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Krause, Amanda E., and North, Adrian C. (2019) *Pop music lyrics are related to the proportion of female recording artists: analysis of the United Kingdom weekly top five song lyrics, 1960–2015.* **Psychology of Popular Media Culture, 8 (3) pp. 233-242.**

Access to this file is available from:

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https://doi.org/10.1037/ppm0000174

Note:

This is an accepted manuscript (pre-print version) of an article published in *Psychology of Popular Media Culture* online on 11 December 2017, available online at: http://psycnet.apa.org/doiLanding?doi=10.1037%2Fppm0000174

You may download the published version directly from the journal (homepage: http://www.apa.org/pubs/journals/ppm/).

Published citation:

Krause, A. E, & North, A. C. (2019). Pop music lyrics are related to the proportion of female recording artists: Analysis of the United Kingdom weekly top 5 song lyrics, 1960-2015. *Psychology of Popular Media Culture, 8*, 3, 233-242. doi:10.1037/ppm0000174

Pop music lyrics are related to the proportion of female recording artists: Analysis of the

United Kingdom weekly top 5 song lyrics, 1960-2015

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Abstract

Previous content analyses of pop music have considered the prevalence of misogynistic portrayals of interpersonal relationships, but have employed relatively small samples of music, and often neglected musician gender. Since cultural depictions create individuals' musical identity, we expect the musical norms identified by previous content analyses to be reflected by lyrics produced by males and females. The lyrics of all 4,534 songs to have reached the United Kingdom's top 5 singles sales chart between March 1960 and December 2015 were computer-analysed to consider the association between 40 aspects of each and both the proportion of females who recorded each song and the gender of the vocalist. There were few associations between lyrical content and *vocalist* gender. However, the *proportion of all musicians who recorded each song who were female* was associated positively with the lyrics containing words indicative of inspiration and variety; and negatively with the lyrics containing different words, and words indicative of aggression, passivity, cooperation, diversity, insistence, embellishment, and activity. Songs recorded by a high proportion of female musicians described a wide range of subject matters in the context of abstract virtues, whereas songs recorded by a high proportion of male musicians were more likely to address stereotyped concepts of adolescent masculinity that were positively- and negatively-valenced.

Running head: Lyrics and gender

Public significance: The popularity of music, particularly among young people, has led to fierce societal debates concerning violent, misogynistic, or otherwise undesirable content.

Empirical content analyses of music, however, have tended to study small samples of songs; and have tended to approach 'music' as a single body of work rather than considering how the content of musical outputs could vary as a function of the characteristics of the musicians who produce it. The current research looks at the lyrics of all songs to have entered the UK top 5 singles chart from March 1960 to December 2015, and shows that the content of the lyrics of these songs is associated with the proportion of the recording artists in question who were female.

Pop music lyrics are related to the proportion of female recording artists: Analysis of the

United Kingdom weekly top 5 song lyrics, 1960-2015

Many content analyses of pop music lyrics and videos have demonstrated the

prevalence of depictions of misogynistic interpersonal relationships, but have typically

employed small samples of music and failed to account for the gender of the musicians

concerned. Given this, it seems appropriate that further consideration of (a wider range of)

music lyrics should focus on the association between the prevalence of various themes

and the gender of the musicians in question. The present research considers the lyrics of

all those songs to have reached the United Kingdom weekly top 5 singles chart from 1960-

2015 in terms of computerised content analysis of 40 themes, and asks whether the

prevalence of these themes is related to two variables, namely (i) the gender of the

vocalist(s) who were featured on *each* song; and (ii) the proportion of the total number of

musicians who recorded *each song* who were female.

Outside of research concerning music, Hess et al. (2000, p. 609) noted that, "One

of the most consistent empirical findings [in the literature at the time of their paper] on sex

differences regards emotional expressivity". Hess et al.'s argument was based on a

number of studies conducted since the 1970s that measured expressiveness in terms of

EMG (e.g., Greenwald, Cook, & Lang, 1989), self-report (e.g., Allen & Haccoun, 1976), or

non-verbal behaviour (e.g., Barr & Kleck, 1995). Moreover, Kring and Gordon (1998) note

that although there is some disagreement on whether this conclusion applies equally to all

emotions, there are numerous studies conducted over several decades (e.g., Allen &

Haccoun, 1976; Buck, Baron, Goodman, & Shapiro, 1980; Lang, Greenwald, Bradley, &

Hamm, 1993; Ragan, 1982) identifying greater expression among females with regard to a

wide range of a range of emotions, such as sadness, disgust, fear, surprise, happiness,

and anger. They note also, however, that expression of emotion is influenced by cultural norms so that, for instance, boys are more likely to conceal their emotion, whereas the female script instead encourages open expression (e.g., Brody, 1985) and greater expression of positive emotion towards others (e.g., Kring & Gordon, 1998; Stoppard & Gruchy, 1993). Other research indicates that gender-based stereotypes exist concerning those emotions that are perceived as more likely to be expressed by males and females respectively, and that these influence self-reports (e.g., Allen & Haccoun, 1976; Feldman-Barrett, Robin, Pietromonaco, & Eyssell, 1998; Fischer, 1993; Plant, Hyde, Keltner, & Devine, 2000). Indeed it is noteworthy that the number of findings concerning sex differences means that research on emotional expressivity has moved on in recent years to considering the social and well-being consequences of suppression and expression of emotion (Chervonsky & Hunt, 2017). What is not clear, however, is whether similar differences in emotional expressivity can be identified in popular music recorded by males and females respectively.

Research concerning both actual and sex-typed differences between males' and females' expression of emotion is particularly interesting in the light of the literature on gender identity and music, which has of course been investigated by many researchers from a variety of theoretical and methodological perspectives. Dibben's (2002) overview, however, highlights one particularly interesting conclusion of much of this work, namely that the musical culture to which we are exposed, and the implicit and explicit messages concerning attitudes and behaviours it contains concerning gender, actively construct our notions of musical identity. Gendered (musical) identity is an active social process that reflects the prevailing (musical) culture. A considerable amount of evidence reviewed by Dibben (2002) indicates that musical identity is subject to gender-based differences and cultural norms. For example, Green (1997) described gender-based differences in beliefs

and behaviours concerning music that were held by teachers and children alike; O'Neill

(1997) reviewed a number of studies that highlight sex-typed beliefs concerning the

gender-appropriateness of certain musical instruments; and numerous studies address

gender differences in musical taste (e.g., North, 2010). In particular, several researchers

argued explicitly during the 1990s that musical works from the classical era to modern pop

music themselves create gendered musical identities (McClary, 1991; Pfeil, 1995; Walser,

1995), such as the portrayal of supposed male power and female innocence in 17th

century opera, and of supposed male virtuosity and technical competence in late 20th

century heavy metal.

     If culturally-prominent depictions of gendered musical identity shape actual

gendered musical identity this then raises the issue of the particular ways in which males

and females are represented in a given musical culture. There exists a number of

statistical content analyses of western pop music and music videos which establish that

pop music portrays males and females differently. The great majority of these content

analyses have focussed on the portrayal of interpersonal relationships, with a particular

focus on high levels of sexuality, sextyping, and misogyny that have persisted over several

decades. Hyden and McCandless's (1983) analysis of lyrics from 1972-1982, for instance,

showed highly sex-typed portrayals of males as competent and proactive, whereas

females were portrayed as seductive. Subsequent content analyses of pop music

throughout the 1980s and 1990s tended to consider both music videos and lyrics per se,

although these tended to indicate a similar high degree of sexism and misogyny

throughout (e.g., Gow, 1996; Sommers-Flanagan, Sommers-Flanagan, & Davis, 1993).

Dukes, Bisel, Borega, Lobato, and Owens (2003), for instance, analysed the 100 most

popular songs in the USA between 1958 and 1998 showing several notable differences in

the lyrics produced by males and females. Over time, female singers made fewer

references to love (although consistently made more references than did males throughout); and more recent songs by females expressed higher levels of romantic selfishness indicative of (at least a desire for) equal status relationships.

Moreover, Ward's (2003) review of 36 studies published since the early 1980s highlighted the societal consequences of content of this nature. Exposure to sexualised media was associated with young people's acceptance of stereotypical and casual attitudes concerning sex, and with distorted expectations of sex. More recent research demonstrates that neither has this situation improved over the years since Ward's review. For instance, Ross and Coleman (2011) highlighted that sex-typed scripts persist in music videos, and note the development of several specific sex-typed scripts for females; Flynn, Craig, Anderson, and Holody (2016) considered the lyrics of the top 20 Billboard songs in a number of genre-specific charts from 2009-2013, and found that females are more frequently objectified than are males; and Van Oosten, Peter, and Valkenburg (2015) found that exposure to sexual music videos by male musicians was associated with adolescent girls showing greater acceptance of female token resistance in sexual contexts. North and Hargreaves (2008) review a number of similar studies that demonstrate how exposure to violent or sexist musical content (either in the form of the music per se or music videos) is associated with the subsequent acceptance or commission of violent or misogynistic acts and attitudes.

Given the literature describing how cultural depictions create individual's musical identity, we would expect the musical norms identified in these content analyses to lead to differences in the musical products emanating from males and females as they conform to the encultured sex-types portrayed. Of greatest relevance to the present research are two direct studies of differences between lyrics by male and female musicians with regard to the portrayal of gender roles. Kreyer and Mukherjee (2009) analysed the lyrics of the top

30 albums in the United States from 2003, and found that first-person references (e.g., "I")

were the most frequent subject. Kreyer (2015) added to this data set lyrics from the United

States' top 50 albums of 2011 in explicitly addressing how these lyrics describe

masculinity and femininity. Lyrics by males and females were, "surprisingly similar, for

instance with regard to what the most frequent nouns are and how they are used" (p.196),

particularly with regard to a preoccupation with the first person. However, there was also a

tendency for lyrics by males to be more aggressive, violent, and domineering; and more

generally for them to feature more 'extreme' and prevalent coverage of (particularly

sexual) relationships, substance abuse, crime, and weaponry. Lyrics by females showed

greater coverage of a perceived lack of safety.

As this brief review of the literature implies, there are also a number of limitations

associated with research to date concerning the content of pop music. First, the majority of

studies have typically analysed the content of a relatively small number of songs (usually

less than 1000) that are not necessarily representative of what is culturally prevalent at the

time in question. Moreover, the majority of studies to date have used human coders to

analyse the content of the music in question. Recent advances in desktop computing

power, however, mean that it is now feasible to use computerised coding, which promotes

consistency and allows consideration of a larger number of songs. Second, (with the

notable exception of Kreyer, 2015) research has considered only a very narrow range of

variables, concerning particularly interpersonal relationships. If interpersonal relationships,

and particularly masculine sex-typed concepts of sexuality and violence, are such a

prevalent component of pop music, and if this content has the potential to influence

musical behaviour as gender theorists claim, then we might well expect to find some

differences in the coverage of these issues by male and female musicians. Moreover,

given the extensive and wide-ranging literature on differences between males' and

females' emotional expressivity (and sociocultural behaviours in general), there may also be differences in the more general lyrical concerns of male and female musicians.

In summary, the research on emotion expression cited above suggests that this might be more common among females; research by gender theorists and music researchers indicates that pop music contains clear messages concerning gender-based musical identity that have the potential to impact on listeners but also musicians; Kreyer's research provides some indication that gender differences in musical outputs may exist; and it is possible to identify a number of limitations in the existing research. To address these issues, we conducted a computerised content analysis of every song to have reached the United Kingdom top 5 singles chart until the end of 2015. The lyrics were coded to allow consideration of the extent to which they addressed interpersonal relationships and sex-typed values. Two additional variables were also calculated manually for each song, namely the proportion of the musicians on the recording who were female, and whether the vocalist was male or female (or whether there was more than one vocalist so that at least both one male and one female performed the vocals).

The present research tested the hypothesis that (a) the proportion of female musicians who performed on a given recording and (b) the gender of the vocalist should be associated with the emotional expressivity of the lyrics and also with particular regard to sex-typed variables. The content of the lyrics relevant to emotional expressivity and sex-typing (particularly with regard to interpersonal relationships), as represented within Diction are inspiration (i.e., abstract virtues deserving universal respect); aggression (i.e., human competition and forceful action); passivity (i.e., compliance, cessation, and inertness); cooperation (i.e., behavioural interactions among people that often result in a group product); diversity (i.e., descriptions of individuals or groups differing from the norm); insistence (i.e., repetition of key words); embellishment (of verbs through the addition of

adjectives indicating praise or blame); and activity (i.e., movement, change, implementation of ideas, and the avoidance of inertia). Given research showing greater the greater expression of emotion by females, the prevalence of sex-typed depictions of males and females in pop music, and how gender identity is created through exposure to pre-existing cultural products, we might expect to find that lyrics associated with females score higher than those by males on variables concerning emotion and sex-typed 'female' characteristics, whereas lyrics associated with males score higher on sex-typed 'masculine' variables.

Method

Lyrics

The research employed all those songs that entered the top five sales charts positions in the United Kingdom for each week from March 1960 through to the end of December 2015. Chart information for 1960-1995 was obtained from Gambaccini, Rice, and Rice (1996) and www.officialcharts.com was used for the period thereafter, as these represent the charts employed by the British Broadcasting Corporation (BBC). BBC radio enjoyed the majority of audience share throughout this period, and used the charts as the basis for music programming during daytime shows, so that the charts represent the music that was most-commonly bought and listened to by the population. The dataset included only one instance of each unique song ($N = 4,534$). The lyrics were obtained from predominantly web-based sources (most commonly www.azlyrics.com) and were corroborated against a second source. A third source was obtained in the case of any discrepancy, which arose usually from there being multiple versions of the song in which case we employed the version clearly intended for radio airplay (such as a designated 'radio edit' or '7" version').

A two-step cleaning process was applied to the lyrics before they were analysed. First, previously eliminated redundancies were re-introduced to ensure that each set of lyrics represented a verbatim copy of the recorded song. For example, instances of 'Chorus' were replaced with the text of the chorus, and instances of 'x2' were replaced by a further instance of the material in question. Second, a number of 'find and replace' word processor operations ensured that contractions were extended so that the words were represented fully (e.g., 'It's' was replaced with 'It is', and so on) and mis-spellings were corrected (so that, for example, 'wanna' was replaced with 'want to').

Coding. Diction 7.0 (Hart, Carroll, & Spiars, 2013) was designed for computer analysis of the content of texts of varying lengths (Sydserff & Weetman, 2002), and was employed to analyse the lyrics of each song. Details of the variables coded by Diction are provided in Table 1. The software has been employed by over 300 published studies to date (see www.dictionsoftware.com/published-studies) and has been used to consider a number of media sources, including songs from the Great Depression era (Cook & Krupar, 2010). The software is based on an initial analysis of 20,000 reference texts (Sydserff & Weetman, 2002) which was used to derive a list of 10,000 common words. These are classified into discrete, non-overlapping 'dictionaries' or variables containing between 10 and 745 words each. Diction calculates the frequency with which the words within a given dictionary appear in a given target text, leading to a score for the text in question on each variable. The software also produces a small number of variables based on the lexical properties of the words themselves (e.g., number of different words). Since the song lyrics were of different lengths, the scores for a given set of lyrics on each of the variables was divided by the total number of words within that text.

-Table 1 here-

Artist Information

Using a number of biographical sources (e.g., music industry web sites and music encyclopaedia, such as www.musicianguide.com and www.library.yale.edu/cataloging/music/biograph.htm), we determined whether the vocalist(s) on each recording were male or female (or whether there were two or more singers representing both males and females). These same sources were also used to calculate the number of individuals or members of the band in question named as the recording artist of each song, and the number of these who were female. This information was used to determine the percentage of those responsible for recording the song in question who were female. Note that in the case of songs credited to a solo performer the denominator was 1, in the case of songs credited to two performers the denominator was 2, and so on; and in the case of bands with changing membership over time we employed as the denominator those people listed as members during the year in which the song in question appeared on the chart. The details of those responsible for recording each song were confirmed by two separate sources. The calculation included only those formally credited as performers on the recordings, and excluded recording studio staff, such as producers, session musicians, or other music industry personnel. Data concerning other contributors to each song were unreliable and/or obscure, and the social presentation of each song was of it emanating from a named band or (group of) individual(s). This latter reason also explains why we measured the proportion of the musicians who were female in addition to the gender of the vocalist per se.

Results

Proportion of female band members

Across the entire data set, only 19.1% of the songs were recorded by female-only musicians, whereas 65.7% of the songs were recorded by male-only musicians. A two-step analysis procedure, using Generalized Linear Mixed Model (GLMM) analyses implemented through SPSS's (Version 22) GENLINMIXED procedure, was used to consider whether the prevalence of each particular lyrical theme was related to the proportion of band members who were female. For the first step, each of the 40 Diction variables in turn was used as a predictor variable, and the criterion variable was the proportion of females among those who recorded the song. Only those 32 Diction variables demonstrating a significant relationship with the criterion variable ($\alpha < .05$, see the Appendix) were retained for the second step. In the second step the Diction variables that survived the first step were entered as predictor variables together in a single GLMM analysis in which the criterion variable was again the proportion of females among those who recorded each song. This analysis was statistically significant, $F(32, 4319) = 8.151$, $p < .001$, $\eta_p^2 = .057$. The results for individual predictor variables are presented in Table 2, showing that significant findings arose concerning number of different words, inspiration, aggression, passivity, cooperation, diversity, insistence, embellishment, variety, and activity.

- Table 2 here –

Vocalist gender

Across the entire data set, females, males, and males and females co-performing vocals together were identified on 24.60%, 63.30%, and 12.10% of the recordings respectively. To investigate whether the lyrics varied as a function of the gender of the vocalist(s), a three-step GLMM analysis procedure was employed, using the same two

steps as above, supplemented by third step which involved a series of binomial analyses

comparing male versus female versus male and female co-performing principal vocalists.

The first step of the analysis showed that 22 variables were related significantly to vocalist

gender and these were retained for the second step (and are shown in the Appendix). The

result of the second step of the analysis was statistically significant, $F(44, 4370) = 5.457$,

$p < .001$, $\eta_p^2 = .052$, and results for individual predictor variables are presented in Table 3.

For those Diction variables that gave rise to significant results in this second step (namely

number of different words, self-reference, and human interest), the results of binomial

comparisons of vocal performances by males versus females versus male and female

vocalists together are presented in Table 4.

- Tables 3 and 4 here -

Discussion

The present research was carried out in the context of previous findings indicating

sex differences in emotional expressivity, that pop music often portrays interpersonal

relationships in misogynistic terms, and that cultural depictions of gender identity are

associated with an individual's musical identity. It is noteworthy that females alone

accounted for only 19.1% of the recordings, whereas the corresponding figure for male-

only recordings was 65.7% (with the remaining 15.2% representing recordings by male

and female musicians working together). Similar results were obtained when considering

the sex of specifically the vocalists concerned. Two aspects of this stand out. First is

simply the small portion of recordings by female-only groups of musicians (and female

vocalists), which will be disappointing to any reader with a liberal world view and is

consistent with a pattern of male domination. Second is the low level of collaboration

between male and female musicians. It would be surprising if such a low level of mixed-sex workplaces were found in other professions. Table 2 shows that the proportion of band members who were female could predict several aspects of the lyrics of all those songs to have appeared on the United Kingdom's top 5 singles chart between 1960 and 2015. There were *positive* associations between the proportion of band members who were female and both inspiration (i.e., abstract virtues deserving universal respect) and variety (i.e., the number of different words used divided by the total number of words); and *negative* associations between the proportion of band members who were female and each of the number of different words in the lyrics; aggression (i.e., human competition and forceful action); passivity (i.e., compliance, cessation, and inertness); cooperation (i.e., behavioural interactions among people that often result in a group product); diversity (i.e., descriptions of individuals or groups differing from the norm); insistence (i.e., repetition of key words); embellishment (of verbs through the addition of adjectives indicating praise or blame); and activity (i.e., movement, change, implementation of ideas, and the avoidance of inertia).

　　　　Of course, the extent to which these findings can be argued as evidence of sex-typed depictions of masculinity and femininity, consistent with earlier work on gender and musical identity, depends on the extent to which the operationalisation of the variables maps onto those stereotypes, and the relative importance that one attaches to individual variables as evidence of this. For instance, the negative relationship concerning aggression is arguably consistent with these sex-types, whereas the negative relationship concerning passivity is not. The clearer conclusion is nonetheless that differences exist in musical outputs as a function of the proportion of the musicians who were female, and this is consistent with the findings of previous research and the arguments of gender theorists

concerning sex differences in emotional expressivity and the relationship between culture

and gender identity.

Two aspects of the results in Table 2 are particularly noteworthy. First, consistent

with Kreyer's (2015) finding that lyrics by males and females were similarly preoccupied

with the first person, there were only a limited number of instances in which the proportion

of band members who were female was related to the prevalence of lyrical themes

concerning the first person and interpersonal relationships. The findings for cooperation,

aggression, and diversity were statistically significant, with the pattern of findings indicating

that the proportion of female band members was associated with less prevalence of

descriptions of behavioural interaction (cooperation), individuals or groups differing from

the norm, and human competition and forceful action (aggression). However, there were

also non-significant findings in the cases of several other variables reflecting the first

person and various aspects of interpersonal relationships, namely self-reference (i.e., first-

person references); collectives (i.e., singular nouns connoting plurality, such as social

groups and geographical entities); blame (i.e., descriptions of social inappropriateness,

evil, misfortune, and denigration); communication (i.e., face-to-face and mediated social

interaction); human interest (i.e., personal pronouns, family members, and more generic

relationships such as friendship); and exclusion (i.e., sources and effects of social

isolation).

This raises a second interesting aspect of the findings in Table 2. The significant

variables clearly indicate a number of relationships between lyrics and the proportion of

female band members, but point to a much more sophisticated pattern of relationships

than the simple notion implied by the existing content analyses of pop music that male

musicians might be more likely than females to produce stereotyped depictions of

interpersonal relationships. Rather, the results support the notion that whereas lyrics by

bands with a higher proportion of female band members reflect a diverse range of subject matters and approaches to the description of these (i.e., inspiration and variety), lyrics by bands with a higher proportion of male members (i.e., the negative relationships in Table 2) adhered to an immature, adolescent stereotype of masculinity. Sometimes the latter had an arguably more positive valence. Specifically, lyrics produced by bands with a higher proportion of males were more likely to feature evidence of interactions leading to a product (i.e., cooperation); and instances of movement, change, and the avoidance of inertia (i.e., activity). However, the adolescent conception of masculinity in songs performed by a higher proportion of male members sometimes had a more negative valence. The results in Table 2 indicate that lyrics recorded by musicians comprising a higher proportion of males were more likely to feature aggression, passivity, insistence, and judgment (via the attachment of praise or blame to verbs, i.e., embellishment). It is tempting to highlight the parallels between this conclusion and that of previous content analyses which describe a misogynistic portrayal of interpersonal relationships in pop music. Lyrics recorded a high proportion of male musicians appear to address issues that are associated closely with the stereotypical immature masculine script, and so it is perhaps unsurprising that previous research should have identified a tendency to present interpersonal relationships in misogynistic terms.

Tables 3 and 4 report analyses concerning the gender of the vocalists per se. The binomial analyses in Table 4 indicate that male vocalists produced higher scores than female vocalists on the number of different words employed; when comparing female vocalists with performances by both male and female vocalists singing together, the latter used a greater number of different words, and the former employed more self-reference and use more terms concerning human interest; and when comparing male vocalists with performances by both males and females singing together, males employed a greater

number of different words, more self-reference, and more terms concerning human interest. However, given the number of variables employed within Diction, the most notable aspect of these findings is how few gave rise to any difference at all as a function of vocalist gender, consistent with the findings of Kreyer (2015). There was no evidence of wide-ranging and greater emotional expression in female compared to male vocal performances, or of males and females respectively producing higher scores on masculine and feminine sex-typed variables. Rather, the weight of evidence concerning gender differences in pop music lyrics indicates that these are found only when considering the proportion of females associated with the recording, rather than the gender of the vocalist per se. It is tempting to speculate on why these two criterion variables should give rise to such different patterns of results, and unfortunate that there is nothing in the data set that speaks to this directly.

We should note five limitations to the generalisability of the present findings. First, the effect sizes in Table 2 are small. This seems reasonable, since a number of factors influence the production of lyrics which would mitigate against larger effect sizes being observed in the variables studied here. The statistical significance of the variables identified here is arguably a better indicator of the existence of relationships of interest. Second, we would ideally have been able to identify the specific contribution of each individual musician to the resulting recording, so that we could isolate the individual(s) responsible for production of the lyrics and/or the specific degree and nature of their contribution. Although limited evidence of this exists for a handful of the songs, the present data represents the best degree of granularity possible while maintaining conventional standards of reliability. Similarly, we note that song writers often differ from performers so that the music and lyrics performed by fe/males may have been written by someone of a different gender. This factor was not included in the present research as there are also

numerous anecdotes describing performers adapting music and lyrics in the recording studio 'on the fly', and these ad hoc changes make it difficult to consider the role of writers as distinct from performers. Third, the present results are limited to only those songs to have appeared on the United Kingdom singles chart. Although several of the songs in question enjoyed popularity elsewhere, it would be inappropriate to generalise from the present findings to other countries. Fourth, the archival approach employed here made it impossible to collect reliable data on the extent to which the musicians themselves identified with stereotypical or biological binary male and female identities. These factors would have made interesting covariates in the analyses, but unfortunately such data do not exist. Finally, while much of the literature on gender and music (reviewed above) focusses on misogyny and the potential impact on (often young) listeners' interpersonal relationships, there is nothing in the present method that speaks to any correlation between the content of the lyrics and subsequent attitudes and behaviour on the part of their audience. In the light of this it is notable that a limited amount of research has shown that listeners' comprehension of lyrics can be highly idiosyncratic (Leming, 1987), discrepant from the messages intended by the lyricist(s) (Konečni, 1984), and subject to external biases (Thorne & Himelstein, 1984). Similarly, other research findings (e.g., Cummings & Roy, 2002) indicate that genres that might be regarded by some as having negative connotations can nonetheless be perceived as empowering by the target market. The association between lyrical content, listeners' understanding of this, and any subsequent impact their attitudes and behaviour is likely complex.

Following from this, we nonetheless conclude by noting one possible practical implication of the present work. As noted earlier, North and Hargreaves's (2008) review of several dozen pieces of research indicates that there *is* an association between exposure to violent or sexist music media and listeners'/viewers' subsequent acceptance or

commission of violent or misogynistic actions and attitudes. The present research did not

assess the subsequent attitudes and behaviours of listeners of course. However, the

present findings suggest that the sex of the musicians concerned might represent an albeit

crude indicator of the types of messages to which listeners are exposed at the level of an

entire national culture, and therefore of the potential societal attitudes and behaviours that

may arise. Future research might investigate, for instance, any association between the

prevalence of male and female musicians in pop music sales charts and the subsequent

prevalence of bellicose vocabulary on social media websites or in news media.

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Table 1.
Summary of the 'Diction' dictionaries (taken from Hart, 1997)

Dictionary	Definition
Numerical terms	Any sum, date or product. Each separate group of integers is treated as a single word.
Ambivalence	Words expressing hesitation or uncertainty.
Self-reference	Contains all first-person references.
Tenacity	All uses of the verb 'to be' (is, am, will, shall), three definitive verb forms (has, must, do) and their variants, and all associated contractions (he'll, they've, ain't).
Leveling	Words used to ignore individual differences and to build a sense of completeness and assurance.
Collectives	Singular nouns connoting plurality that function to decrease specificity e.g. social groupings, task groups (e.g. army), and geographical entities.
Praise	Affirmations of some person, group, or abstract entity.
Satisfaction	Terms associated with positive affective states.
Inspiration	Abstract virtues deserving of universal respect.
Blame	Terms designating social inappropriateness (e.g. naïve), evil, unfortunate circumstances, unplanned vicissitudes, and outright denigrations.
Hardship	Contains natural disasters, hostile actions, censurable human behaviour, unsavoury political outcomes, normal human fears and incapacities
Aggression	Terms embracing human competition and forceful actions.
Accomplishment	Words expressing task completion and organized human behaviour.
Communication	Terms referring to social interaction.
Cognitive terms	Contains words referring to cerebral processes, both functional and imaginative.
Passivity	Words ranging from neutrality to inactivity.
Spatial awareness	Terms referring to geographical entities, physical distances, and modes of measurement.
Familiarity	A selected number of Ogden's (1960) 'operation' words, which he calculates to be the most common words in the English language. Includes common prepositions (across, over, through), demonstrative pronouns (this, that), interrogative pronouns (who, what), and a variety of particles, conjunctions, and connectives (a, for, so).
Temporal awareness	Terms that fix a person, idea, or event within a specific time interval.
Present concern	Selective list of common present-tense verbs concerning general physical activity, social operations, and task performance.
Human interest	Includes standard personal pronouns, family members and relations, and generic terms (e.g. friend).
Concreteness	Words concerning tangibility and materiality.
Past concern	Past tense form of the verbs contained in the Present Concern dictionary.
Centrality	Terms denoting institutional regularities and/or substantive

	agreement on core values.
Rapport	Words denoting attitudinal similarities among people.
Cooperation	Words describing behavioural interactions among people that often result in a group product.
Diversity	Words describing individuals or groups of individuals differing from the norm.
Exclusion	Describes the sources and effects of social isolation.
Liberation	Includes terms describing the maximizing of individual choice and the rejection of social conventions.
Denial	Standard negative contractions (aren't), negative function words (nor), and terms designating null sets (nothing).
Motion	Terms connoting human movement, physical processes, journeys, speed, and transit.
Insistence	A measure of code restriction and semantic 'contentedness'. Includes all words occurring three or more times that function as nouns or noun-derived adjectives, and calculates (number of eligible words x sum of their occurrences) / 10.
Embellishment	Calculated as (praise + blame + 1) / (present concern + past concern + 1).
Variety	The number of different words divided by total words.
Complexity	Mean number of characters per word.
Certainty	Language indicating resoluteness, inflexibility, and completeness and a tendency to speak ex cathedra. Calculated as [Tenacity + Leveling + Collectives + Insistence] – [Numerical Terms + Ambivalence + Self Reference + Variety]
Activity	Language featuring movement, change, the implementation of ideas and the avoidance of inertia. Calculated as [Praise + Satisfaction + Inspiration] – [Blame + Hardship + Denial]
Optimism	Language endorsing some person, group, concept or event, or highlighting their positive entailments. Calculated as [Aggression + Accomplishment + Communication + Motion] – [Cognitive Terms + Passivity + Embellishment]
Realism	Language describing tangible, immediate, recognizable matters that affect people's everyday lives. Calculated as [Familiarity + Spatial Awareness + Temporal Awareness + Present Concern + Human Interest + Concreteness] – [Past Concern + Complexity]
Commonality	Language highlighting the agreed-upon values of a group and rejecting idiosyncratic modes of engagement. Calculated as [Centrality + Cooperation + Rapport] – [Diversity + Exclusion + Liberation]

Table 2.

Results of the Second Step of the GLMM Analysis Concerning the Percentage of Female Band Members (N = 4352).

Variable	F	p	Beta	t	95% CI		η²
Number of different words	40.051	< .001	-0.037	-6.329	-0.048	-0.026	0.009
Numerical terms	1.647	.199	-0.006	-1.283	-0.015	0.003	0.000
Ambivalence	0.490	.484	0.005	0.700	-0.010	0.021	0.000
Self-reference	2.543	.111	0.007	1.595	-0.002	0.015	0.001
Tenacity	2.283	.131	-0.005	-1.511	-0.011	0.001	0.001
Collectives	0.969	.325	0.008	0.984	-0.008	0.025	0.000
Praise	0.039	.844	-0.004	-0.197	-0.043	0.035	0.000
Satisfaction	0.012	.913	0.002	0.110	-0.034	0.038	0.000
Inspiration	9.243	.002	0.052	3.040	0.018	0.085	0.002
Blame	3.470	.063	-0.063	-1.863	-0.129	0.003	0.001
Hardship	0.952	.329	-0.017	-0.976	-0.051	0.017	0.000
Aggression	4.595	.032	-0.033	-2.144	-0.064	-0.003	0.001
Accomplishment	0.785	.376	0.011	0.886	-0.013	0.035	0.000
Communication	1.291	.256	-0.014	-1.136	-0.039	0.010	0.000
Cognitive terms	0.639	.424	-0.008	-0.800	-0.029	0.012	0.000
Passivity	17.458	< .001	-0.049	-4.178	-0.072	-0.026	0.004
Spatial awareness	1.972	.160	-0.010	-1.404	-0.024	0.004	0.000
Temporal awareness	2.192	.139	-0.003	-1.480	-0.007	0.001	0.001
Present concern	2.742	.098	-0.007	-1.656	-0.016	0.001	0.001
Human interest	1.162	.281	-0.003	-1.078	-0.010	0.003	0.000
Cooperation	4.046	.044	-0.067	-2.011	-0.132	-0.002	0.001
Diversity	4.184	.041	-0.137	-2.046	-0.268	-0.006	0.001
Exclusion	0.027	.869	0.005	0.165	-0.057	0.068	0.000
Denial	0.196	.658	-0.007	-0.443	-0.037	0.024	0.000
Insistence	5.880	.015	-0.006	-2.425	-0.011	-0.001	0.001
Embellishment	9.165	.002	-0.133	-3.027	-0.219	-0.047	0.002
Variety	3.902	.048	1.096	1.975	0.008	2.184	0.001
Activity	11.523	.001	-0.041	-3.395	-0.064	-0.017	0.003
Optimism	0.090	.764	-0.016	-0.300	-0.120	0.088	0.000
Certainty	1.040	.308	0.015	1.020	-0.014	0.043	0.000
Realism	2.194	.139	0.016	1.481	-0.005	0.037	0.001
Commonality	0.169	.681	0.019	0.411	-0.070	0.107	0.000

Note. For each predictor variable, degrees of freedom = 1, 4319.

Table 3.

Results of the Second Step of the GLMM Analysis Concerning Vocalist Gender

Variable	F	p	Beta	t	95% CI		η²
Number of different words	22.099	< .001	0.000	0.047	-0.001	0.001	0.000
Ambivalence	1.951	.142	0.001	1.449	-0.001	0.003	0.000
Self-reference	8.931	< .001	0.002	2.583	0.000	0.003	0.002
Tenacity	1.115	.328	-0.001	-1.169	-0.002	0.000	0.000
Blame	2.168	.115	0.002	0.830	-0.003	0.008	0.000
Hardship	1.534	.216	0.004	1.571	-0.001	0.009	0.001
Familiarity	0.231	.794	0.000	0.352	-0.001	0.001	0.000
Present concern	0.776	.460	0.000	0.192	-0.002	0.002	0.000
Human interest	3.52	.030	0.001	2.332	0.000	0.002	0.001
Concreteness	0.513	.598	-0.001	-0.748	-0.002	0.001	0.000
Cooperation	2.058	.128	-0.003	-0.770	-0.010	0.004	0.000
Liberation	1.557	.211	0.004	1.181	-0.003	0.010	0.000
Denial	1.449	.235	0.002	1.686	0.000	0.004	0.001
Motion	1.526	.218	0.000	0.060	-0.003	0.003	0.000
Insistence	1.388	.250	0.000	1.464	0.000	0.001	0.000
Variety	0.398	.671	0.121	0.831	-0.165	0.408	0.000
Complexity	0.684	.505	-0.034	-1.076	-0.095	0.028	0.000
Activity	0.038	.963	0.000	0.074	-0.003	0.003	0.000
Optimism	0.915	.401	-0.002	-1.254	-0.005	0.001	0.000
Certainty	0.122	.885	0.001	0.492	-0.004	0.006	0.000
Realism	0.029	.972	0.000	-0.084	-0.004	0.003	0.000
Commonality	0.782	.458	0.004	1.055	-0.003	0.010	0.000

Note. For each predictor variable, degrees of freedom = 2, 4370.

Table 4.

Results of the Third Step Binomial GLMM Analyses Concerning Vocalist Gender

Variable	Overall mean			*F*	*p*	Beta	*t*	95% CI		η²
	Male	Female	Both							
	Male - Female a									
Number of different words	342.109	300.884		108.577	< .001	0.004	10.420	0.003	0.004	0.027
Self-reference	165.011	165.799		0.020	.886	0.000	-0.143	0.000	0.000	0.000
Human interest	196.575	178.618		1.893	.169	0.001	1.376	0.000	0.002	0.000
	Male - both male and female b									
Number of different words	342.109		319.807	20.532	< .001	0.002	4.531	0.001	0.003	0.006
Self-reference	165.011		120.470	29.027	< .001	0.002	5.388	0.001	0.003	0.009
Human interest	196.575		150.697	31.660	< .001	0.002	5.627	0.002	0.003	0.009
	Female - both male and female c									
Number of different words		300.884	319.807	13.792	< .001	-0.002	-3.714	0.003	-0.001	0.008
Self-reference		165.799	120.470	26.919	< .001	0.003	5.188	0.020	0.004	0.016
Human interest		178.618	150.697	9.724	.002	0.001	3.118	0.001	0.002	0.006

a. For each analysis, degrees of freedom = 1, 3880.

b. For each analysis, degrees of freedom = 1, 3328.

c. For each analysis, degrees of freedom = 1, 1618.

Appendix
Results of the First Step of The GLMM Analyses Concerning Percentage of Female Band Members.

Variable	Percentage of female band members analysis [a]			Vocalist gender analysis [b]		
	F	p	η_p^2	F	p	η_p^2
Number of different words	74.502	< .001	0.017	57.176	< .001	0.025
Numerical terms	10.727	.001	0.002	1.295	.274	0.001
Ambivalence	14.215	< .001	0.003	10.402	< .001	0.005
Self-reference	6.807	.009	0.002	16.645	< .001	0.007
Tenacity	9.385	.002	0.002	15.374	< .001	0.007
Levelling	1.707	.191	0.000	2.129	.119	0.001
Collectives	5.027	.025	0.001	1.264	.283	0.001
Praise	12.566	< .001	0.003	2.765	.063	0.001
Satisfaction	8.773	.003	0.002	1.726	.178	0.001
Inspiration	8.209	.004	0.002	0.669	.512	0.000
Blame	25.503	< .001	0.006	9.182	< .001	0.004
Hardship	25.832	< .001	0.006	10.032	< .001	0.005
Aggression	18.081	< .001	0.004	2.180	.113	0.001
Accomplishment	9.982	.002	0.002	1.040	.354	0.000
Communication	8.953	.003	0.002	2.743	.064	0.001
Cognitive terms	4.884	.027	0.001	1.751	.174	0.001
Passivity	29.000	< .001	0.007	3.455	.032	0.002
Spatial awareness	4.149	.042	0.001	2.571	.077	0.001
Familiarity	3.147	.076	0.001	17.194	< .001	0.008
Temporal awareness	12.497	< .001	0.003	1.656	.191	0.001
Present concern	11.643	.001	0.003	4.177	.015	0.002
Human interest	7.742	.005	0.002	15.230	< .001	0.007
Concreteness	2.580	.108	0.001	5.836	.003	0.003
Past concern	1.820	.177	0.000	2.683	.068	0.001
Centrality	0.241	.623	0.000	0.383	.682	0.000
Rapport	0.026	.872	0.000	0.558	.573	0.000
Cooperation	9.549	.002	0.002	3.518	.030	0.002
Diversity	11.814	.001	0.003	1.685	.186	0.001
Exclusion	8.037	.005	0.002	0.563	.569	0.000
Liberation	0.001	.974	0.000	4.380	.013	0.002
Denial	10.591	.001	0.002	11.088	< .001	0.005
Motion	3.525	.061	0.001	7.861	< .001	0.004
Insistence	18.727	< .001	0.004	7.344	.001	0.003
Embellishment	11.612	.001	0.003	0.817	.442	0.000
Variety	4.352	.037	0.001	26.832	< .001	0.012
Complexity	3.014	.083	0.001	7.969	< .001	0.004
Activity	5.354	.021	0.001	10.160	< .001	0.005
Optimism	6.469	.011	0.001	10.745	< .001	0.005
Certainty	6.722	.010	0.002	11.077	< .001	0.005
Realism	12.220	< .001	0.003	16.267	< .001	0.007
Commonality	5.039	.025	0.001	13.529	< .001	0.006

a. For each analysis, degrees of freedom = 1, 4350.
b. For each analysis, degrees of freedom = 2, 4412.