Musical mnemonics in health science: A first look

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Musical Mnemonics in Health Science: A First Look

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Musical Mnemonics in Health Science: A First Look

Abstract

Song, with its memory enhancement potential and ability to engage, has been employed as a learning tool in some academic settings. Of the countless learning environments, health science may seem the most atypical setting for the musical mnemonic, and yet it may be the most suitable for its application. With medicine’s robust history of student-made mnemonics, it only seems natural that learners and instructors alike have begun to experiment with song meant to educate and entertain, primarily imparting them through popular media sharing sites. This initial assessment of song in health science is meant to highlight notions of efficacy, audience, and use through an informal survey of ten user-made YouTube musical mnemonics. Two of these mnemonics were co-created by the author, while the remaining eight were identified via select search terms and significant viewer numbers. Resulting YouTube data infers that instructors play a major role in the use of musical mnemonics in health science education. User comments indicate that some students have found value in mnemonic songs, helping them recall information during assessments. More robust research methods, like Q-method, meta-analysis, and opinion mining, can further confirm the value and role of musical mnemonics as they pertain to medicine and healthcare.
Practice Points:

- Entertainment-education song has proven to be effective as a memory enhancer and learning tool across a number of disciplines.
- YouTube data infers that instructors share user-made health science songs in lecture and some students use them in preparation for exams.
- Proper research methods, like Q-Method, meta-analysis, and opinion mining, can confirm song’s efficacy and role in health science education.

Notes on Contributor:

Matthew M. Cirigliano, MS, is a medical artist and alumnus of the University of Illinois at Chicago. He has received merit awards from the Association of Medical Illustrators and UIC, exhibited biomedical artwork internationally, published on educational narrative, and has developed patient education media at both TheVisualMD and Understand.com.
INTRODUCTION

Setting the Tone

Music is and always was a form of communication. It is omnipresent in nearly every culture, so much so that anthropologists claim it is “…an essential part of human nature” (Merkur, 1999). In the most ancient of times, song was used as a vehicle for passing stories from one generation to another (Dunlap & Lowenthal, 2010). Since then, its role has expanded. Now, music can be heard accompanying significant events in nearly every society, including weddings, celebrations, funerals, and religious ceremonies (Blacking, 1995). At work, music keeps time, cadence, and rhythm (Dunlap & Lowenthal, 2010) while at play it mirrors our innermost thoughts and feelings (Bennett, 2005). It has been used as a peripheral persuader, a manipulative tool, and a powerful societal unifier (Mackinnon, 2008). Lemieux (2003) describes it as influential, thanks to its “highly engaging, highly repeatable, and participatory nature.” Brown (2006) claims it has the potential to “increase the meaning and memorability of linguistic messages.” Overall, music looks to have found a place in every facet of life, and given its unique qualities, is certainly ripe for use in education.

Called by Brown (2006) an “associative enhancer of communication,” music is a near-perfect learning tool. In terms of cognition, MacKinnon (2010) notes that the linguistic message of a song is processed centrally, while being supported peripherally by non-linguistic musical elements. Explained further, Dissanayake (2006) writes that this central message is interpreted through the audience’s association with emotional stimulation, a phenomenon linked closely to the temporal and tonal variances of a song. This, says Snyder (2000), “provide[s] the context that gives [music] meaning, by relating the moment to a larger framework of ongoing experience.
and previous knowledge.” When read with the work of Weinberger (1998) in mind, these observations can explain why “music offers [such] great opportunities for communication and…can enhance learning and intellectual development.” It is no surprise, then, that studies in music and education link song to a variety of human traits, including memory (Hickok, Buchsbaum, Humphries, & Muftuler, 2003; Snyder, 2000), speech and language acquisition (Hickok et al., 2003), emotion (Craig, 2007; Krumhansl, 2002; Sloboda & Juslin, 2001), intelligence (Schellenberg, 2005), and identity (Hargeaves, Miell, & MacDonald, 2002). By the same token, music has been found to be a useful tool to teach the subjects of humanities, social science (Stovall, 2006), mathematics (Foster, 2004), history (Cooper, 1979), English as a second language (ESL) (Griffee, 1990; Murphey, 1992), humanism (Newell & Hanes, 2003), foreign language (Salcedo, 2002), and, of course, the fundamental learning concepts we often see in children’s programming (Calvert, 2001).

Of all the academic environments, none other has more use for a powerful learning tool like music than medicine, a field notorious for brutal tests in memorization. Anatomy, biochemical pathways, surgery, clinical procedure, diagnostics, medication, and treatment are all part of a health professional’s fundamental knowledge. Unfortunately for students, each one of these subjects contains within them fine, often vital, details that must be recalled correctly in order to succeed. For this reason, many medical students have created their own mnemonics to help them recall information. The word “NAVEL,” for example, is an acronym used to identify the contents of the femoral triangle from the lateral hip towards the medial navel (i.e. Nerve, Artery, Vein, Empty space, Lymphatics). Similarly, the words ‘SOAP BRAIN’ help clinicians remember the eight most common signs and symptoms of lupus. These aide-mémoires, and many more, have been invented to help not only students, but doctors and nurses, recall the
information they need in a healthcare setting. Many mnemonics have been documented in online databases, such as http://www.medicalmnemonics.com, though few, if any, are musical in nature. Fortunately, some creative pioneers have begun to explore this untapped resource and disseminate their own medical music mnemonics online. In this paper, the breadth and potential of musical mnemonics in health science education will be explored. Following the review, the YouTube data of ten medical music mnemonics will be informally analyzed, laying the foundation for further study in this uncharted arena.

**Fundamentals of Entertainment-Education**

For all intents and purposes, educational music falls under the genre of *entertainment-education*. Occasionally called *edutainment*, the practice of combining lecture with amusement is timeworn. In fact, its roots can be traced back to the philosophers of Ancient Greece, who taught moral lessons through the dramatic arts and theatre (Piotrow, 1994). Modern entertainment-education however is, according to Singhal and Rogers (1999), a “relatively new concept,” first pioneered by Miguel Sabido, who used Mexico’s television network to teach sexual health, AIDS prevention, and family planning (Piotrow, 1994). Under the Singhal and Rogers (1999) definition, entertainment-education is “the process of purposely designing and implementing a media message to both entertain and educate, in order to increase audience knowledge about an educational issue, create favorable attitudes, and change overt behavior.” Another take, by Johns Hopkins University, defines entertainment-education as the use of “drama, music, or other communication formats that engage the emotions to inform audiences and change attitudes, behaviour, and social norms” (de Fossard and Lande, 2008). MacKinnon (2008) compares and contrasts these two definitions indicating that, although they both agree on
the goals of entertainment-education, they differ on their delivery methods. Because JHU’s definition of entertainment-education has an affinity for audience participation, it is this definition that fulfills the participatory nature of musical mnemonics.

Educational media embracing participatory communication “involve[s] [the] human subject[s] of social change in the process of communicating” (Dagron, 2001). It allows the target audience to partake, to interact, and to be a part of the message conveyed. MacKinnon (2008) frames dialogue as central to the process, quoting Paulo Freire who proclaims that through dialogue, we are “better able to comprehend and analyze [our] situation, find [our] voice, and effect necessary, contextually appropriate and sustainable social change” (Howson & Witte 2008). In a number of forms, entertainment-education is participatory communication. Educational video games allow players to participate by yielding control. The dramatic arts and song let performers become the vehicle for conveying the message. For some, participation has proven itself to be “the critical element for effecting change” (Sood, 2002). After all, as MacKinnon (2008) points out, health communication theory implies that entertainment-education is essentially participatory in nature, and as its ‘motto’ suggests: “sing and the world sings with you. Lecture, and you lecture alone” (Piotrow, et al. 1997).

Outside of music, participatory entertainment-education has seen significant success in the study of medicine. Interactive applications (Sward, Richardson, Kendrick, & Maloney, 2008), card games (Odenweller, Hsu, & DiCarlo, 1998), video games (Duque, Fung, Mallet, Posel, & Fleiszer, 2008), and performance art, such as improvisational theater (Newcomb & Riddlesperger, 2007), have all been methodically researched as potential learning tools in healthcare. Music and song, however, seem to be missing from the bulk of the literature. Given that the “recall of verbal material… in conjunction with songs [is] greater than recall of spoken
words alone,” it is hard to believe that little is known about music’s efficacy, audience, and use in medical education (Bartlett, 1996). Until more research is done on musical mnemonics in health science, it will always stand as a fertile ground for comprehensive investigation.

Learning with Music in the Health Sciences

Knowledge acquisition is the first step in the pursuit of any career in healthcare. In order to absorb as much information as possible, many medical students arm themselves with mnemonics — witty acronyms, risqué wordplay, and memorable poems — that can help them recall vital, often complicated, concepts. At first, it may seem as though medical music might have evolved from these simple word-based reminders, but surprisingly, the limited history of medical music points to a wholly different origin.

In the fourth quarter of the 20th century, music inspired by medicine was seemingly reserved for novelty song and comedy. Acts like Monty Python, The Arrogant Worms, Weird Al Yankovic, They Might Be Giants, and The Laryngospasms have all at one time mined clinical or anatomical themes as their main source of humor. In these examples, parody, farce, and satire are the presiding end goals. Little can be said for their aim to educate. By the mid to late nineties, this balance began to shift, and educational programming, like Bill Nye the Science Guy, began to incorporate music into their televised lessons. Unlike earlier songs inspired by anatomy and physiology, this breed’s aim was to instruct, though comedic appeal was still very much an acting catalyst.

With the dawn of the 21st century, came a wealth of digital opportunities. Consumer software, social networking sites, and accessible online venues, such as YouTube and Vimeo,
Musical Mnemonics in Health Science

granted aspiring musicians the ability to write, record, publish, and share their own user-generated music. Students, whose musical mnemonics might have gone undocumented before, now had a means to create and distribute their own niche science-inspired songs. Some of these songs, like Gus Halwani’s *Cranial Nerve Mnemonic* (Halwani, 2009) and Ryan Tatar’s *Making ATP* (2008) are parodies on popular songs, while others, like *Shake That Lower Limb* by John Paro (n.d.), are entirely original both in word and melody. As John Paro himself explains in a 2009 NBC news report, medical mnemonics make the perfect lyrics for original songs, helping him recall information while preparing for a future in the medical practice (Johnson & Bryant, 2009).

Interestingly, at about the same time, health science instructors began to explore the benefits of musical mnemonics. In 2009, Tom McFadden, an instructor of human biology at Stanford University, wrote and recorded the parody rap song *Regulatin’ Genes* for use in his courses (Tierney, 2009). Similarly, in 2010, Dierdre Bonnycastle, a professor of the College of Medicine at the University of Saskatchewan, developed an online playlist to aid in course building. Music, it seems, had finally been embraced by the instructors themselves for use in the health science classroom. Though there are songs written to inform the public of environmental dangers, disease, and lifestyle choices, these nonprofit initiatives are not aimed for use in the classroom (MacKinnon, 2010). Generally, user-made examples found online are the only songs written specifically to assist students in study at this time.

Whether these songs are effective learning resources for students in healthcare is still unconfirmed, though some sparse sources may point in the direction of an answer. One study on the use of popular music in online learning revealed that participating students consistently found
musical activities highly immersive, leveraging their interest in music to learn new subjects in the classroom (Dunlap, 2010). This was especially true when students were allowed to compile or create their own educational tunes. A similar experience is shared by Cooper (1994), who states that popular song lyrics are intellectually stimulating, allowing students to “assemble a more reasoned perspective on professional health care reality.” In the context of online sharing, Agazio and Buckley (2009) argue that YouTube videos (which aren’t always musical in nature) can be used as innovative teaching tools, involving students, illustrating theoretical content, and stimulating discussion in digital learning communities. Music tied to video comes with a warning tag however, as substantial past research suggests that visual prompts inhibit associations between written word and spoken response (Wu & Solman, Calvert, 2001). Additionally, factual inaccuracies within user-generated media are common and concerning. Misinformation in any medical or healthcare environment could have adverse consequences for practitioners, and as such, it is recommended that all musical mnemonics be checked for accuracy before being used as trusted resources.

EXPLORATION

YouTube, Statistics, and Limitations

Student and instructor-made musical mnemonics are plentiful on the web, and their accessibility is as simple as searching the right terms. Thanks to a handful of standard YouTube statistical tools, researchers can paint a spotty picture of a given video’s audience and its potential applications. The number of times a video has been viewed, identified as a favorite, liked, disliked, and commented on is displayed publicly below each video. In addition, a music video’s age group appeal is also defined. YouTube Analytics, a recent addition to the site’s
statistical toolbox, features even more information on performance, engagement, audience retention, and demographics, but unfortunately, these data are only available to a video’s creator (Hamilton, 2011). Because of this, only the standard set of *YouTube* statistical tools were available for this reviewer’s use. It is important to note, though, that *YouTube* has several limitations as a statistical tool. The information it provides is primarily qualitative in nature. Its data, for the most part, is descriptive. The user is not given any insight as to the approach used for collecting data, making it difficult to assess its statistical validity. One might view it as a sort of “black box,” withholding the opinion of informed, transparent, predictions and inference. Internal statistical analysis could no doubt be further enhanced by using a multi-method triangulation approach, and yet with *YouTube* there are limited opportunities for cross-referencing. As researchers in social media are aware, extracting useful information from social media is not an easy task (Cambria, Hussain, Grassi & Havasi, 2011) and “…there is still a need for better tools and technologies to search large collections of multimedia data [in order to] find and deliver the right content to a user according to her current needs and preferences” (Venkatesh, et al., 2008). With that said, the following numbers and analyses can best represent a prelude to further research on musical mnemonics in medicine.

**Methods, Observations and Discussion**

The author surveyed the statistical data of ten health science musical mnemonics during a search of the *YouTube* video database (see Table 1). Two of these, *The Pathway* and *The Heart*, were of the author’s own creation, while the remaining eight were identified through search terms like “science,” ‘health,’ ‘anatomy,’ ‘mnemonic,’ and ‘song.’ In addition to the publically
available statistics, notable words, namely words referring to learning, were tallied from each comments section and included in the table.

Table 1: Observed Statistics on Ten YouTube Health Science Music Videos

<table>
<thead>
<tr>
<th>Video Title</th>
<th>Timespan Observed:</th>
<th>Views</th>
<th>Favorites</th>
<th>Comments</th>
<th>Likes</th>
<th>Dislikes</th>
<th>Most Popular Age Groups:</th>
<th>Notable Terms Used in Comments (Times Used):</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Pathway (2007)</td>
<td>August 17&lt;sup&gt;th&lt;/sup&gt;, 2007 – June 28&lt;sup&gt;th&lt;/sup&gt;, 2012</td>
<td>78,503</td>
<td>170</td>
<td>73</td>
<td>130</td>
<td>17</td>
<td>Female 45-54</td>
<td>class (3); studies (1); lecturer (1); exam (11); instructor (1); college (1); educational (1); student (2)</td>
</tr>
<tr>
<td>DNA Replication Song (2007)</td>
<td>November 27&lt;sup&gt;th&lt;/sup&gt;, 2007 – June 28&lt;sup&gt;th&lt;/sup&gt;, 2012</td>
<td>396,407</td>
<td>N/A</td>
<td>1,155</td>
<td>2,474</td>
<td>54</td>
<td>N/A</td>
<td>class (132); learn (45); teacher (121); professor (7); lesson (11); test (64); quiz (4); student (9); educational (2); study (37); pass (14); college (7); lecture (5); lecturer (2); school (21); university (5); course (1); subject (1); final (15); semester (3); instructor (1)</td>
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<tr>
<td>The Heart (2008)</td>
<td>September 6&lt;sup&gt;th&lt;/sup&gt;, 2008 – June 28&lt;sup&gt;th&lt;/sup&gt;, 2012</td>
<td>40,919</td>
<td>80</td>
<td>25</td>
<td>48</td>
<td>5</td>
<td>Male 45-54</td>
<td>exam (28); class (1); learn (45); teacher (7); lesson (11); test (64); quiz (4); student (9); educational (2); study (37); pass (14); college (7); lecture (5); lecturer (2); school (21); university (5); course (1); subject (1); final (15); semester (3); instructor (1)</td>
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<tr>
<td>The PCR Song (2008)</td>
<td>January 8&lt;sup&gt;th&lt;/sup&gt;, 2008 – June 28&lt;sup&gt;th&lt;/sup&gt;, 2012</td>
<td>1,201,455</td>
<td>4,748</td>
<td>963</td>
<td>3,539</td>
<td>81</td>
<td>Female 18-24</td>
<td>exam (29); class (31); learn (5); teacher (22); professor (8); lesson (4); test (15); quiz (3); student (7); educational (3); study (8); pass (5); college (8); lecture (8); lecturer (2); school (8); university (2); course (3); subject (3); lab (38); final (8); semester (2)</td>
</tr>
<tr>
<td>Making ATP (2008)</td>
<td>January 14&lt;sup&gt;th&lt;/sup&gt;, 2008 – June 28&lt;sup&gt;th&lt;/sup&gt;, 2012</td>
<td>282,847</td>
<td>1,570</td>
<td>800</td>
<td>1,440</td>
<td>44</td>
<td>Female 13-17</td>
<td>exam (9); class (45); learn (11); teacher (7); lesson (2); test (21); quiz (3); student (6); educational (4); study (19); pass (6); college (2); lecture (3); school (20); university (7); course (1); subject (1)</td>
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<td><strong>Timespan Observed:</strong></td>
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<tr>
<td><strong>Views:</strong> 203,968</td>
<td><strong>Views:</strong> 58,992</td>
<td><strong>Views:</strong> 80,597</td>
<td><strong>Views:</strong> 390,766</td>
<td><strong>Views:</strong> N/A</td>
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<td></td>
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<tr>
<td><strong>Favorites:</strong> 1,153</td>
<td><strong>Favorites:</strong> 300</td>
<td><strong>Favorites:</strong> 390</td>
<td><strong>Favorites:</strong> 2,250</td>
<td><strong>Favorites:</strong> N/A</td>
<td></td>
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<tr>
<td><strong>Comments:</strong> 243</td>
<td><strong>Comments:</strong> 74</td>
<td><strong>Comments:</strong> 111</td>
<td><strong>Comments:</strong> 944</td>
<td><strong>Comments:</strong> 37</td>
<td></td>
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<tr>
<td><strong>Likes:</strong> 1,048</td>
<td><strong>Likes:</strong> 330</td>
<td><strong>Likes:</strong> 417</td>
<td><strong>Likes:</strong> 3,188</td>
<td><strong>Likes:</strong> 209</td>
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<tr>
<td><strong>Dislikes:</strong> 29</td>
<td><strong>Dislikes:</strong> 3</td>
<td><strong>Dislikes:</strong> 2</td>
<td><strong>Dislikes:</strong> 31</td>
<td><strong>Dislikes:</strong> 5</td>
<td></td>
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<tr>
<td><strong>Most Popular Age Groups:</strong></td>
<td>Female 55-64 Male 45-54 Female 45-54</td>
<td>Female 18-24 Female 45-54 Female 35-44</td>
<td>Female 18-24 Female 45-54 Male 25-34</td>
<td>Female 13-17 Female 45-54 Female 18-24 N/A</td>
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<td><strong>Notable Terms Used in Comments (Times Used):</strong></td>
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<td>lecture (3); test (4); exam (3); class (8); professor (4); instructor (1); teacher (3); study (6); subject (1); course (1); learn (1); lesson (1); school (3); teach (1); educational (2)</td>
<td>exam (2); learn (3); teacher (1); test (3); student (1); study (2); final (1)</td>
<td>learn (1); lesson (3); anatomy 101 (1); test (10); exam (19); student (6); educational (3); study (6); class (14); teacher (12); professor (6); pass (2); lab (15); semester (3); college (2); lecture (5); quiz (3); final (2); school (3); university (1); course (1)</td>
<td>exam (47); class (66); learn (42); teach (17); teacher (129); professor (7); lesson (2); test (130); quiz (6); student (47); educational (4); study (32); pass (29); college (42); lecture (2); lecturer (2); school (53); university (4); course (9); subject (1); lab (2); final (15); semester (4); instructor (2)</td>
<td>exam (2); class (1); student (2); study (3); lab (1); final (2)</td>
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</table>
Slate Magazine reports that only 10% of all YouTube videos break the 1,000-view ceiling (Wilson, 2009). David Gassko, a writer on statistical odds in pop culture, estimates that there is a 1 in 613.2 chance that a given video will attract 10,000 views (Gassko, 2010). With these numbers in mind, the author narrowed selections by choosing mnemonics vastly exceeding 10,000 views. The video with the lowest number of views was Nurses Medication Study Song with 31,213 views.

It is unknown whether the majority of viewers were actively seeking out songs for their health science studies, though user comments inferred that the videos were watched for educational purposes. Learning-related terms, like ‘exam,’ ‘study,’ and ‘lab,’ were all words frequently used in commentary. The word ‘study’ in particular was used most often to indicate how helpful a given song was during a student’s studies. For example, the term was used twice in this context to explain the usefulness of the Muscles of the Leg Song. The most commonly used notable terms were ‘class’ and ‘teacher,’ totaling in at 300 and 321 times respectively over the breadth of all ten videos listed in the table. This, along with candid comments about instructors playing the songs during lecture, supports the notion that teachers are playing an active role in promoting and disseminating musical mnemonics in the classroom. Of particular note are Tom McFadden’s Regulatin’ Genes and Mr. Hsu’s Cellular Respiration Song, both of which were created by instructors and have well over 200,000 views apiece. The words ‘exam,’ ‘test,’ and ‘quiz’ was frequently used in comments indicating how the songs have or will help recall information during coursework assessments. This is reflected in The Pathway and Cellular Respiration Song, where these terms were used in relatively high frequency. Whether or not the majority of students found the songs to be effective learning tools, however, is
unidentifiable, although one would expect that a more robust experimental design and study, using a more targeted research approach, could shed light on this question.

The age group for which each music video was most popular proposes some interesting scenarios about the audience of each video. Some songs, like Making ATP, Muscles of the Leg Song, and Cellular Respiration Song attracted a young audience, while others, like The Pathway, The Heart, and Regulatin’ Genes, garnered a much older following. The content of each song may explain some of this, given that certain subjects are taught at different levels in health science and human biology education, but for videos drawing a majority of viewers over the age of 40, like The Pathway and Regulatin’ Genes for example, another dynamic appears to be at work. Although the ages between 40 and 55 don’t correlate with the average ages of first year medical students or nursing students, which are 24 (Moulton & Amundson, 2005) and 30 (Sheperd, 2009) respectively, they do draw a closer parallel to the ages of average nursing (Alexander & Liu, 2009) and medical school faculty members (Rosseter, 2011). This, coupled with comments about instructors sharing the videos in class, could imply that teachers and professors may be the group most interested in accessing and using those healthcare-related YouTube musical mnemonics. Could it be that instructors get more use out of these musical mnemonics as course builders than students do as a study aids? Are mnemonics used more often as a catalyst for introductory topics rather than study? A controlled assessment on age, application, and appeal could tell us more about who finds musical mnemonics most attractive and for what reasons.

The lean of the binary ‘like’ and ‘dislike’ system was overwhelmingly positive across all ten videos. The most significant difference was seen in the Cranial Nerve Mnemonic, where
there were approximately 208 times more ‘likes’ than ‘dislikes’ tallied. On the low end was The Pathway, with only seven times more ‘likes’ than ‘dislikes’ observed. Unfortunately, little else is known about the reasoning behind this positive slant. A controlled qualitative-quantitative study could pinpoint what factors made each musical mnemonic appealing, or unappealing for that matter. As one paper on social media points out, “…existing tools and research efforts [pertaining to social media venues] are limited to a polarity evaluation or a mood classification according to a very limited set of emotions…and hence they are unable to capture opinions and sentiments that are expressed implicitly” (Cambria, et. al, 2011). The same can be said for the number of ‘favorites’ tallied for each of the musical mnemonic videos. In examples like The Heart, The Pathway, and The PCR Song, there were more ‘favorites’ observed than there were ‘likes.’ Although ‘likes’ and ‘favorites’ are both clear indicators of a positive experience with these musical mnemonics, we cannot assess why a user felt a video was more worthy of favoritism than a simple ‘like.’

CONCLUSIONS & FUTURE RESEARCH

Although YouTube is not completely suited for genuine research regarding musical mnemonics in medicine, it does raise some enticing questions about the utility, value, and appeal of such media. What we can surmise from this review is that students and instructors do use musical mnemonics in conjunction with health science education, and readily so given their popularity. User comments make it clear that teachers play a major role in sharing mnemonics with their students, some of which indicate that the songs had value in preparing for exams. Additional assessments on listener preference, genre, quality, and teaching efficacy can only bolster the case for music in health science education, given that proven methods of data
collection replace less thorough *YouTube* tools. Hybrid qualitative-quantitative studies, like Q-Methodology (*Valenta, 1997*) would be appropriate for gathering data on listener attitudes and opinions, while Meta-analysis techniques, like those used by Means et al. (2010) in their study of the efficacy on online teaching, could be used to combine the findings of independent studies and search for the presence of heterogeneity in results on effectiveness. If social media platforms are found to have value and utility in such a study, the limitations indicated in this paper could be overcome with techniques like opinion mining, sentiment analysis, or the Semantic Web methods described by Cambria et al. (2011). One concern I have when using the collective opinions of individuals as data, is the question of whether the analysts know what is best for the individual, especially when faced with the appeal of performance art like musical mnemonics. Schechner (1974) suggests that, “…mutually exclusive, hierarchical, independent classifications give way to ideas of “clustering” interrelations between data and their evaluations…But this is not the way things were, are or will be. The world is relativistic, pluralist, contradictory, and intra-subjective.” Everyone will have different temperaments and experiences that are reflected in their varied opinions on song in healthcare. Generalizations on those opinions can only paint an incomplete picture. In order to expand our understanding of the potential behind musical mnemonics in healthcare education, debate, discussion, and continued study will be needed. As for my personal experiences with musical mnemonics, I can firmly say that creating health science songs has helped me recall information during my own studies in anatomy and physiology. Whether or not others feel the same is a question worth answering.
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DECLARATION OF INTEREST

The author has no declarations of interest to report.
References


Hsu, Mr. (2010, January 1). Cellular Respiration Song. [Video file]. Retrieved from http://www.youtube.com/watch?v=3aZrkdzrd04


Qc0323. (2007, November 27). DNA Replication Song. [Video file]. Retrieved from


http://www.youtube.com/watch?v=dIZpb93NYlw

