010). However, sifting the relevant data from irrelevant is needed to ensure appropriate categorization of (sub)themes (Yin, 2009).

In presenting the timeline and categories for analysis (linguistic features of the lyrics and suicide risk factors from various sources), we used Huberman and Miles' (2002) conceptual matrix to methodically categorize and display the data. This allowed for a more convenient way of comparing data, categories (linguistic features and suicide factors), timeline, and highlights of Avicii's music career, thus ensuring validation of results (see Table 3).

Stirman and Pennebaker (2001) stated that careers of artists who committed suicide could be classified into early works, which were composed within the first two or three years, middle works, referring to those written in the middle of their career, and late works, within a year of their death. Reflecting on Avicii's career and personal life, this classification is appropriate, as 2014 witnessed his career breakdown due to illness, and 2017 is believed to have been the critical period of producing his late album "TIM", and the year Avicii committed suicide.

Avicii was an inspiration for millennials owing to his enormous contribution to the EDM and folk music crossover industry. His legacy consists of three studio albums, 51 singles and 830 tours (Pulse, 2018). His third album, "TIM," was released posthumously in 2019 (William, 2019, para. 3). In the current corpus, there were 23 songs belonging to early works, six songs composed in his middle career, and 15 late works, comprising 44 songs in total. The list of selected songs in the current corpus is shown in Appendix 1.

For the corpus-based discourse analysis, we examined what and how lexical choices were used in relation to suicidal discourse. The self-created corpus (10,153 tokens) was a collection of 44 songs (each song/single should have more than 10 words), which was then categorized into nine subcorpora based on the year they were released, that is, beginning from 2010 to 2019 (posthumous work from 2018-2019 was labeled as his last album). The subcorpora were then uploaded to the Voyant Tools website for computational analysis (Sinclair & Rockwell, 2016). Voyant Tools is an interactive web-based text-analysis application to interpret extensive texts. Table 4 lists the key analytical tools we used (Sinclair & Rockwell, 2022):

Results

Early Career

Known as a shy, held-back kid, Avicii's career trails a line of public performances that catapulted him to popularity. Born in Stockholm in 1989, he started making music when he was in his teens. He would write and remix tracks in his bedroom where he produced some of his most iconic dance music singles (Avicii, MySpace.

Table 3. Psychobiographical Data Matrix

Stages	Stage 1	Stage 2	Stage 3
Music Composition	Early career	Middle career	Late career
Year	2010-2014	2015-2016	2017-posthumous 2019
Approximate Age (1989-2018)	21-24	25-27	27-28
Music career highlights	<ul style="list-style-type: none"> • Big break in the industry. • Releasing first album. 	<ul style="list-style-type: none"> • Released second album. • Live shows and gigs. 	<ul style="list-style-type: none"> • Last live performance. • Back to composing songs, which were released posthumously.
Reported suicidal risk factors: <ul style="list-style-type: none"> • History of previous suicide attempts • History of depression or other mental illness • Alcohol or drug abuse • Stressful life event or loss 	<ul style="list-style-type: none"> • In and out of surgery • Addicted to psychoactive substances • Stressed • Undergoing addiction counseling 	<ul style="list-style-type: none"> • 2015 therapy intervention • Followed Buddhism • Hospitalization • Inpatient addiction counseling (rehab) 	<ul style="list-style-type: none"> • Loss of interest or pleasure • Physically healthy, practicing Buddhism • Lethal self-harm • Death by suicide • Hospitalization
Thwarted belongingness and perceived burdensomeness: Manifested emotional indicators	<ul style="list-style-type: none"> • History of self-hate, agitation • History of insomnia and loss of appetite • Shame, • Sadness; • Poor physical state and psychological state • Risk-taking 	<ul style="list-style-type: none"> • On the road to healing • Occasional lapses in mental and emotional stability 	<ul style="list-style-type: none"> • Isolation • Desire to self-harm • Feeling hopeless • Heightened state of thwarted belongingness and perceived burdensomeness • Capability to actualize lethal self-harm
Linguistic feature of suicidal behavior <ul style="list-style-type: none"> • Use of self-references (Deixis) <i>I, me, my, mine</i> • Use of Time/place deixis 	Prolific use <i>When, time, pass, waiting</i> Less	Minimized used <i>Day, dawn, late, Friday, Monday</i> Slight increase	Increased use <i>Time, long, forever</i> Heightened and expressed
Speech Act <ul style="list-style-type: none"> • Use of negation (resentment, sadness, anger) • Expressive (emotions-apology) • Commissive, declarative • Implicatures, presuppositions • Use of death-themed words (death, afterlife) 	In reference to euphoric situations	In reference to ending relationships	Stressed reference to dying
Most frequent words in the corpus	<i>Like, I'm, love, make, know</i>	<i>It's, day, love, money, gold</i>	<i>I'm, just, need, love, you're</i>

Table 4. Voyant Tools and Functions

Voyant Tools Used	Functions
Summary	The Summary provides a simple, textual overview of the current corpus, including number of words, longest and shortest documents, most frequent words, and distinctive words.
Cirrus	Cirrus is a word cloud that visualizes the top frequency words of a corpus or document. The most frequently used words are positioned centrally and are sized the largest.
Links	Links or Collocates Graph represents keywords and terms that occur in close proximity as a force directed network graph where keywords are shown linked to collocates.
Trends	Trends is a visualization that represents the frequencies of terms across documents in a corpus or across segments in a document, depending on the mode.
Context	The Contexts tool shows each occurrence of a keyword with a bit of surrounding text (the context). It can also search phrases with positive or negative sentiments
Correlations	The Correlations tool enables an exploration of the extent to which terms (words in corpus) frequencies vary in sync, they rise and fall together (positive) or inversely (negative).

com, n.d.). Levan Tsikurishvili (2017), the director of "Avicii–True Stories" documentary, claims that Avicii's success story began when he won a music production competition held by Pete Tong in 2008, which led to the release of his first ever single "Manman" (Farber, 2018). From 2009 to 2014, Avicii released a series of popular singles. In 2013, he produced his first full length debut album, "True" (Caramanica, 2013), including his most iconic dance-country hit song, "Wake Me Up" (Tsikurishvili, 2017, par. 5).

According to Powell (2018), it was "his struggles with life on the road that seemed to bring out his purpose the most," while other commenters suggested that it was his health struggles (Bein, 2018). In the documentary "True Stories," Avicii revealed his passion for music but he also disclosed his anxiety, stress, and alcohol abuse. In the film he said, "There was never an end to the shows, even when I hit a wall... My life is all about stress." The film ends with him making a premonition about how touring affected him – "It will kill me." (Farber, 2018, para. 1). He performed more than 500 shows before being hospitalized in 2012 due to acute pancreatitis resulting from alcohol overuse. He was quoted saying, "You are traveling around, you live in a suitcase, you get to this place, there's free alcohol everywhere - it's sort of weird if you don't drink," (US Weekly, 2014). He had other serious health problems while on tour, which prompted show cancellations. The discourse of what happened and how it was reported depends on the media outlet's framing of the event and the representation of who asked whom to do what, that is, was Avicii framed as a passive victim or an agent to choice and action (cf. Lim, 2006). For example, Bein (2018) reports, "Doctors urged Avicii to undergo gallbladder removal surgery, but the producer declined, choosing instead to continue working on his debut LP True." (para. 3). Another similar post from Powell (2018b, para. 4) states, "Producer declined surgery to continue work on his True LP." In these examples, Avicii had no agency. It was his producer who was making the decisions for him. While in the following example, Avicii was in

control as Hamp (2014) cites, "He (Avicii) declined, citing preparations for his hit debut LP, *True*, which arrived that September and topped *Billboards*". Nonetheless, it was clear that Avicii had no full authority regarding his work and shows during the early stage of his career. As Hamp (2014) quotes Avicii saying, "I was in the studio 12 hours a day, and then went right back to touring. It's hard to say no in this industry. You want to play everything and be everywhere" (para. 2).

The album "*True*" was released in 2013 and peaked at 5 in the *Billboard* 200 chart for six weeks. When EDM became popular in mainstream culture, Avicii was keen on pushing his creative style. As Browne (2018) reports, "Avicii stood out for his willingness to ignore the genre's boundaries. At Miami's *Ultra* festival in 2013, he debuted "*Wake Me Up*," a strummy anthem blending bluegrass and house music. He brought a band onstage that included banjo and violin – and was booed. According to Bain (2020), "Those who were in the crowd for that set describe the moment as "awkward." Avicii angered some and confused many as he pushed the once underground world of electronic music not just further into the mainstream, but further into genres that many thought it had no business commingling with" (para. 3). But Avicii was convinced that his music would become successful, and his collaborator Salem Al Fakir was quoted as saying "[Tim] was like, "Don't worry about that. They'll understand later." And it did; the song went on to sell 4 million copies and was a Number One hit in 22 countries." (para 3). Avicii had other surgeries in 2014 (Kaufman, 2018), many of which were for his excessive drinking and drug abuse (Farmer, 2021).

The early career subcorpus (2010-2014) is made up of 23 selected songs from Avicii's original compositions containing a total of 4,920 words. The top five most frequent words in the corpus are "like" (64), "I'm" (48), "love" (40), "make" (33), and "know" (32). Below is a list of the distinctive words from the top 10 songs (of the 23 albums) compared to the rest of the subcorpus:

- 1 2010 *Blessed*: blessed (5), sing (6), problems (4), wondering (2), stressed (2)
- 10 2012 *3 Million*: amazing (7), wanna (8), miss (4), pass (4), let (6)
- 11 2012 *Dancing in my...*: dancing (28), she's (10), girl (8), head (11), sugar (4)
- 12 2012 *I Could Be the...*: set (10), free (10), way (12), feel (10), make (10)
- 13 2012 *Last Dance*: dance (11), worth (5), final (5), closer (5), lets (5)
- 14 2012 *Superlove*: superlove (4), inside (2), spirit (1), sexual (1), gonna (1)
- 15 2012 *Wake Me Up*: lost (7), wiser (4), finding (4), wake (5), older (4)
- 16 2012 *We Write the...*: write (29), story (15), song (14), welcome (5), reinvent (3)
- 17 2012 *X You*: radio (6), activity (6), yeah (3), sound (3), heartbeat (3)
- 18 2013 *Addicted To You*: addicted (5), powerful (2), hooked (2), drug (2), drowning (2)

Love was the main theme in his early works, but the word "like" was the most frequently repeated. The idea of being "liked" was the underlying message, and this can be linked to his previous experience of creating his own music style, wanting to be "liked" and accepted, but being booed and rejected at first. Nonetheless,

looking at the gist of the words from the list above, the songs exude a positive feeling of being young, free, and exuberant by doing what most young people do: dancing, singing, loving, and feeling sexual. At the very beginning of his career, Avicii felt "lucky and blessed," being ultimately accepted by the public, yet somehow struggling to find a connection with people and being "fully" accepted (Tsikurishvili, 2017). This is manifested in his songs, as there was a change in the themes as the years passed. By mid-2012 to 2013, Avicii was expressing difficult emotions, using words like "lost," "finding," "wiser," and "older." The lexicogrammatical usage of the past tense "lost" and the present continuous "finding" sets the linguistic context which presupposes that he had gone astray or missed his way— a metaphorical expression of losing one's way or direction in life. The contextual clues from Voyant Tools suggest that "finding" collocates with the term "myself," hence the phrase "finding myself." The correlational patterns for the token "myself" (Table 5) also positively correlate with "finding" ($r = 1$), and with the terms "I'm" and "lost," as in "lost myself," with significance value of $< .446$, $r = .272$. This suggests Avicii's pattern of consistency of pairing these terms together all the time in his compositions.

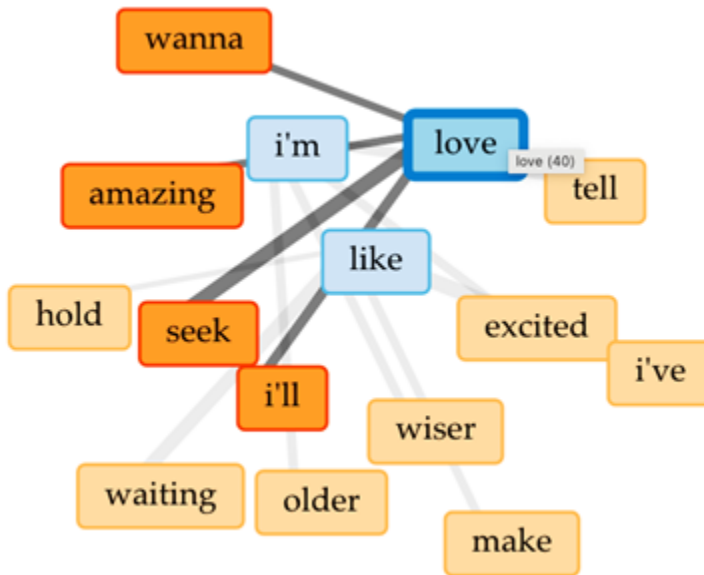
The psychobiographical information corresponds to these computational results as well, as it was during the early part of Avicii's career when he rose to fame and was at the height of his touring career with a strong following among his fans. He wrote how he was feeling in his song, "Wake Me Up." He was having the time of his life, but people told him that he was "too young to understand," "caught up in a dream," and that he should "open up" his eyes or else "life will pass" him by. Yet, he was open to all the excitement that life has thrown at him, saying "well, that's fine with me." There was a metaphorical allusion to passing through "darkness" and how he navigated himself through it, that is, "feeling his way" only "guided by a beating heart." The lyrics he wrote suggest other people's opinions and expectations of him, and for him, this was the "weight of the world" he was "trying to carry." Avicii embodied an adventurous persona, a risk-taker, someone who gallantly embraced life and what it has to offer (Tsikurishvili, 2017). The song takes an ironic turn towards the end, using the same words yet alluding to something in reverse to what he previously thought.

But for Avicii, "Life's a game made for everyone, And love is a prize"— a prize

Table 5. Correlations for "Myself"

Term 1	Term 2	Correlation (r)	Significance (p)
Finding	myself*	1	0
I'm	myself*	0.456	0.184
Lost	myself*	0.272	0.446
It's	myself*	0.166	0.645
Know	myself*	-0.048	0.895

Figure 1. Collocates for "Love"



that he could win or lose, a prize he was willing to bet his life on. Voyant Tools' Links-collocates graph for "love" ($n = 40$ in early works subcorpus, see Figure 1) shows the keywords (in blue) that appear in close proximity and are linked to collocates (in orange). The darker the shade, the stronger the collocation network of the words. This suggests the following contextual denotations: "wanna love," "amazing love," "seek love," and "I'll love." It is interesting to note that Avicii thinks "love is amazing," but the lexicogrammatical connotation of these word links implies a different scenario, that is, "seek(s) and wants love." This suggests that he does not have it yet, but "I'll love" refers to a commissary speech act—a promise/commitment (to himself) to the future prospect of finding love. Cross-referencing this to real-life events, this was the time his relationship with his then girlfriend since 2011, Emily Goldberg, ended (Newsbeat, 2018), which suggests that he was open to new love.

Middle Career (2015-2016)

Avicii's middle career was marked by his work ethic and attitude to carry on despite his struggles with health. In 2015, he entered a rehab facility after "his family staged an intervention" as he continuously fell "into the grasps of crippling opioid addiction" (Farmer, 2021). He postponed all performances for that year. This gave Avicii time to recuperate. He was quoted saying, "I have a

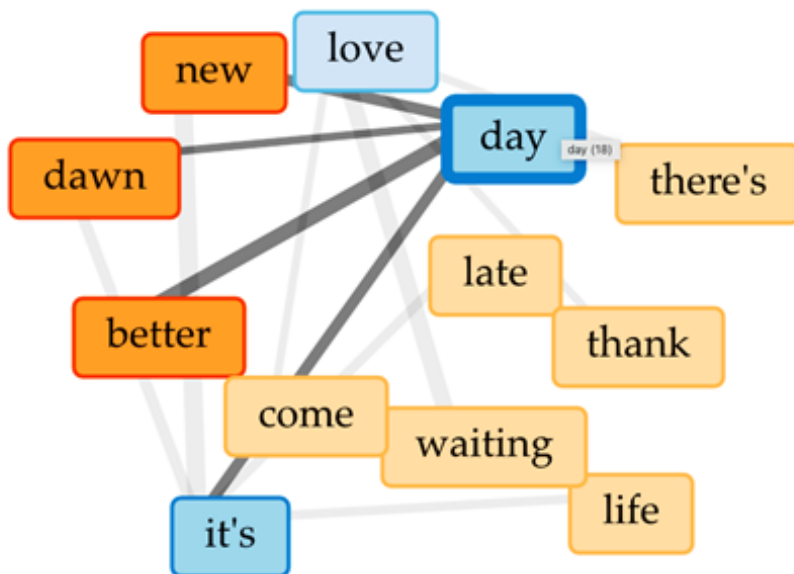
great opportunity to focus on myself and spend time trying to grow up in a way I never got the chance to — normal, or as normal as it could get." (Powell, 2018a). That normality meant getting back to his creative side. As a result, he released his music video called "Feeling Good" to celebrate new beginnings. It garnered more than 41 million views on YouTube. The video produced in collaboration with Volvo showed video footage of him with his family and friends. Although the music video has a poignant message, the fact that it was still a music production with a commercial sponsor at a time when he was supposed to be recuperating raises more questions about his work ethic. Four months later, he canceled the remaining performances lined up for 2015. However, his team also "promised a larger tour to come." (Bein, 2018, para. 8). Other articles noted that Avicii continued working. For him, it was about shouldering responsibilities (Hamp, 2014; Kaufman, 2016, Torres, 2019).

According to Browne (2018) the album "Stories" "was not as successful as the 2013 album "True," and old friends saw signs of strain again." (para. 8). Avicii made a comeback in 2016, performing at Miami's Ultra Music Festival. However, like in previous years, he suffered another breakdown and announced that he would not go on tours anymore due to "the strain of live performances exacerbating his problems." In an emotional open letter published online, Avicii wrote to his fans: "My choices and career have never been driven by material things, although I'm grateful for all the opportunities and comforts my success has availed me... I know I am blessed to be able to travel all around the world and perform, but I have too little left for the life of a real person behind the artist. I will however never let go of music—I will continue to speak to my fans through it, but I've decided this 2016 run will be my last tour and last shows. Let's make them go out with a bang!" (qtd. in Kaufman, 2016).

The live shows tended to be big, overwhelming productions, and to his friends, Avicii possessed "the duality of having a gigantic sense of theatrical ambition but, at the same time, being a very humble and simple guy. He was caught between the two, and life began grinding on him." (Browne, 2018, para. 9). He did one last show in Ibiza in 2016 before finally retiring from touring. It was apparent that Avicii felt the pressure to perform live to "financially support his management team." Tsikurishvili was quoted as saying "He felt responsibility to take care of his co-workers" (in Farber, 2018, para. 15).

Looking at the results of the computational text analysis for the middlecareer subcorpus (six singles, 1,501 total words), it is interesting to note that the most frequent words are: "it's" (20), "day" (18), "love" (17), "money" (15), and "gold" (14). They reflect the important things in Avicii's life at this point in time. Looking at the list of distinctive words compared to the rest of the subcorpus, the general representation sends out a positive impression of how Avicii was feeling despite the presence of lexemes that have negative connotations, for example, "broken arrows," "ain't," and "pure grinding." In addition, words ending in -er, such as "better" ("feeling better," "better day") and "easier," also imbue a positive feeling.

Figure 2. Collocates for "Day"



Distinctive words (compared to the rest of the subcorpus):

24 2015 *Broken Arrows*: late (6), hope (5), heart (7), arrows (4), shooting (3).

25 2015 *Feeling Good*: new (13), know (12), feel (9), it's (12), dawn (4).

26 2015 *For a Better Day*: better (11), magic (6), wish (3), sang (3), pretty (3).

27 2015 *Pure Grinding*: money (15), working (14), til (14), gold (14), ain't (11).

28 2015 *Waiting For Love*: waiting (9), there's (5), love (11), won't (2), wild (2).

29 2016 *Taste the Feeling*: taste (7), stop (6), sing (6), easier (5), feeling (7).

The overall psycholinguistic sentiment is positive and hopeful, as shown in the visual representation of the word collocations associated with "day," (see Figure 2).

"Love" is a recurring theme from Avicii's middle career subcorpus, and like the collocational context of his early career, he was still "waiting for love" (see Figure 3). The collocation network graph for "love" as the keyword shows the following patterns: "come love," "thank love," "there's love," "waiting love." Using "waiting" as the keyword (see Figure 3), there is only one word closely linked to it: "love." This underscores the importance of love for Avicii. The difference between these two collocation graphs lies in semantics. In Avicii's early career, the collocation phrases are "seek love," "I'll love," and "wanna love," which suggest that he is seeking love—something that he did not have. There was a sense of desperation. In the middle career subcorpus, the collocational context changed his disposition towards love: Although he was open and welcoming, "there is love" and he was "thankful" for it, yet, he was still "waiting," but not in vain. He was not

despondently waiting for the right person to love and/or love him back.

"Money" and "gold" were also the most frequent words. Since lov' was in the same list, one could speculate that Avicii loved money, hence the reason behind his frenetic schedule. Cross-referencing this with the psychobiographical findings suggests a different perspective. Commenting on Avicii's retiring from tours, Farber (2018) writes that "Despite his insistence on backing out, Pournouri (agent) grouses on camera that the DJ (Avicii) 'doesn't understand the value of money'." (para. 16). This gives a hint who the influential person in his career choices was. His choices were not driven by material things. In other words, it was not all about money, not for himself at least, but for the sake of other people whom he thought depended on him. He felt obligated to work the way they thought was best for him and for them. However, Martin (2019) reported that "By 2016, he'd had enough. He fired his manager and retired from touring," and quotes Avicii saying "'I know I am blessed to be able to travel all around the world,' he said at the time, 'but I have too little left for the life of a real person behind the artist.'" (para. 4).

The keyword "money" highly correlated with the words "gold" ($r = .97$), "Friday," and "Monday" ($r = .908$, Table 6). In the middle career subcorpus, these words can be found in the song "Pure Grinding," which is a neologistic metaphorical expression referring to working laboriously. Hence, working from Monday to Friday alludes to hard work, and as the lyrics go, "Working my money 'til I get gold" suggests working non-stop until he gets rich. The lines "Try to make a dollar out of 15 cents but I ain't understand how the money was spent. My mama told me, 'Boy you ain't got no sense, if we put it all together, can we pay this rent?'" also connote spending more than he earns and not having enough left to pay for bills.

Figure 3. Collocates for "Love" (Left) and "Waiting" (Right)

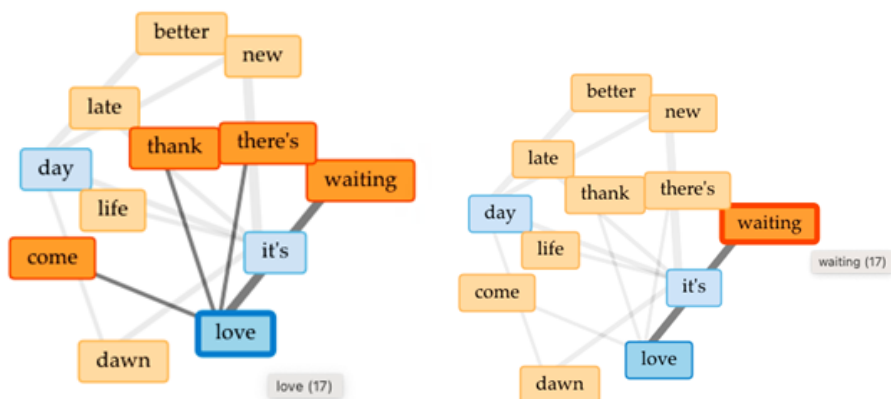


Table 6. Correlations for "Money"

Term 1	Term 2	Correlation (<i>r</i>)	Significance (<i>p</i>)
gold	money	0.975	0.000
Friday	money	0.908	0.000
Monday	money	0.908	0.000
Can't	money	0.847	0.001
cause	money	0.847	0.001
grinding	money	0.058	0.873

Late Career (2017-Posthumous 2019)

Heeding the advice of his family and friends, Avicii went into rehab (Martin, 2019). A large part of 2017 was spent on exploring a spiritual path guided by the philosophy of Buddhism and the work of Eckhart Tolle (Bain, 2020). Empire (2022) reports that Avicii was involved with transcendental meditation to reduce anxiety and had "weaned himself off opioids – prescribed by doctors" (para. 1) to help with pancreatitis-related pain and surgeries. And although he tried to stay away from prescribed drugs, Mosesson (qtd. in Empire, 2022) claims that "Bergling still smoked a lot of weed" (para. 10). Nonetheless, Mosesson writes that Avicii seemed to be on the path to recovery with meditation, therapy, social support from his friends, and constant communication with his family. In the same year, he released *Avicii (01)*, his six-track extended play (EP). Tsikurishvili's documentary *Avicii: True Stories* (Powell, 2018a) was also released that year. According to reports, Avicii traveled to Muscat, Oman for a vacation and to visit friends in April 2018. He was in the process of completing his third album, which was two-thirds finished, when he took his own life in Oman in 2018 (Lynch, 2018).

The third and last album, "Tim" is a compilation of the songs he was hoping to release (Farber, 2019). Avicii's family wanted this album to be part of his legacy, with the net proceeds given to the Tim Bergling Foundation dedicated to working with charities addressing suicide prevention and mental health issues. Klas Bergling asked Avicii's friends (Carl Falk, Vincent Pontare, and Salem Al Fakir, among others) who had worked with him previously to help complete the album. Martin (2019) reports, "Their roles in the posthumous production process focused largely on arrangement, editing, and finishing vocal recordings." (para. 17). According to Torres (2019), this posthumous album features collaborations with big artists like Chris Martin of Coldplay ("Heaven," which features Martin's vocals), Imagine Dragons, and New Jersey duo Arizona. "Tough Love" was a collaboration with Swedish singer Agnes doing the vocals.

Falk says that "there was never an ego with him" (qtd. in Martin, 2019, para. 10). Falk felt compelled to see this production through, he adds, "when someone close to you passes, the emptiness becomes a mission... He told me that this was the first time he'd enjoyed making music in years, so I had to make this as good

as I possibly could to honor him and our friendship" (para. 12). Al Fakir and Pontare also worked on three songs for "Tim"—"Piece of Mind," "Tough Love," and "Excuse Me Mr Sir"—both admitted that Avicii, who was shy, was "getting out of that bad place, exercising and meditating... and he was strong. Everyone could see it" (para. 14). Both claimed that he had "the same energy and focus during the writing of Tim as during the sessions for his debut album, "True." (para. 14). Nonetheless, they kept their promise of keeping the tracks at a version Avicii would have approved of. As Martin (2019) commented, "Listening to the songs after Bergling's death, they find that they illuminate his state of mind; how the DJ felt pressured to live up to the outwardly glamorous lifestyle of his profession, and how young fans might cope with having seen their musical hero struggle." (para. 16). Torres (2019) added that "Tim is thematically much darker than any of Avicii's previous records, focusing on substance abuse and the effects of fame (para. 12)". Nonetheless, Al Fakir thought that "There are still more questions than answers, because we'd seen him in a good place" (para. 14).

The late career subcorpus is made up of 15 singles (3,732 words) that were released from 2017 to 2019, including one year of posthumous work. Since this list is a compilation of the songs Avicii wanted to be released (Middleton, 2018), it is longer compared to the middle career subcorpus. The most frequent words in the late career subcorpus were: "I'm" (88), "just" (45), "need" (35), "love" (30), and "you're" (30). The frequency count for "I'm" ($n = 88$) was higher compared to the early career subcorpus ($n = 48$). This highly supports the theory that those with suicidal ideation tend to use first person pronoun (Stirman & Pennebaker, 2001; Handelman & Lester, 2007).

Distinctive words (compared to the rest of the subcorpus):

- 30 2017 *Lonely Together*: lonely (18), let's (7), little (9), hate (6), change (6)
- 31 2017 *Without You*: going (6), you'd (3), said (3), got (4), tear (2)
- 32 2019 *Aint a Thing*: ain't (24), baby (9), swear (4), long (4), shit (3)
- 33 2019 *Bad Reputation*: reputation (9), bad (9), got (13), follow (9), guess (6)
- 34 2019 *Excuse Me Mr Sir*: really (20), need (17), cause (12), bring (7), coming (6)
- 35 2019 *Fades Away*: fades (9), away (9), days (4), can't (6), run (2)
- 36 2019 *Forever Yours*: forever (15), tell (10), ya (4), let (6), i've (4)
- 37 2019 *Freak*: freak (10), maybe (7), think (7), you're (12), told (4)
- 38 2019 *Heart Upon My...*: sleeve (7), broken (9), low (6), head (6), heart (7)
- 39 2019 *Heaven*: heaven (13), went (12), died (9), think (9), raise (2)
- 40 2019 *Hold The Line*: line (8), hold (8), die (6), we're (4), push (3)
- 41 2019 *Never Leave Me*: leave (13), she'll (6), hope (6), knows (6), reckon (4)
- 42 2019 *Peace Of Mind*: wanna (29), free (16), relief (9), fast (6), let (10)
- 43 2019 *SOS*: lovers (10), underground (5), drugs (5), time (9), touch (3)
- 44 2019 *Tough Love*: tough (10), weight (6), place (6), arms (6), there's (7)

In the visual representation of the most frequent words (see Figure 4), some

lexicons have reappeared, for example, "I'm," "love," "need," "know," and so forth but with a higher frequency count, which reiterates the message being sent. There were also terms and word patterns associated with suicide risk factors such as "feeling lonely," "broken," "freak" (as a form of self-perception and self-criticism), "fades away," "hate," "can't run," and so forth. Avicii articulated how he struggled with lack of support when he was looking for others to understand his situation and save him from these negative thoughts, for example, "sinking away," "a break in the ocean," "getting lost at sea," and so forth. This illustrates his highly confused state of being unable to decide what to do. "Lost at sea" repeatedly appeared in the song "Without You," which primarily described the tough situation he was in, dealing with suicidal thoughts and withdrawing from his loved ones, yet unable to handle the situation on his own.

There were direct references to death too, for example, "heaven," "leave," and "died." Words such as "tough," "reputation," and temporal deictics such as "time," "forever," and so forth could suggest these were the things he was mostly concerned about at the time of his passing. The "Bonnie and Clyde" reference is also a significant allusion to death. In addition, the characters Bonnie and Clyde were leading dangerous lives because they saw themselves as victims of the system. Avicii may have related to their situation as someone who got caught up in a complex scheme of producers and the companies they represent. Firing his manager and going solo was indeed "risky" and "dangerous." The insinuations Avicii made painted his production company in a negative light, vilifying those who pushed him to the limits while he suffered. He described himself as a confused victim, compliant till the end.

In addition, Voyant Tools's affective filter using the Keywords in Context extracted and identified these terms to contain negative sentiments (see Table 7): bad reputation and concern about what people think or say have negative connotations.

Suicide discourse suggests that there is a prominent use of "I" in reference to the self, which is perceived as an egoistic view of one's self, particularly during the end or latter part of one's life before committing suicide. Based on the word trends in Voyant Tools, a distinctive difference in the relative frequencies of the terms ("I" and "we") was observed across documents in a corpus or across segments in a document (see Figure 9). Peak points for "I" (blue line) across the late career subcorpus show a consistent placement which was greater than the frequency of use for "We" (green line). "I's" highest point (0.116) across this subcorpus was found in the song "Heaven" (2019), which has strong reference to death. As Avicii wrote in the lyrics, "Yeah, I think I just died, And went to heaven." The last two songs he wrote, "SOS" and "Tough Love" also used the pronoun "I" frequently. The highest point for the pronoun "We" (0.056) in this subcorpus is found in the song "Hold the Line" (2019, see Figure 5). This song sends a resolute message about resilience and carrying on despite challenges. "We" is used here to denote oneself and another or others, and their determination to persevere. In this song, there is a sense of togetherness and hope, as can be seen from the lyrics:

Figure 5. Word Trends for "I" and "We" in Late Career Subcorpus

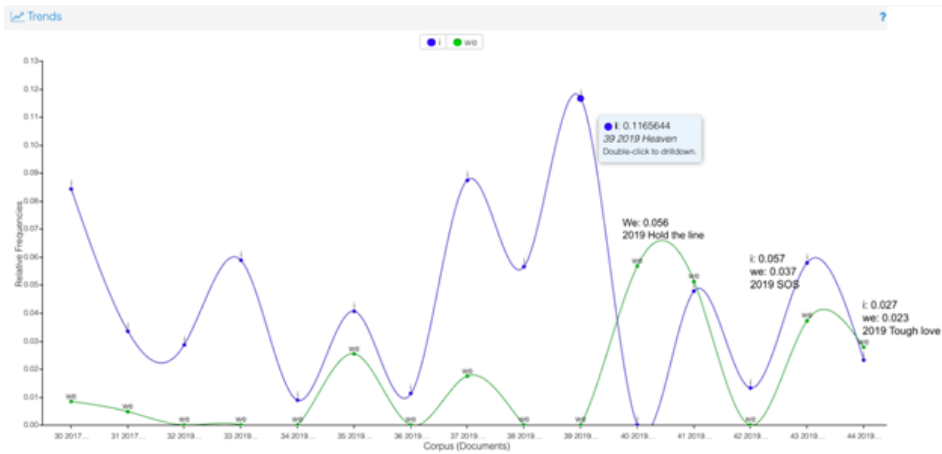
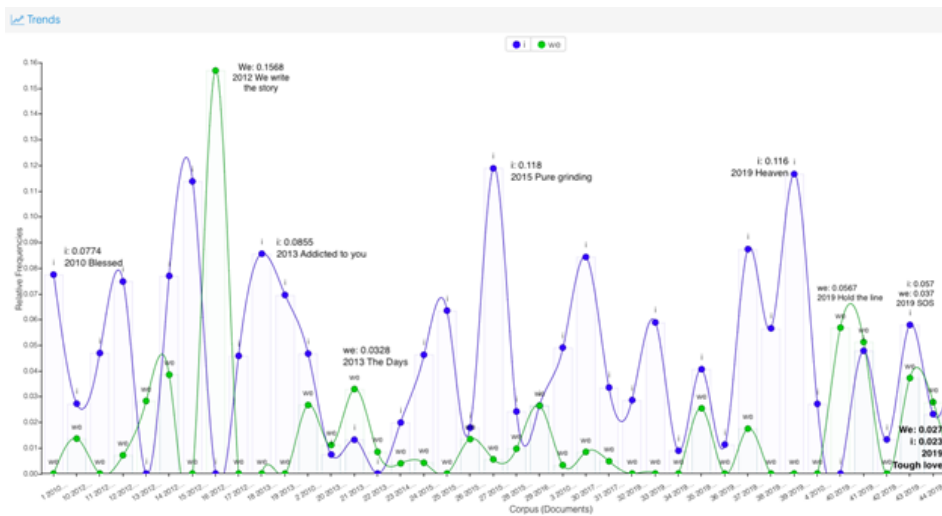


Figure 6. Word Trends for "I" and "We" in 2010-2019 Combined Corpus



Discussion

The findings strongly suggest that throughout his career, Avicii showed signs that he was committing self-harm (drugs and alcohol abuse)—characteristic of someone with suicidal ideations. His dependence on alcohol was a result of the stress and anxiety his touring had on him (Farmer, 2021). Throughout his career,

he was in and out of the hospital for various medical reasons (Kaufman, 2018). The extreme physical toll on his body and on his mental health was clear, and this was publicly documented either through interviews, video recording of his shows, or the things he posted online for his fans (Bein, 2018; Powell, 2018a). It was well-known among his friends and family that he worked long hours, and some labeled this kind of work as intense or grinder sessions (Halperin, 2018). Avicii would labor on songs for hours on end without sleep or breaks if others did not stop him or tell him to rest (Torres, 2019). These toxic habits and self-abusive behaviors became his norm (Mosesson, 2021 in Empire, 2022). He was living in pain most of his adult life. The hospitalizations were signs that his body was strained beyond limits. His illness and his drug and alcohol dependency were indicators of high suicide risk (cf. Joiner, 2005).

The findings from both the psychobiographical and corpus discourse analyses show that Avicii was confronted with psychological and emotional problems related to his self-image, reputation, and loneliness during his entire career. His alcohol and drug abuse, history of depression, and stressful life, to name a few, are suicidal risk factors (cf. Ermakova & Bukiera, 2014; Van Orden et al., 2010) that were already present from the early stages of his career. His excessive alcohol intake and drug dependency exacerbated his poor mental state. Despite the physical toll this had on him, he had a successful and active career. His posthumous track album "Tim" contains songs that he wrote and wanted to be released, which, according to Kennedy (2019, para. 1), "is a farewell wave from an artist who clearly was at the top of his game".

The findings also indicate that the events that happened throughout his early to late career, which constituted clear signs of suicidal risk, were closely aligned with the interpersonal-psychological theory of suicide (Joiner, 2019; Van Orden et al., 2010). Avicii's tragic death by suicide was a culmination of connected factors which were compounded in time. He was perennially exposed to negative painful experiences (his songs being rejected and booed, relationship break-ups, health problems, depression and anxiety) and yet he continued with his grueling schedule and working compulsively at the expense of his health (Martin, 2019). The psychological state of constantly feeling lonely and wanting love were signs of thwarted belongingness, that there was something amiss with his social connections. His self-perceived shame and low self-esteem which was related to his shyness and laid-back personality intensified his compulsive behavior, and his poor physical health caused by his behavior and misguided choices were all signs of perceived burdensomeness (Joiner, 2005; Wetherall et al., 2019). His life was characterized by difficult emotions and circumstances. He got used to suffering from extreme pain and this could have augmented his desire to take his own life. Joiner (2005) refers to this as "fearlessness" - the heightened capacity to commit suicide. Avicii realized too late that he needed to improve both his mental and physical health. During the latter part of his life, there was no indication of career disengagement. He was pacing himself well but still he was continuously

Table 8. Linguistic Indicators and Suicide Risk Factors Found in Avicii's Songs

Self-isolation	<ul style="list-style-type: none"> - be lonely - got to learn how to love without you - got to carry my cross without you - stuck in the middle - figure it out without you - am going up without you - am going to tear this city down without you - can't be your friend - left out chasing innocence - left with the pieces - running away from myself and the truth I fear
Lost and confused	<ul style="list-style-type: none"> - caught in the middle - caught the edge of a knife, it hurts - am all messed up - am losing patience - am getting lost at the sea - sleepwalking, drifting out into nothing
Depression	<ul style="list-style-type: none"> - down, down, down low - falling, lying awake till the morning - a roller-coaster beyond belief - my head down low, I still feel broken - a heart upon my sleeve, broken down - down upon my knee - down on my luck - beaten and broken up got a bad reputation - how depressed I've been - see all the scars - Beaten and bathed in blood - Sinking away in slow motion
Rest and death	<ul style="list-style-type: none"> - try to catch my breath - am going Bonnie and Clyde without you - die young - just died - went to heaven - help me to put my mind to rest - get a little peace - about to make a move - unwind

working writing and finishing songs. Avicii remained active until his sudden death despite having unmet interpersonal needs (i.e., continuously longing for love). These unmet interpersonal needs (Joiner, 2005; Van Orden et al., 2010) could have triggered and intensified his suicidal ideation.

By comparing the results from the computational text analysis with Avicii's life events, we found striking similarities and implications of his predisposition to mental stress and indications of his call for help. As Boyd and Schwartz (2021) claimed, there is a psychological connection between language and feelings, thoughts, and behavior. There were clear linguistic and behavioral indicators of

suicidal thoughts and desperation that emerged in Avicii's writing. For someone who suffered from depression, substance abuse, and emotional vulnerability, those signs should have been seen as warning signs of suicide, as defined by The American Association of Suicidology (2020). Table 8 shows the linguistic indicators of suicide risk factors extracted from the corpus following Jashinsky et al.'s (2014) linguistic indicators. Avicii's lexical choice(s) in his compositions reveal linguistic representations of difficult emotions ("lonely," "hurt," "fear," etc.) and suicidal ideation (e.g., "dying young"). According to Edwards (2001), the discursive psychology of emotions is manifested through constant talking about emotions. Avicii's suicide discourse was conveyed in his compositions through various speech acts (Searle et al., 1980). For instance, he expressed himself through interviews about his mental state (assertive), and in lyrics e.g., "feeling sad" (expressives), "can't be your friend" (declarative), "am going Bonnie and Clyde without you" (commissive), and "so wake me up" (directive). There was also the prolific use of deixis first-person pronoun "I" during the height of his career, which intensified towards the end of his life. The death-themed lexicons explicitly stressed his reference to dying. In hindsight, his discourse about his anxiety, stress, and being perpetually tired, lonely, and in pain, was indeed his distress signals— his S.O.S.

Conclusion

The current study investigated the discourse and suicide ideation of Avicii. The methodological framework for psychobiographical research (Van Niekerk, 2021; Schultz, 2005) focusing on Avicii's career history and corpus-based discourse analysis of his compositions with reference to suicidal risk factors (Joiner, 2005; Van Orden et al., 2010) were used to formulate a timeline of his life and career development as well as the discursive representations of emotions and suicidal ideation in the linguistic patterns of his songs.

The findings suggest that Avicii made references to death and suicide in his songs. We identified and analyzed how his feelings (often difficult) were expressed in the lyrics, particularly the shifting linguistic behavior toward death, by looking at the lexical trend patterns based on suicidal risk signs throughout his psychobiographical career timeline. The emphasis on the corpus-based discourse analysis approach to investigating mental distress strengthened the relationship between language and suicide, as we attempted to provide a taxonomy of linguistic features associated with suicide found in the lyrics.

Overall, the relevance and accuracy of the interpersonal theory of suicide was confirmed by the study. In addition, the value of psychobiographical research as a means to investigate suicidal ideation was reiterated as well. Likewise, this study made valuable contributions to psychobiographical research and corpus discourse analysis. It also offered an objective interpretation of Avicii's life story and explicated some remarkable aspects of that life, for instance, his career

development, how he coped with stress and anxiety, and how he tried to heal himself mentally, physically, and spiritually.

For future studies, we suggest incorporating a larger corpus of song lyrics from other suicidal artists working in the EDM industry to generate stronger linguistic patterns consistent and/or correlated with alcohol/drug substance and other social factors. It will likely increase the validity of these findings and contribute to better understanding mental disorders and emotional health as manifested in writing. This study has positive implications in the field of applied linguistics and psychology. It is also relevant as it touches on the suicidal language of an artist- a pertinent issue today, as suicide and suicidal thoughts are becoming relatively common. Suicidal thoughts do not choose people based on age or ethnic background. Having these thoughts does not mean weakness or flaws. An awareness of the warning signs and risks manifested in one's writings, like Avicii's song lyrics, can potentially save lives.

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Conflict of Interest Disclosure

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Research Ethics Statement

The study was conducted in accordance with the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct.

Authorship

Aiden Yeh: research concept and design, collection and/or assembly of data, data analysis and interpretation, writing the article, critical revision of the article, final approval of the article.

Pham Thi Minh Trang: research concept and design, collection and/or assembly of data, data analysis and interpretation, writing the article.

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Appendix

List of singles (with lyrics) by Avicii included in the corpus.

#	Release year	Category	Name	Note	
1			Blessed		
2			Don't hold back		
3	2010		Seek bromance		
4			So excited		
5			Sweet dream		
6			Tweet it		
7			Collide		
8		2011		Fade into darkness	Non-album singles
9			Silhouettes		
10			3 million		
11			Dancing in my head		
12		Early	I could be the one		
13	2012		Last dance		
14			Super love		
15			We write the story	Eurovision Song Contest: Malmö 2013	
16			Wake me up		
17			X You		
18			Addicted to you	Album "True"	
19	2013		Hey brother		
20			Lay me down		
21			You make me		
22			The days	The Days / Nights EP	
23			The nights		
24			Feeling good	Non-album single	
25	2014		Broken arrows		
26		Middle	For a better day	Album "Stories"	
27			Pure grinding		
28			Waiting for love		
29	2016		Taste the feeling	Non-album single	
30			Lonely together	Extended play "Avicii (01)"	
31	2017		Without you		
32			Aint a thing		
33			Bad reputation		
34			Excuse me		
35			Fades away		
36			Forever yours		
37			Freak	Album "TIM"	
38		2019		Heart up...my sleeve	(after death)
39				Heaven	
40				Hold the line	
41			Never leave me		
42			Peace of mind		
43			SOS		
44			Tough Love		