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Memory for music and the implications of expertise for music recall: a review ; Memory for the recall of popular songs: a comparative study of musicians and nonmusicians

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Memory for Music and the Implications of Expertise for Music Recall: A Review

Memory for the Recall of Popular Songs: A Comparative Study of Musicians and

Nonmusicians

Simon MacLachlan

A report submitted in Partial Fulfilment of the Requirements for the Award of Bachelor of

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Submitted May, 2009

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Simon MacLachlan

Memory for Music and the Implications of Expertise for Music Recall: A Review

Abstract

How people remember music is not only a practical concern for musicians, it also poses an interesting challenge for psychological theory (Wallace, 1994). One question that has often been overlooked is what occurs during the time that elapses between the stimulus onset (hearing music) and the generation of a response (an indication that the song has been remembered). While there is evidence to show that memory for song may be biased in a forward direction (Sibma, 2003), the role of expertise on memory for song may provide a deeper understanding of the nature of our memory for music. This review examined the literature regarding the processes and structures of memory as they relate to musical recall, specifically the role of long-term and auditory memory, "chunking" mechanisms, rhythm and the integration of text and melody as components of song, with special emphasis on examining the nature of expertise in general and how musical expertise may influence music recall in particular.

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Memory for Music and the Implications of Expertise for Music Recall: A Review

How people remember music is not only a practical concern for musicians, it also poses an interesting challenge for psychological theory (Wallace, 1994). The majority of research on the processes and structure of human memory over the past 40 years has tended to focus on visual tasks and human voice audition (Bartlett & Snelus, 1980; Dowling, 1978; Rubin, 1977). More recently, the focus of studies on music has broadened to include the perception of stimulus qualities (such as pitch and melody), attentional processes and skill acquisition, particularly in the area of music performance (Aiello & Sloboda, 1994; Oura & Hatano, 1988; Palmer & Drake, 1997).

The study of memory as it relates to music, while it offers an insight into processes of human memory, has proven difficult for researchers (Wallace & Rubin, 1991). Music is often seen as a specialist discipline requiring skills and competencies not possessed or understood by the researcher (Ericsson & Smith, 1991). Further, varying levels of expertise across a broad area of music theory and performance on various instruments have yielded broad methodological and statistical data (Bigand, 1997). However, since music plays an inherent role in everyday life and is a natural part of the human experience, it has proven to be a useful and important tool in the study of memory (Rubin, 1977; Serafine, Crowder, & Repp, 1984).

One particular question that is often neglected by studies on memory involves the nature of our memory for music, specifically what occurs during the time that elapses between the stimulus onset (hearing music) and a response being generated (an indication that the song has been remembered). For example, when a song is recalled, is the experience akin to pushing play on a tape recorder, whereby access to our musical

memory is serial in nature, or do we possess more flexible mental facilities with parallel access to musical recall, akin to the random access memory of a computer?

While there is some evidence to suggest that people may replay or remember music in a forward serial direction (Sibma, 2003), one question that has been largely overlooked is whether all individuals process and remember music in the same way. Previous research has shown that expertise in a given domain provides a mnemonic aid to memory and that musical expertise in particular acts to facilitate music recall (Aiello & Sloboda, 1994; Ginsborg & Sloboda, 2007; Kilgour, Jakobson, & Cuddy, 2000; Ruthsatz et al., 2008).

Specifically, studies examining the integration of text and melody as components of song have found that text and melody may be learned and remembered independently of each other, but when learned as a song, they appear to be processed as an integrated memory representation (Serafine, Crowder, & Repp, 1984; Serafine et al., 1986; Purnell-Webb & Speelman, 2008). Further, those with musical expertise were found to possess superior recall for both text and melody presented separately and together when compared to those without this expertise (Kilgour et al., 2000; Ginsborg & Sloboda, 2007). While there is evidence to suggest that those with expertise may demonstrate superior encoding techniques and structural knowledge of song (Ginsborg & Sloboda, 2007; Ruthsatz et al., 2008), the nature of this effect and whether it can be attributed solely to expertise and not other causal factors remains unclear.

This review examines the literature regarding the processes and structures of memory as they relate to musical recall, specifically the role of long-term and auditory memory, "chunking" mechanisms, rhythm and the integration of text and melody as components of song, with special emphasis on examining the nature of expertise in

general and how musical expertise may influence music recall in particular. Finally, directions for future research are suggested.

Long-term Memory and the Phonological Loop

Human memory is a mental system that receives, stores, organises, alters and recovers information from sensory input (Dowling, Tillmann & Ayers, 2002). Studies on memory for music have specified the term "auditory memory" in order to describe the process used whenever a person identifies any sound of nature, a spoken statement, or the tune of a familiar song. This process involves the skills of attending, listening, processing, storing, and recalling sensory information (Wallace, 1994).

There are two kinds of auditory memory; short-term auditory memory is the ability to recall something heard very recently, while long-term auditory memory is the ability to remember something heard some time ago (Herbert & Peretz, 1997). Since the ability to recognise and interpret these sounds is not innate, evidence suggests these sounds must have been learned first and stored in memory for later retrieval (Herbert & Peretz, 1997; Wallace, 1994).

It is currently accepted by many music psychologists that a dual memory system as proposed by Atkinson and Shiffrin (1968) and Baddeley and Hitch (1974) applies to auditory memory and includes long-term memory (LTM) and short-term memory (STM). LTM is memory, stored as meaning, that can last as little as a few days or as long as a lifetime. It differs structurally and functionally from short-term memory which stores items for approximately 20 seconds, and it is generally accepted that the STM can hold between five and nine items (information such as numbers, phrases or words) at any one time. Since the current review focuses on studies examining long-term memory for music, STM is not reviewed in detail.

Addressing the limitations of the dual memory system theory, Baddeley proposed a model of working memory involving three factors; a central executive controller and two slave systems including the phonological loop and visuo-spatial sketchpad. The phonological loop facilitates the encoding of speech and other auditory information, and is comprised of a phonological (speech) store and an articulatory control process based on inner speech. The visuo-spatial sketchpad processes visual information.

While the phonological loop introduced a theory for auditory encoding in working memory, it did not adequately differentiate between the processing of verbal information and musical information. This is evidenced by studies showing that recall of a series of to-be-remembered musical pitches is severely affected by the interpolation of other musical tones, but not by spoken numbers. Further, background music heard with lyrics was found to interfere with reading comprehension while instrumental music did not. Thus, Humphreys, Bain and Pike (1989) suggested that the clear differentiation between verbal and musical information warranted further investigation. Baddeley and Hitch (1974) suggested that the degree of separation between the processing of verbal and musical information evident in previous research literature justified a music memory loop, however the research is unclear as to whether a musical loop is attached to the phonological loop.

Memory for Song and the Integration of Text and Melody

One question that is often overlooked by music psychologists is whether all individuals process and remember music in the same way. While an abundance of studies have focused on the musical performance of trained musicians and pitch discrimination judgements and melodic expectancy effects in untrained listeners, fewer studies have examined how individuals remember music or the comparison between how those with

musical training and those without training are able to recall music. Well-known and popular songs, however, have provided a common ground for examining both trained and untrained musicians' ability to recall music. Song, as an inherent part of the human experience, influences and informs all individuals irrespective of cultural, political, or socioeconomic background, and popular songs can bridge these divides. While many consider it difficult to remember high school algebra and French verbs, it is considerably easier to sing along with Top 40 songs heard a decade ago.

As a stimulus, song presents an interesting challenge for memory theorists since it consists of two seemingly separate components, melody and text (lyrics). Each of these components may be learned and remembered independently of the other; however, when learned together as a song, they appear to be processed somewhat differently than when learned independently (Serafine, Crowder, & Repp, 1984).

Purnell-Web and Speelman (2008) and Wallace (1994) suggest that the melody and text (lyrics) of a song are processed together as an integrated unit to form a representation in memory. This produces an additional retrieval cue to the memory, via either the melody or the text. However, this theory does not fully explain why songs persist in memory over very long periods of time when other equally important verbal and biographical material is lost (Peynircioglu, Rabinovitz, & Thompson, 2008).

Opposing hypotheses have been proposed to explain how melody and text combine to produce a representation of song in LTM. For example, Bartlett and Snelus (1980) tested the accuracy of song recall based on the lifespan memory of participants for 56 popular songs divided into two lists of 28 songs each. From the list, participants aged between 37 and 56 years of age were first asked to indicate which of the songs they were familiar with, and then asked to recall the lyrics of the familiar songs as well as the year

the song was popular. For each of the songs recognised, participants were tested twice, with both the song title and the melody as cues to facilitate recall. With accuracy of recall defined as the ability to remember three words of the lyrics aside from the song title, it was found that participants could accurately recall the year of popularity of the song and the lyrics of recognised songs, although this ability declined with age. Moreover, the melodies of songs were found to be better cues to lyrical recall for a song than song title. Bartlett and Snelus (1980) proposed that this difference in cue effectiveness may have been due to the separateness of the components of melody and text that comprise a song, and suggested that different methods of retrieval cueing for LTM for songs should be examined in future research, specifically the advantage of melody over song title as a cue to lyrical recall. However, the results of this experiment may be inconclusive due to the methodological issue of testing memory for only three words beyond the title, as this does not appear to present an accurate reflection of memory for a song.

This separation effect between text and melody was studied by Serafine, Crowder and Repp (1984), whose findings revealed that while text and melody may be learned and remembered independently of each other, when learned as a song, they appear to be processed differently, as an integrated memory representation. While Serafine et al. (1986) described these findings as experimental and not explanatory, they also suggested the findings were a reflection of subtle interaction effects between melody and text.

Wallace (1994) and later Schulkind, Posner and Rubin (2003) have shown that the repetition of a melody across verses leads to improved memory when compared to verses of varying melodies. A series of experiments were conducted in which unfamiliar melodies were paired with simple ballad lyrics. Participants first heard five presentations of three taped verses of a ballad in either a song condition or spoken word condition.

They were then instructed to recall in writing as many of the words of the song as they could remember after the first, second and fifth repetitions of the complete song. The results showed that verbatim recall of the lyrics was greater in the song condition than in the spoken word condition for every trial. This suggests that the repetition of the melody across verses differentiates each verse from the other, and provides information to the listener regarding the number of lines of text and the length of each line. Wallace (1994) further suggests that the melodic structure within each repetition of the verse provides cues for the number of syllables in each line, the phonetic stress patterns and number of accents, helping to facilitate recall of the song.

Studies by Rubin (1977) and Serafine et al. (1986) support this theory, noting that the songs, when remembered, were thought to be processed as prosodic effects of non-semantic sound patterns. For example, if the melodic component of a song is changed, the words sound different. Moreover, when the words of a song are altered, the melody sounds different. Sibma (2003) provides "The ABC Song", "Twinkle, Twinkle, Little Star", and "Baa Baa Black Sheep" as examples of songs that possess virtually the same melody, noting that the first two songs are melodically identical while the third is a subtle variation.

To further examine the effect of repetition of melody, Wallace and Rubin (1991) presented participants with three verses, each sung to a different melody but retaining the same metre, rhythm, timing, notes and tonal centre of the original melody. Verbatim recall for this condition was compared with a spoken condition and a condition in which all verses were sung to the same melody. It was found that verbatim recall for the conditions containing three different melodies was not significantly different from recall in the spoken condition, and that verbatim recall for the same-melody condition over

three verses was significantly better than in the other two conditions. Wallace and Rubin (1991) concluded that when a new melody is first heard, it acts as a distractor hindering lyrical recall. However, as the melody is repeated across verses and becomes more familiar to the listener, recall is facilitated by providing structural information regarding syllables, accents and stress patterns within a line of the verse. Together, these functions of melodic repetition aid lyrical recall and help the listener to differentiate one verse from another. It was also found that repetition of rhythmical information (the consistency and regularity of a musical beat) across verses somewhat overcame the distracting influence of the melodies, helping to facilitate recall, and approximating recall for the spoken condition.

An important finding by Wallace (1994) indicates the presence of a "chunking" mechanism as an aid to memory for song, suggesting that individual pieces of information are collected both perceptually and cognitively as larger, integrated "wholes". For melody and verbal material (text), chunking was found to increase the encoding capacity of STM and improve the storage and retrieval processes of LTM.

It was further suggested that the chunking process for songs works in a series of stages, with rhythm grouped in word pairs or phrases, which are in turn grouped by the melody and number of stresses per line. Rhyming lines are also linked together, with verses echoing the same idea also grouped together. Imagery and meaning expressed through this configuration of word pairing, rhyme and word stressing are integrated in order to help facilitate memory for the text. Longitudinal studies on the development of the ability to reproduce songs have found that the order of this representation in memory is as follows; words are learned first, then rhythm, melodic contour, intonation, and finally the integration of the various components of the piece (Wallace & Rubin, 1991).

While research has examined how structure, rhythm and chunking mechanisms facilitate music recall, studies have neglected to focus on what occurs during the time that elapses between the stimulus onset (hearing a song) and a response (an indication about whether the song has been remembered) being generated. Specifically, when a song is recalled, is the experience akin to pushing play on a tape recorder, whereby a serial access to our musical memory is present, or do we possess more flexible mental facilities with parallel access to musical recall, akin to the random access memory of a computer? Sibma (2003) examined the direction in which music was recalled, and proposed that memory for song is biased in a forward direction, so that when two excerpts of a song were played and a participant was asked to recall the position of one excerpt in relation to another, the participant would search in a forward direction mentally from the first excerpt to the second excerpt.

In the experiment, 44 university students and 6 members of the public were asked to identify whether the second excerpt (probe line) of a pair of excerpts taken from a song, came before or after the first excerpt (target line) in the normal course of the song. Seven pairs of excerpts, three pairs falling before the target line, and four pairs occurring after the target line, were presented for each of eight popular and two new songs heard earlier. It was found that RT for the identification of probe lines occurring after the target line was shorter than those coming before the target line, indicating that participants were searching in a forward direction, such that if the probe line came after the target line, a memory search would progress forward from the target line to the probe line and a response key was pressed as soon as possible to indicate that the probe line came after. If the probe line came before the target line in the course of the songs, the participant's performance suggested they would mentally play the song in a forward direction from the

target line, progress to the end of the song, begin from the beginning and then finally reach the probe line excerpt. RT was therefore slower for this condition, indicating that memory for song recall is biased in a forward direction.

While Sibma (2003) has shown that memory for song is biased in a forward direction, previous studies have focused primarily on long-term memory for recall of text and melody. The majority of studies on music recall, however, have neglected to examine the influence of musical expertise on memory, despite many studies indicating that expertise influences memory in other domains. The rationale for exploring the effect of musical expertise is therefore important in determining the nature of our memory for music. Research examining musical expertise and its effect on music recall is reviewed below.

Factors Implicated In Musical Expertise

The scientific study of expertise has been a major focus within cognitive psychology for the past thirty years. In the broadest sense, *expertise* may be defined as the application of extensive knowledge and ability in a particular area of study, by virtue of training, education, profession, publication or experience, possessing knowledge of a subject beyond that of the average person (Aiello & Sloboda, 1994).

Studies of expert and novice performance in many domains reveal both quantitative differences (such as accuracy and speed) and qualitative differences, including different error types that arise, and sensitivity to different structural aspects (Aiello & Sloboda, 1994). Skilled performance in tasks such as typing, chess playing, and sports is usually faster, more accurate, and reflects more highly structured representations of the task than performance by less accomplished individuals (Ericsson & Smith, 1991; Ericsson & Staszewski, 1989). To a certain extent, these differences can be generalised to

a complex task such as music performance. For example, skilled pianists can play faster, make fewer errors, perform more consistently, and plan ahead (anticipate) with more efficiency than beginners (Palmer & Drake, 1997).

Musical expertise has tended to be studied within the context of general expertise, defined as technical achievement, mastery of an instrument or of compositional skill. Aiello and Sloboda (1994) propose that musical expertise is defined by the ability to detect pattern and structure in music and to conceive the activity of performing and listening to music in terms of these patterns. Secondly, the level of skill is almost entirely dependent on the amount of relevant practice undertaken, since learning to detect pattern and structure is proportional to the amount of time spent practicing the skill. Thirdly, as skills become practiced and fluent, they tend to become automatic, with the details of performance disappearing from conscious awareness. Fourthly, since patterns and structures tend to be specific to a particular domain, there is little skill transfer across other domains (Aiello & Sloboda, 1994).

There exists in the literature contradictory evidence regarding the causal predictors of musical expertise and how these factors interact to produce expertise, involving the role of practice, general intelligence, and innate ability as predictors of musical expertise. Other research focuses on memory expertise and recall for ballads. This evidence is reviewed below.

Innate and Environmental Factors Influencing Musical Expertise

Current research suggests that the necessary component for acquiring expertise in a given field is deliberate practice (Aiello & Sloboda, 1994; Ginsborg & Sloboda, 2007; Rubin, Wallace, & Houston, 1993). However, Ruthsatz, Detterman, Griscom and Cirullo (2008) propose that the process of becoming an expert may be better understood through

a combination of factors including general intelligence, domain-specific skills and deliberate practice. While these factors have been found to be separately implicated in the acquisition of expertise, Ginsborg and Sloboda (2007) have shown that these factors also interact to produce expertise, and that innate talent may also contribute to skill acquisition.

Ruthsatz, Detterman, Griscom and Cirullo (2008) investigated the effects of both environmental factors and talent on expert performance in both high school and conservatory-level musicians across two studies. In the first study, 178 high school band members were tested from two separate high schools on The Advanced Raven's Progressive Matrices Intelligence Test, Gordon's Advanced Measures of Music Audiation Test and Ericsson's Musical Training Questionnaire, in order to test general intelligence, domain-specific musical skills (musical achievement) and deliberate practice. Significant relationships were found between all individual factors and musical achievement. Further, while the domain-specific skill (musical achievement) did add a significant increment to general intelligence, it was not found to be totally independent of general intelligence. General intelligence and domain-specific musical ability were significantly correlated.

Previous research on musical expertise (Aiello & Sloboda, 1994), posits that as groups of musicians become elite within their chosen domain, there should be an increase in mean scores for general intelligence, domain-specific skill and deliberate practice time. Ruthsatz et al. (2008) tested this hypothesis in the second study by comparing individual differences within more competitive and experienced musicians, and, secondly, comparing the high school musician group to the conservatory-level group. Eighty-three

conservatory music majors were tested across the same three tests as the high school group.

It was found that mean levels for all three tests administered to the conservatory-level group were greater when compared to the high school group. Thus, higher-level musicians reported significantly higher mean levels on innate characteristics such as general intelligence and music audiation, in addition to higher levels of accumulated practice time. These factors together accounted for more of the variance in music performance than practice alone, suggesting that a multi-factor view may be the best explanation for the acquisition of musical expertise (Ruthsatz et al., 2008).

Moreover, a methodological discrepancy between the two groups studied by Ruthsatz et al. (2008) may have influenced the results, since the high school group were self-selected based on a self-report scale of musical ability, while the conservatory-group were selected based on their conservatory membership requiring specific levels of graded expertise (Ruthsatz et al., 2008). Finally, since performance scores for the conservatory group were based on initial auditions required by their course, these scores were collected prior to the ability and practice scores measured by the current study. Thus, audition scores may have influenced practice and ability scores, rather than vice versa. It must also be noted that while significant correlations were found across the three factors, whether the relationship between these factors are causal or not remains unclear.

The Effect of Musical Expertise on Memory for Text and Melody

While the studies reviewed above appear to indicate that musical expertise enhances both musical memory and performance, further research has shown that this is not always the case.

Korenman and Peynircioglu (2004) found that participants with musical expertise performed worse on a memory task involving familiar music with novel titles. Participants were played song excerpts of varying melodic and instrumental familiarity, from popular songs to unfamiliar pieces, paired with mock animal-name titles. They were then asked to recall the target when given either the melody or the title as a cue. Alternatively, they were instructed to give a feeling-of-knowing rating (FOK). Korenman and Peynircioglu (2004) found that recall for titles was better than it was for melodies, and recall was enhanced with increasing melodic familiarity of both the cues and the targets. Accuracy of FOK ratings (but not magnitude) also increased with increasing familiarity of song excerpts. Although similar ratings were given after melody and title cues, accuracy was better when song titles were given as cues. Further, when participants knew the real titles of the familiar excerpts, recall was enhanced, but this had no significant effect on participants' FOK ratings. These findings suggest that knowledge of the original title may have interfered with memory performance.

The results of a study conducted by Tillman and Bigand (1998) found contrary results, however. Brief target song excerpts were played to two groups of participants with and without musical training, with each target presented either in advance of or immediately following each full song. Participants in the musical training group were better able to recall the target excerpts than participants with no musical training. It was hypothesised that musicians possessed detection strategies based on their trained ability to listen for the instrumentation and melodic structure (the ebb and flow) of a song. They suggested that the position of the target excerpts (before and after the full song) initiated different detection strategies possessed by the musically trained group but not by the untrained group.

While the studies examined above demonstrate an analysis of melodic familiarity, pitch perception, pitch discrimination and recall of song titles among musicians and non-musicians, very few studies have examined the effect of melodic and lyrical recall amongst trained singers.

Ginsborg and Sloboda (2007) studied the effect of singers' recall for the words of a new, unaccompanied song to determine whether the memorisation process was separate from or integrated with hearing the melody to that song.

Sixty singers (35 female and 25 male) were asked to perform an unaccompanied song from memory, following deliberate learning and memorisation of the words separately and together. The ages of participants ranged from 18 to 61, and most were university-based music students or sang in university choirs; six were experienced professional or semi-professional singers, with musical expertise defined by the extent of musical training undergone by participants and determined in a brief interview in the course of the experimental procedure.

A novel, unaccompanied song was constructed by setting the second verse of the poem 'The Moon and a Cloud', by W.H. Davies, to the melody of an English folk song, 'The Lowlands of Holland'. Singers with high levels of musical expertise who memorised the words and melody of the song together for the whole of their practice time had more accurate and more fluent recall for the song than those who spent the bulk of their practice time memorising the words and melody separately. This finding concurs with Tillman and Bigand's (1998) hypothesis that listeners with musical training had better recall for words set to music, and Wallace's (1994) suggestion in the study of recall for the words of ballads, that melody provides a framework for retrieving the words that are more meaningful and therefore more memorable for those with musical expertise.

Ginsborg and Sloboda (2007) found that singers with high levels of musical expertise, given the opportunity to sing rather than to recite, as in Kilgour, Jakobson and Cuddy's (2000) study, had superior recall not only for the words, but also for the melody of the song in comparison to those with low levels of expertise. This demonstrates superior strategies for memorising and recall, not just reading music, since all the participants had passed an initial screening test, first singing the song (or at least the melody) accurately at sight from notational score.

Ginsborg and Sloboda (2007) found that participants with high levels of musical expertise gave more accurate and fluent performances than those with lower levels of musical expertise, but only when they had memorised the words and melody together. Further, it was found that the relationship between the words and melodies of songs in memory, for singers who have deliberately memorised songs, was such that they were neither recalled entirely separately nor integrated to such an extent that if one component is recalled erroneously, recall for the other was inevitably affected. Specifically, words and melody were not integrated to such an extent that if the melody was forgotten, so were the words, and vice versa. Rather, they were stored and retrieved in association with one another.

The nature of the advantage to the high expertise group using the strategy of memorising words and melody together remains unclear in this study, however. It has been suggested by Kilgour, Jakobson and Cuddy (2000) that words and melody may be represented independently and simultaneously such that not only are words and melody for a song memorised, but also the association between them, in such a way that singers are more likely to be able to retrieve one component accurately when recall for the other fails.

Alternatively, while Wallace (1994) suggests that music can structure recall for words so that when words are forgotten, memory for the music provides cues enabling the words to be 'picked up' again, Tan and Speckman (2005) propose that memory for words may structure recall for the melody. However, the melody has to be sufficiently simple to be useable as a framework for recalling words. Further, the participant must be sufficiently musically expert to learn and recall words accurately.

Further research by Kilgour, Jakobson and Cuddy (2000) involving 78 university undergraduates found that higher levels of musical training led to enhanced memory for verbal material, demonstrating better recall performance than those with no musical training. It was also found that recall for sung lyrics was superior to that for spoken lyrics for both the musical training and no musical training groups. Consistent with earlier findings (Wallace, 1994), recall performance was best among participants who learned text presented in the context of a song, as opposed to those who learned it in a spoken format. This effect was present regardless of the level of music training of the participants and provides support for the idea that the additional structure imposed by a melody can serve as a mnemonic, or an assistant to recall (Kilgour et al. 2000).

Previous research indicates that there are limits to this usefulness, however. Rubin, Wallace and Houston (1993) found that the music must be phonetically compatible with the lyrics to be an effective mnemonic—that is, the number of notes in the melody should reasonably match the number of syllables in the lyrics. In addition, Wallace (1994) and Rubin, Wallace and Houston (1993) argued that if the music is not relatively simple and easily learned, its mnemonic effect is reduced and will detract attention from the text and hinder recall. In this regard, although the music used in Kilgour's et al. (2000) study would be considered fairly simple, it appeared that (contrary

to prediction) even subjects with music training required several exposures to the melody before it was able to serve as a useful mnemonic.

One possible confound, however, may affect the interpretation of the effect of melody on memory for text. When verbal pieces were set to music, their rate of presentation to the participant may have been slower than if they were spoken. This was seen in the two sung renditions in the experiment (each approximately 73 seconds in duration), taking 35% longer to deliver than the spoken rendition, completed in 54 seconds (Kilgour et al., 2000). It is possible that, given this difference, the melodic advantage observed during the experiment may have resulted from a longer encoding time for participants for the two conditions involving melody than in the spoken condition. Earlier research (Rubin, Wallace & Houston, 1993) has demonstrated that slower presentation rates allow for rehearsal and improved immediate recall of word lists, and that the rate of presentation affects the rate of recall, which in turn affects the accuracy of recall.

Kilgour et al. (2000) also found that regardless of the spoken or sung presentation conditions, musicians consistently outperformed participants with no musical training for recall performance. During the conditions accompanied by melody, musicians often sang, hummed the melody, or tapped out the rhythm during recall while the musically untrained participants did not. While this may help facilitate encoding and recall, it may simply be a reflection of the musicians' greater confidence with their own musical abilities.

Musically trained participants also outperformed the untrained participants for the spoken text condition (Kilgour et al. 2000). While studies have suggested that those with musical expertise demonstrate a greater sensitivity to various aspects of musical structure

and superior encoding strategies with respect to musical material (Aiello, 1994; Palmer, 1997; Rubin, Wallace & Houston, 1993), Kilgour et al. (2000) suggest that this may not always be the case. Since musically trained participants outperformed untrained participants even on the spoken text condition, they suggest that enhanced recall of verbal material may be due to a group difference in a non-musical factor such as general intelligence, spatial and semantic memory, language development and reading ability. This was not substantiated in their research, however.

Future Research

While there is evidence to suggest (as reviewed above) that expertise impacts upon human memory and that musical expertise may influence our ability to recall music, the research remains unclear as to the nature of its effect. For example, if, as the research suggests, that expertise may provide a deeper understanding of the encoding strategies required to recall music effectively and the rhythmic and structural aspects of music, how would this occur? While Sibma (2003) has shown that our memory for song is biased in a forward direction, the effect of musical expertise on this effect is unclear. For example, the serial effect of music recall may be pronounced in those with extensive musical training, or different encoding strategies may be used altogether as a result of expertise, such that a parallel processing method of text and melody may be implemented. Further research is required in order to examine the causal nature of the effect of musical expertise. This may be achieved by comparing a musical expertise condition with a no expertise condition using Sibma's (2003) research methodology whereby accuracy and RT for recall is measured in order to determine whether those with expertise recall song excerpts in a serial, forward direction as evidenced by Sibma's (2003) study, whether a

parallel processing approach is present, or whether there is no differentiation in

processing and recall between the two conditions.

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Memory for the Recall of Popular Songs: A Comparative Study of Musicians and

Nonmusicians

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Memory for the Recall of Popular Songs: A Comparative Study of Musicians and

Nonmusicians

How people remember music is not only a practical concern for musicians, it also poses an interesting challenge for psychological theory (Wallace, 1994). One question that has often been overlooked is what occurs during the time that elapses between the stimulus onset (hearing music) and the generation of a response (an indication that the song has been remembered). While there is some evidence to show that memory for song may be biased in a forward direction (Sibma, 2003), the role of expertise on memory for song may provide a deeper understanding of the nature of our memory for music. In the current experiment, 40 participants, 20 participants with musical expertise and 20 participants with no expertise (20 men, 20 women, mean age = 34.5 years), were asked to identify whether the second excerpt (test line) of a pair of excerpts taken from a popular song, came from 'before' or 'after' the first (probe line) in the normal course of the song. Seven pairs of excerpts, four pairs falling before the target line, and three pairs occurring after the target line, were presented for each of the eight songs heard earlier. Reaction time (RT) and accuracy of participant responses were measured. While it was predicted that RTs for identifying the test lines occurring 'after' the probe line would be shorter than those coming 'before' the target line, exploratory predictions were made regarding the effect of expertise *a priori*. While no significant differences in RT and accuracy were found between Musicians and Nonmusicians, results supported the first hypothesis with significantly shorter RTs in the 'after' condition than the 'before' condition, indicating that memory for music is biased in a forward direction.

Memory for Music and the Effect of Musical Expertise on Music Recall: A Comparative

Study of Musicians and Nonmusicians

How people remember music is not only a practical concern for musicians, it also

poses an interesting challenge for psychological theory (Wallace, 1994). The majority of

research on the processes and structure of human memory over the past 40 years has

tended to focus on visual tasks and human voice audition (Bartlett & Snelus, 1980;

Dowling, 1978; Rubin, 1977). More recently, the focus of studies on music has

broadened to include the perception of stimulus qualities (such as pitch and melody),

attentional processes and skill acquisition, particularly in the area of music performance

(Aiello & Sloboda, 1994; Oura & Hatano, 1988; Palmer & Drake, 1997).

One particular question that is often neglected by studies on memory involves the

nature of our memory for music, specifically what occurs during the time that elapses

between the stimulus onset (hearing music) and a response being generated (an indication

that the song has been remembered). For example, when a song is recalled, is the

experience akin to pushing play on a tape recorder, whereby access to our musical

memory is serial in nature, or do we possess more flexible mental facilities with parallel

access to musical recall, akin to the random access memory of a computer?

While there is some evidence to suggest that people may replay or remember

music in a forward serial direction (Sibma, 2003), one question that has been largely

overlooked is whether all individuals process and remember music in the same way.

Previous research has shown that expertise in a given domain provides a mnemonic aid to

memory and that musical expertise in particular acts to facilitate music recall (Aiello &

Sloboda, 1994; Ginsborg & Sloboda, 2007; Kilgour, Jakobson, & Cuddy, 2000; Ruthsatz

et al., 2008).

Specifically, studies examining the integration of text and melody as components of song have found that text and melody may be learned and remembered independently of each other, but when learned as a song, they appear to be processed as an integrated memory representation (Serafine, Crowder, & Repp, 1984; Serafine et al., 1986; Purnell-Webb & Speelman, 2008). Further, those with musical expertise have been found to possess superior recall for both text and melody presented separately and together when compared to those without this expertise (Ginsborg & Sloboda, 2007; Kilgour et al., 2000). While there is evidence to suggest that those with expertise may demonstrate superior encoding techniques and structural knowledge of song (Ginsborg & Sloboda, 2007; Ruthsatz et al., 2008), the nature of this effect and whether it can be attributed solely to expertise and not other causal factors remains unclear.

Well-known and popular songs, however, have provided a common ground for examining both trained and untrained musicians' ability to recall music. As a stimulus, song presents an interesting challenge for memory theorists since it consists of two seemingly separate components, melody and text (lyrics). Each of these components may be learned and remembered independently of the other; however, when learned together as a song, they appear to be processed somewhat differently than when learned independently (Serafine, Crowder, & Repp, 1984).

Purnell-Web and Speelman (2008) and Wallace (1994) suggest that the melody and text (lyrics) of a song are processed together as an integrated unit to form a representation in memory. This produces an additional retrieval cue to the memory, via either the melody or the text. However, this theory does not fully explain why songs persist in memory over very long periods of time when other equally important verbal and biographical material is lost (Peynircioglu, Rabinovitz, & Thompson, 2008).

This separation effect between text and melody was studied by Serafine, Crowder and Repp (1984), whose findings revealed that while text and melody may be learned and remembered independently of each other, when learned as a song, they appear to be processed differently, as an integrated memory representation. While Serafine et al. (1986) described these findings as experimental and not explanatory, they also suggested the findings were a reflection of subtle interaction effects between melody and text.

Wallace (1994) and later Schulkind, Posner and Rubin (2003) have shown that the repetition of a melody across verses leads to improved memory when compared to verses of varying melodies. A series of experiments were conducted in which unfamiliar melodies were paired with simple ballad lyrics. Participants first heard five presentations of three taped verses of a ballad in either a song condition or spoken word condition. They were then instructed to recall in writing as many of the words of the song as they could remember after the first, second and fifth repetitions of the complete song. The results showed that verbatim recall of the lyrics was greater in the song condition than in the spoken word condition for every trial. This suggests that the repetition of the melody across verses differentiates each verse from the other, and provides information to the listener regarding the number of lines of text and the length of each line. Wallace (1994) further suggests that the melodic structure within each repetition of the verse provides cues for the number of syllables in each line, the phonetic stress patterns and number of accents, helping to facilitate recall of the song.

To further examine the effect of repetition of melody, Wallace and Rubin (1991) presented participants with three verses, each sung to a different melody but retaining the same metre, rhythm, timing, notes and tonal centre of the original melody. Verbatim recall for this condition was compared with a spoken condition and a condition in which

all verses were sung to the same melody. It was found that verbatim recall for the

conditions containing three different melodies was not significantly different from recall

in the spoken condition, and that verbatim recall for the same-melody condition over

three verses was significantly better than in the other two conditions. Wallace and Rubin

(1991) concluded that when a new melody is first heard, it acts as a distractor hindering

lyrical recall. However, as the melody is repeated across verses and becomes more

familiar to the listener, recall is facilitated by providing structural information regarding

syllables, accents and stress patterns within a line of the verse.

   While research has examined how structure, rhythm and melody-text integration

facilitate music recall, studies have neglected to focus on what occurs during the time that

elapses between the stimulus onset (hearing a song) and a response (an indication about

whether the song has been remembered) being generated. Specifically, when a song is

recalled, is the experience akin to pushing play on a tape recorder, whereby a serial

access to our musical memory is present, or do we possess more flexible mental facilities

with parallel access to musical recall, akin to the random access memory of a computer?

Sibma (2003) examined the direction in which music was recalled, and proposed that

memory for song is biased in a forward direction, so that when two excerpts of a song

were played and a participant was asked to recall the position of one excerpt in relation to

another, the participant would search in a forward direction mentally from the first

excerpt to the second excerpt.

   In Sibma's (2003) experiment, 44 university students and 6 members of the public

were asked to identify whether the second excerpt (probe line) of a pair of excerpts taken

from a song, came before or after the first excerpt (target line) in the normal course of the

song. Seven pairs of excerpts, three pairs falling before the target line, and four pairs

occurring after the target line, were presented for each of eight popular and two new songs heard earlier. It was found that RT for the identification of probe lines occurring after the target line was shorter than those coming before the target line, indicating that participants were searching in a forward direction, such that if the probe line came after the target line, a memory search would progress forward from the target line to the probe line and a response key was pressed as soon as possible to indicate that the probe line came after. If the probe line came before the target line in the course of the songs, the participant's performance suggested they would mentally play the song in a forward direction from the target line, progress to the end of the song, begin again from the beginning and then finally reach the probe line excerpt. RT was therefore slower for this condition, indicating that memory for song recall is biased in a forward direction.

The majority of studies on music recall, however, have neglected to examine the influence of musical expertise on memory, despite many studies indicating that expertise influences memory in other domains. The rationale for exploring the effect of musical expertise is therefore important in determining the nature of our memory for music.

Studies of expert and novice performance in many domains reveal both quantitative differences (such as accuracy and speed) and qualitative differences, including different error types that arise, and sensitivity to different structural aspects (Aiello & Sloboda, 1994). Skilled performance in tasks such as typing, chess playing, and sports is usually faster, more accurate, and reflects more highly structured representations of the task than performance by less accomplished individuals (Ericsson & Smith, 1991; Ericsson & Staszewski, 1989). Specifically, various studies indicate that musical expertise enhances both musical memory and performance.

The results of a study conducted by Tillman and Bigand (1998) found that when brief target song excerpts were played to two groups of participants with and without musical training, with each target presented either in advance of or immediately following each full song, participants in the musical training group were better able to recall the target excerpts than participants with no musical training. It was hypothesised that musicians possessed detection strategies based on their trained ability to listen for the instrumentation and melodic structure (the ebb and flow) of a song. They suggested that the position of the target excerpts (before and after the full song) initiated different detection strategies possessed by the musically trained group but not by the untrained group.

Ginsborg and Sloboda (2007) studied the effect of singers' recall for the words of a new, unaccompanied song to determine whether the memorisation process was separate from or integrated with hearing the melody to that song. Singers with high levels of musical expertise who memorised the words and melody of the song together for the whole of their practice time had more accurate and more fluent recall for the song than those who spent the bulk of their practice time memorising the words and melody separately. This finding concurs with Tillman and Bigand's (1998) hypothesis that listeners with musical training had better recall for words set to music, and Wallace's (1994) suggestion in the study of recall for the words of ballads, that melody provides a framework for retrieving the words that are more meaningful and therefore more memorable for those with musical expertise.

The nature of the advantage to the high expertise group using the strategy of memorising words and melody together remains unclear in Ginsborg and Sloboda's (2007) study, however. It has been suggested by Kilgour, Jakobson and Cuddy (2000)

that words and melody may be represented independently and simultaneously such that not only are words and melody for a song memorised, but also the association between them, in such a way that singers are more likely to be able to retrieve one component accurately when recall for the other fails.

Alternatively, while Wallace (1994) suggests that music can structure recall for words so that when words are forgotten, memory for the music provides cues enabling the words to be 'picked up' again, Tan and Speckman (2005) propose that memory for words may structure recall for the melody. However, the melody has to be sufficiently simple to be useable as a framework for recalling words. Further, the participant must be sufficiently musically expert to learn and recall words accurately.

Based on Wallace's (1994) research, Wallace (1994) and Sibma (2003) proposed that when presented with an excerpt (probe line) from a song and then asked to identify whether a second excerpt (test line) comes before or after the first excerpt, a serial memory search would be implemented, such that the song would be replayed in a forward direction from the probe line until the test line is reached. If the test line comes before the probe line in the normal course of the song, the memory search would progress from the probe line in a forward direction, reach the end of the song and then return to the beginning until the probe line is located.

Therefore, the aim of the current study was to investigate the direction of memory for music, using a strategy based on Sibma's (2003) research, in order to test the hypothesis that memory for music is biased in a forward direction. It was hypothesised that by recording accuracy and reaction times of responses in identifying song excerpt positions, that reaction times would be quicker for excerpts occurring after the probe line in the normal course of the song, and longer for excerpts occurring before the probe line.

Furthermore, while musical expertise has been found to influence memory for music,

contrary evidence exists in regard to the nature of this effect (Ginsborg & Sloboda, 2007;

Ruthsatz et al., 2008; Tillman & Bigand, 1998). Therefore, it was hypothesised that

experienced musicians may demonstrate an alternative strategy. However, if the serial

nature of memory for music exists for those without musical expertise, experienced

musicians may demonstrate the same facility, but to a greater extent. Alternatively, no

differentiation may exist, and expertise may have no influence on the serial nature of

memory for music.

Method

Research Design

Two independent variables were manipulated in this experiment. The first

independent variable, a within-subjects factor, had seven levels codifying the temporal

distances between the 'probe' line and 'test' lines of each popular song. The second

independent variable, musical expertise, had two levels: (1) musical expertise and (2) no

musical expertise, representing a between-subjects factor.

The dependent variables in this experiment were: (1) reaction time (RT) measured

in milliseconds, of participant responses identifying each test line's position and (2)

accuracy of responses (AC) recorded as percentage (%) correct.

Participants

A total of 40 participants were recruited for this experiment. Two groups of 20

participants each were categorised into musical expertise and no musical expertise

conditions. Participants were recruited on a voluntary basis from among undergraduate

psychology students attending Edith Cowan University, the general public, music

students currently tutored by the author, and music teachers currently employed at a

music tuition school. The study involved four stages: a musical training questionnaire,

song selection, an experimental stage, and a de-briefing questionnaire after completion of

the experimental stage. Participants ranged in age from 17 to 66 years, consisting of 20

females (mean age = 33 years) and 20 males (mean age = 36 years).

For the purpose of this study, the participants within the musical expertise group

had received at least 5 years of music tuition either in music theory or playing an

instrument, and were assessed using a self-report questionnaire before commencement of

the experiment. Participants with less than 5 years of music tuition (either in music theory or playing an instrument) were considered nonmusicians.

Each participant involved in the experimental stage received a ticket for a raffle prize of $70 cash. Each participant was given an information letter describing the experiment and a letter of informed consent to sign, stating that any information provided would be held in strict confidence and that participants were free to withdraw at any time. Ethical issues concerning voluntary participation and the confidentiality of the data were addressed in the information letter and informed consent letter (see Appendices A and B).

Materials

A brief self-report questionnaire regarding the participants' level of musical training was administered to prospective participants in order to gauge musical expertise (see Appendix C).

A selection of 35 popular songs appearing on hit song compilations, in print media, on the internet and heard on the radio, were compiled for this experiment. Copies of all popular songs were obtained from compact disc recordings. Two additional songs were used for short practice trials. Due to methodological constraints, each of the 35 songs were selected on the basis that they followed a consistent structure of 4-line verses and 3, 4 or 5-line choruses, where verse and chorus positions followed interchangeably. A minimum of 3 verses was required, and none of the lines of any verse was repeated in any other verse or chorus.

The probe excerpt for each song was fixed as the second line of the second verse, and the test excerpts were the same line (the second line) occurring in both the earlier and later verses, the next line (the third line) in each of the verses, the last line of verse three, and the first line of verse one (see Appendix I).

The particular temporal distances of the popular songs were selected based on each song possessing the same melody for a particular line in the verse being identical for that same line in other verses. Thus, each second line has the same melody as the probe line, and each of the third line excerpts also shared the same melody.

All songs were re-recorded onto a Compaq Presario Notebook and song excerpts (one probe line and seven test lines) were cut and extracted using Audacity 1.2.6. Songs were played to participants through the software SuperLab Pro, enabling participant responses to be recorded via key-strokes on a purpose-built response box designating three buttons, "A", "B" and "Next".

Finally, a de-briefing questionnaire was administered to participants in order to gauge their impressions of their performance, and to elucidate on their perceived method of their song recall (See Appendix D).

Procedure

Participants were asked to select 8 songs from the list of 35 songs they were most familiar with in regard to either the lyrics, melody or both. They were given an instruction sheet designed to acquaint them with the correct method of response, and were tested individually in a quiet room in front of a laptop, listening through headphones. The researcher was present to answer any questions the participants had.

All eight songs chosen were played to the participants in their entirety. This required approximately 30 minutes, depending on the participants' song choices. The correct method of response in the experiment was then demonstrated by presenting five sets of two numbers to the participant, and asking whether the second number came before or after the first number in a normal counting sequence (see Appendix E).

Once participants understood the appropriate method of response, a practice song trial was presented (see Appendix F). The procedure of the trial followed the same format as the number practice trials with song excerpts replacing numbers. Feedback was given via a message on the screen regarding accuracy.

The procedure of the experimental trials followed the same format as the practice song trial. Participants were instructed to press the 'B' key if the second excerpt preceded the first excerpt in the song, or the 'A' key if it came after. When participants had completed a trial, they were asked to press the 'next' key to advance to the next trial. Seven pairs of probe and test line excerpts were presented for all eight songs in a new random order for each song and participant. No feedback was given during the testing phase.

Ethics

It was explained to the participants via an information letter and letter of informed consent that names and any information given would be held in the strictest confidence and that no identifying information would be used in any written form. In addition, participants were informed that their participation was voluntary and that they could withdraw from the study at any time. Written permission was obtained from all parents prior to the commencement of the interviews indicating that they agreed for themselves and their child to participate in the study. Obtained participant data was only available to the researcher and supervisor. Prior to commencement of the research project, approval from the Ethics Committee of the Faculty of Computing Health and Science of Edith Cowan University was obtained.

Results

Data Screening for Reaction Times

The mean reaction times (RTs), measured in milliseconds (ms) to identify the location of test lines (song excerpt positions), were calculated for 40 participants across two groups: The 'Musician' group and the 'Nonmusician' group for each of the seven test lines in each song condition. The mean scores were calculated by totaling the RTs from correctly identified test line responses in each song condition for each participant and averaging these scores for each song condition. As such, incorrect responses were excluded.

The test line excerpts for which 'before' was the correct response were Lines 1, 2 and 3 of Verse 1 (V1) and Line 1 of Verse 2 (V2). The test line excerpts for which 'after' was the correct response were Lines 2, 3 and 4 of Verse 3 (V3). Preliminary screening of the data involved checking for missing entries, range of scores and outliers. While there were no missing scores, one participant was identified as an outlier, with RT scores lying three or more standard deviations away from the mean, in both the 'before' condition (Verse 1 Line 1) and 'after' condition (Verse 2 Line 1). The remaining 39 participants were included for further analysis of RT and accuracy (accuracy data screening and analyses are discussed below).

Mean RTs and standard deviations (SDs) for all participants for both groups are presented in Table 1.

Table 1.   *Means and Standard Deviations of Mean Reaction Times (ms) as a*

Function of Test Position for Musicians and Nonmusicians.

	Group					
	Nonmusicians		Musicians		Total	
	M	SD	M	SD	M	SD
Excerpt Position						
Before						
(1) V1 L1	3498.2	941.3	3541.6	1062.9	3519.9	991.2
(2) V1 L2	4240.3	1269.6	3909.1	820.9	4074.7	1068.5
(3) V1 L3	4678.4	1199.3	4745.8	1290.6	4712.1	1230.2
(4) V2 L1	4783.3	1525.0	4359.0	971.3	4571.2	1280.1
After						
(5) V3 L2	4174.9	1157.5	3853.1	1038.5	4014.0	1097.6
(6) V3 L3	4430.8	1219.6	4235.2	1069.2	4333.0	1136.4
(7) V3 L4	4211.4	1027.5	3924.0	851.1	4067.7	942. 5
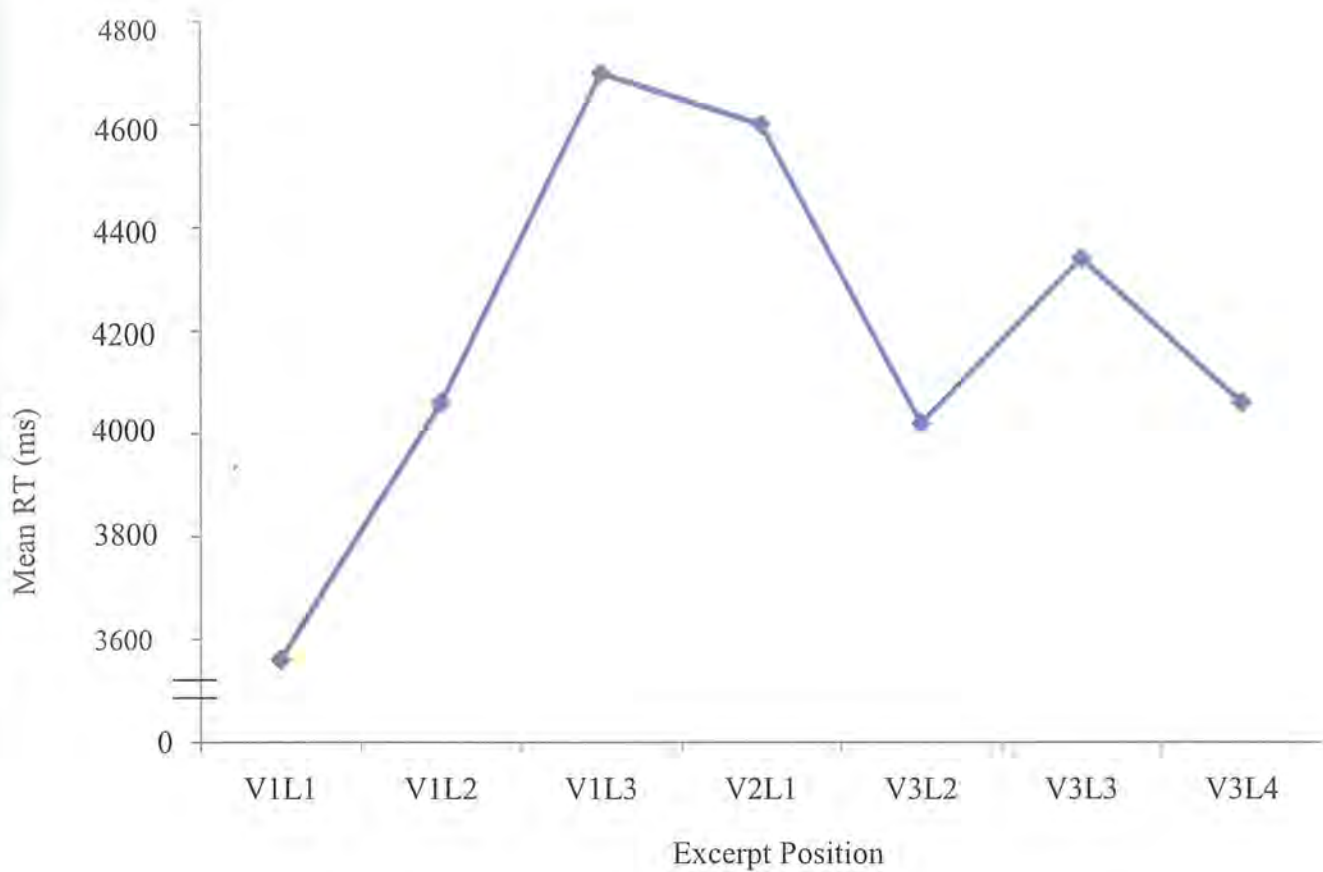
Figure 1.   Mean Reaction Time (ms) as a Function of Excerpt Position (Musicians and Nonmusicians Combined).

Reaction Time Analysis

A repeated measures mixed design analysis of variance (ANOVA) was conducted on mean RT scores across the seven song conditions presented to participants in both the Musician and Nonmusician groups. When the effect of song condition was tested, Mauchly's test indicated that the assumption of sphericity had been violated ($\chi^2(20) = 33.23$, $p < .05$); therefore degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\varepsilon = .94$).

A significant difference in mean RT for the song conditions was found, $F(5.62, 213.49) = 8.83$, $p < .05$. Exploratory Post hoc comparisons were conducted using Tukey's HSD on all pairwise comparisons for the combined means of both Musicians and

Nonmusicians, revealing significant differences between the following pairs of conditions (with > indicating the directional difference in RT): Verse 1 Line 3 > Verse 1 Line 1; Verse 1 Line 3 > Verse 1 Line 2; and Verse 2 Line 1 > Verse 1 Line 1. All post hoc comparisons conducted in the study were assessed at an alpha level of .05.

The effect of expertise (Musician and Nonmusician groups) was not significant; $F(1, 38) = .672, p < .05$, nor was the Group x Condition interaction; $F(5.62, 213.49) = .514, p < .05$. However, since a priori predictions were made regarding differences in means between Musicians and Nonmusicians, further post hoc comparisons were conducted for analyses of RT on the two groups separately (see below). The RTs for each test line (song condition) for all participants averaged across all songs for both Musicians and Nonmusicians are presented in Appendices K and L.

Further exploratory post hoc comparisons were conducted using Tukey's HSD on all pairwise comparisons for Nonmusicians, revealing the following significant differences: Verse 1 Line 2 > Verse 1 Line 1; Verse 1 Line 3 > Verse 1 Line 1; and Verse 2 Line 1 > Verse 1 Line 1; and for Musicians, revealing the following significant differences: Verse 1 Line 3 > Verse 1 Line 1; Verse 1 Line 3 > Verse 1 Line 2, and Verse 2 Line 1 > Verse 1 Line 1. Finally, cross-comparisons were conducted across groups for RT for each of the test lines, such that each test line mean for Musicians was compared to the corresponding test line mean for Nonmusicians. However, no significant differences were found.

An inspection of mean RTs presented in Figure 1 revealed that, excluding Verse 1 Line 1, mean RT for the 'before' condition was greater than for the 'after' condition, however RT for Verse 1 Line 1 was quickest. This seems to demonstrate a primacy effect for Verse 1 Line 1, such that RT was quicker for this condition based on its position

being the first in the song and thus the most identifiable. In order to examine the effect of song condition (test line position) further, with line position as a constant, a 2 x 2 x 2 repeated measures ANOVA was conducted on mean RTs for within-subjects factors of Line (2 and 3) and Verse (1 and 3). While a significant main effect was found for Line (2 and 3), $F(1,38) = 11.82$, $p < .05$, there was no effect for Verse and no interaction between Verse and Line conditions. There was no effect for Group as a between-subjects factor; $F(1,38) = .559$, $p < .05$ and no interaction effect for Group x Verse x Line $F(1,38) = .267$, $p < .05$ for Lines 2 and 3 of Verses 1 and 3.

Based on a priori predictions regarding the serial nature of memory, it was expected that there may be a difference in RT between the 'before' and 'after' song conditions. Therefore, Tukey's HSD post hoc comparisons were conducted on all possible pairwise conditions, revealing significant differences in mean RT between Verse 1 Line 3 > Verse 1 Line 2 for the combination of means for Musicians and Nonmusicians and for Musicians alone. However, no significant differences were found for Nonmusicians alone. Combined means and standard deviations for Musicians and Nonmusicians are presented in Table 2.

Table 2.   *Means and Standard Deviations of Reaction Time (ms) for Lines 2 and 3 in Verses 1 and 3.*

	Verses			
	1		3	
	M	*SD*	*M*	*SD*
Line 2	4074.75	991.24	4014.03	1097.63
Line 3	4712.14	1230.26	4333.04	1136.47

Screening of Accuracy

Mean accuracy (ACC) was calculated as percentage (%) correct for participant responses identifying the position of the probe line excerpt as occurring either 'before' or 'after' the test line. Means were obtained for participants in both Musician and Nonmusician groups (see Appendices M and N). To ensure that responses were better than chance alone, mean responses of less than 50% for each excerpt across participants were excluded from the analysis. However, mean scores did not fall below this criterion. One participant, with multiple responses falling below 50% and with mean scores for accuracy averaged across all conditions calculated as 53.5%, was excluded from further analyses, since correct responses were no better than chance alone. These mean accuracy scores were identified as being more than three standard deviations below the mean. Mean ACC and SDs were calculated for the remaining participants for both groups, and are shown in Table 3.

Table 3.   *Means and Standard Deviations of Percent (%) Correct as a Function of Test Position for Musicians and Nonmusicians.*

	Group					
	Nonmusicians		Musicians		Total	
	M	*SD*	*M*	*SD*	*M*	*SD*
Excerpt Position						
Before						
(1) V1 L1	87.5	14.6	83.7	18.6	85.6	16.6
(2) V1 L2	76.2	16.6	71.8	15.6	74.0	16.1
(3) V1 L3	58.7	19.4	60.6	16.8	59.6	18.0
(4) V2 L1	69.3	15.4	67.5	19.1	68.4	17.2
After						
(5) V3 L2	72.5	13.2	72.5	13.2	72.5	13.2
(6) V3 L3	70.0	18.3	76.2	12.7	73.1	15.8
(7) V3 L4	78.7	17.2	83.7	14.6	81.2	16.0

Accuracy Analysis

A repeated measures mixed design ANOVA was conducted on the mean differences obtained from ACC scores across the seven song conditions presented to participants in both Musician and Nonmusician groups. Mauchly's test was not significant, indicating that the assumptions of sphericity had been met.

A significant difference in mean ACC for the song conditions was found, $F(6, 228) = 12.08, p < .05$. Exploratory Post hoc comparisons were conducted using Tukey's HSD on all pairwise comparisons for the combined means of both Musicians and Nonmusicians, revealing the following significant differences: Verse 1 Line 1 > Verse 1

Line 3; Verse 1 Line 2 > Verse 1 Line 1; Verse 1 Line 2 > Verse 1 Line 3; Verse 3 Line 3 > Verse 1 Line 3; Verse 1 Line 1 > Verse 2 Line 1, and Verse 3 Line 4 > Verse 2 Line 1.

The effect of expertise (Musicians and Nonmusician groups) was not significant; $F(1,38) = .860, p < .05$, nor was the Group x Condition interaction; $F(6,228) = .732, p < .05$. However, as for RT, a prediction was made a priori that differences in means may exist for 'before' and 'after' conditions, therefore Tukey's HSD comparisons were conducted on Musicians and Nonmusician groups combined (ignoring expertise as a factor), and on Musician and Nonmusician groups alone for all pairwise conditions. The following significant differences were found: Verse 1 Line 2 > Verse 1 Line 3; Verse 1 Line 1 > Verse 1 Line 3 and Verse 1 Line 1 > Verse 2 Line 1 for Nonmusicians, and Verse 1 Line 1 > Verse 1 Line 3; Verse 3 Line 3 > Verse 1 Line 3; Verse 1 Line 1 > Verse 2 Line 1 and Verse 3 Line 4 > Verse 2 Line 1 for Musicians.

Finally, cross-comparisons were conducted across groups for ACC for each of the test lines, such that mean ACC for each test line for Musicians was compared to the corresponding test line mean for Nonmusicians. However, no significant differences were found. The ACC for each test line for all participants averaged across all songs for both Musicians and Nonmusicians are presented in Appendices M and N.

As for RT, in order to examine the effect of test line position further, a 2 x 2 x 2 repeated measures ANOVA was conducted on mean ACC for within-subjects factors of Line (2 and 3) and Verse (1 and 3) combining mean scores for Musicians and Nonmusicians. A significant main effect was found for Verse (1 or 3), $F(1,38) = 5.02, p < .05$ and Line (2 or 3), $F(1,38) = 7.55, p < .05$. A significant Verse x Line interaction was also found; $F(1,38) = 14.36, p < .05$. However, the effect of Group $F(1,38) = .742, p <$

.05 was not significant, and nor was Group x Line x Verse interaction; $F(1,38) = .000$, p < .05. Means and standard deviations are presented in Table 4.

Table 4.   *Means and Standard Deviations for Accuracy (%) as a Function of Lines 2 and 3 in Verses 1 and 3.*

	Verses			
	1		3	
	M	SD	M	SD
Line 2	85.6	16.6	72.5	13.2
Line 3	59.6	18.0	73.1	15.8

Figure 2 indicates that while ACC for Lines 2 and 3 of Verse 3 for Nonmusicians are similar, ACC for Verse 1 was far greater for Line 2 than for Line 3.
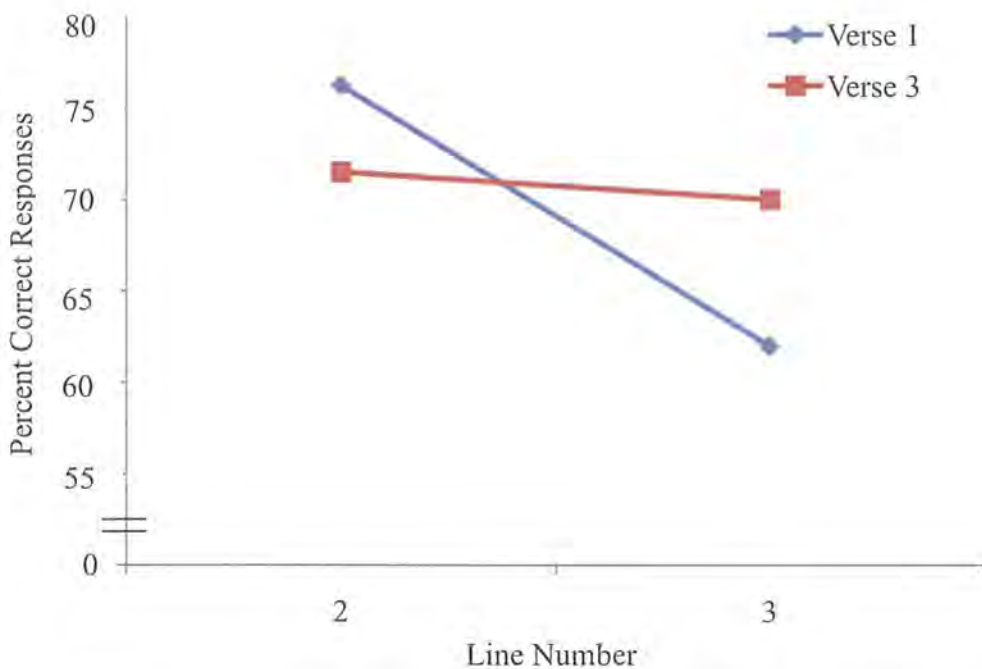
Figure 2.   Accuracy (Percent Correct) of Responses for Lines 2 and 3 in the 'Before' (Verse 1) and 'After' (Verse 3) Condition for Nonmusicians.

Figure 3 indicates that while ACC for Lines 2 and 3 of Verse 3 increases for

Musicians, ACC decreases for the same lines for Verse 1.
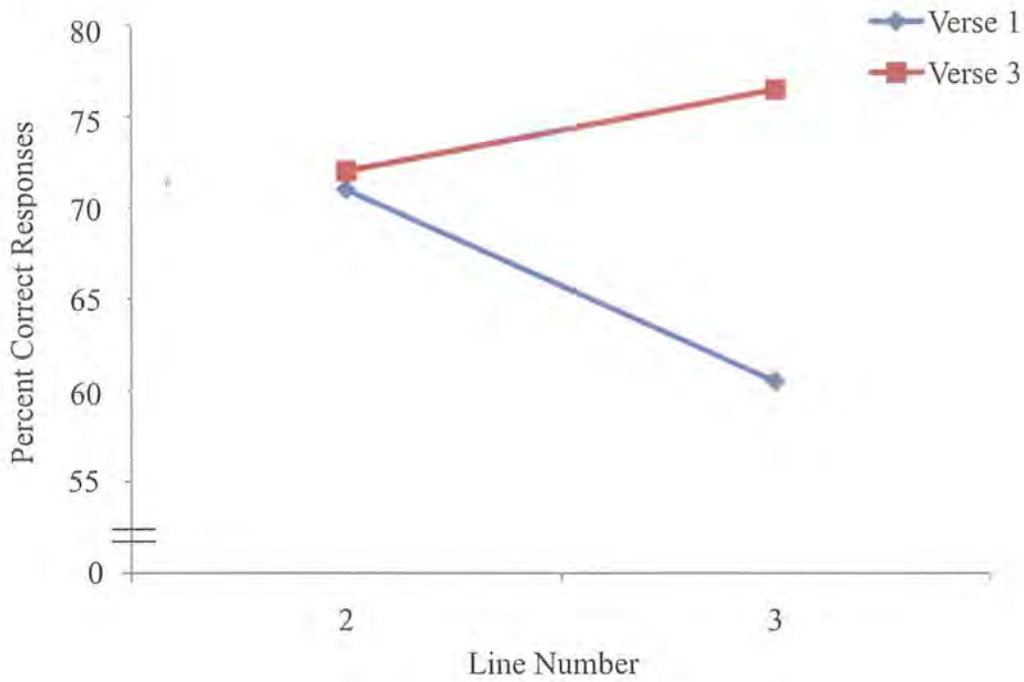
Figure 3.   Accuracy (Percent Correct) of Responses for Lines 2 and 3 in the 'Before'

(Verse 1) and 'After' (Verse 3) Condition for Musicians.

Discussion

The current study examined what occurs between the onset of a stimulus (hearing a song) and the generation of a response (an indication that the song has been remembered). Firstly, the hypothesis was tested that memory for music may be biased in a forward direction, such that when two excerpts of a song were played, a memory search would progress in a serial direction from one excerpt to another. Secondly, the effect of musical expertise on this hypothesis was explored in order to determine whether expertise had an effect on the serial nature of memory for music, and if so, in what direction this would occur.

The study found no significant difference in RT or ACC between Musicians and Nonmusicians, however post hoc comparisons revealed significant differences in means between the two groups for both RT and ACC. Excluding Verse 1 Line 1 (attributed to the primacy effect), the mean RTs for correctly identified test lines positioned before the probe line in the normal course of a song were longer than for test lines occurring after the probe line. Excluding Verse 1 Line 1, mean ACC was generally lower in the 'before' condition than the 'after' condition, however no significant differences were found between mean scores of percent correct for 'before' and 'after' conditions. Significant main effects were found for Verse (1 and 3) and Line (2 and 3) for Musicians and Nonmusicians together. An interaction effect was found for Verse x Line, where ACC was higher for Line 2 than for Line 3, but for the same lines in Verse 1, accuracy was similar. A significant main effect was found for Nonmusicians alone for Line (2 and 3) and an interaction effect was found for Verse x Line. A significant main effect was found for Musicians alone for Verse, and an interaction effect was found for Verse x Line, such

that while ACC increased from Lines 2 to 3 in Verse 3, ACC decreased for the same lines

for Verse 1.

Reaction Times

 While no significant differences in RT were found between Musicians and

Nonmusicians, post hoc comparisons revealed significant individual differences in means

between the two groups, such that there was a significant effect between Verse 1 Line 2

and Verse 1 Line 3 for Musicians, but not for Nonmusicians. Further, the effect of song

excerpt position was tested in order to determine significant differences between 'before'

and 'after' conditions, testing Lines 2 and 3 of Verses 1 and 3). Post hoc comparisons

revealed significant differences between Verse 1 Line 2 and Verse 1 Line 3 and Verse 1

Line 3 and Verse 3 Line 2 for Musicians, but no significant differences were found for

Nonmusicians.

 The finding that mean RTs for the 'before' condition were generally slower than

the 'after' condition supported the first hypothesis that memory for music is biased in a

forward direction. This result is consistent with Wallace's (1994) research indicating that

repetition of melody, rhythm and 'chunking' mechanisms across verses facilitates the

recall of song lyrics, such that song excerpts occurring at the end of a song were more

immediately identifiable than excerpts occurring at the beginning of the song. As such, it

was observed that RT was longest for Verse 1 Line 3 and Verse 2 Line 1, the two

excerpts representing the furthest distance from the probe line (Verse 2 Line 2). While

this was hypothesised previously, it was noted that combined means for both groups

revealed that RT was slightly longer for Verse 1 Line 3, the second furthest distance from

the probe line, than Verse 2 Line 1, the furthest distance. This is most likely due to its

closer proximity to the probe line making it more identifiable than for Verse 1 Line 3, such that the lyrics and melody contained in adjacent excerpts were easier to identify.

It was noted, however, that while RT increased from Verse 1 Line 3 to Verse 2 Line 1 for Nonmusicians, RT decreased for Musicians significantly for the same two conditions, representing the largest difference in means of any of the song conditions between Musicians and Nonmusicians (see Figure 1). This effect is striking, since it may demonstrate a strategy used by Musicians in order to obtain the temporal distance of song excerpts, as described by Ginsborg and Sloboda (2007) and Kilgour, Jakobson and Cuddy (2000). Similarly, while RT for Verse 1 Line 1 was quickest, a primacy effect is a likely causal factor, such that the first line in the song makes the excerpt the most identifiable. This is likely since RT for this condition was significantly quicker than for all other conditions, including the condition directly after the probe line in the normal course of the song.

Excluding Verse 1 Line 1, RT was quickest for Verse 3 Line 2, the condition immediately following the probe line. This supports the first hypothesis, yet was contrary to findings by Sibma (2003) that mean RT for this condition was the second slowest. However, it was observed that mean RT for Line 2 in both Verses 1 and 3 were almost identical, suggesting that since the melody was the same for both conditions, identification of this excerpt position may have been facilitated by the integration effect of text and melody, such that the identical melody provided a cue for the recall of the lyrics, described by Purnell-Webb and Speelman (2008) and Serafine, Davidson, Crowder and Repp (1986). Conversely, this effect, as discussed by Tillman and Bigand (2001), may be explained by the identical melody acting as a distractor to lyrical recall, such that RT was similar for the two conditions because participants were uncertain of

which Verse the test line came from, and simply guessed. However, this is unlikely, since ACC was consistently high for this condition.

Accuracy

As explained above, ANOVA testing revealed no difference in mean ACC between Musician and Nonmusician groups. However, post hoc comparisons revealed significant differences between Verse 1 Line 3 and Verse 3 Line 3 and Verse 2 Line 1 and Verse 3 Line 4 for Musicians but not for Nonmusicians. Further significant differences were found for Verse 1 Line 2 and Verse 1 Line 3 for Nonmusicians but not for Musicians.

As for RT, ACC was highest for Verse 1 Line 1, again reflecting a strong primacy effect of participant responses. ACC was lowest for Verse 1 Line 3 and Verse 2 Line 1 and increased gradually until Verse 3 Line 4, where ACC for the first and last song conditions were similar. Thus, ACC began at a high level (indicating a primacy effect), decreased until reaching the lowest ACC in the middle of the song, and then increased again until the end of the song. While the primacy effect observed for RT is also evident for ACC, similarly high ACC for Verse 3 Line 4 is suggestive of a recency effect, whereby participants found the last excerpt in the song almost as identifiable as the first excerpt.

Demonstrating a similar pattern to findings for RT, ACC was worse for Verse 1 Line 3 than Verse 2 Line 1. In contrast to RT however, ACC only slightly improved from Verse 2 Line 1 to Verse 3 Line 2. Further, while ACC decreased from Verse 3 Line 2 to Verse 3 Line 3 for Nonmusicians, ACC for the same conditions increased for Musicians. While ACC decreased for Lines 2 and 3 of Verse 3 for Nonmusicians, ACC increased for the same conditions for Musicians (see Figures 2 and 3). However, this difference was

not found to be significant. Finally, significant effects for Verse and Line and an interaction effect for Verse x Line for ACC and significant effects for Verse and Line for RT (Musicians and Nonmusicians combined) provides evidence for and suggests the use of strategies used by participants in identifying the position of song excerpts.

When responding to the de-briefing questionnaire administered after completion of the experimental trials (see Appendix D), participant consensus suggested that the song was played mentally from the first excerpt (probe line) in a forward direction until the second excerpt (test line) was reached. However, various participants from the Musician group described taking cues from the crescendo and diminuendo (ebb and flow) of the melody and from changes in chord progressions in order to establish the position of excerpts within the song.

It was seen that many participants from the Musician group chose to ignore the lyrics in favour of the song's melodic structure. This is in stark contrast to the Nonmusician group, who focused primarily on lyrics and emphasised the storytelling quality of the song, consistent with previous research by Herbert and Peretz (1997), Bartlett and Snelus (1980) and Wallace (1994). When participants were asked how they thought they performed, while responses were varied, the majority described the task as relatively easy, and most enjoyed the challenge. While few participants were confident with their performance, most were surprised by how well they performed when shown their results.

While ANOVA testing revealed no significant differences between Musicians and Nonmusicians, post hoc comparisons, participant response consensus from the de-briefing questionnaire and trends in the data indicate that Musicians may use an alternative strategy to Nonmusicians in identifying the position of song excerpts.

However, if this is the case, the nature of this strategy remains unclear. The pattern of RT and ACC scores and general participant consensus on searching strategies indicates that participants were not guessing, but using a consistent strategy hypothesised in the current study based on previous research by Sibma (2003) and Wallace (1994). Directions for further research in this area are discussed below.

Limitations of the Current Experiment and Directions for Future Research

The aim of the current experiment was to determine the nature of our memory for music, and sought to examine whether the experience of recalling music was akin to pushing play on a tape recorder, whereby access to our musical memory is serial in nature, or whether we possess more flexible mental facilities with parallel access to musical recall, akin to the random access memory of a computer. Further, the effect of musical expertise on this strategy was examined. While the current study methodology was based on research by Sibma (2003) and on theories of memory for ballads, prose and melody-text integration put forward by Wallace (1994), it was largely exploratory in regard to the influence of expertise. However, the current study was successful in presenting results that may give some direction for future research.

While a broader range of songs were included in the current study than were used by Sibma (2003) (with structural criteria no less stringent), due to the nature of the methodological restraints required in order for songs to conform to the structure required, many popular songs could not be included. Despite this, no participant had difficulty in selecting well-known songs. Future studies replicating the current study methodology should involve both smaller and larger numbers of songs in order to determine the effect this has on participant responses.

Based on suggestions put forward by Sibma (2003) the current study collected more data with regard to musical training and preferences, and conducted a formal debriefing session in order to investigate the participants' searching strategy. However, the current study could be replicated with more stringent participant selection strategies. While most participants in the expertise group had approximately 10 years of musical training, further studies could involve participants with more experience (possibly from music conservatories) in order to clarify the effect of musical expertise on the recall of popular songs. Wallace (1994) proposed that how people remember music is a challenge for psychological theory, and it is hoped that the current study has contributed to the field of knowledge in this area.

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List of Appendices

Appendix A

Participant Research Information Letter

Information Letter

This experiment is designed to investigate the processes of human memory as it relates to musical recall, and is being conducted by Simon MacLachlan, an Honours student in Psychology at Edith Cowan University. This experiment conforms to the guidelines set in place by the university's Committee for the Conduct of Ethical Research, and has been approved by the committee.

In this experiment, you will be asked to answer some questions about some popular songs. These songs will be played on a laptop through headphones, and you will be asked to respond to questions presented after listening to each song by pressing keys on the keyboard.

The aim of this is to clarify and examine how memory for music is influenced by the presence of absence or musical expertise. Your participation will last for one session of approximately 60 to 90 minutes. Do not be concerned if you find some of the questions difficult to answer; other participants may feel the same way!

Any information that you provide will be held in strict confidence by the researcher, no names will be recorded and all data obtained will be recorded in group form only. Your participation is voluntary and you may withdraw from the study at any time at no consequence, and any data obtained will be removed upon request.

Any questions concerning this study may be directed to myself or to the research supervisor and Associate Professor Dr. Craig Speelman on (08) 6304 5724. If you would like to talk to an independent individual regarding this research, please contact Honours Co-ordinator Dr. Justine Dandy on (08) 6304 5105.

Thank you very much for your time and participation,

Simon MacLachlan.

Appendix B

Informed Consent Letter

Informed Consent Letter

I have read and acknowledged the attached information letter regarding the current

experiment on memory for music. Any questions I have asked have been answered to my

satisfaction. I agree to participate in this experiment with the understanding that I may

withdraw at any time at no consequence, and that I will not be personally identified at any

time. I agree that data obtained from this study may be published.

Participant   Date:

Researcher   Date:

Appendix C

Musical Training Questionnaire

Brief Musical Training Questionnaire

1. What is your age?

    a. 15-25.
    b. 25-35.
    c. 35-45.
    d. 44-55.
    e. 55-65.
    f. 65 or over.

2. Have you ever had music training of any kind (music theory in general or on one or more instruments)? If your answer is no, skip to **Question 7**.

    a. Yes.
    b. No.

3. If so, how many years of musical training have you received?

    _____

    _____

4. In what area is your musical training? (for example, classical, contemporary, opera, jazz etc).

    _____

    _____

5. If you play an instrument, what instrument(s) do you play? If answer is no, skip to **Question 7**.

    _____

    _____

6. How often do you play your chosen instrument(s)? Circle the appropriate answer.

    a. Never.
    b. Rarely (1-2 times per year).
    c. Fairly regularly (1-2 times per month).
    d. Regularly (1-2 times per week).
    e. Constantly (daily).

7. Do you feel that musical theory, expertise or playing an instrument could or does benefit you in other ways? (For example; memory, learning, attention, relaxation, enjoyment).

    a. No.
    b. Maybe/Unsure.
    c. Probably.
    d. Definitely.

Appendix D

De-briefing Questionnaire

Short De-Briefing Questionnaire

1. How do you feel you performed on the experiment?

    _____

    _____

    _____

    _____

2. How would you rate the difficulty of the experiment?

    a. Very easy.

    b. Easy.

    c. Average.

    d. Difficult.

    e. Very difficult.

3. How did you search for the song excerpts? (For example, mentally replaying the melody or lyrics from the beginning of the song until the excerpt, or some other way?).

    _____

    _____

    _____

    _____

    _____

    _____

Appendix E

Practice Trial Instructions Presented on Screen

"In the following trial you will be shown a number, and then asked to decide whether a

second number comes **BEFORE** or **AFTER** the first number in a normal counting

sequence.

You will be asked to press the key marked 'B' if the second number comes BEFORE the

first number, or the key marked 'A' if the second number comes AFTER the first

number".

Appendix F

Song Trial Instructions Presented on Screen

Now you will hear two excerpts from the songs that were played for you earlier. For each

pair of excerpts, decide whether the second excerpt you hear comes BEFORE or

AFTER the first excerpt in the standard course of the song. You will be presented

with seven pairs of excerpts for each song.

As soon as possible, press the 'B' key if you think the second excerpt comes BEFORE

the first excerpt, or press the 'A' key if you think the second excerpt comes AFTER

the first excerpt.

Appendix G

Sequence of Practice Trial Questions Presented on Screen

Screen 1:
(Prompt)

> "Excerpt
> One"

Screen 2:
(Probe digit)

> 9

Screen 3:
(Blank Screen)

Screen 4:
(Prompt)

> "Excerpt
> Two"

Screen 5:
(Test digit)

> 6
>
> "Press 'B' for
> Before or 'A'
> for After"

Screen 6:
(Prompt)

> "Press
> Spacebar
> for next
> trial"

Appendix H

Sequence of Song Excerpt Trial Presented on Screen

Screen 1:
(Prompt)

```
"Excerpt
One"
```

Screen 2:
(Probe digit)

```
One-line
excerpt is
played
```

Screen 3:
(Blank Screen)

```


```

Screen 4:
(Prompt)

```
"Excerpt
Two"
```

Screen 5:
(Test digit)

```
One-line
excerpt is
played
"Press 'B' for
Before or 'A'
```

Screen 6:
(Prompt)

```
"Press
Spacebar
for next
trial"
```

Appendix I

Popular Song List and Track Length Times

Popular Song List	Track Length
Jefferson Airplane – Somebody To Love	3 minutes 01 seconds
Led Zeppelin – Stairway To Heaven	8 minutes 00 seconds
Creedence Clearwater Revival – Bad Moon Rising	2 minutes 15 seconds
The Eagles – Hotel California	6 minutes 30 seconds
Simon & Garfunkel – Mrs. Robinson	3 minutes 48 seconds
Bryan Adams – Summer of '69	3 minutes 34 seconds
Leonardo's Bride – Even When I'm Sleeping	3 minutes 54 seconds
The Bee Gees – Jive Talkin'	3 minutes 44 seconds
John Farnham – You're The Voice	4 minutes 49 seconds
The Beatles – Let It Be	4 minutes 03 seconds
The Monkees – I'm A Believer	2 minutes 26 seconds
Men At Work – Down Under	3 minutes 43 seconds
The Clash – Rock The Casbah	3 minutes 43 seconds
Madonna – Like A Prayer	5 minutes 51 seconds
Queen – We Will Rock You	2 minutes 02 seconds
The Temptations – I Heard It Through The Grapevine	3 minutes 04 seconds
The Rolling Stones – I Can't Get No (Satisfaction)	3 minutes 43 seconds
U2 – Pride (In The Name Of Love)	3 minutes 50 seconds
Crowded House – Better Be Home Soon	3 minutes 10 seconds
Creedence Clearwater Revival – Fortunate Son	2 minutes 18 seconds
Billy Joel – The Piano Man	5 minutes 38 seconds
Queen – Another One Bites The Dust	3 minutes 36 seconds
The Rolling Stones – Wild Horses	5 minutes 44 seconds
Lynyrd Skynyrd – Sweet Home Alabama	4 minutes 41 seconds
Fleetwood Mac – Don't Stop	3 minutes 10 seconds
Carole King – You Make Me Feel Like A Natural Woman	3 minutes 58 seconds
Bob Marley – I Shot The Sheriff	4 minutes 41 seconds
Michael Jackson – Thriller	5 minutes 57 seconds
Eric Clapton – Layla	4 minutes 39 seconds
John Denver – Take Me Home (Country Roads)	3 minutes 11 seconds
The Beach Boys – Sloop John 'B'	2 minutes 58 seconds
Dire Straits – Money For Nothing	8 minutes 25 seconds
Cat Stevens – Wild World	3 minutes 20 seconds
Simon & Garfunkel – Bridge Over Troubled Water	4 minutes 55 seconds
INXS – New Sensation	3 minutes 42 seconds

Trial Songs

Joan Baez - Blowin' In The Wind	0 minutes 46 seconds
John Lennon – Imagine	3 minutes 42 seconds

Appendix J

List of Songs and Song Selection Frequency

Number of Times Chosen	Popular Song Title
13	Creedence Clearwater Revival – Bad Moon Rising
14	Billy Joel – The Piano Man
13	Bob Marley – I Shot The Sheriff
16	Bryan Adams – Summer of '69
7	Carole King – You Make Me Feel Like A Natural Woman
10	Cat Stevens – Wild World
4	The Temptations – I Heard It Through The Grapevine
4	Creedence Clearwater Revival – Fortunate Son
14	Crowded House – Better Be Home Soon
13	Dire Straits – Money For Nothing
17	The Monkees – I'm A Believer
18	The Eagles – Hotel California
18	Queen – We Will Rock You
1	The Clash – Rock The Casbah
4	Eric Clapton – Layla
5	Fleetwood Mac – Don't Stop
3	The Bee Gees – Jive Talkin'
10	Simon & Garfunkel – Bridge Over Troubled Water
1	Jefferson Airplane – Somebody To Love
10	John Denver – Take Me Home (Country Roads)
9	The Rolling Stones – I Can't Get No (Satisfaction)
10	John Farnham – You're The Voice
0	The Beach Boys – Sloop John 'B'
17	Led Zeppelin – Stairway To Heaven
2	Leonardo's Bride – Even When I'm Sleeping
14	Lynyrd Skynyrd – Sweet Home Alabama
6	Madonna – Like A Prayer
13	Men At Work – Down Under
7	Michael Jackson – Thriller
12	Queen – Another One Bites The Dust
5	Simon & Garfunkel – Mrs. Robinson

"Summer of '69" by Bryan Adams (3 minutes 34 seconds)

(Verse 1)

I got my first real six-string	'First' test line, earlier verse
Bought it at the five-and-dime	'Same' test line, earlier verse
Played it till my fingers bled	'Next' test line, earlier verse
It was the summer of '69	

(Verse 2)

Me and some guys from school	
Had a band and we tried real hard	**Probe Line**
Jimmy quit and Jody got married	'Next' test line, same verse
I shoulda known we'd never get far	

(Chorus 1)
Oh when I look back now
That summer seemed to last forever
And if I had the choice
Yeah – I'd always wanna be there
Those were the best days of my life

(Verse 3)

Ain't no use in complaining	
When you got a job to do	'Same' test line, later verse
Spent my evenings down at the drive-in	'Next' test line, later verse
And that's when I met you	'Last' test line, later verse

(Chorus 2)
Standing on your mama's porch
You told me that you'd wait forever
Oh and when you held my hand
I knew that it was now or never
Those were the best days of my life

(Verse 3)
Man we were killin' time
We were young and restless
We needed to unwind
I guess nothin' can last forever - forever, no

(Verse 4)
And now the times are changin'
Look at everything that's come and gone
Sometimes when I play that old six-string
I think about you, wonder what went wrong

(Chorus 3)
Standing on your mamas porch
You told me it would last forever
Oh the way you held my hand
I knew that it was now or never
Those were the best days of my life

"Somebody To Love" by Jefferson Airplane (3 minutes 01 second)

(Verse 1)

When the truth is found	'First' test line, earlier verse
To be lies	'Same' test line, earlier verse
And all the joy	'Later' test line, earlier verse
Within you dies	

(Chorus)
Don't you want somebody to love
Don't you need somebody to love
Wouldn't you love somebody to love
You better find somebody to love

(Verse 2)

When the garden's flowers,	'First' test line, same verse
Baby, are dead,	**Probe Line**
Yes, and your mind, your mind	
Is so full of red	

(Chorus)
Don't you want somebody to love
Don't you need somebody to love
Wouldn't you love somebody to love
You better find somebody to love

(Verse 3)

Your eyes, I say your eyes	
May look like his	'Same' test line, later verse
Yeah but in your head, baby	'Next' test line, later verse
I'm afraid you don't know where it is	'Last' test line, later verse

(Chorus)
Don't you want somebody to love
Don't you need somebody to love
Wouldn't you love somebody to love
You better find somebody to love

(Verse 4)
Tears are running,
They're all running down your breast
And your friends, baby,
they treat you like a guest

(Chorus)
Don't you want somebody to love
Don't you need somebody to love
Wouldn't you love somebody to love
You better find somebody to love

"Stairway To Heaven" by Led Zeppelin (8 minutes 00 seconds)

(Verse 1)

There's a lady who's sure all that glitters is gold   'First' test line, earlier verse

And she's buying a stairway to heaven   'Same' test line, earlier verse

And when she gets there she knows if the stores are closed   'Next' test line, earlier verse

With a word she can get what she came for

(Chorus 1)

Woe oh oh

Oh oh oh

And she's buying a stairway to heaven

(Verse 2)

There's a sign on the wall but she wants to be sure   'First' test line, same verse

'Cause you know sometimes words have two meanings   **Probe Line**

In a tree by the brook there's a songbird who sings

Sometimes all of our thoughts are misgiven

(Chorus 2)

Woe oh oh oh oh oh

And it makes me wonder

Woe oh oh oh oh oh

And it makes me wonder

(Verse 3)

And it's whispered that soon, if we all call the tune

Then the piper will lead us to reason   'Same' test line, later verse

And a new day will dawn for those who stand long   'Next' test line, later verse

And the forest will echo with laughter   'Last' test line, later verse

(Chorus 3)

If there's a bustle in your hedgerow Don't be alarmed now

It's just a spring clean for the May Queen

Yes there are two paths you can go by but in the long run

There's still time to change the road you're on

And it makes me wonder

(Chorus 4)

Your head is humming and it won't go in case you don't know

The piper's calling you to join him

Dear lady can't you hear the wind blow and did you know

Your stairway lies on the whispering wind

"Bad Moon Rising" by Creedence Clearwater Revival (2 minutes 15 seconds)

(Verse 1)

I see a bad moon a-rising.   'First' test line, earlier verse

I see trouble on the way.   'Same' test line, earlier verse

I see earth quakes and lightnin'.   'Next' test line, earlier verse

I see bad times today.

(Chorus)

Don't go 'round tonight

it's bound and take your life,

there's a bad moon on the rise.

(Verse 2)

I hear hurricanes a-blowing,   'First' test line, same verse

I know the end is coming soon.   **Probe Line**

I fear rivers over flowing.

I hear the voice of rage and ruin.

(Chorus)

Don't go 'round tonight

it's bound and take your life,

there's a bad moon on the rise.

All right

(Verse 3)

Hope you got your things together.

Hope you are quite prepared to die.   'Same' test line, later verse

Look's like we're in for nasty weather.   'Next' test line, later verse

One eye is taken for an eye.   'Last' test line, later verse

(Chorus)

Don't go 'round tonight

it's bound and take your life,

there's a bad moon on the rise.

"Hotel California" by The Eagles (6 minutes 30 seconds)

(Verse 1)
On a dark desert highway, cool wind in my hair, warm smell
of colitas, rising up through the air.
Up ahead in the distance, I saw a shimmering light, my head
grew heavy and my sight grew dim, I had to stop for the night.
There she stood in the doorway, I heard the mission bell, and
I was thinking to myself, 'this could be heaven or this could be
hell'.
Then she lit up a candle and she showed me the way, there were
voices down the corridor,
I thought I heard them say...

'First' test line, earlier verse

'Same' test line, earlier verse

'Next' test line, earlier verse

(Chorus 1)
Welcome to the Hotel California.
Such a lovely place, such a lovely face.
Plenty of room at the Hotel California
Any time of year, you can find it here.

(Verse 2)
Her mind is definitely twisted, she got the Mercedes Benz,
she got a lot of pretty, pretty boys that she calls friends.
How they dance in the courtyard, sweet summer sweat,
some dance to remember, some dance to forget.
So I called up the captain, 'Please bring me my wine',
he said, 'we haven't had that spirit here since
nineteen sixty nine'.
And still those voices are calling from far away,
wake you up in the middle of the night just to hear them say...

'First' test line, same verse

Probe Line

(Chorus 2)
Welcome to the hotel California.
Such a lovely place, such a lovely face.
They're livin' it up at the Hotel California.
What a nice surprise, bring your alibis.

(Verse 3)
Mirrors on the ceiling, the pink champagne on ice,
and she said 'we are all just prisoners here, of our own device'.
And in the master's chambers, they gathered for the feast,
they stabbed it with their steely knives,
but they just can't kill the beast.
Last thing I remember, I was running for the door, I had to find
the passage back to the place I was before.
'Relax,' said the night man, we are programmed to receive,
you can check out any time you like, but you can never leave!

'Same' test line, later verse

'Next' test line, later verse

'Last' test line, later verse

"Mrs. Robinson" by Simon & Garfunkel (3 minutes 48 seconds)

(Chorus)
And here's to you, Mrs. Robinson,
Jesus loves you more than you will know, whoa, whoa, whoa,
God bless you, please Mrs. Robinson
Heaven holds a place for those who pray, hey, hey, hey, hey, hey, hey.

(Verse 1)
We'd like to know a little bit about you for our files,   'First' test line, earlier verse
We'd like to help you learn to help yourself,   'Same' test line, earlier verse
Look around you, all you see are sympathetic eyes,   'Next' test line, earlier verse
Stroll around the grounds until you feel at home.

(Chorus)
And here's to you, Mrs. Robinson,
Jesus loves you more than you will know, whoa, whoa, whoa,
God bless you, please, Mrs. Robinson
Heaven holds a place for those who pray, hey, hey, hey, hey, hey, hey.

(Verse 2)
Hide in the hiding place where no one ever goes,   'First' test line, same verse
Put it in your pantry with your cupcakes,   **Probe Line**
It's a little secret just the Robinson's' affair,
Most of all you've got to hide it from the kids.

(Chorus)
Koo-koo-ka-choo, Mrs. Robinson,
Jesus loves you more than you will know, whoa, whoa, whoa,
God bless you, please, Mrs. Robinson,
Heaven holds a place for those who pray, hey, hey, hey, hey, hey, hey.

(Verse 3)
Sitting on a sofa on a Sunday afternoon,
Going to the candidates' debate,
Laugh about it, shout about it when you've got to choose,
Every way you look at this you lose.

(Chorus)
Where have you gone, Joe DiMaggio,
Our nation turns its lonely eyes to you, woo, woo, woo,   'Same' test line, later verse
What's that you say, Mrs. Robinson,   'Next' test line, later verse
Jolting Joe has left and gone away, hey, hey, hey, hey, hey, hey   'Last' test line, later verse

"Summer of '69" by Bryan Adams (3 minutes 34 seconds)

(Verse 1)

I got my first real six-string	'First' test line, earlier verse
Bought it at the five-and-dime	'Same' test line, earlier verse
Played it till my fingers bled	'Next' test line, earlier verse
It was the summer of '69	

(Verse 2)

Me and some guys from school	
Had a band and we tried real hard	**Probe Line**
Jimmy quit and Jody got married	'Next' test line, same verse
I shoulda known we'd never get far	

(Chorus 1)
Oh when I look back now
That summer seemed to last forever
And if I had the choice
Yeah – I'd always wanna be there
Those were the best days of my life

(Verse 3)

Ain't no use in complaining	
When you got a job to do	'Same' test line, later verse
Spent my evenings down at the drive-in	'Next' test line, later verse
And that's when I met you	'Last' test line, later verse

(Chorus 2)
Standing on your mama's porch
You told me that you'd wait forever
Oh and when you held my hand
I knew that it was now or never
Those were the best days of my life

(Verse 3)
Man we were killin' time
We were young and restless
We needed to unwind
I guess nothin' can last forever - forever, no

(Verse 4)
And now the times are changin'
Look at everything that's come and gone
Sometimes when I play that old six-string
I think about you, wonder what went wrong

(Chorus 3)
Standing on your mamas porch
You told me it would last forever
Oh the way you held my hand
I knew that it was now or never
Those were the best days of my life

"Even When I'm Sleeping" by Leonardo's Bride (3 minutes 54 seconds)

(Verse 1)
Don't be confused by my apparent lack of ceremony,   'First' test line, earlier verse
My mind is clear.   'Same' test line, earlier verse
I may be low or miles high off in the distance,   'Next' test line, earlier verse
I want you near.

(Chorus)
I love you... even when I'm sleeping.
When I close my eyes,
You're everywhere.

(Verse 2)
And if they take me flying on the magic carpet,   'First' test line, same verse
See me wave.   **Probe Line**
If our communication fails I'll reconnect it,
I want to rave.

(Chorus)
I love you... even when I'm sleeping.
When I close my eyes,
You're everywhere.

(Verse 3)
No matter where the road is leading us remember,
Don't be afraid.   'Same' test line, later verse
We have a continent that sometimes comes between us,   'Next' test line, later verse
That's okay.   'Last' test line, later verse

(Chorus)
I love you... even when I'm sleeping.
When I close my eyes,
You're everywhere.

"Jive Talkin'" by The Bee Gees (3 minutes 44 seconds)

(Chorus)
It's just your jive talkin', you're telling me lies, yeah.
Jive talkin', you wear a disguise.
Jive talkin', so misunderstood, yeah.
Jive talkin', you really no good.

(Verse 1)
Oh my child you'll never know,   'First' test line, earlier verse
Just what you mean to me,   'Same' test line, earlier verse
Oh my child you got so much,   'Next' test line, earlier verse
You're gonna take away my energy.

(Chorus)
With all your jive talkin' you're telling me lies, yeah.
Good lovin' still gets in my eyes,
Nobody believes what you sy,
It's your jive talkin' that gets in the way.

(Verse 2)
Oh my love, you're so good,   'First' test line, same verse
Treating me so cruel,   **Probe Line**
There you go with your fancy lies,
Leaving me like a dumbstruck fool.

(Chorus)
With all your jive talkin', you're telling me lies yeah,
Jive talkin', you wear a disguise,
Jive talkin' so misunderstood, yeah.
Jive talkin', just ain't no good.

(Verse 3)
Love talkin' is all very fine, yeah
Jive talkin' just isn't a crime,   'Same' test line, later verse
And if there's somebody you'll love till you die,   'Next' test line, later verse
Then all that jive talkin' just gets in your eye.   'Last' test line, later verse

(Chorus)
Jive talkin' you're telling me lies, yeah.
Good lovin' still gets in my eyes,
Nobody believes what you say,
It's just your jive talkin' that gets in the way.

"You're The Voice" by John Farnham (4 minutes 49 seconds)

(Verse 1)

We have the chance to turn pages over, we can write what we want to write	'First' test line, earlier verse
We gotta make ends meet before we get much older	'Same' test line, earlier verse
We're all someone's daughter, we're all someone's son	'Next' test line, earlier verse
How long can we look at each other, down the barrel of a gun?	

(Chorus)
You're the voice try and understand it,
Make a noise and make it clear, whoa oh oh,
We're not gonna live in silence,
We're not gonna live in fear, whoa oh oh, whoa oh oh.

(Verse 2)

This time We know we all can stand together	'First' test line, same verse
We have the power to be powerful, Believing we can make it better	**Probe Line**
We're all someone's daughter We're all someone's son	
How long can we look at each other Down the barrel of a gun?	

(Chorus)
You're the voice try and understand it
Make a noise and make it clear, Whoa oh,
We're not gonna sit in silence
We're not gonna live in fear, Whoa oh oh.

(Verse 3)

We're all someone's daughter,	
We're all someone's son.	'Same' test line, later verse
How long can we look at each other	'Next' test line, later verse
Down the barrel of a gun?	'Last' test line, later verse

(Chorus)
You're the voice try and understand it,
Make a noise and make it clear, whoa oh,
We're not gonna sit in silence,
We're not gonna live in fear, whoa oh oh, whoa oh oh.

(Repeat Chorus)

"Let It Be" by The Beatles (4 minutes 03 seconds)

(Verse 1)

When I find myself in times of trouble, mother Mary comes to me	'First' test line, earlier verse
Speaking words of wisdom, let it be.	'Same' test line, earlier verse
And in my hour of darkness, she is standing right in front of me	'Next' test line, earlier verse
Speaking words of wisdom, let it be.	

(Chorus)
Let it be, let it be.
Let it be, let it be.
Whisper words of wisdom,
Let it be.

(Verse 2)

And when the broken hearted people living in the world agree	'First' test line, same verse
There will be an answer, let it be.	**Probe Line**
For though they may be parted, there is still a chance that they will see	
There will be an answer, let it be.	

(Chorus 2)
Let it be, let it be
Let it be, let it be
Yeah there will be an answer,
Let it be.

(Verse 3)

And when the night is cloudy, there is still a light that shines on me	
Shine on until tomorrow, let it be.	'Same' test line, later verse
I wake up to the sound of music, mother Mary comes to me	'Next' test line, later verse
Speaking words of wisdom, let it be.	'Last' test line, later verse

(Chorus 3)
Let it be, let it be, let it be, yeah let it be.
There will be an answer, let it be.
Let it be, let it be, let it be, yeah let it be.
Whisper words of wisdom, let it be.

(Repeat Chorus)

"I'm A Believer" by The Monkees (2 minutes 26 seconds)

(Verse 1)
I thought love was only true in fairy tales,   'First' test line, earlier verse
Meant for someone else but not for me.   'Same' test line, earlier verse
Ah, love was out to get to me, that's the way it seemed. 'Next' test line, earlier verse
Disappointment haunted all my dreams.

(Chorus)
Then I saw her face, now I'm a believer.
Not a trace of doubt in my mind.
I'm in love,
I'm a believer, I couldn't leave her if I tried.

(Verse 2)
I thought love was more or less a givin' thing.   'First' test line, same verse
Seemed the more I gave the less I got.   **Probe Line**
What's the use in trying, all you get is pain.
When I needed sunshine I got rain.

(Chorus)
Then I saw her face, now I'm a believer.
Not a trace of doubt in my mind.
I'm in love,
I'm a believer, I couldn't leave her if I tried.

(Verse 3)
Ahhhh
Love was out to get to me.   'Same' test line, later verse
Now that's the way it seemed.   'Next' test line, later verse
Disappointment haunted all my dreams.   'Last' test line, later verse

(Chorus)
Yes, I saw her face, now I'm a believer.
There's not a trace of doubt in my mind.
I'm in love, well, I'm a believer.
Yeah, yeah, yeah, yeah, yeah, yeah, yeah ah-uh-uh.

"Down Under" by Men At Work (3 minutes 43 seconds)

(Verse 1)
Traveling in a fried-out Combie,
On a hippie trail, head full of zombie.
I met a strange lady, she made me nervous.
She took me in and gave me breakfast, and she said

'First' test line, earlier verse
'Same' test line, earlier verse
'Next' test line, earlier verse

(Chorus 1)
"Do you come from a land down under?
Where women glow and men plunder?
Can't you hear, can't you hear the thunder?
You better run, you better take cover."

(Verse 2)
Buying bread from a man in Brussels.
He was six foot four and full of muscles.
I said, "Do you speak-a my language?"
He just smiled and gave me a vegemite sandwich, and he said

'First' test line, same verse
Probe Line

(Chorus 2)
"I come from a land down under
Where beer does flow and men chunder.
Can't you hear, can't you hear the thunder?
You better run, you better take cover."

(Verse 3)
Lying in a den in Bombay
With a slack jaw, and not much to say.
I said to the man, "Are you trying to tempt me
Because I come from the land of plenty?", and he said

'Same' test line, later verse
'Next' test line, later verse
'Last' test line, later verse

(Chorus 3)
"Oh! Do you come from a land down under? (oh yeah yeah)
Where women glow and men plunder?
Can't you hear, can't you hear the thunder?
You better run, you better take cover."

"Rock The Casbah" by The Clash (3 minutes 43 seconds)

(Verse 1)
Now the king told the boogie men 'You have to let that raga drop',
The oil down the desert way has been shaking to the top.
The sheik he drove his Cadillac, he went a-cruisin' down the 'ville,
The muezzin was a-standing on the radiator grille.

'First' test line, earlier verse
'Same' test line, earlier verse
'Next' test line, earlier verse

(Chorus)
The Shareef don't like it.
Rockin' the Casbah, rock the Casbah.
The Shareef don't like it.
Rockin' the casbah, Rock the Casbah.

(Verse 2)
By order of the prophet we ban that boogie sound.
Degenerate the faithful with that crazy Casbah sound.
But the bedouin they brought out, the electric camel drum.
The local guitar picker got his guitar picking thumb, as soon as the
Shareef had cleared the square they began to wail.

'First' test line, same verse
Probe Line

(Chorus)
The Shareef don't like it.
Rockin' the Casbah, rock the Casbah.
The Shareef don't like it.
Rockin' the Casbah, rock the Casbah.

(Verse 3)
The king called up his jet fighters, he said you better earn your pay
Drop your bombs between the minarets down the Casbah way
As soon as the Shareef was chauffeured outta there
The jet pilots tuned to the cockpit radio blare

'Same' test line, later verse
'Next' test line, later verse
'Last' test line, later verse

(Chorus)
The Shareef don't like it.
Rockin' the Casbah, rock the Casbah.
The Shareef don't like it.
Rockin' the Casbah, rock the Casbah.

"Like A Prayer" by Madonna (5 minutes 51 seconds)

(Verse 1)

Life is a mystery,	'First' test line, earlier verse
Everyone must stand alone.	'Same' test line, earlier verse
I hear you call my name	'Next' test line, earlier verse
And it feels like home.	

(Chorus)
When you call my name, it's like a little prayer.
I'm down on my knees, I wanna take you there.
In the midnight hour, I can feel your power.
Just like a prayer you know I'll take you there.

(Verse 2)

I hear your voice, it's like an angel sighing.	'First' test line, same verse
I have no choice, I hear your voice, feels like flying.	**Probe Line**
I close my eyes, oh God I think I'm falling.	
Out of the sky, I close my eyes, Heaven help me.	

(Chorus)
When you call my name it's like a little prayer.
I'm down on my knees, I wanna take you there.
In the midnight hour, I can feel your power.
Just like a prayer, you know I'll take you there.

(Verse 3)

Like a child you whisper softly to me.	
You're in control just like a child, Now I'm dancing.	'Same' test line, later verse
It's like a dream, no end and no beginning.	'Next' test line, later verse
You're here with me, it's like a dream, let the choir sing.	'Last' test line, later verse

(Chorus)
When you call my name it's like a little prayer
I'm down on my knees, I wanna take you there
In the midnight hour I can feel your power
Just like a prayer you know I'll take you there

(Repeat Chorus)

"We Will Rock You" by Queen (2 minutes 02 seconds)

(Verse 1)
Buddy you're a boy make a big noise.   'First' test line, earlier verse
Playin' in the street gonna be a big man some day.   'Same' test line, earlier verse
You got mud on your face, you big disgrace.   'Next' test line, earlier verse
Kickin' your can all over the place.

(Chorus)
We will, we will
Rock you.
We will, we will
Rock you.

(Verse 2)
Buddy you're a young man, hard man.   'First' test line, same verse
Shoutin' in the street, gonna take on the world some day. **Probe Line**
You got blood on your face, you big disgrace.
Wavin' your banner all over the place.

(Chorus)
We will, we will
Rock you.
We will, we will
Rock you.

(Verse 3)
Buddy you're an old man, poor man
Pleadin' with your eyes, gonna make you some peace some day.   'Same' test line, later verse
You got blood on your face, you big disgrace.   'Next' test line, later verse
Somebody better put you back in your place.   'Last' test line, later verse

(Chorus)
We will, we will
Rock you.
We will, we will
Rock you.

"I Heard It Through The Grapevine" by The Temptations (3 minutes 04 seconds)

(Verse 1)
Ooh, I bet you're wonderin' how i knew, 'bout your plans to make me blue,   'First' test line, earlier verse
With some other guy you knew before.   'Same' test line, earlier verse
Between the two of us guys you know I love you more.   'Next' test line, earlier verse
It took me by surprise I must say, when I found out yesterday

(Chorus)
Don't you know that I heard it through the grapevine.
Not much longer would you be mine.
Oh, I heard it through the grapevine.
Oh, i'm just about to lose my mind.
Honey, honey, yeah.

(Verse 2)
Ohh I know a man ain't supposed to cry, but these tears I can't hold inside.   'First' test line, same verse
Losin' you would end my life you see,   **Probe Line**
'Cause you mean that much to me
You could have told me yourself, that you loved someone else.

(Chorus)
Instead I heard it through the grapevine.
Not much longer would you be mine.
Oh, I heard it through the grapevine.
And i'm just about to lose my mind.
Honey, honey, yeah.

(Verse 3)
Yeah people say believe half of what you see son, and none of what you hear.
But I can't help but be confused.   'Same' test line, later verse
If it is true, please tell me dear.   'Next' test line, later verse
Do you plan to let me go for the other guy you loved before?   'Last' test line, later verse

(Chorus)
Don't you know I heard it through the grapevine.
Not much longer would you be mine.
Oh, I heard it through the grapevine.
Oh, i'm just about to lose my mind.
Honey, honey, yeah.

"(I Can't Get No) Satisfaction" by The Rolling Stones (3 minutes 43 seconds)

(Chorus)
I can't get no satisfaction.
I can't get no satisfaction.
'Cause I try and I try and I try and I try.
I can't get no, I can't get no .

(Verse 1)
When I'm drivin' in my car, and that man comes on the radio.   'First' test line, earlier verse
He's tellin' me more and more about some useless information.   'Same' test line, earlier verse
Supposed to fire my imagination.   'Next' test line, earlier verse
I can't get no, oh no no no.

(Chorus)
I can't get no satisfaction.
I can't get no satisfaction.
'Cause I try and I try and I try and I try.
I can't get no, I can't get no.

(Verse 2)
When I'm watchin' my TV and that man comes on to tell me   'First' test line, same verse
How white my shirts can be.   **Probe Line**
Well he can't be a man 'cause he doesn't smoke
The same cigarrettes as me.

(Chorus)
I can't get no, oh no no no, hey hey hey, that's what I say.
I can't get no satisfaction, I can't get no girl with action.
'Cause I try and I try and I try and I try.
I can't get no, I can't get no.

(Verse 3)
When I'm ridin' round the world, and I'm doin' this and I'm signing that,
And I'm tryin' to make some girl   'Same' test line, later verse
Who tells me baby better come back later next week,   'Next' test line, later verse
'Cause you see I'm on a losing streak.   'Last' test line, later verse

(Chorus)
I can't get no, oh no no no.
Hey hey hey, that's what I say.
I can't get no, I can't get no.
I can't get no satisfaction.
No satisfaction, no satisfaction, no satisfaction.

"Pride (In The Name Of Love)" by U2 (3 minutes 50 seconds)

(Verse 1)
One man come in the name of love.   'First' test line, earlier verse
One man come and go.   'Same' test line, earlier verse
One man come he to justify.   'Next' test line, earlier verse
One man to overthrow.

(Chorus)
In the name of love.
What more in the name of love.
In the name of love.
What more in the name of love.

(Verse 2)
One man caught on a barbed wire fence. 'First' test line, same verse
One man he resist.   **Probe Line**
One man washed on an empty beach.
One man betrayed with a kiss.

(Chorus)
In the name of love.
What more in the name of love.
In the name of love.
What more in the name of love.

(Verse 3)
Early morning, April 4.
Shot rings out in the Memphis sky.   'Same' test line, later verse
Free at last, they took your life.   'Next' test line, later verse
They could not take your pride.   'Last' test line, later verse

(Chorus)
In the name of love.
What more in the name of love.
In the name of love.
What more in the name of love.

"Better Be Home Soon" by Crowded House (3 minutes 10 seconds)

(Verse 1)

Somewhere deep inside   'First' test line, earlier verse
Something's got a hold on you.   'Same' test line, earlier verse
And its pushing me aside.   'Next' test line, earlier verse
See it stretch on forever.

(Chorus)

I know I'm right
For the first time in my life.
That's why I tell you,
You'd better be home soon.

(Verse 2)

Stripping back the coats   'First' test line, same verse
Of lies and deception.   **Probe Line**
Back to nothingness,
Like a week in the desert

(Chorus)

I know I'm right
For the first time in my life.
That's why I tell you,
You'd better be home soon.

(Bridge)

So don't say no, don't say nothing's wrong,
Cos when you get back home maybe I'll be gone.

(Verse 3)

It would cause me pain
If we were to end it.   'Same' test line, later verse
But I could start again,   'Next' test line, later verse
You can depend on it.   'Last' test line, later verse

(Chorus)

I know I'm right
For the first time in my life.
That's why I tell you,
You'd better be home soon.

(Repeat Chorus)

"Fortunate Son" by Creedence Clearwater Revival (2 minutes 18 seconds)

(Verse 1)
Some folks are born made to wave the flag,   'First' test line, earlier verse
Ooh, they're red, white and blue.   'Same' test line, earlier verse
And when the band plays hail to the chief,   'Next' test line, earlier verse
Ooh, they point the cannon at you, lord,

(Chorus)
It ain't me, it ain't me,
I ain't no senators son, son.
It ain't me, it ain't me;
I aint no fortunate one, no.

(Verse 2)
Some folks are born silver spoon in hand,   'First' test line, same verse
Lord, don't they help themselves, y'all.   **Probe Line**
But when the taxman comes to the door,
Lord, the house looks like a rummage sale, yes.

(Chorus)
It ain't me, it ain't me,
I ain't no millionaires son, no.
It ain't me, it ain't me;
I ain't no fortunate one, no.

(Verse 3)
Some folks inherit star spangled eyes,
Ooh, they send you down to war, lord,   'Same' test line, later verse
And when you ask them, how much should we give?   'Next' test line, later verse
Ooh, they only answer more! more! more! Ya'll,   'Last' test line, later verse

(Chorus)
It ain't me, it ain't me,
I aint no military son, son.
It ain't me, it ain't me;
I ain't no fortunate one, one.

(Repeat Chorus)

"The Piano Man" by Billy Joel (5 minutes 38 seconds)

(Verse 1)
Its nine o'clock on a Saturday, the regular crowd shuffles in.   'First' test line, earlier verse
There's an old man sitting next to me making love to his tonic and gin.   'Same' test line, earlier verse
He says 'son, can you play me a memory? I'm not really sure how it goes,   'Next' test line, earlier verse
But it's sad and its sweet and I knew it complete when I wore a younger mans clothes'.

(Chorus)
Sing us a song, you're the piano man.
Sing us a song tonight.
Well, we're all in the mood for a melody,
And you've got us feeling alright.

(Verse 2)
Now john at the bar is a friend of mine, he gets me my drinks for free.   'First' test line, same verse
And he's quick with a joke or to light up your smoke,   **Probe Line**
but there's someplace that he'd rather be.
He says 'Bill, I believe this is killing me', as the smile ran away from his face,
'Well I'm sure that I could be a movie star if I could get out of this place'.

(Chorus)
Sing us a song, you're the piano man.
Sing us a song tonight.
Well, we're all in the mood for a melody,
And you've got us feeling alright.

(Verse 3)
It's a pretty good crowd for a Saturday and the manager gives me a smile,
Cause he knows that it's me they've been coming to see,   'Same' test line, later verse
to forget about life for a while.
And the piano, it sounds like a carnival, and the microphone smells like a beer. 'Next' test line, later verse
And they sit at the bar and put bread in my jar,   'Last' test line, later verse
 and say, 'man, what are you doing here?'.

(Chorus)
Sing us a song, you're the piano man.
Sing us a song tonight.
Well, we're all in the mood for a melody,
And you've got us feeling alright.

"Another One Bites The Dust" by Queen (3 minutes 36 seconds)

(Verse 1)
Steve walks warily down the street, with the brim pulled way down low.   'First' test line, earlier verse
Ain't no sound but the sound of his feet, machine guns ready to go.   'Same' test line, earlier verse
Are you ready, are you ready for this, are you hanging on the edge of your seat? 'Next' test line, earlier verse
Out of the doorway the bullets rip to the sound of the beat.

(Chorus)
Another one bites the dust.
Another one bites the dust.
And another one gone, and another one gone, another one bites the dust.
Hey, I'm gonna get you too.
Another one bites the dust.

(Verse 2)
How do you think I'm going to get along without you, when you're gone.   'First' test line, same verse
You took me for everything that I had, and kicked me out on my own.   **Probe Line**
Are you happy, are you satisfied, how long can you stand the heat?
Out of the doorway the bullets rip to the sound of the beat.

(Chorus)
Another one bites the dust.
Another one bites the dust.
And another one gone, and another one gone, another one bites the dust.
Hey, I'm gonna get you too.
Another one bites the dust.

(Verse 3)
There are plenty of ways you can hurt a man and bring him to the ground,
You can beat him, you can cheat him, you can treat him bad and   'Same' test line, later verse
leave him when he's down.
But I'm ready, yes I'm ready for you, I'm standing on my own two feet.   'Next' test line, later verse
Out of the doorway the bullets rip, repeating the sound of the beat.   'Last' test line, later verse

(Chorus)
Another one bites the dust.
Another one bites the dust.
And another one gone, and another one gone, another one bites the dust.
Hey, I'm gonna get you too.
Another one bites the dust.

"Wild Horses" by The Rolling Stones (5 minutes 44 seconds)

(Verse 1)
Childhood living is easy to do,   'First' test line, earlier verse
The things you wanted I bought them for you,   'Same' test line, earlier verse
Graceless lady you know who I am,   'Next' test line, earlier verse
You know I can't let you slide through my hands.

(Chorus)
Wild horses,
Couldn't drag me away,
Wild, wild horses,
Couldn't drag me away.

(Verse 2)
I watched you suffer a dull aching pain,   'First' test line, same verse Now
You decided to show me the same,   **Probe Line**
No sweeping exits or offstage lines,
Could make me feel bitter or treat you unkind.

(Chorus)
Wild horses,
Couldn't drag me away,
Wild, wild horses,
Couldn't drag me away.

(Verse 3)
I know I dreamed you a sin and a lie,
I have my freedom but I don't have much time,   'Same' test line, later verse
Faith has been broken, tears must be cried,   'Next' test line, later verse
Let's do some living after we die.   'Last' test line, later verse

(Chorus)
Wild horses,
Couldn't drag me away,
Wild, wild horses,
We'll ride them some day.

(Repeat Chorus)

"Sweet Home Alabama" by Lynyrd Skynyrd (4 minutes 41 seconds)

(Verse 1)

Big wheels keep on turning, carry me home to see my kin.	'First' test line, earlier verse
Singing songs about the Southland, I miss Alabamy once again and I think it's a sin, yes	'Same' test line, earlier verse
Well I heard mister Young sing about her, well I heard 'ole Neil put her down	'Next' test line, earlier verse
Well I hope Neil Young will remember, a southern man don't need him around anyhow	

(Chorus)
Sweet home Alabama,
Where the skies are so blue.
Sweet Home Alabama,
Lord, I'm coming home to you.

(Verse 2)

In Birmingham they love the governor.	'First' test line, same verse
Now we all did what we could do.	**Probe Line**
Now Watergate does not bother me.	
Does your conscience bother you? Tell the truth.	

(Chorus)
Sweet home Alabama,
Where the skies are so blue.
Sweet Home Alabama,
Lord, I'm coming home to you

(Verse 3)

Now Muscle Shoals has got the Swampers,	
And they've been known to pick a song or two.	'Same' test line, later verse
Lord they get me off so much,	'Next' test line, later verse
They pick me up when I'm feeling blue, now how about you?	'Last' test line, later verse

(Chorus)
Sweet home Alabama,
Where the skies are so blue.
Sweet Home Alabama,
Lord, I'm coming home to you.

(Repeat Chorus)

"Don't Stop" by Fleetwood Mac (3 minutes 10 seconds)

(Verse 1)
If you wake up and don't want to smile,   'First' test line, earlier verse
If it takes just a little while,   'Same' test line, earlier verse
Open your eyes and look at the day,   'Next' test line, earlier verse
You'll see things in a different way.

(Chorus)
Don't stop, thinking about tomorrow,
Don't stop, it'll soon be here,
It'll be better than before,
Yesterday's gone, yesterday's gone.

(Verse 2)
Why not think about times to come,   'First' test line, same verse
And not about the things that you've done.   **Probe Line**
If your life was bad to you,
Just think what tomorrow will do.

(Chorus)
Don't stop, thinking about tomorrow,
Don't stop, it'll soon be here,
It'll be better than before,
Yesterdays gone, yesterdays gone.

(Verse 3)
All I want is to see you smile,
If it takes just a little while,   'Same' test line, later verse
I know you don't believe that its true,   'Next' test line, later verse
I never meant any harm to you.   'Last' test line, later verse

(Chorus)
Don't stop, thinking about tomorrow,
Don't stop, it'll soon be here,
It'll be better than before,
Yesterdays gone, yesterdays gone.

Don't you look back,
Don't you look back.

"(You Make Me Feel Like) A Natural Woman" by Carole King (3 minutes 58 seconds)

(Verse 1)

Looking out on the morning rain, I used to feel uninspired,	'First' test line, earlier verse
And when I knew I had to face another day, Lord, it made me feel so tired.	'Same' test line, earlier verse
Before the day I met you, life was so unkind,	'Next' test line, earlier verse
But your love was the key to my peace of mind.	

(Chorus)
'Cause you make me feel,
You make me feel,
You make me feel,
Like a natural woman.

(Verse 2)

And when my soul was in the lost-and-found, you came along to claim it.	'First' test line, same verse
I didn't know just what was wrong with me, 'till your kiss helped me name it.	**Probe Line**
Now I'm no longer doubtful of what I'm living for,	
'Cause if I make you happy I don't need to do more.	

(Chorus)
You make me feel,
You make me feel,
You make me feel,
Like a natural woman.

(Verse 3)

Oh, baby what you've done to me (what you've done to me),	
You make me feel so good inside (good inside),	'Same' test line, later verse
And I just wanna be (wanna be) close to you.	'Next' test line, later verse
You make me feel so alive.	'Last' test line, later verse

(Chorus)
You make me feel,
You make me feel,
You make me feel,
Like a natural, natural woman.

"I Shot The Sheriff" by Bob Marley (4 minutes 41 seconds)

(Verse 1)
Yeah! All around in my home town, they're trying to track me down.
They say they want to bring me in guilty for the killing of a deputy,
For the life of a deputy.
But I say:

'First' test line, earlier verse
'Same' test line, earlier verse
'Next' test line, earlier verse

(Chorus)
(I shot the sheriff.) - The Sheriff.
But I swear it was in self-defence.
Oh, no! (ooh, ooh, oo-oh) Yeah!
I say I shot the sheriff - oh, Lord! (And they say it is a capital offence).
Yeah! (ooh, ooh, oo-oh) Yeah!

(Verse 2)
Sheriff John Brown always hated me, for what, I don't know.
Every time I plant a seed, he said "kill it before it grows".
He said "kill them before they grow".
And so:

'First' test line, same verse
Probe Line

(Chorus)
Read it in the news (I shot the sheriff) Oh, Lord!
But I swear it was in self-defence. Where was the deputy? (oo-oo-oh)
I say I shot the sheriff,
But I swear it was in self-defence. (oo-oh) Yeah!

(Verse 3)
Freedom came my way one day and I started out of town, yeah!
All of a sudden I saw sheriff John Brown aiming to shoot me down,
So I shot - I shot - I shot him down and I say
If I am guilty I will pay.

'Same' test line, later verse
'Next' test line, later verse
'Last' test line, later verse

(Chorus)
(I shot the sheriff) But I say (I didn't shoot no deputy),
I didn't shoot no deputy (oh, no-oh), Oh no!
(I shot the sheriff) I did!
But I didn't shoot no deputy. oh! (oo-oo-ooh)

(Repeat Chorus)

"Thriller" by Michael Jackson (5 minutes 57 seconds)

(Verse 1)

It's close to midnight and something evil's lurking in the dark.	'First' test line, earlier verse
Under the moonlight you see a sight that almost stops your heart.	'Same' test line, earlier verse
You try to scream but terror takes the sound before you make it.	'Next' test line, earlier verse
You start to freeze as horror looks you right between the eyes, you're paralyzed.	

(Chorus)
'Cause this is Thriller, Thriller Night,
And no-one's gonna save you from the beast about strike.
You know it's Thriller, Thriller Night,
You're fighting for your life inside a killer, thriller tonight.

(Verse 2)

You hear the door slam and realise there's nowhere left to run.	'First' test line, same verse
You feel the cold hand and wonder if you'll ever see the sun.	**Probe Line**
You close your eyes and hope that this is just imagination,	
But all the while you hear the creature creeping up behind, you're out of time.	

(Chorus)
'Cause this is Thriller, Thriller Night.
There ain't no second chance against the thing with forty eyes.
You know it's Thriller, Thriller Night,
You're fighting for your life inside of killer, thriller tonight.

(Bridge)
Night creatures call,
And the dead start to walk in their masquerade.
There's no escaping the jaws of the alien this time (They're Open Wide),
This is the end of your life.

(Verse 3)

They're out to get you, there's demons closing in on every side.	
They will possess you unless you change the number on your dial.	'Same' test line, later verse
Now is the time for you and I to cuddle close together.	'Next' test line, later verse
All through the night I'll save you from the terror on the screen, I'll make you see.	'Last' test line, later verse

(Chorus)
That this is Thriller, Thriller Night,
'Cause I can thrill you more than any ghost would dare to try.
Girl, this is Thriller, Thriller Night,
So let me hold you tight and share a killer, killer, chiller, thriller here tonight.

(Repeat Chorus)

"Layla" by Eric Clapton (4 minutes 39 seconds)

(Verse 1)
What'll you do when you get lonely
And nobody's waiting by your side?
You've been running and hiding much too long.
You know it's just your foolish pride.

'First' test line, earlier verse
'Same' test line, earlier verse
'Next' test line, earlier verse

(Chorus)
Layla, you've got me on my knees.
Layla, I'm begging, darling please.
Layla, darling won't you ease my worried mind.

(Verse 2)
I tried to give you consolation
When your old man had let you down.
Like a fool, I fell in love with you,
Turned my whole world upside down.

'First' test line, same verse
Probe Line

(Chorus)
Layla, you've got me on my knees.
Layla, I'm begging, darling please.
Layla, darling won't you ease my worried mind.

(Verse 3)
Let's make the best of the situation,
Before I finally go insane.
Please don't say we'll never find a way
And tell me all my love's in vain.

'Same' test line, later verse
'Next' test line, later verse
'Last' test line, later verse

(Chorus)
Layla, you've got me on my knees.
Layla, I'm begging, darling please.
Layla, darling won't you ease my worried mind.

"(Take Me Home) Country Roads" by John Denver (3 minutes 11 seconds)

(Verse 1)

Almost heaven, West Virginia,	'First' test line, earlier verse
Blue ridge mountains, Shenandoah river,	'Same' test line, earlier verse
Life is old there, older than the trees,	'Next' test line, earlier verse
Younger than the mountains, blowing like a breeze.	

(Chorus)
Country roads, take me home
To the place I belong.
West Virginia, mountain mama,
Take me home, country roads.

(Verse 2)

All my memories gathered round her,	'First' test line, same verse
Miners lady, stranger to blue water.	**Probe Line**
Dark and dusty, painted on the sky,	
Misty taste of moonshine teardrop in my eye.	

(Chorus)
Country roads, take me home
To the place I belong.
West Virginia, mountain mama,
Take me home, country roads.

(Verse 3)

I hear her voice, In the morning hour she calls me,	
The radio reminds me of my home far away,	'Same' test line, later verse
And driving down the road I get a feeling	'Next' test line, later verse
That I should have been home yesterday, yesterday.	'Last' test line, later verse

(Chorus)
Country roads, take me home
To the place I belong.
West Virginia, mountain mama,
Take me home, country roads.

"Sloop John 'B'" by The Beach Boys (2 minutes 58 seconds)

(Verse 1)

We come on the Sloop John 'B', My grandfather and me,	'First' test line, earlier verse
Around Nassau town we do roam,	'Same' test line, earlier verse
Drinking all night, got into a fight,	'Next' test line, earlier verse
Well I feel so broke up, I want to go home.	

(Chorus)

So hoist up the John 'B' sail, see how the mainsail sets,
Call for the captain ashore, let me go home.
Let me go home, I wanna go home, oh yeah,
Well I feel so broke up I wanna go home.

(Verse 2)

The first mate he got drunk and broke in the captains trunk,	'First' test line, same verse
The constable had to come and take him away.	**Probe Line**
Sheriff john stone why don't you leave me alone	
Yeah, yeah, well I feel so broke up I wanna go home.	

(Chorus)

So hoist up the John 'B' sail, see how the mainsail sets,
Call for the captain ashore, let me go home.
Let me go home, I wanna go home, oh yeah,
Well I feel so broke up I wanna go home.

(Verse 3)

The poor cook he caught the fits, he threw away all my grits,	
And then he took and he ate up all of my corn.	'Same' test line, later verse
Let me go home, why don't they let me go home,	'Next' test line, later verse
This is the worst trip I've ever been on.	'Last' test line, later verse

(Chorus)

So hoist up the John 'B' sail, see how the mainsail sets,
Call for the captain ashore, let me go home.
Let me go home, I wanna go home, oh yeah,
Well I feel so broke up I wanna go home.

"Money For Nothing" by Dire Straits (8 minutes 25 seconds)

(Verse 1)

Now look at them yo-yos, that's the way you do it,	'First' test line, earlier verse
you play the guitar on the MTV.	
That ain't working, that's the way you do it,	'Same' test line, earlier verse
money for nothing and your chicks for free.	
Now that ain't working, that's the way you do it,	'Next' test line, earlier verse
lemme tell ya, them guys ain't dumb,	
Maybe get a blister on your little finger,	
maybe get a blister on your thumb.	

(Chorus)
We gotta install microwave ovens,
Custom kitchen deliveries.
We gotta move these refrigerators,
We gotta move these colour TV's.

(Verse 2)

See the little faggot with the earring and the makeup,	'First' test line, same verse
Yeah buddy that's his own hair.	**Probe Line**
That little faggot got his own jet airplane,	
That little faggot he's a millionaire.	

(Chorus)
We gotta install microwave ovens,
Custom kitchens deliveries.
We gotta move these refrigerators,
We gotta move these colour TV's.

(Verse 3)

I shoulda learned to play the guitar,	
I shoulda learned to play them drums.	
Look at that mama, she got it sticking in the camera,	'Same' test line, later verse
man we could have some fun.	
And he's up there, what's that? Hawaiian noises?	'Next' test line, later verse
He's Banging on the bongos like a chimpanzee.	
That ain't working that's the way you do it,	'Last' test line, later verse
get your money for nothing get your chicks for free.	

(Chorus)
We gotta install microwave ovens,
Custom kitchen deliveries.
We gotta move these refrigerators,
We gotta move these colour TV's, Lord.

"Wild World" by Cat Stevens (3 minutes 20 seconds)

(Verse 1)
Now that I've lost everything to you, you say you wanna start something new,   'First' test line, earlier verse
And it's breakin' my heart you're leaving, baby, I'm grieving,   'Same' test line, earlier verse
But if you wanna leave, take good care, I hope you have a lot of   'Next' test line, earlier
verse
nice things to wear,
But then a lot of nice things turn bad out there.

(Chorus)
Oh, baby, baby, it's a wild world,
It's hard to get by just upon a smile.
Oh, baby, baby, it's a wild world,
I'll always remember you like a child, girl.

(Verse 2)
You know I've seen a lot of what the world can do, and it's breakin'   'First' test line, same verse
my heart in two
Because I never wanna see you a sad girl, don't be a bad girl,   **Probe Line**
But if you wanna leave, take good care, I hope you make a lot of
nice friends out there,
But just remember there's a lot of bad and beware.

(Chorus)
Oh, baby, baby, it's a wild world.
It's hard to get by just upon a smile.
Oh, baby, baby, it's a wild world,
I'll always remember you like a child, girl.

(Verse 3)
Baby, I love you,
But if you wanna leave, take good care.   'Same' test line, later verse
I hope you make a lot of nice friends out there,   'Next' test line, later verse
But just remember there's a lot of bad and beware.   'Last' test line, later verse

(Chorus)
Oh, baby, baby, it's a wild world,
It's hard to get by just upon a smile.
Oh, baby, baby, it's a wild world,
I'll always remember you like a child, girl.

"Bridge Over Troubled Water" by Simon & Garfunkel (4 minutes 55 seconds)

(Verse 1)
When you're weary, feeling small,   'First' test line, earlier verse
When tears are in your eyes, I will dry them all;   'Same' test line, earlier verse
I'm on your side, oh, when times get rough,   'Next' test line, earlier verse
And friends just can't be found.

(Chorus)
Like a bridge over troubled water
I will lay me down.
Like a bridge over troubled water
I will lay me down.

(Verse 2)
When you're down and out, when you're on the street,
When evening falls so hard, I will comfort you.   **Probe Line**
I'll take your part, oh, when darkness comes
And pain is all around.

(Chorus)
Like a bridge over troubled water
I will lay me down.
Like a bridge over troubled water
I will lay me down.

(Verse 3)
Sail on silver girl, sail on by,
Your time has come to shine, all your dreams are on their way,   'Same' test line, later verse
See how they shine, whoa, if you need a friend,   'Next' test line, later verse
I'm sailing right behind.   'Last' test line, later verse

(Chorus)
Like a bridge over troubled water
I will ease your mind.
Like a bridge over troubled water
I will ease your mind.

"New Sensation" by INXS (3 minutes 42 seconds)

(Verse 1)

Live baby live, now that the day is over.	'First' test line, earlier verse
I got a new sensation in perfect moments, impossible to refuse.	'Same' test line, earlier verse
Sleep baby sleep, Now that the night is over,	
And the sun comes like a god into our room, all perfect light and promises.	'Next' test line, earlier verse

(Chorus 1)
Gotta hold on you,
A new sensation,
Right now,
Gonna take you over, A new sensation.

(Verse 2)

Dream baby dream, of all that's come and going,	'First' test line, same verse
And you will find out in the end, there really is, there really is no difference,	**Probe Line**
Cry baby cry, when you've got to get it out.	
I'll be your shoulder, you can tell me all, don't keep it in ya, that's the reason why I'm here	

(Chorus)
Are you ready for a new sensation?
Right now.
Gonna take you on a new sensation,
A new sensation.

(Verse 3)

Hate baby hate, when there's nothing left for you.	
You're only human, what can you do? It'll soon be over, don't let your pain take over you	'Same' test line, later verse
Love baby lovel, it's written all over your face.	'Next' test line, later verse
There's nothing better we could do than live forever, well that's all we've got to do.	'Last' test line, later verse

(Chorus)
Hey now Im gonna take you over,
A new sensation.
Right now I gotta hold on you,
A new sensation.

Trial Song 1: "Blowin' In The Wind" by Joan Baez (0 minutes 46 seconds)

(Verse 1)

How many roads must a man walk down   'First' test line, same verse

Before they call him a man

How many seas must a white dove sail   **Probe Line**

Before she sleeps in the sand

How many times must the cannonballs fly   'Last' test line, same verse

Before they are forever banned

(Chorus)

The answer, my friend,

Is blowin' in the wind.

The answer is blowin' in the wind.

Trial Song 2: "Imagine" by John Lennon (3 minutes 42 seconds)

(Verse 1)
Imagine there's no heaven, it's easy if you try.
No hell below us, above us only sky.   'Same' test line, earlier verse
Imagine all the people
Living for today.

(Verse 2)
Imagine there's no countries, it isn't hard to do.
Nothing to kill or die for, and no religion too.   **Probe Line**
Imagine all the people
Living life in peace.

(Chorus)
You may say that I'm a dreamer
But I'm not the only one.
I hope someday you'll join us
And the world will be as one.

(Verse 3)
Imagine no possessions, I wonder if you can.
No need for greed or hunger, a brotherhood of man.   'Same' test line, later verse
Imagine all the people
Sharing all the world.

(Chorus)
You may say that I'm a dreamer
But I'm not the only one.
I hope someday you'll join us
And the world will live as one.

Appendix K

Average Mean Reaction Times (ms) of Correct Responses for Each Probe Line for

Nonmusicians

Excerpt No.	1	2	3	4	5	6	7
Participant	Verse 1 Line 1	Verse 1 Line 2	Verse 1 Line 3	Verse 2 Line 1	Verse 3 Line 2	Verse 3 Line 3	Verse 3 Line 4
1	6377.8	5383.3	6568.5	8199.4	4446.8	4635.5	4712.5
2	3114.8	4296.7	4367.8	3395.0	3335.3	3404.6	3882.5
3	2761.3	3370.3	2943	3278.5	3145.2	4397.7	2818.4
4	2903.7	3460.3	3991.5	3777.4	5420.0	3574.5	4672.1
5	3971.8	3932.5	6468	6068.8	5128.2	4033.5	3989.0
6	2502.7	3293.5	3468.8	4771.2	3590.8	4251.6	3978.6
7	3992.2	6597.0	4652.8	7454.0	3482.5	5438.1	4297.7
8	3721.1	2313.2	3903.3	3284.0	2437.5	2070.0	3099.5
9	4120.3	6540.2	4748.3	4069.0	4102.5	4630.0	5123.5
10	2980.5	3720.6	4958.6	3294.4	3457.8	4003.4	2830.0
11	3103.6	6340.1	6721.5	4420.6	5668.0	4961.5	5160.8
12	3948.8	4548.0	4003	7479.6	3944.1	6969.6	5463.2
13	3363.0	4312.6	3925.4	5310.1	5045.4	4503.6	4453.0
14	3261.0	3018.2	4219.2	3931.7	5806.6	4500.7	5813.4
15	3502.3	5496.7	4655.6	5206.1	4223.4	3666.8	3835.1
16	3104.4	3071.1	3300.7	3467.4	4581.0	4544.5	4012.8
17	2921.0	3416.4	3174	4136.2	3087.1	3165.5	2725.1
18	4675.8	4896.3	6566.4	5484.1	4440.8	6544.8	4289.5
19	3845.7	3975.0	5941.5	5294.3	6275.6	6381.7	6233.1
20	1793.1	2824.1	4991.3	3345.0	1880.7	2938.8	2838.8
Average	3498.2	4240.3	4678.5	4783.3	4174.9	4430.8	4211.4

Appendix L

Average Mean Reaction Times (ms) of Correct Responses for Each Probe Line for

Musicians

Excerpt No.	1	2	3	4	5	6	7
Participant	Verse 1 Line 1	Verse 1 Line 2	Verse 1 Line 3	Verse 2 Line 1	Verse 3 Line 2	Verse 3 Line 3	Verse 3 Line 4
1	2983.0	3020.5	6869.7	3981.7	2511.2	3294.2	3940.7
2	2011.6	3754.1	3849.4	3945.1	2915.5	3743.8	3263.1
3	2441.6	3407.5	3655.6	2963.4	2992.1	3319.8	2531.3
4	4768.2	4838.8	5333.5	4742.4	4958.7	5051.8	4650.0
5	3504.5	4153	6284.7	6270.2	6323.0	6435.7	4599.0
6	5396.8	3278.2	5709.1	5502.2	4085.3	5107.7	4779.5
7	3142.5	3881.5	4226.7	2519.5	3119.4	3356.6	3071.8
8	5453.2	6210.7	5096.6	4850.0	4501.1	5221.3	4900.1
9	3390.5	3022.4	3680.3	4221.0	2848.7	3277.3	4614.5
10	4578.0	4421.3	7495.8	5069.2	3975.5	6195.4	4361.5
11	2553.2	4825.0	2845.3	3286.0	4833.4	2834.4	3266.0
12	4052.8	4102.1	4308.5	4938.8	4569.4	3975.5	3221.5
13	2110.0	3367.5	3884.2	4918.2	3058.5	4060.7	3160.0
14	4901.5	4877.0	4538.6	4446.1	2710.8	2717.0	2429.1
15	3113.6	4176.8	4342.8	4013.4	5070.6	4901.2	5445.0
16	2881.2	3539.4	3674.7	3547.2	2875.6	3829.4	3486.5
17	3081.5	3088.7	5550.3	5099.8	4628.0	3997.6	4009.2
18	4378.5	3869.8	6342.0	4465.8	3217.1	3664.0	4117.8
19	3585.5	3126.6	2996.5	5468.2	4585.5	5510.8	4918.1
20	2505.2	3223.0	4232.2	2933.0	3282.8	4211.1	3716.5
Average	3541.6	3909.2	4745.8	4359.0	3853.1	4235.3	3924.0

Appendix M

Accuracy Scores Measured as Percent (%) Correct for Nonmusicians

Excerpt No.	1	2	3	4	5	6	7
Participant	Verse 1 Line 1	Verse 1 Line 2	Verse 1 Line 3	Verse 2 Line 1	Verse 3 Line 2	Verse 3 Line 3	Verse 3 Line 4
1	50	100	50	62.5	62.5	75	100
2	75	87.5	75	87.5	75	75	75
3	100	62.5	62.5	87.5	50	87.5	75
4	100	100	75	62.5	62.5	50	87.5
5	100	100	50	62.5	62.5	75	87.5
6	87.5	87.5	62.5	62.5	87.5	62.5	37.5
7	87.5	50	62.5	87.5	87.5	87.5	87.5
8	75	62.5	37.5	75	87.5	50	100
9	75	50	75	62.5	50	87.5	50
10	75	62.5	37.5	62.5	62.5	87.5	100
11	100	87.5	50	75	87.5	75	100
12	100	62.5	25	62.5	75	62.5	62.5
13	87.5	75	87.5	75	75	75	62.5
14	100	87.5	100	100	75	50	62.5
15	100	87.5	62.5	87.5	87.5	100	75
16	87.5	75	50	62.5	75	25	75
17	62.5	87.5	50	50	87.5	87.5	75
18	100	75	62.5	75	75	62.5	87.5
19	87.5	50	25	37.5	75	50	87.5
20	100	75	75	50	50	75	87.5
Average	86.8	76.2	58.7	69.4	72.5	70.0	78.7

Appendix N

Accuracy Scores Measured as Percent (%) Correct for Musicians

Excerpt No.	1	2	3	4	5	6	7
Participant	Verse 1 Line 1	Verse 1 Line 2	Verse 1 Line 3	Verse 2 Line 1	Verse 3 Line 2	Verse 3 Line 3	Verse 3 Line 4
1	100.0	87.5	87.5	100.0	50.0	62.5	87.5
2	75.0	100.0	62.5	87.5	87.5	62.5	100.0
3	100.0	100.0	62.5	62.5	75.0	87.5	75.0
4	87.5	87.5	50.0	62.5	87.5	75.0	87.5
5	100.0	75.0	50.0	87.5	62.5	87.5	75.0
6	75.0	50.0	75.0	62.5	75.0	87.5	100.0
7	75.0	75.0	50.0	25.0	87.5	75.0	100.0
8	62.5	50.0	37.5	62.5	75.0	75.0	87.5
9	100.0	75.0	100.0	100.0	87.5	75.0	87.5
10	87.5	75.0	62.5	75.0	75.0	87.5	75.0
11	87.5	62.5	37.5	50.0	62.5	62.5	75.0
12	100.0	75.0	75.0	62.5	62.5	87.5	87.5
13	25.0	50.0	50.0	87.5	75.0	50.0	37.5
14	100.0	62.5	62.5	75.0	87.5	100.0	100.0
15	62.5	75.0	62.5	62.5	62.5	62.5	87.5
16	100.0	62.5	50.0	62.5	75.0	87.5	75.0
17	75.0	62.5	75.0	62.5	62.5	75.0	100.0
18	87.5	75.0	50.0	75.0	87.5	75.0	87.5
19	87.5	50.0	37.5	50.0	50.0	62.5	75.0
20	87.5	87.5	75.0	37.5	62.5	87.5	75.0
Average	83.7	71.9	60.6	67.5	72.5	76.2	83.7

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