

The aesthetics of rhyme schemes

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Abstract EN:

Abstract: The relationship between rhyme and aesthetic appeal has been extensively explored, showing that rhyme is generally perceived as more beautiful than non-rhyme in many cultures. However, previous research has focused on rhyme as a general feature, without considering whether differences in rhyme schemes produce differences in aesthetic appeal. Therefore, to investigate which rhyme schemes are more aesthetically pleasing, I compared the aesthetic appeal of coupled rhyme, alternate rhyme, and no-rhyme, with the prediction that coupled and alternate rhymes would be perceived as more appealing than no-rhyme. In this study, 28 participants first listened to 15 audio stimuli in an artificial mini-language, including five separate stanzas for each of the three rhyme patterns. The participants were then asked to rate how beautiful they found each stimulus on a Likert scale from 1 to 6. Contrary to my predictions, the findings revealed no significant difference in aesthetic appeal between the different rhyme schemes. Nonetheless, this study serves as a pilot study for follow-up research that could build on the limitations of the current study to further explore the topic of the aesthetics of rhyme schemes.

Keywords: aesthetics, aesthetic appeal, rhyme, rhyme schemes, artificial language

Abstract DE:

Die Beziehung zwischen Reim und ästhetischer Wahrnehmung wurde bereits umfassend untersucht und zeigte, dass Reime im Allgemeinen als schöner wahrgenommen werden als Nicht-Reime. Frühere Forschungen konzentrierten sich jedoch auf Reim als allgemeines Merkmal, ohne zu berücksichtigen, ob Unterschiede in Reimschemata auch Unterschiede in der ästhetischen Wirkung hervorrufen. Daher habe ich zur Untersuchung der Frage, welche Reimschemata als besonders ästhetisch empfunden werden, die ästhetische Wirkung von Paarreim, Kreuzreim und Nicht-Reim verglichen – mit der Vorhersage, dass Paar- und

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Kreuzreime als ansprechender wahrgenommen werden würden als Nicht-Reime. In dieser Studie hörten 28 Teilnehmende zunächst 15 Audiostimuli in einer künstlichen Mini-Sprache, darunter fünf separate Strophen für jedes der drei Reimschemata. Anschließend wurden die Teilnehmenden gebeten, auf einer Likert-Skala von 1 bis 6 zu bewerten, wie schön sie jeden Stimulus fanden. Entgegen meiner Erwartungen zeigten die Ergebnisse jedoch keinen signifikanten Unterschied in der ästhetischen Wirkung zwischen den verschiedenen Reimschemata. Nichtsdestotrotz dient diese Studie als Pilotstudie für weiterführende Forschung, die auf den Einschränkungen der aktuellen Untersuchung aufbauen kann, um das Thema der Ästhetik von Reimschemata weiter zu erforschen.

Keywords: Ästhetik, ästhetische Wirkung, Reim, Reimschema, künstliche Sprache

1. Introduction

Aesthetic appeal has long been at the center of culture and civilization. The term ‘aesthetic’ originates from the Greek word *aisthetikos*, whose translation relates to sense perception (Lomas 2022). Aesthetic appeal is therefore associated with the perceived beauty of a particular feature. However, defining aesthetic appeal is quite difficult, as it is a highly subjective concept – different people might have different ideas of what they perceive as ‘aesthetic’ or ‘beautiful’. In the field of language and linguistics, the connection between aesthetic appeal and linguistic features is a relatively new field, although it has already been the subject of some research (e.g. Lomas 2022; Rastall 2008). As Rastall (2008) explains, language is very often assessed by linguists in terms of its aesthetic appeal. Accents, dialects, or speaking styles are very often judged based on perceived beauty, which can lead to stigmatization or prestige (Rastall 2008). However, many factors can contribute to the aesthetic appeal of a linguistic feature.

Rhyme, for instance, is considered to hold high aesthetic appeal due to certain qualities it possesses. First, since repetition is generally perceived as being pleasant, rhyme would have a high aesthetic appeal (Rastall 2008). Another theory that could explain the seemingly high perceived beauty of rhyme is the cognitive fluency theory. The cognitive fluency theory states that features that are easy to process are often perceived as more pleasing (Hunt & Stielstra 2018; Reber et al. 2004). Since rhyme is logical and allows us to draw connections between different words, it facilitates processing and is perceived as more appealing (Hunt & Stielstra 2018). The effect of ease of processing on aesthetic appeal has also been researched in a study by Reber et al. (2004), which found a connection between fluent processing and positive aesthetic reception. Thus, due to its regularity and fluency, rhyme appears more familiar and aesthetic. It has therefore been employed in various art forms, particularly poetry and music, all over the world for centuries (Sykäri & Fabb 2022).

To better understand the broad appeal of rhyme, various research has been conducted on the relationship between rhyme, ease of processing, and aesthetic appeal (Coch et al. 2005; Kramer & Donchin 1987; Menninghaus et al. 2015; Obermeier et al. 2013; Obermeier et al. 2016; Rugg 1984). Findings consistently show differences in aesthetic appeal between rhyme and non-

rhyme. An example are the two experiments conducted by Obermeier et al. (2013; 2016), where the rhyming stanzas presented to the participants generally received higher liking ratings than the non-rhyming stanzas. However, while these studies (Obermeier et al. 2013; Obermeier et al. 2016) included alternate and coupled rhyme as stimuli, they did not investigate the differences in aesthetic appeal between these rhyme schemes.

This study examines the aesthetic perception of different rhyme schemes to determine which are most appealing. To explore this, I compare the perceived aesthetic appeal of alternate rhyme, coupled rhyme, and a no-rhyme control condition. Both coupled and alternate rhymes are end-rhyme schemes: coupled rhyme follows an AABB pattern, with rhymes appearing in consecutive lines, while alternate rhyme follows an ABAB pattern, with rhymes in alternating lines (Bergman 2017). Since rhyme is perceived as more aesthetic than non-rhyme (Obermeier et al. 2016), the prediction is that both of the rhyming conditions will be perceived as more aesthetic than the non-rhyme condition. Nevertheless, coupled rhyme is perceived as more regular than alternate rhyme, and, since repetition is considered aesthetically pleasing (Rastall 2008), coupled rhyme should receive higher aesthetic ratings than alternate rhyme. Furthermore, according to the cognitive fluency theory (Hunt & Stielstra 2018), coupled rhyme is easy to process as the rhyme is immediately repeated in the next line, so it should be identified as more aesthetic. Therefore, similarly to Obermeier et al. (2013), I suggest a connection between cognitive fluency, regularity, and the aesthetic appeal of rhyme. Based on this connection, I predict a difference in aesthetic appeal between different rhyme schemes, with coupled rhyme receiving a higher aesthetic rating than alternate rhyme, and both rhyming conditions being perceived as more aesthetic than the no-rhyme condition.

2. Methods

2.1. Experimental conditions and procedure

The experiment was part of a larger testing session conducting research on rhyme, consisting of two phases. First, the participants filled in a questionnaire about their age, gender, first and second languages, level of education, and field of study. In the second phase, the participants completed four experiments, each focusing on a slightly different research question. This study focuses on the first of four experiments, where participants listened to audio stimuli and rated their beauty on a Likert scale from 1 (not beautiful at all) to 6 (very beautiful) by pressing the corresponding key (Fig. 1).

How beautiful do you find this recording?

press the spacebar to play the recording

not beautiful
at all

1 2 3 4 5 6

very
beautiful

Press the respective key.

Figure 1. The interface of the experiment, showing the rating task based on a Likert scale from 1 (not beautiful at all) to 6 (very beautiful).

As Figure 1 shows, participants had to press the spacebar on their keyboard to play the audio recording and then press the key corresponding to their aesthetic rating of the stimulus, from 1 to 6. The stimuli for my experiment were audio files with three different rhyme schemes forming the three conditions: coupled rhyme, alternate rhyme, and no-rhyme (Table 1).

	Coupled Rhyme (AABB)	Alternate Rhyme (ABAB)	No-rhyme
Version 1	Abit conu dula lebabs Dohon exap floyok hobabs Ibed maly okin pimed Apod yeme tety kamed	Abit conu dula lebabs Ibed maly okin pimed Dohon exap floyok hobabs Apod yeme tety kamed	Dohon exap floyok banton Abit conu dula asseld Apod yeme tety slopel Ibed maly okin winets
Version 2	Acte coga fene nelens Dama gata tano falens Yavo sile pema inting Poge sape akim upting	Acte coga fene nelens Yavo sile pema inting Dama gata tano falens Poge sape akim upting	Dama gata tano lassul Acte coga fene gloune Poge sape akim tunmes Yavo sile pema slonad
Version 3	Alan bepe geve clazet Cono ampe idil dizet Bily dade juty timax Lega kili mafa somax	Alan bepe geve clazet Bily dade juty timax Cono ampe idil dizet Lega kili mafa somax	Cono ampe idil metgo Alan bepe geve litish Lega kili mafa sizzah Bily dade juty locans
Version 4	Mido acun pupo bastas Opan бага fapi sostas Bune deme exap tabib Anis guta hona embib	Mido acun pupo bastas Bune deme exap tabib Opan бага fapi sostas Anis guta hona embib	Opan бага fapi hommos Mido acun pupo uplitz Anis guta hona dullo Bune deme exap patest
Version 5	Huma idos yofa chemon Lalo netu kiske fimon Owap fovy tano doken Vime ugod polan quaken	Huma idos yofa chemon Owap fovy tano doken Lalo netu kiske fimon Vime ugod polan quaken	Lalo netu kiske wafet Huma idos yofa gamled Vime ugod polan mastes Owap fovy tano deptic

Table 1. The stimuli in written form, with five versions for each of the three conditions, which equals fifteen total stimuli.

As shown in Table 1, for each condition there were five stimuli, thus there was a total of fifteen stimuli, presented in a random order to each participant. In total, the testing session took

between ten to fifteen minutes to complete, and my specific experiment lasted around five minutes

2.2. Participants

In total, there were 28 participants (19 female, 7 male, 2 prefer not to say). The mean age of the participants was 23.63 years ($SD=11.24$), with ages ranging from 14 to 52 years. The participants spoke a total of 38 different native languages, the most common being German (28.95%), followed by French (15.79%) and English (10.53%). The most common second languages were English (31.82%), German (25.76%) and French (12.12%). All of the participants read and agreed to a consent form at the beginning of the experiment. The aim of the research was not explained to the participants at the beginning of the experiment to prevent it from influencing their answers, but it was briefly revealed to them at the end, before they renewed their consent. The experiment was conducted on a voluntary basis and no remuneration was offered to any of the participants.

2.3. Setting

Participants completed the experiment individually, using their own computers and headphones of unspecified brands. The experiment was designed on OpenSesame 4.0.5 (Mathôt et al. 2012) and conducted on the MindProbe server, powered by the open-source software JATOS (Lange et al. 2015).

2.4. Stimulus material

The stimuli were audio files in an artificial language, partially inspired by the stimuli in the study by Obermeier et al. (2013), to remove linguistic connotations. According to Obermeier et al. (2013, 6), who tested the appeal of both real words and pseudo-words, “lexicality [...] did not impact the overall aesthetic appraisal of the stanzas, but only influenced the emotional ratings”. Therefore, removing lexicality should not have an impact on the aesthetic perception of the stanzas, but would help remove the emotional associations of the stimuli, which could have influenced the ratings if they had been present.

To create the artificial words, I used the software UniPseudo (New et al. 2024), which produced hundreds of artificial words based on its English word database. I then chose words from this list, making sure not to select words that were too similar to English words or that I knew had meaning in another natural language. I also excluded any words with the sound /r/, as I wanted the pronunciation to be as neutral as possible (not pertaining to any particular natural language) and the sound /r/ is pronounced very differently in different languages. With the words I chose, I created stimuli of four lines each, with each line containing four words consisting of eight syllables (two syllables per word). I first started with the coupled rhyme stimuli, choosing words that rhymed as the final two words of each verse, or editing some of the words slightly to make them rhyme better. For the alternate rhyme, I switched the order of the lines so that each final word would rhyme with the final word two verses below or above it. For

the non-rhyming stimuli, I once again switched the order of the lines by placing the first and last lines of the coupled rhyme condition as the second and third verse respectively, and I also replaced the last word of each line with non-rhyming words.

Once the written stimuli had been prepared (see Table 1), I created audio files out of them using an online voice generator (Voice Generator n.d.). To do this, I inputted each of my stimuli into the program and downloaded the corresponding audio with the 'Anna' voice (also shown as 'German' on some browsers), as it was the voice with the least identifiable pronunciation features. Using this artificial voice generator (Voice Generator n.d.) prevented any associations with a real speaker to be made.

2.5. Analysis

When data collection was completed on MindProbe (Lange et al. 2015), I manually formatted the data in Microsoft Excel (Microsoft Corporation 2024) to only include the data relevant to my experiment. Once the data was properly formatted, it was analyzed using R Statistical Software Version 4.3.2 (R Core Team 2023) and the "tidyverse" package (Wickham et al. 2019). Additionally, in a separate Excel file (Microsoft Corporation 2024), I completed the statistical calculations of the participants' age, gender, and languages.

3. Results

The results collected from the 28 participants showed similar measures of centrality and dispersion for the ratings of each of the three conditions. The median rating was 3 for all three conditions, but the mean and standard deviation varied slightly. For alternate rhyme, the mean rating was 2.99, with a standard deviation of 1.27. For coupled rhyme, the mean rating was 3.25, with a standard deviation of 1.34. Finally, for the non-rhyming condition, the mean rating was 3.19, with a standard deviation of 1.27. For illustration, Figure 2 shows the distribution of the results.



Figure 2. Boxplots displaying the distribution of the results for alternate rhyme, coupled rhyme and no-rhyme.

Figure 2 shows that the median rating was the same for all conditions, with a value of 3. The value of the first quartile ($Q1 = 2$) and the value of the third quartile ($Q3 = 4$) are also the same for all conditions. Similarly, the minimum rating ($Q0 = 1$) and the maximum rating ($Q4 = 6$), which were the lowest and highest possible ratings provided to participants, are the same for all conditions. However, for the alternate condition, most of the ratings seem to be within the interquartile range and quite close to the median, while for the coupled condition, the data seems a bit more spread out. The non-rhyming condition also has a high number of data points within the interquartile range, but they spread a bit further away from the median than for the alternate rhyme. The measures of dispersion show that most participants did not seem to find the stimuli neither particularly appealing nor unappealing, since most of the ratings were close to the median and the center of the Likert scale.

The results are further illustrated in Figure 3 below, which shows the mean ratings for all three conditions, with the error bars representing the 95% confidence intervals.

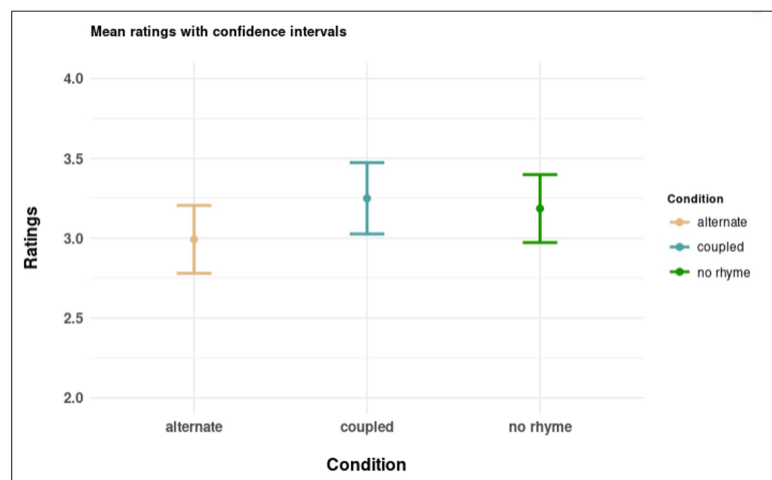


Figure 3. The mean ratings of beauty for alternate rhyme, coupled rhyme and no-rhyme (error bars indicate 95% confidence intervals).

The data in Figure 3 shows little correlation between the differences in rhyme schemes and the aesthetic ratings of the stimuli, as the mean ratings for each condition are very similar to each other. In addition, the 95% confidence intervals overlap, signifying no real significance. Consequently, although coupled rhyme received a mean rating of 3.25 (95% CI 3.03-3.47), which is slightly higher than the non-rhyming condition with a mean rating of 3.19 (95% CI 2.97-3.40), and alternate rhyme with a mean rating of 2.99 (95% CI 2.78-3.21), these minor differences are insignificant as the 95% confidence intervals largely overlap. Therefore, we can be 95% confident that there is no real significant difference between coupled rhyme, alternate rhyme, and no-rhyme.

4. Discussion

This paper aimed to investigate the aesthetic appeal of different rhyme schemes, with results showing that there was no significant difference in the perceived beauty of the various rhyme schemes. While the coupled rhyme received a slightly higher mean rating than the other two conditions, the overlapping 95% confidence intervals for all of the conditions showed that there was no significant difference in terms of the aesthetic appeal of coupled rhyme, alternate rhyme and no-rhyme. This finding contradicts the initial hypothesis, which predicted that coupled rhyme would be rated as the most aesthetically appealing, followed by alternate rhyme, with the no-rhyme condition receiving the lowest ratings.

An explanation for these results could lie in the theory from which the hypothesis was drawn. The hypothesis is based on the cognitive fluency theory, which suggests that features that are easier to process tend to be perceived as more appealing (Hunt & Stielstra 2018; Reber et al. 2004). However, the cognitive fluency theory, when examined more carefully, is actually composed of two parts: perceptual fluency and conceptual fluency (Obermeier et al. 2016). While perceptual fluency refers to the processing of the form or characteristics of the feature, conceptual fluency relates to the meaning of the feature (Obermeier et al. 2016). Therefore, rhyme would be considered easy to process due to its regularity and familiarity, according to perceptual fluency, and due to the recognizability of the meaning of the rhyming words, according to conceptual fluency. However, in my experiment, since I removed lexicality by using an artificial language, only perceptual fluency and not conceptual fluency could apply. Therefore, participants recognized the regular and familiar pattern of the rhyme, but since they did not understand the meaning of the words, this affected their ease of processing, and consequently their perception of the rhyme schemes in terms of aesthetic appeal.

In addition, the methodological limitations of this study also contributed to the results not supporting the initial hypothesis. First, the final sample consisted of 28 participants instead of the planned 40, due to technical difficulties. Furthermore, numerous incomplete data sets further reduced usable data. Thus, this small sample size likely failed to represent the real population, possibly obscuring larger differences in aesthetic ratings. Another limitation is that the differences between the stimuli were not very audible, since the same words were reused across conditions. Several participants reported that the stimuli sounded the same or very

similar, which likely led to ratings close to the center of the scale, around 3 or 4. Additionally, the voice generator (Voice Generator n.d.) used to record the stimuli was deemed too ‘robotic’ and unappealing by some participants, contributing to overall low aesthetic ratings. Finally, the fixed pace of the audio and the length of the experiment caused boredom and disengagement among participants, which likely decreased their attention and response accuracy.

In general, while the use of an artificial language was useful to remove linguistic connotations, it also reduced the naturalness and authenticity usually found in human languages. By contrast, the prior study conducted by Obermeier et al. (2013) created their stimuli of pseudo-words by changing syllables in pre-existing German words and by following German phonotactic rules, which made the stimuli more natural while still removing lexicality. The present study, on the other hand, by using a word generator, did not consider the organicity of the artificial language, likely influencing its aesthetic perception and causing the difference in findings between the two studies. Therefore, efforts to standardize the experiment to avoid subjectivity made it overly rigid and potentially discouraged the participants. Future experiments could be made more approachable for participants by using a human voice or a natural language. While this change would increase subjectivity, it could also provide interesting results, offering valuable data for comparison. Furthermore, follow-up research could explore the relationship between the conceptual fluency aspect of the cognitive fluency theory and the aesthetic appeal of rhyme schemes in greater detail. For instance, by introducing lexicality through the use of a natural language, coupled and alternate rhymes might receive different aesthetic ratings. Moreover, further studies could explore different rhyme patterns, such as internal and slant rhymes (Abdullayev 2023), or chain and enclosed rhymes (Bergman 2017) – to investigate their effect on aesthetic appeal and how it differs from the results presented in this study.

5. Conclusion

In conclusion, this study aimed to determine which rhyme schemes are considered more aesthetically pleasing, with the hypothesis that coupled rhyme would have the highest aesthetic appeal, followed by alternate rhyme, and no-rhyme. Although the results did not confirm the initial hypothesis, this study can be used as a pilot study for follow-up research on rhyme aesthetics. If future studies do find differences in perception of the different rhyme schemes, the results could have implications for music and poetry, where rhyme is prevalent. Finding out which rhyme patterns are perceived as more aesthetic could help when writing poems, songs, or advertisements to make them more appealing. Furthermore, one could research the connection between rhyme and memory (Jambrovic 2024), and more specifically the effect of different rhyme schemes on memorability. In addition to providing useful information about language processing, this research on rhyme and memory could be applied to many different fields, such as advertising and education. Moreover, further exploring the connection between ease of processing and aesthetic appeal could lead to a greater understanding of the mechanisms involved in language perception and application.

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