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# The Effect of Musical Training and Musical Complexity on Focus of Attention to Melody or Harmony

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# THE EFFECT OF MUSICAL TRAINING AND MUSICAL COMPLEXITY ON FOCUS OF ATTENTION TO MELODY OR HARMONY

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## ABSTRACT

The purpose of this study was to investigate the effects of musical training and musical complexity on focus of attention to melody or harmony. Participants ($N = 192$) were divided into four groups: University Jazz Majors ($n = 64$); University Music Majors consisting of instrumental performance or music education majors, ($n = 64$); High School instrumentalists ($n = 32$) consisting of tenth through twelfth grades, and Junior High School instrumentalists ($n = 32$) consisting of seventh- and eighth-graders. The university participants were further divided into response mode groups. Half of the music major and jazz major ($n = 32$) participants responded continuously via the Continuous Response Digital Interface (CRDI). The remaining university participants ($n = 32$) and the high school and junior high school participants responded via the static Likert-type scale measure. The musical complexity variable was categorized into four levels of melodic complexity (M1 – least complex; M2 – less complex; M3 – more complex; M4 – most complex) and four levels of harmonic complexity (H1 – least complex; H2 – less complex; H3 – more complex; H4 – most complex). Each trial consisted of a melodic complexity/harmonic complexity pairing performed by the same performer on jazz piano. Four levels of melodic complexity and four levels of harmonic complexity produced a total of 16 pairs of stimuli heard by each participant. In an attempt to control for order effect, the stimulus pairs were presented in four block-random orders so that no melodic or harmonic complexity levels would be heard consecutively. A four-factor ANOVA was conducted with two between subjects factors (order and musical training groups) and two within subjects factors (melodic complexity and harmonic complexity). Significant differences were found for focus of attention to melodic complexity, $F_{(3, 504)} = 94.63$, $p < .001$, and focus of attention to harmonic complexity, $F_{(3, 504)} = 12.97$, $p < .001$. Significant interactions occurred between musical training and focus of attention. Data show a positive relationship between harmonic focus of attention and increased musical training. Suggestions for future research into the effect of musical complexity and musical training are discussed.

# CHAPTER 1
# INTRODUCTION

Music consists of both horizontal (melodic/temporal) and vertical (harmonic) structures. Melody is generally perceived in a linear fashion and harmony in a vertical one. If music were simply the interplay between melody and harmony as independent units, it would be relatively easy to comprehend musical information. It would seem naïve to think of melody and harmony as mutually exclusive entities that conveniently coexist. Harmony and melody are, in fact, inexorably connected and one can be seen as an extension of the other. Even considering melody alone, research indicates that the listener implies certain harmonic structures from the melodic material present (Lerdahl & Jackendoff, 1983; Murphy, 1999; Platt & Racine, 1994). Butler and Brown (1994) suggest that the temporal nature of a melody actually creates harmonic structures in the listener as the melody progresses from note to note.

Composer/conductor Leonard Bernstein (1976) explained various aspects of music in his Harvard lecture series "Six Unanswered Questions." One of the lectures focused on melody, harmony, and their importance in the musical language. Bernstein compared musical structure with Chomsky's "deep structure" model of language (as sited in Bernstein, 1976). In simple terms, Bernstein suggested that melody functions as the "surface structure" while harmony is the "deep structure," but noted that when music or language become too complex, they begin to lose meaning, clarity, and substance for the listener.

Bernstein suggested that notes relate to syllables and, as specific collections of syllables create different sentences; different collections of notes create phrases. While this concept may not transfer at all levels, it is Bernstein's attempt at simplifying a concept that is both incredibly complex and, by its very nature, a phenomenon known only to the observer himself. Although this transfer is insightful, in language, words are symbolic representations of specific meaning (ideas, concepts, actions). Musical notes and rests are symbolic representations of sound and silence. They may not elicit specific meanings or ideas beyond themselves. The musical meaning is more in the order, intensity, and inflection in which the notes and rests are performed.

Aiello (1994b) illuminated similarities between language and music, such as inherent structure and the belief that both develop temporally and have some sort of meaning for the listener. Both music and language can be perceived in at least three levels: phonetic, syntactic, and semantic. The author suggested that a phrase in either format is a psychological structure and that it is the inherent ambiguity of music that separates it from language. In music, a specific harmonic progression can imply numerous melodies and the same melody can fit numerous harmonies. Language tends to be more linear and layering effects tend to obfuscate the meaning of the text while music allows for complexity and simultaneity.

There is a phrase oft used suggesting that music is the “universal language.” If this phase refers to the idea that music has an effect on all those who listen to it, then this statement is plausible, but to suggest music affects all listeners in the same way would be false. Further, to suggest that music has a universal meaning to all listeners would be even more difficult to substantiate. If the universality of music were the case, a sacred piece would be equally meaningful and understood by all those who listen to it; from Christians to atheists and Buddhists to Muslims. This illustration highlights cultural differences in musical meaning. One might consider differences in music perception or musical understanding. Does a Bach prelude have the same meaning to a classically trained musician as to a person completely untrained? Consider a work by either Bartok or Reich. It would seem that musical training has some effect on a listener’s ability to listen and understand the musical stimulus. An important question arises: is it merely a matter of exposure? Aiello (1994b) suggests that “Music can truly be seen as a universal language in the sense that music has meaning for everyone who listens to it" (p. 60).

The development of perception has been investigated and research has shown that music perception can be seen in very young children. In a series of three experiments, Palmer, Jungers, and Jusczyk (2001) found that children as young as 10-months of age can distinguish between familiar and novel music stimuli. Similarly, musically experienced listeners identified familiarized excerpts placed in different melodic contexts. The data show that identification was more accurate for excerpts whose prosodic cues (intensity and articulation) conflicted with the structure of the melodic context. The results support the concept that episodic memory for music incorporates stimulus-specific acoustic features as well as abstract structural features. Fagen, Prigot, Carroll, Pioli, Stein, and Franco (1997) found that three-month old children displayed one-day musical retention regardless of the musical selection but seven-day retention was seen only when the test music matched the training music.

Gardiner and colleagues (1990) tested memory for well-known musical phrases first for recognition in the absence of any specific musical context and then for recall given the preceding musical phrase as a contextual cue. Recognition and recall were found to be largely, but not completely, independent. There was no evidence of any greater dependency between recognition and recall than that previously observed in the relation between word recognition and recall, as summarized by the Tulving-Wiseman law. These findings significantly extend the applicability range of this law. Boisen (1981) found that melodic context affected the accuracy of students' aural perception of rhythmic completeness and incompleteness. As evidenced by the three previous studies, context is consequential in musical perception.

In a study of the electrophysiological differences of children’s baseline EEG frequencies and those recorded while listening to musical stimuli, Flohr (1996) found that the experimental group that received musical instruction showed significantly different EEG frequencies than the control group, particularly within the frequencies associated with increased cognitive processing and greater relaxation. There were no significant differences between groups on the behavior measures of spatial processing, but the results suggest that a clearer understanding of how music and music-related tasks are manifested in the electrical activity of the brain is an initial step in developing better instructional strategies for early education.

Sloboda (1984) reviewed research on the differences and similarities between the reading processes of successful and poor readers and the implications for music knowledge in reading for performance. He suggested that music reading is a form of music perception. Sloboda found that the "skill effect" of music training shows better readers have better visual memories for notation and are more attentive to structural configurations within the stimulus. Further, much of the stimulus read is analyzed for musical significance before a response is formulated. Results indicated that musicians are better readers than nonmusicians due to more efficient coding and storage mechanisms which results in their retention of stimulus details (Sloboda, 1985).

From Bernstein’s approach of “top down” understanding (1976) to Berlyne’s (1974, 1976) *new experimental aesthetic* and his concept of “from below” understanding, there seems to be some conflict as to how music is perceived. Brooks and Brooks (1993) stated that "each of us makes sense of our world by synthesizing new experiences into what we previously have come to understand" (p. 4) which suggests that perception as a whole, and music perception specifically, may be significantly influenced by our personal experiences and training. Therefore, the purpose of this study was to investigate the effects of musical training and musical complexity on focus of attention to melody or harmony.

## CHAPTER 2
## REVIEW OF LITERATURE

In the book *Musical Perceptions*, Bharucha (1994) suggested that musical expectation is centered on a tonal hierarchy revolving around octaves and fifths. In an attempt to illuminate this concept, he presented a spatial representation of key relationships and noted that chords that have common tones and, by extension, keys that have common tones tend to be the most closely related cognitively. This theory of tonal hierarchy was developed using a series of studies involving probe tones following the presentation of a musical stimulus. The researcher found the root, third, and fifth of a key were perceived as the most consonant to the listener. These relationships help develop schematic expectations (typical, culturally generic) and verdical (piece or genre specific) expectations. To investigate musical perception is a task of enormous proportions. Research in music perception is an investigation of characteristics of music and their effect on the listener so that those effects may be generalized to a much larger population.

Povel (1996) completed a preliminary study evaluating his theory of tonal levels within a key and found that harmonic progressions led to tonal expectation. The participants identified the tone they thought should follow a four chord harmonic progression. The results show that tonic was the most expected tone followed by the fifth and median, which constitute the other tones in the tonic triad.

Music perception occurs, at least at some level, when a listener is experiencing musical stimuli. Goolsby's (1994) research into eye movement suggests that control of eye movement, perceptual span, and attending to visual stimuli seem to be related to the higher-order processes involved in music reading. This evidence supports the idea that music reading is a form of music perception. While this research project focused on aural perception as its basis for inquiry, some notable research studies must be addressed that are important for any discussion of focus of attention (Berlyne, 1974; Berlyne, Craw, & Salapatek, 1963). For example, Berlyne et al. (1963) investigated the effects of the complexity of visual stimuli (high/low) and extrinsic motivation as measured by galvanic skin response (GSR). The data suggest some presence of increased GSR with more complex or incongruous visual patterns but this effect seems to be apparent only when the subjects' attention is focused on the task at hand. The results did show that GSR levels increased with novelty and with extrinsically motivated instruction. This study sheds light on the possibility of affective and arousal responses to other modes of stimulation such as listening. One study in particular, Ciepluch (1988), found no significant differences between the combination of music sight-reading achievement and listening or sight-reading achievement and activity sensory mode (visual, written word, listening, activity). These results suggest a possible similarity in information processing regardless of mode.

Perception of Melody

Melodies, not unlike harmonic progressions, are temporal in nature. The progression of tones affects the listener’s perception of the overall melody (Davidson, 1994; Dowling, 1973). The tonal context of the melody seems to be based on the most stable tones present; tonic and fifth (Bharucha, 1983). Contrapuntal music, such as a fugue or canon, may be analyzed from a theory point of view, as multiple melodic layers, but Dowling suggested that it [contrapuntal music] is perceived as a single musical presentation and the listener focuses on one melodic layer at a time.

Geringer and Madsen (1995/1996) found that melody seems to be attended to by both musicians and nonmusicians alike, while Gudmundsdottir (1999) found the ability to recognize melodies seems to be present at a young age. Schellenberg (1996) completed three experiments that tested his implication-realization model's description of tone-to-tone expectancies for continuations of melodies. The model successfully predicted listeners' judgments across different musical styles, regardless of musical training or nationality.

Pedagogically, Chivington (1990) demonstrated that teaching melodic and rhythmic patterns transferred to increased accuracy in performance of novel patterns. Pembrook (1987) found that in training melodic accuracy, a majority of students do not sing accurately enough after only listening to a melody once to benefit from vocalization memory techniques. Reviews of melodic perception investigations suggest possible links between melodic recognition and several different variables such as: contour (Dowling, 1973, 1978, 1994); the presence of text (Feierabend, Saunders, Holahan, & Getnick, 1998); metrical and modal alterations (Madsen & Staum, 1983; Madsen & Madsen, 2002); and timbre and register (Gudmundsdottir, 1999). Parisi (2002) demonstrated that fourth- and fifth-grade students could discriminate between a known melody and an improvised melody. Research suggests that melodic perception skills such as recognition, discrimination, and melodic expectation. The presence of melodic perception leads to the question of the development of harmonic perception and when it may occur.

Perception of Harmony

Research literature suggests that listeners tend to invoke some form of implied harmony while experiencing a musical stimulus. The harmony can be implied by any number of elements including the actual melodic pitches or the listener's personal experiences. When harmony is present in the stimulus, the harmony seems to be a function of key relationships rather than actual chords as the listener tends to perceive various key relationships, as in sonata form, rather than specific chords or progressions. These relationships are what create expectations in the listener and the musical experience is directly related to the resolution of those expectations (Meyer, 1994).

Harmonic expectancy seems to develop temporally during the listening process and it is possible that the order of melodic tones directly affects the perception of key center. In a study using a piece considered tonally ambiguous, Charles Ives' *Concorde Sonata*, Butler and Brown (1994) found that although participants identified 10 out of the possible 12 "tonics," however the first and final tones of the tone row garnered the most responses suggesting a tendency toward primacy and recency responses in this particular atonal example.

Anderson and Tunks (1992) investigated the level of expectation within various chord progressions and found that students were more accurate in harmonic identification tasks on highly expected chords and less accurate on less expected chords. Additionally, the data revealed a positive, albeit weak, correlation between expectancy and appeal/preference. The effect of melodic tones and their order on harmonic elements such as key center perception and expectancy suggests what may seem obvious. Melody and harmony are inexorably linked.

Perception of Melody and Harmony

Although several studies mentioned previously isolated melody and harmony from one another, rarely are they presented independently especially if one accepts Meyer's (1994) concept of listener implied harmony regardless of the actual presence of harmony. It would seem difficult to sever the relationship between melody and harmony for experimental purposes. Structurally, music tends to be constructed to have a "horizontal" melodic identity and a "vertical" harmonic function (Sloboda, 1985) and harmony and melody can be perceived both collectively and independently.

Melody and harmony are interrelated and it is the nature of that relationship that effects the perception of key changes, melodic sight-reading success, and "goodness" ratings of musical stimuli to name but a few. Harmonic relationships are created whether melody and harmony are presented simultaneously or individually. When melody is played alone, there seems to be evidence of an implied harmonic function that may lead to both melodic and harmonic expectation.

Meyer's (1994) *Theory of Expectancy* suggests that music creates expectations in the listener and the fulfillment, or lack thereof, create meaningful musical experiences. Even melody played alone creates expectations due to harmony inferred by the listener. Melodic expectancy seems to utilize previous knowledge and organizational structures (Schmuckler, 1988). Once again, the tonal context affects the musical perception of the listener and expectations are created.

Previous investigations suggest that listeners tend to process melody and harmony differently whether it is related to performance of a children's song (Sterling, 1984) or in identifying a key change (Thompson & Cuddy, 1992). Sterling (1984) investigated the existence of a developmental sequence for harmonic perception in first-, third-, fifth-, and seventh-grade children by utilizing singing of familiar melodies ("Jingle Bells," "Old MacDonald Had a Farm," and "Twinkle, Twinkle Little Star"). Each melody was measured for pitch accuracy based on four accompaniment conditions: melodic replication, traditional tonal harmony, chromatic harmony, and dissonant harmony. Results suggest that harmonic perception improves with age, significantly so between first- and third-grade. The conditions that achieved the highest performance scores were melodic replication and tonal harmonic accompaniment; chromatic and dissonant harmonies scored the lowest. For the younger participants, dissonant and chromatic harmonies appeared to be distracters for pitch accuracy whereas the researcher surmised that reactions of older participants to dissonant and chromatic harmonies seemed to be preference based. Performance scores appeared to be affected by the nature of the melody and the perceived relationship between melody and accompaniment. In other words, each melody presented issues inherent to that specific melody.

Investigations into perception of location, direction, and distance of modulation and direction of key change has shown a close correspondence between modulation distance and judged distance with four-voice harmonic presentation and single-voice stimuli (Thompson & Cuddy, 1989, 1992). Results indicated that participants did not hear direction and distance equally in both directions (around the cycle of 5ths) and that melody and harmony may follow different principles when pertaining to modulation. These researchers suggest that more information (i.e. harmony) may allow for clearer identification of key and key change. Platt and Racine (1994) found that show that musicians seemed to be more influenced by the note's relationship to the triad while nonmusicians were more influenced by the size of the melodic interval between the probe tone and the previous note. Additionally, musical guidelines seem to be determined by a combination of both chord recognition and anchoring perceptual mechanisms and found that a sequence of tones perceived as a melody tends to be identified in terms of its underlying [implied] harmony (Povel & Jansen, 2001, 2002).

Another facet of the relationship between melody and harmony is the listener's ability to discriminate melody and harmony when presented simultaneously. Costa-Giomi (1991) investigated the effect of melody on chord discrimination on four- and five-year-old Argentine and American children. She found that children had more difficulty discriminating chords when played as accompaniment than when played alone and that five-year-olds were more accurate than four-year-olds. These data suggest that young children are capable of harmonic discrimination but seem unable to disassociate melody from harmony. Developmentally, discrimination skills seem to improve with age. This study reaffirms Schmuckler's (1988) findings of the perceptual independence of melody and harmony. Perhaps melody and harmonic accompaniment, when played simultaneously, compete for the listener's attention.

Correlations have been shown between discrimination of harmonization skills and sight-reading accuracy and on mode identification (Grutzmacher, 1987). Results suggest that melodic sight-reading improved more with students who were taught tonal pattern content in a teaching sequence in combination with vocalization showed more improvement than those students who received instruction consisting primarily of nominal data (definitions and descriptors). Data also imply that tonal pattern content in a teaching sequence increased understanding and identification of major and minor tonality.

Perception of Complexity

Complexity, as defined by Arkes, Rettig, and Scougale (1986), is the amount of information that is presented at a time. Radocy (1982) expanded this definition by suggesting that complexity is "a matter of how elaborate, fancy, or complicated the music is. . . the reasons for musical complexity might include elaborate rhythms, ornate melodies, lack of obvious formal structure, and/or rich instrumentation" (p. 93). In a study by Rohner (1985), complexity is defined "according to rhythm, consonance/dissonance (harmony), tonality, orchestration and novelty dimensions" (p. 27). However described, researchers continue to explore how musical complexity relates to various variables.

The two primary categories of complexity are objective complexity, which includes the physical characteristics of the stimulus (tempo, instrumentation, form, etc), and subjective complexity, which is a function of objective characteristics and listener experience and sophistication (Hargreaves, 1984). Research shows that rhythmic activity may be a strong predictor of complexity judgments regardless of musical training (Duke, Geringer, & Madsen, 1991; Kuhn, 1987). More sophisticated listeners valued harmonic implications more than less sophisticated listeners (Conley, 1981). Similarly, McMullen (1976) found the percentage of rhythmic redundancy affected subjective complexity ratings of college music majors.

The optimal complexity model, originally based on visual response data, suggests an observer's avoidance of attentional competition (Arkes, et al, 1986; Broadbent, 1958; Heyduk, 1975; Konecni & Sargent-Pollock, 1976). James's (1984) developed an objective complexity model to try and empirically measure the complexity of a melody based on the number of pitch and rhythm changes that occur. The author based his theory on Berlyne's (1974) inverted-U theory of complexity and preference. The theory states that as complexity level increases, so will the level of preference until a peak is reached. Following the peak, as complexity continues to increase, preference will decrease. James' model of objective and subjective complexity contains sociological influences (parental and peer attitudes), experiential characteristics (prior exposure to the stimulus), subjective influences (timbre, pitch range, frequency), and objective influences (redundancy, motion, change of pitch, change of rhythm, change magnitude). A positive relationship was found between rated complexity and preference as well as between preference and set complexity. Although these data suggest support for the author's objective complexity model, the small sample makes generalizations from these data inappropriate. While this model appears to function for melodic complexity, it seems difficult to transfer this directly to empirically measure harmonic complexity or complexity of a complete music context. An additional dimension would need to be incorporated to account for harmonic changes as well as harmonic rhythm, pitch and rhythm changes. The importance of this investigation is the possible correlation between the number of pitch and rhythm changes and perceived complexity. Steck and Machotka (1975) suggested that the optimum level of complexity is specific to individuals and their experiences.

Studies support the conclusion that there is a strong relationship between preference, musical experience, cultural exposure, and objective complexity (Heyduk, 1975; North & Hargreaves, 1995). Additionally, a review of complexity research shows an interesting number of inverted-U relationships between complexity and numerous characteristics such as preference (North & Hargreaves, 1995; Vitz, 1966), familiarity (North & Hargreaves, 1995; Radocy, 1982), and music training (Hargreaves, 1984; North & Hargreaves, 1995). Crozier’s (1974) data evidenced an inverted-U relationship between melodic complexity and Osgood’s evaluative dimension of music but found a linear relationship between melodic complexity and the Osgood activity dimension.

Other research indicates linear relationships between harmonic complexity and listener sophistication (Conley, 1981), rhythmic density and complexity with tempo perception (Kuhn, 1987), and musical complexity and aesthetic response (Coggiola, 1997). Coggiola used four jazz recordings representing four levels of musical sophistication and found that jazz musicians and nonjazz musicians displayed aesthetic response differences with the stimulus considered the most conceptually advanced only. Additional research data show inverse relationships between arousal, concurrent task complexity, and melodic complexity (Arkes, Rettig, & Scougale, 1986; Konecni & Sargent-Pollock, 1976) which suggest competition for listener attention may affect responses to musical stimuli as mentioned earlier with Schmuckler (1988).

Development, Experience and Musical Perception

Similar to other skill acquisition, time spent on the task does not necessarily lead to expertise. Sloboda (1988) noted that cognitive representation of tonality and meter are a result of enculturation up to age 10 and continued development beyond is due to musical training. Additional research is needed to investigate music perception skills, for instance, continue during this time. Studies of children's listening patterns indicate a developmental pattern for concept recognition seems to develop beginning with recognition of timbre, then rhythm, melody, and harmony (Hufstader, 1977). It is possible that melody becomes a more prominent characteristic for listeners as they develop even without specific musical training (Hufstader, 1977; Madsen & Geringer, 1990).

Several studies have shown musical skills and/or discrimination improve with age or experience including tempo discrimination (Miller & Eargle, 1990); rhythm acquisition (Shehan, 1987); and recall of visual musical stimulus (Meinz & Salthouse, 1998). Research suggests that both cognitive representation of music (Umemoto, 1997) and harmonic perception improve with age (Sterling, 1984). Additionally, a large number of research studies evidence that musical experience may lead to skill development such as sight-reading (Elliott, 1982; McPherson, 1994; McPherson, 1997; McPherson, Bailey, & Sinclair, 1997; Scripp, 1995; Sunderland, 1994; Williams, in press) and emotional response (Giles, 1994). Wilson and Wales (1995) investigated children's compositions and found that compositional complexity increased with age as did preference for activities that require active participation (Bowles, 1998).

Complexity perception seems to be a byproduct of experience and training (North & Hargreaves, 1995; Sims, 2001, Vitz, 1966). Some researchers have noted that mere exposure increases preference ratings (Cairns, 1966; Zajonc, 1968). Additional research suggests that cultural exposure leads to familiarity (North & Hargreaves, 1995) and a narrowing of preference over time (Geringer, 1982). Bartlett (1969) found that preference for listener-selected popular music decreased with repeated listenings but classical music preference increased with the same repeated listening process. This could be due to familiarity or complexity of the music or any number of unknown factors.

Study of melodic recognition and listening patterns show that these skills tend to develop with age. Feierabend and colleagues (1998) investigated the effect of listening repetition and text/no text on song recognition of preschool-age children. Data indicate a significant correlation between participants and type of song. These results are similar to previous findings evidencing that young children are able to discriminate between similar melodies and identify familiar melodies with adequate success (Madsen & Madsen, 2002; Madsen & Staum, 1983). Van Egmond and Povel (1996) found that chromatically altered versions of a melody were perceived as more similar to the original melody than diatonically altered versions.

In a study of novice and expert music listeners, Gromko (1993) suggested that experts and novices listen differently. These data suggest novice listeners need to be taught how to and what to listen for in order to understand a piece of music or a specific genre or style. Wolpert (1990) noted that saturation of music within a listener's environment does not equate to melodic and harmonic attention without some form of music training:

> "Music educators may need to teach a new awareness of harmonic accompaniment and key relationships in a more systematic way than they are doing at present. Further, this research may lend empirical verification to what music therapists have long known: instrumentation is attended to and found of interest" (pp. 103-104).

In a study pertaining to differential listening patterns, Johnson (1996) showed that students in an advanced band tended to listen to the *gestalt* of a recorded performance while the students in a less advanced band tended to focus on more specific aspects such as their own section (woodwind, brass, percussion). Data indicate that listening patterns seem to change over time and with experience. This information is important because it may cue educators to teach listening skills and possibly address focus of attention skills.

Cook (1994) suggests that musical training does not appear to significantly affect grouping behavior (of the stimulus) and suggests that tonal closure affects listeners most effectively when the stimulus is under a minute and that tonal closure does not necessarily transfer to extended works. Cook states "ear training, aural training, or aural analysis creates the interface between musical sound and the theoretical knowledge in terms of which musicians create, notate, and reproduce music" (p. 81). Cook noted that listening to music involves constructing a "musical grammar" to fit the piece being heard.

Research into differential patterns of music listening has conflicting results. Some studies have shown that musicians and nonmusicians exhibit different listening patterns (Elliott, 1991; Geringer & Madsen, 1995/1996; Rentz, 1990; Wolpert, 1990). Other research indicates that this is not the case (Geringer & Madsen, 1984; Madsen, Byrnes, Capperella-Sheldon, & Brittin, 1993). Interestingly, melody ranked high among all elements for both musicians' and nonmusicians' listening patterns regardless of excerpts used (Madsen, 1997; Madsen & Geringer, 1990).

## Discrimination and Musical Perception

Discrimination is the ability to identify differences and similarities as well as extract specific information. Some discrimination abilities and preferences seem to be somewhat "natural" human behaviors and although they may improve with experience, the basic ability is already present. Conley (1981) found that the amount of rhythmic activity in a stimulus may be a strong predictor of complexity judgments regardless of background. Additionally, more sophisticated listeners (music graduate students) valued harmonic implications more than less sophisticated listeners. Prior research by Bartlett (1969) found that instrument/voices, melody, and dynamics accounted for 78 percent and 75 percent of total discriminations for classical and popular music respectively for nonmusicians.

Several researchers have sought to isolate different musical elements in order to empirically measure music perception. Kuhn (1987) found that listeners, regardless of age, had no difficulty discriminating tempo or meter changes when all other variables remained constant (meter and complexity of melody). His study suggested that rhythmic density/complexity may have an effect on tempo perception. Conversely, Geringer and Madsen (2003) discovered that subtle tempo changes were nearly imperceptible to the listener. Additional studies have investigated musical discrimination and how it is affected by visual stimuli (Flowers & Duke, 1990); tempo preference (LeBlanc, Colman, McCrary, Sherrill, & Malin, 1988); and subject's socio-economic status (McDonald, 1974).

Elliott (1991) investigated the effects of tonal complexity and context, or mode of stimulus presentation, on pitch discrimination of musicians and nonmusicians. The experiment attempted to isolate both the complexity of a tone and its context. The first two testing procedures used 20 pairs of tones each. The first used simple sine-waves as the presentation stimuli and the second used complex tones (square-waves). The participants were asked to determine if the second tone was higher or lower than the first. Initially the trials began at or about an octave and gradually diminished intervalically. Next, the researcher put the tone pairs into a rhythmic context and a simple melodic context. Results suggest that both musicians and nonmusicians performed significantly better for the rhythmic context than in any of the other modes. The nonmusicians scored lowest on the melodic mode presentation which could be considered the most *musical* context. Very little relationship was found between the four subtests, however, which might indicate that each of the four contexts was measuring different qualitative skills.

There is ample research on discrimination of contour and note grouping (Davidson, 1994), concerning rhythmic grouping behaviors (Duke, Geringer, & Madsen, 1991), and musical concept recognition (Hopkins, 2002). Melodic discrimination for same/different (Madsen & Madsen, 2002; Madsen & Staum, 1983; Pembrook, 1987), improvisation (Parisi, 2002) and identification of simultaneous melodies (Gudmundsdottir, 1999) have also been investigated. Several researchers have sought to measure musicians' ability to discriminate quality of a performance (Byo & Brooks, 1994; Madsen, Geringer, & Heller, 1991, 1993; Geringer & Madsen, 1998, Madsen & Geringer, 1999), or musical sophistication (Coggiola, 1997; Fleming, 2001).

<u>Focus of Attention</u>

In music research, focus of attention concerns what a listener is attending to pertaining to the stimulus being heard. Madsen and Geringer (2000/2001) developed a model of meaningful listening to illustrate the characteristics and facets of focus of attention (music listening). The researchers took into account the emotional aspects of music listening with specific discrimination of sound events and noted the importance of keeping the listener on-task. The researchers suggested that focus of attention can be divided into two categories: "discrimination" and "emotion." The authors noted that discrimination does not create an emotional response or *vice versa*, that music listening is enhanced by an active listening process, that competition for attention tends to dilute both factors competing for attention, and that listening must be the focus for it to be "meaningful."

It appears that the listener must be focused on the music/experience in order to achieve an aesthetic experience and research has shown that certain test and measurement tools actually help keep the listener on task to the aural stimulus presented (Madsen, Brittin, & Capperella-Sheldon, 1993; Madsen & Geringer, 2000/2001). In an educational setting, any task performed concurrently with the active listening process should not compete for attention itself. In an earlier study, Madsen and Geringer (1983) investigated the on-task/off-task behaviors of students during various classroom activities. The data show that the lowest levels of off-task behavior occurred during music performance while “getting ready” activities and student/teacher verbal interactions elicited the highest off-task behaviors.

While considerable advances have taken place in science during the last century, there is still much mystery surrounding the complexities of the human brain. McMullen (1980) and Hargreaves (1986) suggest that observers "collate" information from different aspects of the stimulus (complexity, familiarity, and “surprisingness”) and the resulting effect determines further exploration of that stimulus. Hedden (1973) identified and classified reaction response styles (associative, cognitive, physical, involvement, or enjoyment) and noted these styles may filter listening and affect reaction to musical stimuli. When discussing listeners’ focus of attention, it would seem appropriate to consider just how a person hears and processes information. Bamberger (1994) describes the listening process as "instant perceptual problem solving."

The listening process requires a listener to hear the stimulus and then complete some sort of analysis. Some have suggested that this process generally follows the *gestalt* principles of perception. Although originally used with visual stimuli, these principles have been transferred to aural stimuli. Three such principles are: (1) *proximity*, a listener's tendency to organize items into groups (i.e. phrases, melodies, themes); (2) *good continuation*, the tendency to look for structures that follow a logical course or direction (i.e. melodic contour, harmonic progressions), and (3) *similarity* in which the listener tends to look for structures that have similarities, such as repetition or harmonic form (Aiello, 1994b; Murphy, 1999). *Gestalt* principles seem to have influenced the development of other theories including Meyer's (1994) *Information Theory*, Lerdahl and Jackendoff's (1983) *Generative Theory of Tonal Music*, and Bamberger's (1994) concept of metric and motivic rhythmic perception.

Bregman's (1993) *Auditory Scene Analysis* is based on the *gestalt* principle of grouping, which is promoted by similarity in color or by proximity in space. Musically, these characteristics transfer to timbre or pitch and intervallic relationships. These characteristics tend to cause a listener to group sensory stimuli that have been perceived from the same or a closely related producer of an auditory event. This process can affect whether listeners hear a mixture of tones as a composite timbre or if listeners decompose the data and perceive them as several individual timbres.

> "To recognize the component sounds that have been added together to form the mixture that reaches our ears, the auditory system must somehow create individual descriptions that are based on only those components of the sound that have arisen from the same environmental event" (p. 11).

Bregman's theory is based on four environmental regularities: (1) unrelated sounds seldom start and stop at the same time; (2) gradualness of change; (3) vibrating bodies tend to give function in multiples of a common fundamental when doing so with a repetitive period; and (4) changes that take place in an acoustic event will affect all the components of the resulting sound concomitantly. Since music is a temporary [temporal] stimulus, auditory identification and groups develop over time as patterns emerge.

Dowling (1994) suggests melodic contour as another form of music perception and stimulus organization utilized by the listener. As in Davidson's (1994) studies with children's songs, Dowling focused on the cognitive use of contour when hearing and remembering melodies. He illustrated that contour is one of many aspects of music perception and noted that not only rhythm, as with Bamberger (1994), but harmony and melody are contextual and embedded within the cognitive listening process.

A number of authors have investigated possible relationships between musical complexity and task complexity choice. The *limited capacity model* (Arkes, Rettig, & Scougale 1986; Broadbent, 1958) suggests that a listener has a finite amount of attending capacity that is divided among the simultaneous layers of a musical event. Konecni and Sargent-Pollock (1976) achieved similar results suggesting that a finite amount of processing may lead to a choice of less complex aural stimulus to avoid attentional competition. It would seem pertinent to question whether complexity has any effect on the listener who is not musically sophisticated enough to be aware of complexity at all (Arkes, Rettig, & Scourgale, 1986).

Sloboda (1985) hypothesized that polyphonic music is an ambiguous pattern capable of "figure-ground" reversal. This hypothesis suggests that the listener creates the organizational structure to which all elements of the stimulus will be measured. In other words, she/he will treat only one melody as the focal point and all other parts become part of the harmonic "ground." Costa-Giomi (1991) queried whether melody and accompaniment, when played simultaneously, compete for the listener's attention.

Several authors investigated the effects of listener field dependence/independence on description and identification of music excerpts (Ellis, 1995) and musical form identification (Ellis & McCoy, 1990). Ellis (1995) found that field dependence/independence accounted for significant variance in identifying musical excerpts. Ellis and McCoy (1990) found that field independence participants scored higher for all music forms on the test and significantly so on all except the fugue which suggest that field independence listeners seem to be more able to extract salient characteristics need to identify musical form. Interestingly, previous music experience failed to account for significant variance in excerpt identification. In a study of information processing (concrete/abstract) and musical complexity, Rohner (1985) found no significant relationship between musical complexity and information processing or between abstract and concrete thinkers. The author concluded that concrete thinkers may actually be processing more information than abstract thinkers regardless of stimulus complexity.

Research has shown that basic listening skills are influenced by the tonal quality of the musical stimulus (consonant/dissonant), the register/tessitura of the various musical layers (high and low), and the timbre(s) of the sounds produced (Gudmundsdottir, 1999; Lerdahl & Jackendoff, 1983; Wolpert, 1990). Madsen and Wolfe (1979) found that in tasks that require an individual to attend to music, this attention demands a high degree of personal involvement that tends to limit the amount of possible "other" behaviors.

In music research, there has been much interest investigating the listening patterns comparing musicians and nonmusicians. For empirical investigations, it is necessary to isolate the experimental variables in a controlled setting in order to ascertain the effects of that variable on a particular event (Madsen & Madsen, 1997). Studies have shown that musicians and nonmusicians listen differently when isolating musical elements (Capperella, 1989; Geringer & Madsen, 1995/1996; Madsen & Geringer, 1990) or pitch discrimination (Geringer & Madsen, 1984). While there are differences in listening patterns between musicians and nonmusicians, there are some similarities in aesthetic response (Lychner, 1995; Madsen, Byrnes, Capperella-Sheldon, & Brittin, 1993), perception of gradual tempo change (Duke, Geringer, & Madsen, 1991), discriminating between familiar and novel performances (Palmer, Jungers, & Jusczyk, 2001), focus of attention based on musical context (Rentz, 1992), labeling of musical stimulus/elements (McDonald, 1974). Lychner (1995) found that for aesthetic response, labels had little or no effect on listener's responses to musical stimulus as measured by the Continuous Response Digital Interface (CRDI).

Research into the listening patterns of musicians and nonmusicians has achieved some interesting results. It appears that nonmusicians find melody and dynamics as the most salient characteristics for focus of attention while musicians responded to timbre and melody (Geringer & Madsen, 1995/1996). Listening pattern differences for musicians and nonmusicians were illustrated, for example, when the data showed a high, positive correlation for preference and stimuli considered salient for "everything" while nonmusicians' data showed a mild, negative correlation for the same stimuli.

Nonmusicians differ in their hierarchical patterns of listening. They tend to respond highest to dynamics (Capperella, 1989), dynamics and melody (Geringer & Madsen, 1995/1996), and focus on timbre, such as brass and percussion, more so than on melody or theme (Rentz, 1992; Wolpert, 1990). These results seem to correspond somewhat with the learning sequence exhibited by children of timbre, rhythm, melody, and harmony as shown in Hufstader (1977).

Gudmundsdottir (1999) investigated first-, third-, and fifth-grade children's ability to process simultaneous melodies such as the "Barney Song," "Frere Jacques," and an unfamiliar melody created for the study. These melodies were presented in different registers and with different timbres. Results indicate that younger students tended to focus on the melody presented in the upper register and always identified the trumpet timbre regardless of register. Third-graders seemed more aware that two melodies were present but it was still difficult for them to correctly identify both melodies. By fifth-grade, it seemed easy to attend to two melodies when at least one was familiar. Further investigation into using more than one unfamiliar melody seems needed (e.g. Dowling, 1994). Gudmundsdottir questioned whether the participants were able to refocus after identifying the first melody.

A continuous line of research has investigated musicians' patterns of listening and evaluative discrimination abilities. Investigations have focused on patterns of listening for salient elements (Geringer & Madsen, 1995/1996; Johnson, 1996); discrimination between intonation of good and bad performances with and without accompaniment (Madsen, Geringer, & Heller, 1991); tone quality in good/bad performances (Madsen, Geringer, & Heller, 1993); musicians' evaluation of tone quality and intonation of good/bad performances (Geringer & Madsen, 1998; Madsen & Geringer, 1999) and melodic recognition (Wolpert, 1990). This line of research into listening patterns suggests that musical training may influence the way listeners hear and analyze musical stimuli. Further research is needed to investigate the experiences that most affect listening pattern development. As mentioned previously, an environment saturated with music does not necessarily translate to melodic and harmonic attention without some form of music training. It seems important to teach students an awareness of the structural aspects of music so that they can further develop discrimination skills and make informed choices regarding the music stimulus rather than merely being "bombarded" by musical stimuli.

## Continuous Response Digital Interface

The Continuous Response Digital Interface (CRDI) was designed to allow measurement of participant responses over time. With the aid of this and other devices, investigators are able to isolate various individual musical elements or combinations of elements in an attempt to better understand the ways music is perceived as well as investigations into listener characteristics and how those may affect music perception. It has proven to be a reliable and flexible measurement tool for recording numerous experimental variables. Brittin and Sheldon (1995) completed an investigation of continuous versus static measurement and found consistency within groups of musicians and nonmusicians for both response modes and Gregory (1995) investigated the reliability of CRDI measures. The history of CRDI research has been recently summarized by Geringer, Madsen, and Gregory (in press).

The CRDI has been used successfully to measure a number of responses, including aesthetic response (Lychner, 1995; Madsen, Brittin, & Capperella-Sheldon, 1993; Madsen, Byrnes, Capperella-Sheldon, & Brittin, 1993); aesthetic response and musical tension (Fredrickson, 1995; Fredrickson & Coggiola, 2003); aesthetic response and distracters (Southall, 2003); aesthetic response and tempo (Geringer & Madsen, 2003); emotional response to music (Madsen, 1997); mood states (Goins, 1998); felt emotional response (Adams, 1984); and perceived rubato (Johnson, 1992), and others. The CRDI has been utilized to measure affective response in combination with jazz experience (Coggiola, 1997); music with video (Geringer, Cassidy, & Byo, 1996); and discrimination (DeNardo & Kantorski, 1995; Parisi, 2002). Other investigations have included preference (Gregory, 1994), preference and evaluation of tone quality and intonation (Geringer & Madsen, 1998; Madsen & Geringer, 1999), loudness judgments (Geringer, 1995), and performance evaluation (Byo & Brooks, 1994; Fleming, 2001).

The CRDI has also been used to measure focus of attention (Rentz, 1992); focus of attention and aesthetic response (Madsen & Coggiola, 2002); focus of attention and preference (Geringer & Madsen, 1995/1996); and focus of attention of musical elements (Capperella, 1989) as well as experiments involving the listening patterns of musicians and/or nonmusicians (Johnson, 1996); listening patterns/intonation (Madsen, Geringer, & Heller, 1991); listening patterns/tone quality (Madsen, Geringer, & Heller, 1993); musicians' performance evaluation (Geringer & Madsen, 1998); and listening patterns/tone quality and intonation (Madsen & Geringer, 1999). As evidenced by the literature review above, the CRDI has been utilized for a multitude of measurement purposes because it allows for the collection of data and the musical stimulus to occur concurrently, and it may help to focus listener’s attention. The research mentioned above tended to focus on extant music in the western art style.

Jazz Stimuli in Experimental Research

The use of jazz stimuli in experimental research is noticeably small. Coggiola (1997) investigated the affective responses of jazz musicians and nonjazz musicians on pieces of increasing sophistication/complexity. LeBlanc, Colman, McCrary, Sherrill, & Malin (1988) used jazz stimuli for a study of tempo preference and found that all participants preferred faster tempi as with a previous study also using jazz stimulus (LeBlanc & McCrary, 1983). Parisi (2002) used a improvisation and a well-known melody in jazz style and found that young children were able to discriminate between a learned piece and improvisation. Goins (1998) used the music of jazz guitarist Pat Metheny to investigate the effect of jazz music on a listener’s moodstate(s). As discussed earlier, Fagen et al. (1997) used jazz and classical music as retrieval stimuli for three-month-old infants.

Murphy (1999) believes that a successful listener in jazz is the one who “gets it” because she/he understands certain musical conventions, traditions, and can speak the language of jazz. Data from Madura (1996) show jazz theory knowledge as a significant predictor for vocal jazz improvisation achievement while May (2003) suggests that self-evaluation of improvisation is the single best predictor of achievement in instrumental jazz improvisation followed by aural imitation ability.

Fredrickson and Coggiola (2003) compared music majors' and nonmajors' perceptions of tension for two selections of jazz music CRDI. The pieces were two versions of W. C. Handy's "St. Louis Blues"-- one by Nat King Cole and another by Ella Fitzgerald was more improvisatory. They found that responses for music majors and nonmusic majors are similar. They found that the presentation order affected the tension magnitude. This order effect was most apparent when the more complex Fitzgerald version was first which created a larger range of tension magnitude than the less complex Cole example that followed. They speculate that when the more complex stimulus occurred first, the listeners were better able to make tension comparisons than when the more complex followed the simpler stimulus. The first stimulus created a "tension context" that, in turn, affected the next stimulus. The authors found, as with previous research, the graphic display for tension perception was more differentiated than for the aesthetic responses.

Aiello (1994a) suggests that music created specifically for research tends to lack context and musical value which, in turn, affects the validity of the results gleaned. While she expresses the need to simplify or create specific musical stimuli for specific research goals, one must be careful not to remove the “music” from the stimulus. With the digital technology available currently, researchers can observe the effects of alterations to extant music without significantly affecting the physical quality of the performance. The use of jazz in experimental research is limited. Because jazz is a prevalent American art form and its influence can be seen throughout popular music, research with jazz stimuli is certainly warranted.

Statement of Purpose

A review of pertinent literature suggests that perception of complexity is an individual attribute that may or may not be affected by musical training. The concept that individuals have a preference for an optimum level of complexity raises questions for what variables may affect that level. Additionally, preference and perceived complexity tend to exhibit an inverted-U relationship. How does perceived complexity relate to focus of attention? How does musical training related to focus of attention? Does musical training affect perception of complexity within a stimulus? What correlations exist, if any, between harmonic complexity and melodic complexity?

The purpose of this study is to investigate the following research questions:

1. Is there a significant difference between musical training and focus of attention to melody and harmony?

2. Is there a difference in focus of attention among levels of melodic complexity and levels of harmonic complexity?

3. Is there a significant difference between level of musical training and musical complexity?

4. Is there a significant difference between static measures and continuous response measures for musical training?

5. Is there a significant difference between static and continuous response measures for focus of attention?

6. Is there a significant difference between static and continuous response measures for musical complexity?

# CHAPTER 3
# METHOD

This study was designed to acquire empirical data to investigating the effect of musical training and musical complexity on focus of attention to melody or harmony. The stimulus was composed specifically for this project and a jazz idiom was chosen, in part, due to the relatively small number of empirical studies using the genre. The stimulus was based on a 12-bar blues in C major and consisted of four melodic examples (M1, M2, M3, M4) and four harmonic examples (H1, H2, H3, H4). The examples were written in four levels of complexity labeled low (M1; H1), moderately low (M2; H2), moderately high (M3; H3), and high complexity (M4, H4) for both melody and harmony (see Appendix E). All possible melody/harmony pairings, 16 trials, and four, block-random orders (A, B, C, D) were used in an attempt to control for possible order effects. The stimulus was performed on solo piano and digitally recorded to 2 tracks, using *Sonar*, to control for timbre effects and to ensure appropriate synchronization of all possible pairs. The orders and verbal instructions were converted to mp3 files and arranged into the four orders. The manipulation of the examples was completed using *AcidDJ 5.0* and recorded to a compact disc (audio). A five member panel of experts representing over 80 years of direct experience with the jazz idiom validated the stimulus tape.

## Selection of Participants

One of the independent variables, musical training, was represented by four groups. Group 1 ($n = 64$) consisted of university jazz students. These participants were jazz majors from The Florida State University, the University of North Florida, Kansas State University, and the University of Missouri – Kansas City. Group 2 ($n = 64$) were university instrumental music and music education majors primarily trained in the classical tradition with little or no jazz experience from The Florida State University. The high school (Group 3, $n = 32$) and junior high school instrumentalist (Group 4, $n = 32$) attended public school in Tallahassee, Florida. All members of the high school wind ensemble and the upper level junior high school wind ensemble were potential participants. The students who returned signed “Parental Consent Forms” (see Appendix C) were then selected at random for participation in the study.

The experimental design was an unbalanced, split-plot design intended to compare static measurement (Likert-type scale) and continuous measurement (Continuous Response Digital Interface).The overall design included two between subjects factors (order and musical training groups) and two within subjects factors (melodic complexity and harmonic complexity). The comparison of static with continuous responses involved university participants only (*n* = 128). Group 1 and Group 2 were divided equally into continuous response (CRDI) groups (university jazz musicians, *n* = 32; university nonjazz musicians, *n* = 32) and static response groups (university jazz musicians, *n* = 32; university nonjazz musicians, *n* = 32). Groups 3 and 4 used on the static measurement and each group was evenly divided among the four stimulus orders.

All participants (*N* = 192) were asked to complete an “Informed Assent Form” prior to beginning the stimulus recording (see Appendix B). The high school (*n* = 32) and junior high school participants (*n* = 32) returned a signed “Parental Consent Form” prior to entering the data collection area (see Appendix C).

Continuous Response Participants

The Continuous Response Digital Interface (CRDI) participants (*n* = 64) were tested in groups of four to eight. They were instructed on the use of the CRDI dial and the overlay was explained both on the “CRDI Demographics Form” (see Appendix D) and aurally by the researcher. The left half of the overlay was designated as “melodic elements” and right “harmonic elements” (see Figure 1). The participants were instructed to return the CRDI dial to the “WAIT” area at the conclusion of each trial. Two practice examples were composed to acquaint the participants with the process. After a 10-second silence, the 16 trials were heard with a two-second pause between each trial. Each trial was introduced with a verbal cue (i.e. “Example 1”). At the conclusion of all trials, the participants answered two additional questions pertaining to their use of the dial and their self-perceived focus of attention to melody and harmony on an Osgood differential scale with “melodic elements” and “harmonic elements” serving as descriptors.

Static Response Participants

The static measure participants ($n$=128) completed a similar same questionnaire, with instructions appropriate for the static measurement (see Appendix E), and the static measure figure was explained (see Figure 2). Two practice examples were composed to

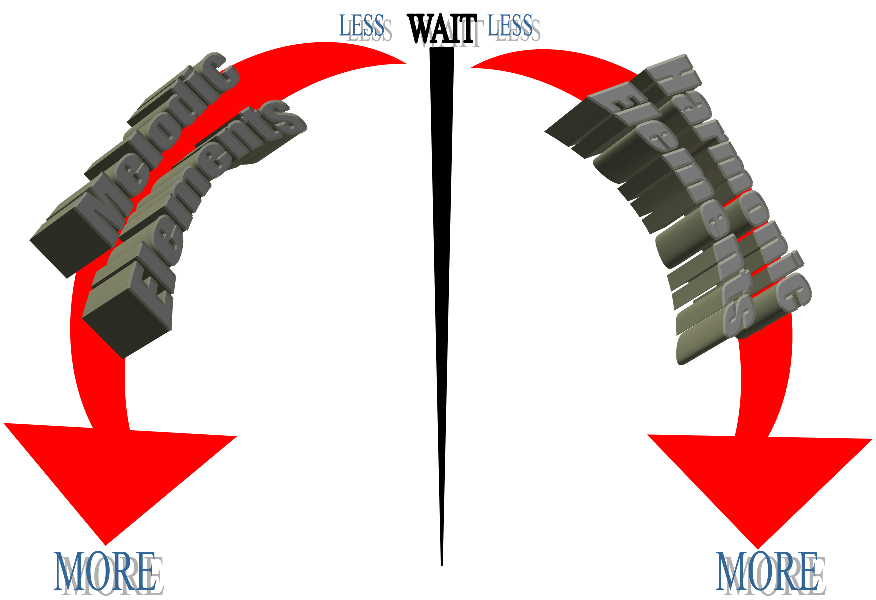


*Figure* 1. Overlay for Continuous Response Digital Interface (CRDI).

acquaint the participants with the process. After a 10-second silence, the 16 trials were heard with a two-second pause between each trial. Each trial was introduced with a verbal cue (i.e. "Example 1"). At the conclusion of the trials, the participants answered an

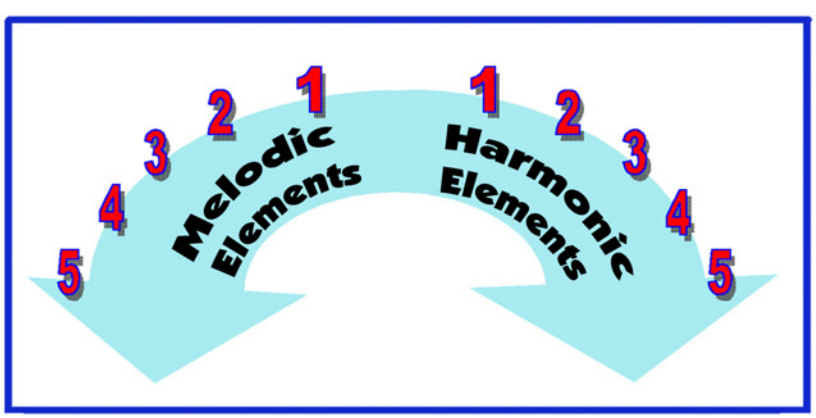


*Figure* 2. Static Measure – 10-Point Likert-type Scale.

additional question pertaining to their self-perceived focus of attention to melody and harmony on a single Osgood differential scale with “melodic elements” and “harmonic elements” serving as the anchors for both the static response forms and the CRDI dial overlay (see Appendices F & G).

<u>Stimulus Presentation</u>

The stimulus was recorded onto a compact disc with each order as a designated track. The continuous response participants were tested in groups ranging from one to eight. Since multiple venues were utilized, the presentation environment varied as well. The CRDI stations were set up with a chair and either a table or a music stand. When tables were available, partitions were set up to isolate each participant during the listening activity. When tables were not available, the CRDI dial were placed on music stands and the participants were isolated so that individual dials were not visible to other participants. Efforts were made to isolate the individual participants from one another in an attempt to control for possible peer influence. All data collection was observed by the researcher. The stimulus was played with average peak levels set between 70 and 80 dBA.

The purpose of this study was to investigate the relationships between musical training and musical complexity and focus of attention for melody or harmony. The stimulus was designed to isolate melodic complexity and harmonic complexity while maintaining some semblance of music context. The melodic and harmonic elements were designed to be idiomatic to jazz style and form.

## CHAPTER 4
## RESULTS

The purpose of this study was to investigate the possible effects of musical training and musical complexity on focus of attention to melody or harmony. One hundred ninety-two persons served as participants (*N* = 192), divided into four groups: University Jazz Majors (*n* = 64); University Music Majors consisting of instrumental performance or music education majors, (*n* = 64); High School instrumentalists (*n* = 32) consisting of tenth through twelfth grades, and Junior High School instrumentalists (*n* = 32) consisting of seventh- and eighth-graders.

The university participants were further divided into response mode groups. Half of the music major and jazz major (*n* = 32) participants responded continuously via the Continuous Response Digital Interface (CRDI). The remaining university participants (*n* = 32) and the high school and junior high school participants responded via a static Likert-type scale measure.

The musical complexity variable was categorized into four levels of melodic complexity (M1 – least complex; M2 – less complex; M3 – more complex; M4 – most complex) and four levels of harmonic complexity (H1 – least complex; H2 – less complex; H3 – more complex; H4 – most complex). Each trial consisted of a melodic complexity/harmonic complexity pairing performed by the same performer on jazz piano. Four levels of melodic complexity and four levels of harmonic complexity produced a total of 16 pairs of stimuli. Each participant heard all 16 pairs. In an attempt to control for possible order effects, the stimulus pairs were presented in four block-random orders so that none of the same melodic or harmonic complexity levels would be heard consecutively.

### Statistical Analysis

The dependent measures were designed to create a forced choice for participants. There was no “neutral” or “both” area to select. The static response dependent measure was a 10-point Likert-type scale and the CRDI dial represented a forced choice measurement of focus of attention to melody or harmony (see Figure 1). In order to compare CRDI responses and rating scale measurements, the CRDI data were collapsed and transformed into a Likert-type scale. The CRDI dial was divided into 10 zones; each zone constituted a 25-degree range and represented for each point on a 10-point rating scale.

A four-factor analysis of variance (ANOVA) was conducted with two between subjects factors (order and musical training groups) and two within subjects factors (melodic complexity and harmonic complexity). A significance level of .05 was used for interpretation of all statistical analyses. The results of the ANOVA are shown in Table 1.

The first research question pertained to the effect of musical training on focus of attention for melody and harmony. Significant differences were found for focus of attention for the musical training groups, $F_{(5, 168)} = 4.02$, $p < .001$. The scores for the University Music Majors – CRDI group (M = 5.65) were higher than all other groups (see Table 2). A post-hoc Scheffé test showed that the University Jazz Majors – static (M = 5.55) and University Music Majors – CRDI (M = 5.65) groups were significantly different than the Junior High School instrumentalists (M = 4.92) for focus of attention to melody or harmony ($p < .05$).

There was not a significant main effect for the four presentation orders (see Appendix E). Significant differences were found for focus of attention to melodic complexity, $F_{(3, 504)} = 94.63$, $p < .001$. A post-hoc Scheffé test indicated that the two lowest levels of melodic complexity (M1, M2) were significantly different than the higher two levels ($p < .01$). The two most complex melodies were not significantly different from one another. Table 3 shows means for the four levels.

The results for harmonic complexity indicated significant differences for focus of attention to harmonic complexity, $F_{(3, 504)} = 12.97$, $p < .001$. The Scheffé test indicated significant differences between the highest level of harmonic complexity (H4) and all other levels but no significant differences between the lower three levels of harmonic complexity (see Table 4).

Table 1

Four-way *ANOVA* for Focus of Attention

| Source | *df* | MS | *F* | *p* |
|---|---|---|---|---|
| Order (O) | 3, 168 | 8.35 | 1.00 | .39 |
| Group (G) | 5, 168 | 33.55 | 4.02 | < .001 * |
| Melodic Complexity (M) | 3, 504 | 372.53 | 94.63 | < .001 * |
| Harmonic Complexity (H) | 3, 504 | 52.66 | 12.97 | < .001 * |
| O x G | 15, 168 | 12.21 | 1.46 | .12 |
| O x M | 9, 504 | 2.89 | .73 | .69 |
| G x M | 15, 504 | 12.09 | 3.07 | < .001 * |
| O x H | 9, 504 | 9.60 | 2.36 | .012 * |
| G x H | 15, 504 | 30.48 | 7.51 | < .001 * |
| M x H | 9, 1512 | 2.02 | .76 | .65 |
| O x G x M | 45, 504 | 4.72 | 1.20 | .18 |
| O x G x H | 45, 504 | 4.46 | 1.20 | .31 |
| O x M x H | 27, 1512 | 2.62 | .99 | .48 |
| G x M x H | 45, 1512 | 2.34 | .88 | .69 |
| O x G x M x H | 135, 1512 | 3.13 | 1.18 | .08 |

* = significant difference ($p < .05$).

Table 2

Focus of Attention: Means for Music Training Groups

| Group | | | | | |
|---|---|---|---|---|---|
| UMC | UJS | UJC | UMS | HS | JH |
| 5.65 | 5.55 | 5.44 | 5.35 | 5.26 | 4.92 |

*Note. Note.* Group = University Music Major – static (UMS), University Music Major – CRDI (UMC), University Jazz Major – static (UJS), University Jazz Major – CRDI (UJC), High School Instrumentalist (HS), Junior High School Instrumentalist (JH)
Underlines indicate no significant differences using Scheffé test ($p > .05$) between means.

Table 3

Focus of Attention: Means for Melodic Complexity

| Complexity Levels | | | |
|---|---|---|---|
| M1 | M2 | M3 | M4 |
| 6.16 | 5.73 | 4.79 | 4.77 |

*Note.* Underlines indicate no significant difference ($p > .05$) between means.
M1 = least melodic complexity, M4 = most melodic complexity.

Table 4

Focus of Attention: Means for Harmonic Complexity

| Complexity Levels | | | |
|---|---|---|---|
| H1 | H2 | H3 | H4 |
| 5.20 | 5.15 | 5.38 | 5.73 |

*Note.* Underlines indicate no significant differences ($p > .05$) between means.
H1 = least harmonic complexity, H4 = most harmonic complexity.

Significant interactions occurred between musical training and focus of attention to melodic complexity and musical training and focus of attention to harmonic complexity. The significant interaction, $F_{(15, 504)} = 3.07$, $p < .001$, between melodic complexity ratings and musical training is shown in Figure 3. The graph illustrates the generally positive relationship between increased melodic complexity and melodic focus of attention (it should be remembered that lower values on rating scales indicated increased attention to melody). It is interesting to note the change toward decreased attention to melody for the University Jazz groups and the University Music – CRDI group for the highest level of melodic complexity.

The significant interaction ($F_{(15, 504)} = 7.51$, $p < .001$) between harmonic complexity and musical training is graphed in Figure 4. It can be seen that the Junior High group gave lower ratings to harmonic focus as complexity increased. Conversely, harmonic focus of attention ratings of all University participants increased as complexity increased.

The analysis also revealed a significant interaction between stimulus orders and focus of attention to harmonic complexity ($F_{(9, 504)} = 2.36$, $p = .012$). Figure 5 displays the relationships between the four orders and harmonic complexity ratings. No consistent pattern in the mean values across the harmonic complexity conditions seems apparent.

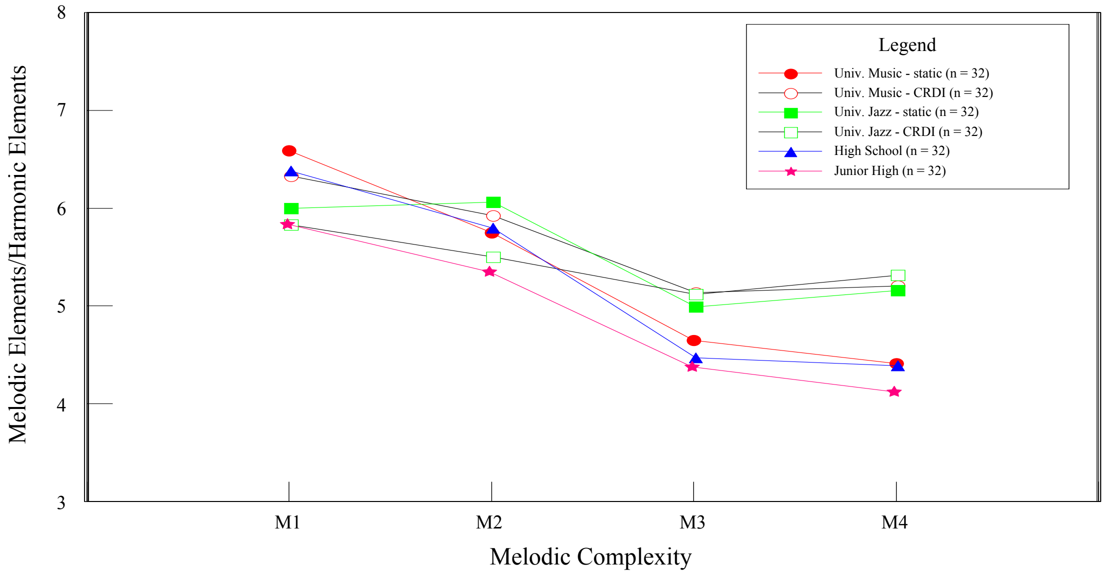


*Figure 3*. Interaction of Musical Training and Melodic Focus of Attention

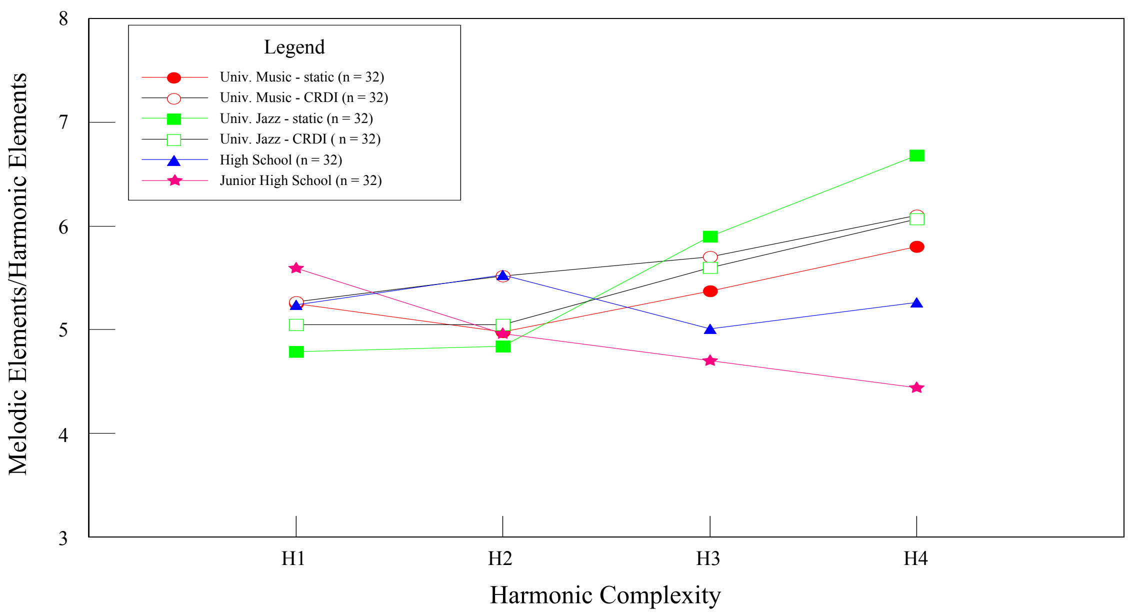


*Figure 4*. Interaction of Musical Training and Harmonic Focus of Attention

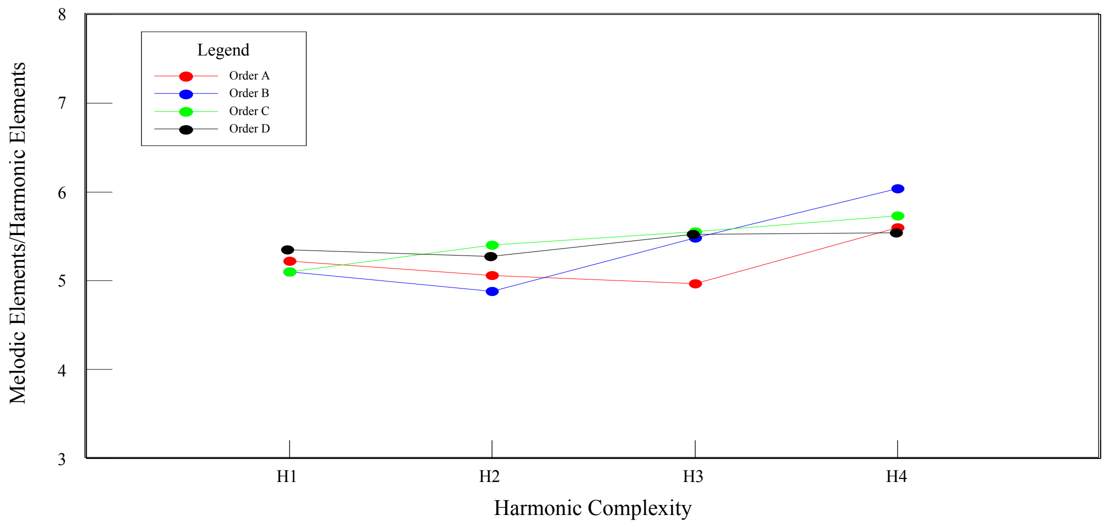


*Figure 5*. Interaction of Order and Harmonic Focus of Attention

Overall means for each combination of harmonic and melodic complexity were calculated. The pairing of the highest level of melodic and harmonic complexity (M4H4) resulted in the largest standard deviation across subjects (2.35) as shown in Table 5. Overall means across stimulus pairs are shown in Figure 6.

Table 5

Focus of Attention Means for Complexity Pairings

| Source | *Mean* | *SD* |
|---|---|---|
| M1H1 | 5.94 | 1.95 |
| M1H2 | 5.95 | 1.90 |
| M1H3 | 6.24 | 1.86 |
| M1H4 | 6.51 | 1.93 |
| M2H1 | 5.56 | 1.89 |

Table 5 *(continued)*

| Source | *Mean* | *SD* |
|---|---|---|
| M2H2 | 5.49 | 1.86 |
| M2H3 | 5.82 | 1.85 |
| M2H4 | 6.05 | 1.87 |
| M3H1 | 4.61 | 1.88 |
| M3H2 | 4.70 | 1.81 |
| M3H3 | 4.78 | 1.99 |
| M3H4 | 5.07 | 2.12 |
| M4H1 | 4.68 | 1.96 |
| M4H2 | 4.45 | 1.84 |
| M4H3 | 4.66 | 2.02 |
| M4H4 | 5.28 | 2.35 |

*Note.* Means represent Focus of Attention to Melody or Harmony.

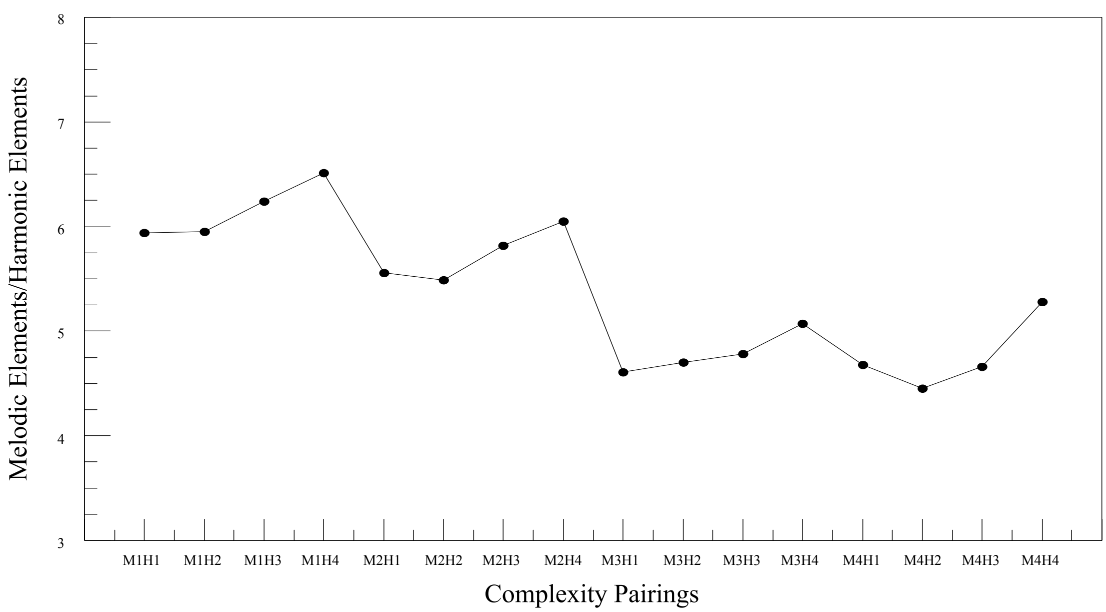


*Figure 6*. Focus of Attention: Complexity Pairing Means for All Participants ($N$ = 192)

Participants were asked to rate their self-perceived focus of attention level for melody or harmony on a 10-point Likert-type scale (1 = All Melody; 10 = All Harmony). These data were compared to the overall means of the focus of attention responses for each participant. A *Pearson product-moment correlation* showed that participants' self-perception of focus of attention was correlated ($r = .46$) with the specific stimulus responses (see Table 6). *Pearson* correlations for the musical training groups indicated positive relationships between overall perception of attention focus and the rating scales used for each stimulus. Correlations of all training groups were significant ($p < .05$) with the exception of the University Jazz Majors – CRDI group.

Table 6

*Pearson Product-Moment Correlations* for Focus of Attention: Self-perception versus Response Means

| Group | Pearson *r* | *p* |
|---|---|---|
| University Music – static | .51 | < .01 * |
| University Music – CRDI | .47 | < .01 * |
| University Jazz – static | .52 | < .01 * |
| University Jazz – CRDI | .22 | .22 |
| High School | .48 | < .01 * |
| Junior High School | .42 | < .02 * |
| All | .46 | < .01 * |

* = significant difference ($p < .05$).

Graphic Analysis

The CRDI responses were represented using a two-dimensional (XY) line plot.

Individual responses were graphed for analysis. Group means were found in one of two ways. The CRDI sampled one data point per second for each trial which produced 21 data points per person for each of the 16 trials. For the graphic analysis for each group, a mean was calculated for each of the 21 data points. This resulted in a graphic representation of each trial for the two groups of CRDI participants.

After completing the CRDI response phase, the CRDI participants were asked if their movement of the CRDI dial accurately reflected their listening patterns. Five participants (out of 64) indicated that their dial movement did not reflect their focus of attention accurately. Figures 6 through 11 represent graphic representations of means for each data point collected by the CRDI for the groups. Figure 7 shows Focus of Attention responses of University Music Majors (*n* = 32) to melody by increasing harmonic complexity. It suggests a somewhat positive relationship between increased melodic complexity and increase of focus of attention to melody. Within each level of melodic complexity (M1, M2, M3, M4) there is also a positive relationship between increasing harmonic complexity (H1, H2, H3, H4) and focus of attention to harmony with the exception of pairings containing Melody 3 (more complex). Figure 8 shows that as harmonic complexity increases (H1, H2, H3, H4), focus of attention to harmony increases. As with the graph of melody by increasing harmonic complexity, there is generally a positive relationship of increasing melodic complexity (M1, M2, M3, M4) and increase of focus of attention to melody within each section of harmonic complexity.

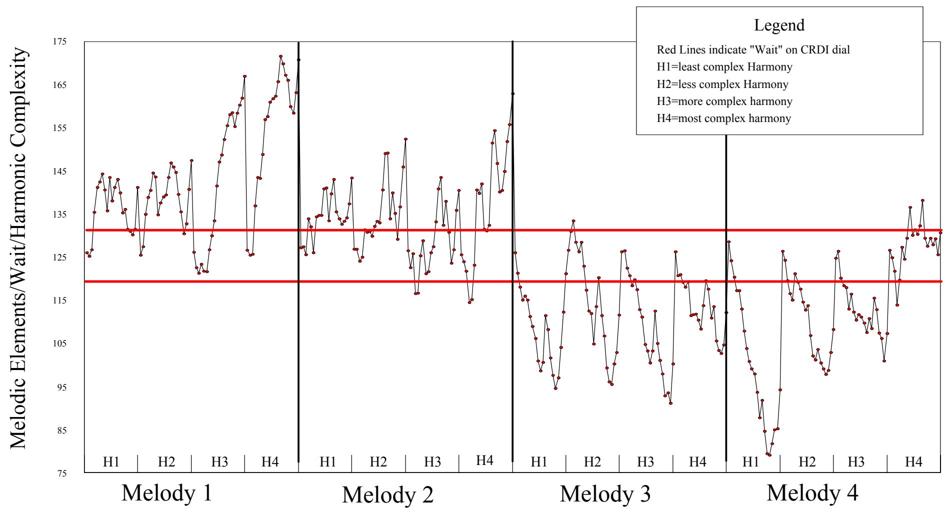


*Figure 7*. Focus of Attention: University Music Majors (CRDI) – Harmony by Increasing Melodic Complexity.

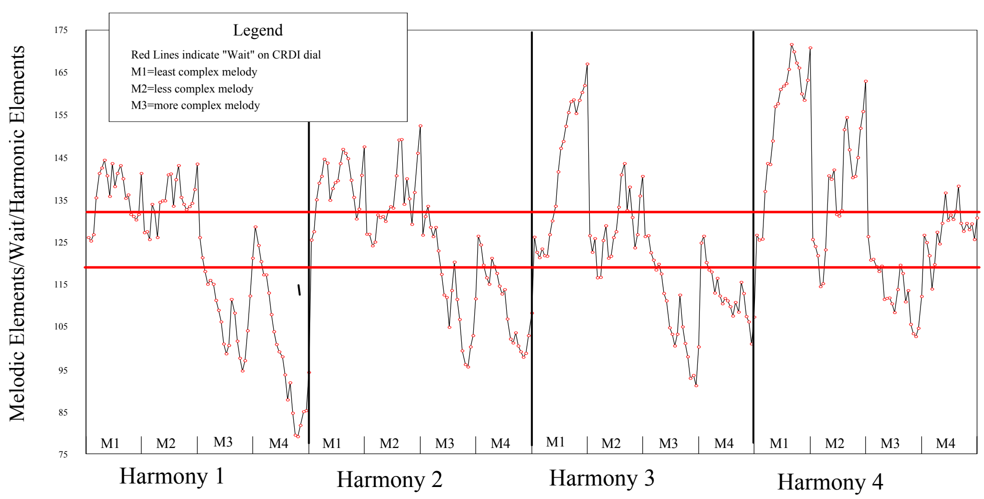


*Figure 8*. Focus of Attention: University Music Majors (CRDI) – Harmony by Increasing Melodic Complexity.

Figures 9 and 10 show Focus of Attention responses of University Jazz Majors (*n* = 32) for melody by increasing harmonic complexity and for harmony by increasing melodic complexity respectively. Similar to University Music Majors, the graph shows an overall positive relationship between increased melodic complexity and increase of focus of attention to melody as well as for increasing harmonic complexity and focus of attention to harmony. Figure 10 reversed the parameters of the graph to show harmonic complexity levels by increasing melodic complexity. These data show that as harmonic complexity increases, so does focus of attention to harmony. There seems to be a positive relationship between increasing melodic complexity and increase of focus of attention to melody within each section of harmonic complexity.

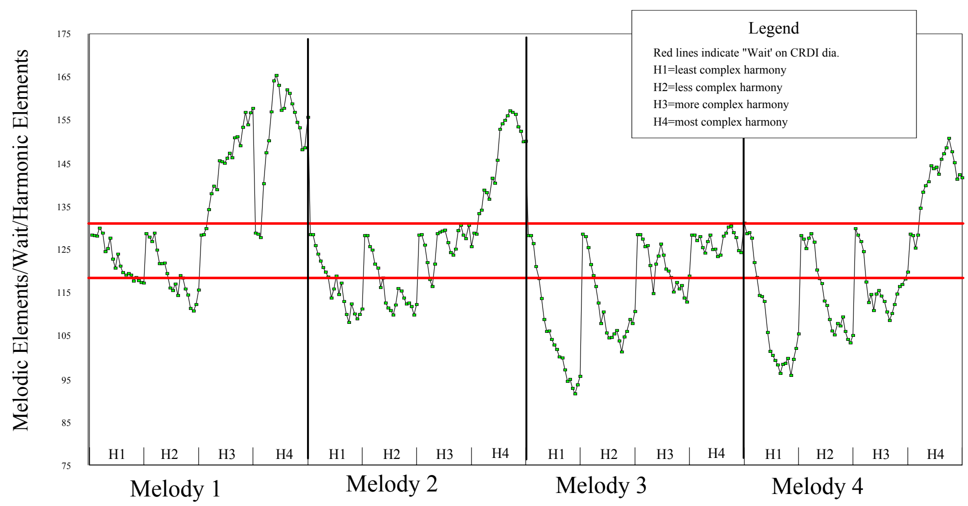


*Figure* 9. Focus of Attention: University Jazz Majors (CRDI) – Melody by Increasing Harmonic Complexity.

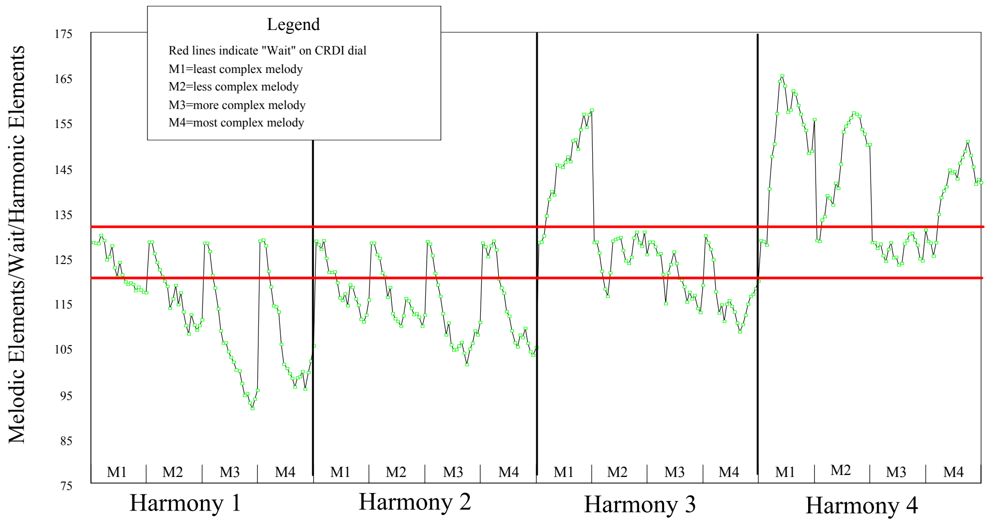


*Figure* 10. Focus of Attention: University Jazz Majors (CRDI) – Harmony by Increasing Melodic Complexity.

Figure 11 displays both University Music Majors and University Jazz Majors' focus of attention responses. In comparing the graphs of each group, responses are similar. The most noticeable differences occur for the complexity pairings of M1H1, M1H2, M2H1, M2H2 and M3H4. The graphs show that for these particular pairings, University Jazz Majors tended to focus their attention toward melody while the University Music Majors tended to focus their attention toward the harmonic elements of the stimuli. Responses for the other complexity pairings are nearly identical. These results show that as complexity increases, University Music Majors and University Jazz Majors tend to have similar focus of attention responses. Figure 12 shows increasing melodic complexity within harmonic complexity levels.

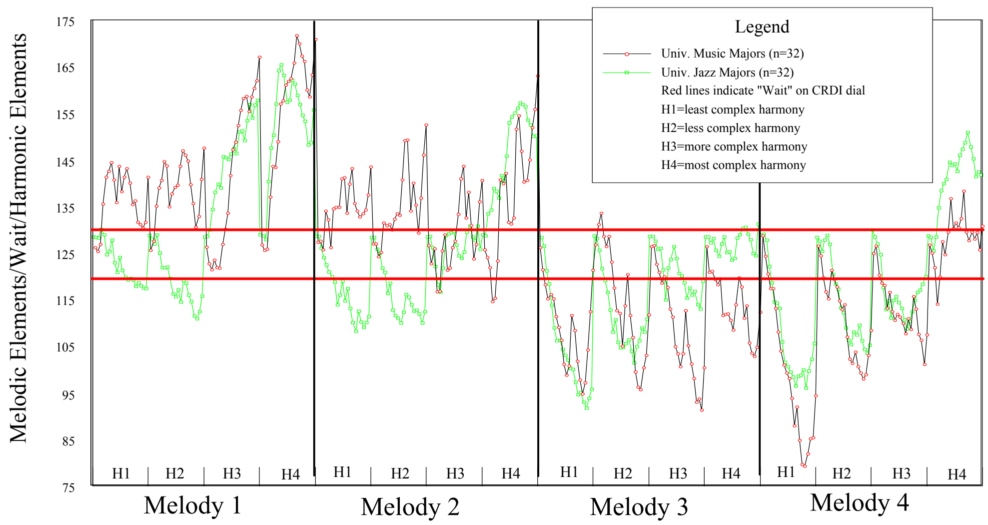


*Figure* 11. Focus of Attention: University Music Majors and Jazz Majors (CRDI) – Melody by Increasing Harmonic Complexity.

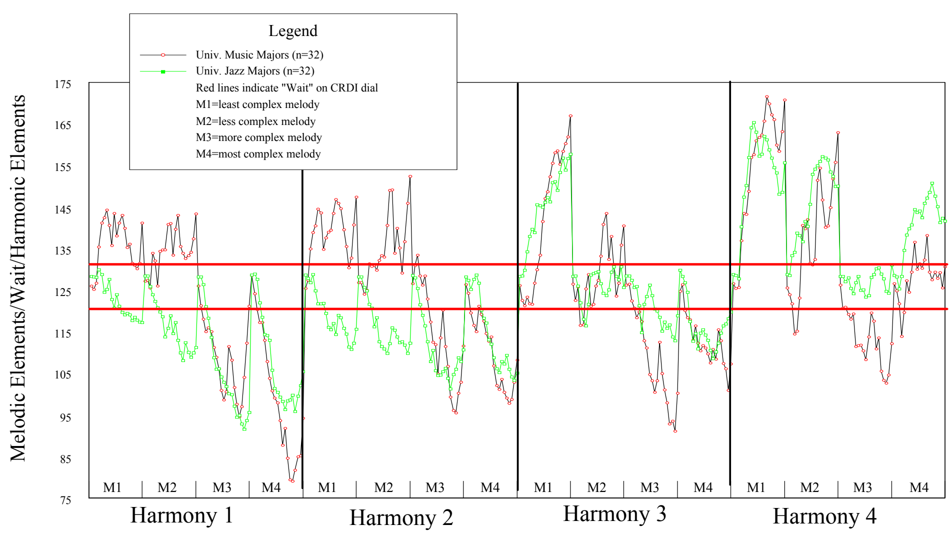


*Figure* 12. Focus of Attention: University Music Majors and Jazz Majors CRDI) – Harmony by Increasing Melodic Complexity.

Focus of attention data were collapsed into a mean for each level of complexity based on the 10-point Likert-type scale. This aggregation allowed for visual comparison of each level of melodic complexity and harmonic complexity and focus of attention. Figure 13 shows a generally positive relationship between increasing melodic complexity and increased focus of attention for melody for all groups ($N$ = 192). The data show a positive relationship between increased harmonic complexity and increased focus of attention to harmony for all groups except for the Junior High Instrumentalists and the High School students, particularly for H2-H3.

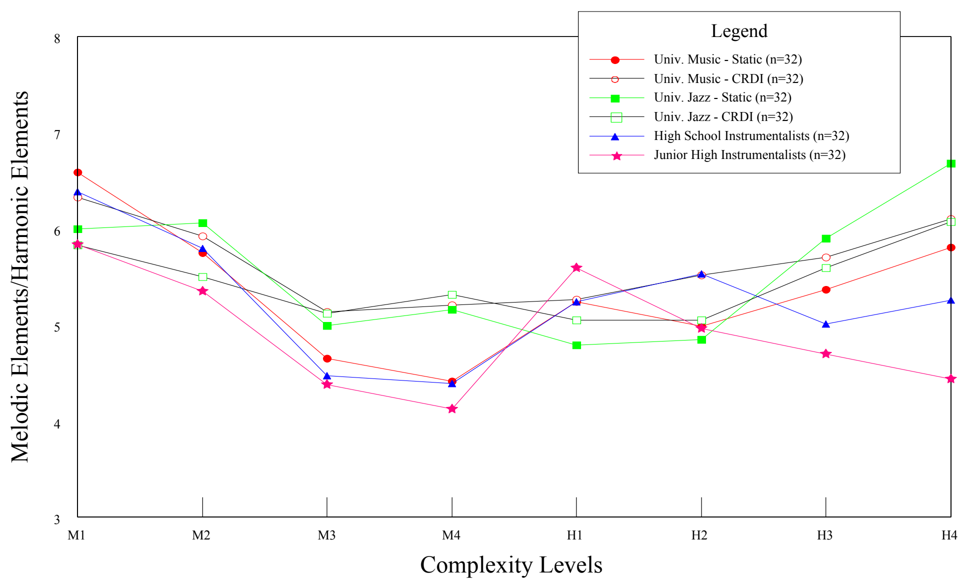


*Figure* 13. Focus of Attention: Complexity Means: All Participants (N=192).

# CHAPTER 5
# DISCUSSION

The purpose of this study was to investigate the effects of two independent variables, musical training and musical complexity, on focus of attention to melody or harmony. Additionally, static and continuous measurement tools were compared. Questions were raised pertaining to relationships between musical training and musical complexity and focus of attention. Additionally, the data were analyzed for possible relationships among the harmonic and melodic complexity levels

The first research question pertained to the relationship between musical training and focus of attention. The data for levels of musical experience suggest that as musical training increases, focus of attention to harmony increases. While the largest difference in focus of attention occurred between the younger groups and the university participants, data show a positive relationship between harmonic focus of attention and increased musical training. Although not statistically significant, data show those participants trained in the jazz idiom tend to focus their attention toward harmonic elements slightly more so when compared to other groups.

As illustrated in the review of literature, young children seem to display melodic discrimination skills that improve with age (Madsen & Madsen, 2002; Madsen & Staum, 1983). Musical training tends to lead to an awareness of melody and harmonic accompaniment Wolpert (1990). Schmuckler (1988) suggests that harmonic and melodic perception is an additive process yet perceptually independent. Sterling (1984) suggests that, in young children, harmonic perception improves with age and that perception seems to be affected by the perceived relationship between the melody and accompaniment.

Previous research has shown that musical training may lead to melodic focus of attention. The data from this investigation suggest that while melodic focus of attention increases with musical training, it seems that musical training also leads to an increased awareness of harmonic elements of music. The results suggest that the university participants focus on harmonic elements more than the high school or junior high school participants. The high school and junior high instrumentalist groups exhibited listening patterns seemingly more influenced by melodic focus of attention. The junior high school instrumentalists’ responses showed an inverse relationship between increased melodic focus of attention and increased harmonic complexity. Although the high school instrumentalists’ responses tended to lean toward harmonic focus of attention, they exhibited an inverted-U relationship between focus of attention and harmonic complexity. Figures 10 and 11 show that when melody and harmony both at the highest complexity levels, focus of attention shifted toward harmonic elements suggesting that harmonic complexity showed a greater influence on focus of attention than melodic complexity.

The second research question was related to the effects of musical complexity on focus of attention. The musical complexity variable showed interesting results as evidenced by an increase in focus of attention toward increased complexity for both harmonic and melodic elements. For all groups except the junior high instrumentalists, there was a generally positive relationship between both increased melodic complexity and increased melodic focus of attention and increased harmonic complexity and increased harmonic focus of attention. These data suggest that musical complexity does directly affect focus of attention. In an educational setting, it would seem prudent to approach the teaching of listening skills with the concept that listeners tend to perceive melodic elements and harmonic elements as two, independent entities. Further research is needed to determine if a more cohesive listening pattern is useful or even possible through pedagogical means.

Possible interactions between musical training and melodic complexity were the focus of the next research question. Significant interactions were found between melodic complexity and musical training and harmonic complexity and musical training. These interactions imply that musical training affected focus of attention for both melodic and harmonic complexity. Further research is required to determine the variables that contributed to these interactions. They could be due to musical training, personal musical experiences, or any number of unknown variables.

Data showed significant differences in focus of attention for melodic complexity and significant differences in focus of attention for harmonic complexity for the static measure participants. The data also showed no significant interactions between melodic complexity and harmonic complexity. This lack of significant interaction seems to concur with previous investigations indicating listeners perceive melody and harmony independently (Costa-Giomi, 1991; Schmuckler, 1988).

The final research questions concerned comparison of response modes and possible interactions between the static and continuous measures and the effects of musical training and musical complexity. The Continuous Response Digital Interface (CRDI) was designed to give a visual representation of listening patterns over time and these results allowed for visual comparisons of university music majors and university jazz majors. Figures 3 through 8 illustrate relationships between melodic and harmonic complexity levels and focus of attention. For example, Figure 7 shows an overall trend for increased melodic focus of attention and that a concurrent positive relationship for increase in harmonic focus of attention with increasing harmonic complexity occurs within each melodic complexity grouping. Figure 8 shows an overall positive relationship between increased focus of attention to harmony and increasing harmonic complexity. Additionally, there is a concurrent positive relationship between increased melodic focus of attention and increasing melodic complexity within each harmonic complexity level. When both melodic and harmonic complexity levels are at their highest, harmonic complexity seems to have the most influence on focus of attention for both jazz majors and music majors with the jazz majors exhibiting a higher focus of attention for harmonic elements.

As mentioned previously, the CRDI data were collapsed and transformed into the 10-point Likert-type scale so that direct comparisons could be made among all groups. It should be noted such that aggregation of CRDI limits the benefits of the continuous measure by reducing response variability. Brittin and Duke (1997) suggest that continuous response measures may be most effective when internal variability is present within the stimulus. If the purpose of a study is to investigate listeners' change in perception over time, continuous measures would seem more appropriate for that task. Because of the short length and the relative internal homogeneity of each excerpt, the use of the CRDI in this study perhaps functioned as a continuous measure of static responses. The graphs show much overlap among the four university groups. Statistical analysis showed no significant differences between the University participants using the CRDI versus those using the static scale. The comparisons among the university participants show similar responses between the CRDI groups, but the widest spread of complexity means occurred for the static measure group of university music majors. The complexity mean for the simplest melody level was higher than the other university groups in harmonic focus of attention but complexity means for the highest complexity melody showed the highest focus of attention for melody of all groups and complexity levels. The static university music majors showed the clearest positive relationship between increased melodic complexity and increased melodic focus of attention. The CRDI response group of music majors displayed the clearest positive relationship between increased harmonic focus of attention and increased harmonic complexity.

When comparing static and continuous measures groups, data suggest a positive relationship between melodic complexity and focus of attention to melody for the all melodic complexity levels. An exception occurred in the responses of both static and continuous groups of university music majors and the static measure group of university jazz majors for the most complex melodic grouping. The focus of attention means for the most complex melody indicates a slight shift toward harmonic focus of attention. One possible explanation could be that those participants were more influenced by the harmonic activity when paired with the most complex melody. It appears that the usefulness of the CRDI may be affected by the length of the stimulus and the sophistication of the participants. Visual analysis of participants' individual CRDI graphs show many participants used the CRDI in a static manner rather than continuous. It is apparent that many participants moved the dial to their initial focus of attention to melody or harmony and remained stationary before returning to the "wait" portion of the dial at the completion of each trial.

Following all listening trials, participants were asked to indicate their overall perceived focus of attention for melody and harmony on a 10-point Likert-type scale (1=All Melody; 10=All Harmony). Results suggest that all groups had a relatively accurate perception of their focus of attention for melody and harmony. This response occurred after all stimuli were presented. This question was purposefully placed on a separate sheet from the static measures so that the participants would not have a visual cue for how they responded to the stimulus just completed. Several participants asked if they could review their responses prior to answering the final question and their requests were politely declined. The data suggest that the groups were reasonably accurate (most correlations were above .40) with their perception of their overall listening focus of attention.

## Limitations of the Study

One possible factor affecting this study was the stratification of the university music participants. The interactions found among the university participants and the variance within the jazz participants in particular suggest that the perhaps the jazz majors were not internally consistent with regards to experience and previous training. Perhaps comparing music performance and jazz performance majors at comparable levels of experience or training might result in a more precise comparison. Another possibility would be a pretest of sorts to determine level of harmonic understanding or an aural discrimination measure.  An additional limitation to this study was the melodic stimulus created. While the melodic complexity stimuli increased in complexity tonally and rhythmically, the melodies may have lacked in melodic interest for the listener. Future studies may require a series of melodies with more internal interest which may be a lead to an even more realistic comparison of focus of attention.

## Conclusions

These results are interesting because they represent an initial investigation into the effects of musical complexity on focus of attention. Previous studies have investigated the listening patterns of various age musicians and nonmusicians and the data of this study showed some support for their findings especially as they pertain to melodic and harmonic perception. The CRDI participants' means for focus of attention were not different from their static counterparts. This lack of difference between response modes has been found in other studies wherein stimuli were 30-45 seconds or less in durations (Geringer & Madsen, 1995/1996). Beyond the graphic representations of the individual participants and group listening patterns, the inherent strength of this measure is to display response over time in a graphic fashion that allows for direct listening pattern comparisons with events occurring in the music stimuli.

One important issue related to music education is the use of musical stimuli that are presented in a manner that represented a somewhat natural musical context. The stimuli for this investigation were nested within a known idiom and a familiar blues form. As suggested by Aiello (1994a), musical stimuli must be contextual enough to create a realistic musical experience. It was a goal of this researcher to use music from an idiom that was recognizable and displayed appropriate stylistic character. Although some of the participants mentioned that the music became "boring," this suggests that the form used was known enough to the listeners to create expectations. The participants trained in the jazz idiom made several informal comments pertaining to the predictability of the blues form through the progression of the stimulus presentation. These participants in particular seemed to be listening for nuances and changes in the melodic and harmonic elements as the stimulus progressed.

The sample size of this study was relatively large but inferences made to the entire population should occur with caution. This investigation attempted to expand the research base regarding focus of attention and musical complexity. As with most research into complex topics, research must occur in a step-by-step fashion. As one example, further research should address the effects of instrument or voice part on melodic and harmonic focus of attention. Does a soprano listen differently than an alto? Does a tuba player listen differently than a trombonist? Do vocalists listen differently than instrumentalists? Do those trained as rhythm section members listen differently than wind players? Do musicians trained on chordal instruments listen differently than those trained on single-line instruments?

Several additional factors of this investigation should be addressed and are of importance to music education. The indication that a change in listening patterns may occur at some point between junior high school and higher education suggest that listening patterns and musical perception are still developing through junior high school and high school musical experiences. If this is the case, it seems important to investigate the variables that are the most influential in the development of listening patterns and skills. Teaching listening skills may prove more effective if there is a clearer understanding of how students listen. Do listening patterns level off? When does this occur? This study suggests that focus of attention listening patterns for melodic and harmonic complexity continue to shift as musicians' experience and training increase.

Previous investigations suggest that various music skills such tempo discrimination (Miller & Eargle, 1990), rhythm acquisition (Shehan, 1987), sight-reading (Elliott, 1982; McPherson, 1994; McPherson, 1997; McPherson, Bailey, & Sinclair, 1997; Scripp, 1995; Sunderland, 1994; Williams, in press), and harmonic perception (Sterling, 1984) improve with age. There has been little attention shown to musical complexity perception and focus of attention. The investigation of listening patterns has shown that melodic recognition is present at a young age and improves with age (Feierabend et al., 1998; Madsen & Madsen, 2002; Madsen & Staum, 1983; van Egmond & Povel, 1996). As training increases, the disparity between expert and novice music listeners seems to grow (Gromko, 1993). Wolpert (1990) suggests that exposure to musical stimulus does not necessarily lead to changes in listening patterns. Results of the present study combined with previous investigation indicate that the development of listening patterns in musicians is an area that is in need of additional empirical research.

# APPENDIX A
# HUMAN SUBJECTS COMMITTEE APPROVAL

**Florida State**
**UNIVERSITY**

Office of the Vice President
for Research
Tallahassee, Florida 32306-2763
(850) 644-5260 • FAX (850) 644-
4392

# APPROVAL MEMORANDUM
from the Human Subjects Committee

**Date: November 20, 2003**

**From: David Quadagno, Chair**

**To:** ***Lindsey R. Williams***
***2420 Basswood Land***
***Tallahassee, FL 32308***
**Dept: Music Education**
**Re:** Use of Human subjects in Research
**Project entitled: The Effects Musical Training and Musical Complexity on Focus of Attention of Melody and Harmony**

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The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Human Subjects Committee at its meeting on **November 12, 2003.** Your project was approved by the Committee.

**The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals which may be required.**

If the project has not been completed by **November 11, 2004,** you must request renewed approval for continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the project to the Committee for approval. Also, the principal investigator must promptly report, in writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000446.

APPLICATION NO.
03.640 Cc: C. Madsen

APPENDIX B

INFORMED ASSENT FORM

**INFORMED ASSENT FORM**

I freely and voluntarily and without element of force or coercion, consent to be a participant in the research project entitled "The Effects of Musical Training and Musical Complexity on Focus of Attention of Melody and Harmony."

This research is being conducting by Lindsey R. Williams who is a doctoral candidate for a PhD in Music Education at Florida State University. I understand that the purpose of his research project is to better understand the factors that may lead to listening focus of attention in a musical setting.

I understand that I will be asked to fill out a paper and pencil questionnaire. The total time commitment will be about 12 minutes.

I understand that my participation is totally voluntary and I may stop participating at any time without penalty. All my answers to the questions will be anonymous and identified by a subject code number. My name will not appear on any results.

I have been given the right to ask and have answered any inquiry concerning the study. Questions, if any, have been answered to my satisfaction.

I understand that I may contact Lindsey R. Williams, Florida State University, School of Music, HMU 101A, (850) 644-6159, for answers to questions about this research or my rights. Group results will be sent to me upon my request.

I have read and understand this consent form.

____________________________ ____________________
(Subject) (Date)

____________________________
(Witness)



Additional inquires may be made to the Florida State University Human Subjects Committee by calling (850) 644-8633

APPENDIX C

PARENTAL CONSENT FORM

**PARENTAL CONSENT FORM**

Dear Parent(s):

My name is Lindsey R. Williams. I am in the process of completing my Ph.D. in Music Education at The Florida State University School of Music.

I would like to have your permission to use your son/daughter in a listening project. He/she will be asked to listen to 16 short excerpts of music and, while listening, indicate whether he/she was listening to melody or harmony and to what degree. Your son/daughter will also be asked to complete a brief questionnaire for demographic data such as: gender, grade, primary musical instrument, and private instruction experience. All information obtained will be used only in the most ethical manner for the purpose of furthering research in music education. When the results are published, all participants will be anonymous. Your child may stop at any time during the project without penalty.

If you have any questions concerning this research study or your child's participation in the study, please feel free to contact Dr. Clifford K. Madsen or me at The Florida State University, School of Music, (850) 644-4565. Your time and consideration is greatly appreciated.

Sincerely,

Lindsey R. Williams

---

I give consent for my child, ______________________________, to participate in the above study. I understand that all responses by my child will remain anonymous.

______________________________
Parent's Name Printed

______________________________
Parent's Signature

____________
Date

FLORIDA STATE UNIVERSITY
Approved: 11.20.03
HS No. 03.640
Void After 11-11-04
INSTITUTIONAL REVIEW BOARD

# APPENDIX D

# PRINCIPAL CONSENT FORM

## PRINCIPAL CONSENT FORM

I, ________________________________, have given Lindsey R. Williams my permission to use my students in a listening project. I understand that there is no risk involved in this project. I also understand that I will be able to stop the project at any time.

Lindsey R. Williams, who is a doctoral candidate at The Florida State University, is conducting this research. The purpose of his research is to investigate empirically musicians' focus of attention on melody and harmony. Students will be asked to listen to 16 short excerpts of music. At the conclusion of each excerpt, data concerning their responses will be gathered via an 11 point Likert-type scale. In addition, the students will fill out a brief questionnaire gathering demographic data (gender, grade, primary instrument, and private instruction experience). The session will last approximately 15 minutes. The project will be held in an area approved by music teacher.

I understand that I may contact Dr. Clifford K. Madsen or Lindsey R. Williams, The Florida State University, School of Music, (850) 644-4565, for answers to questions about this research or my rights. Group results will be sent to me upon my request.

________________________________________

Principal (Date)

# APPENDIX E
# STIMULUS ORDER

| **Order A** | | **Order B** | | **Order C** | | **Order D** | |
|---|---|---|---|---|---|---|---|
| | PraxEx 1 | | PraxEx 2 | | PraxEx 2 | | PraxEx 1 |
| | PraxEx 2 | | PraxEx 1 | | PraxEx 1 | | PraxEx 2 |
| 1 | M2H3 | 1 | M3H2 | 1 | M4H1 | 1 | M1H4 |
| 2 | M1H1 | 2 | M2H1 | 2 | M3H3 | 2 | M3H3 |
| 3 | M3H4 | 3 | M4H4 | 3 | M1H2 | 3 | M4H2 |
| 4 | M1H2 | 4 | M1H1 | 4 | M4H3 | 4 | M1H1 |
| 5 | M4H3 | 5 | M4H2 | 5 | M1H1 | 5 | M3H2 |
| 6 | M3H1 | 6 | M1H3 | 6 | M2H4 | 6 | M2H4 |
| 7 | M2H4 | 7 | M3H1 | 7 | M3H1 | 7 | M4H3 |
| 8 | M1H3 | 8 | M2H4 | 8 | M2H2 | 8 | M2H1 |
| 9 | M4H2 | 9 | M3H3 | 9 | M3H4 | 9 | M3H4 |
| 10 | M2H1 | 10 | M1H2 | 10 | M1H3 | 10 | M2H2 |
| 11 | M3H3 | 11 | M3H4 | 11 | M2H1 | 11 | M1H3 |
| 12 | M1H4 | 12 | M4H1 | 12 | M3H2 | 12 | M3H1 |
| 13 | M2H2 | 13 | M2H3 | 13 | M4H4 | 13 | M1H2 |
| 14 | M4H4 | 14 | M1H4 | 14 | M2H3 | 14 | M4H4 |
| 15 | M3H2 | 15 | M4H3 | 15 | M4H2 | 15 | M2H3 |
| 16 | M4H1 | 16 | M2H2 | 16 | M1H4 | 16 | M4H1 |

# APPENDIX F
# CONTINUOUS RESPONSE MODE INSTRUCTIONS AND DEMOGRAPHIC INFORMATION

Participant #________

You are going to hear 16 short musical excerpts. As you listen, you will be asked to move the dial in front of you corresponding with your focus of attention on melody or harmony. As you can see, the left portion of the dial represents melody with "less melody" toward the center and "more melody" toward the far left. The right portion of the dial represents harmony with "less harmony" toward the center and "more harmony" toward the far right. Feel free to move the dial as much or as little as you like. At the conclusion of each example, please move your dial to the area marked "WAIT."

Please complete the following and we will begin shortly.

**Demographic Information** (Please CIRCLE the appropriate response)

1. What is your academic status?

   Univ. Music Major    Univ. Jazz Major

2. What is your primary instrument?________________________________________
3. Do you study privately?    YES    NO

   If yes, how many years have you studied privately?_______

4. What is your gender?    Female    Male

5. Have you ever participated in a study using the Continuous Response Digital Interface (CRDI)?    YES    NO

   If "YES," how many?    One    Two    Three    Four

Please listen to the following excerpts. Move the dial so that it corresponds with your focus of attention on melody or harmony. At the conclusion of each excerpt, please return the dial to the center section marked "WAIT."

On the scale below, please mark where you feel that you tend to focus your attention when listening to music. The far left suggests that you focus on “melody only” and the far right suggests “harmony only.”

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Melody | | | | | | | | | Harmony |

Do you feel that your dial movement corresponded to your focus of attention on melody and harmony? YES NO

**Thank you for your time and responses.**

APPENDIX G

STATIC RESPONSE MODE INSTRUCTIONS

AND DEMOGRAPHIC INFORMATION

Participant #________

You are going to hear 16 short musical excerpts. At the conclusion of each excerpt, please circle the number corresponding to your focus of attention to melody or harmony. As you can see, the left portion of the diagram represents melody with "less melodic elements" toward the center and "more melodic elements" toward the far left. The right portion of the diagram represents harmony with "less harmonic elements" toward the center and "more harmonic elements" toward the far right. Please complete the following and we will begin shortly.

**Demographic Information** (Please CIRCLE the appropriate response)

1. What is your academic status?

   Junior High     High School

   Univ. Music Major     Univ. Jazz Major

2. What is your primary instrument?________________________________________
3. Do you study privately?     YES     NO

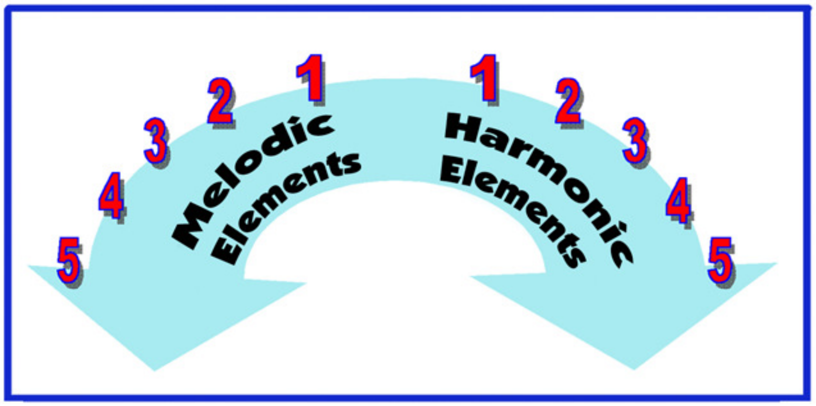
   If yes, how many years have you studied privately?_______

4. What is your gender?     Female     Male

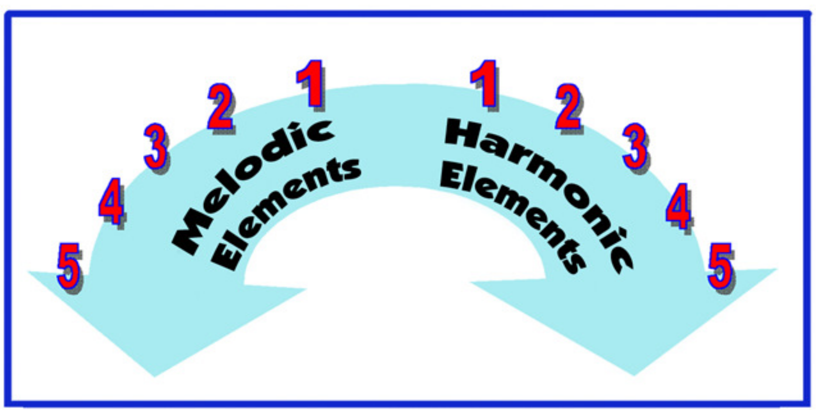
Please listen to the following excerpts. At the conclusion of each excerpt, please circle the number corresponding to your focus of attention to melody or harmony.

Please circle the number that best describes your focus of attention for the excerpt that you hear.
On the diagram below, the numbers on the left correspond with less melody (1) to more melody (5).
The numbers on the right correspond with less harmony (1) and more harmony (5).
For example, if you are listening exclusively to harmony, circle the “5” on the far right.
If you are listening exclusively to melody, circle the “5” on the far left.
If you are listening to both but a little more melody than harmony, circle the “1” on the left.

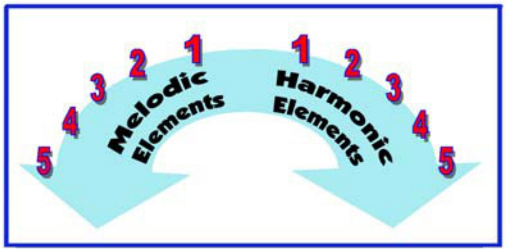
Practice Example #1



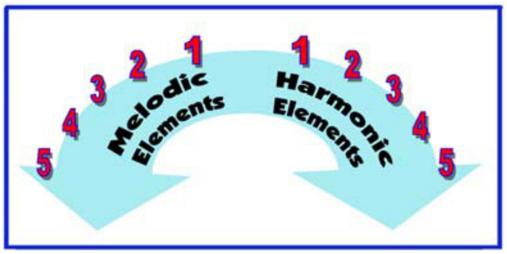

Practice Example #2



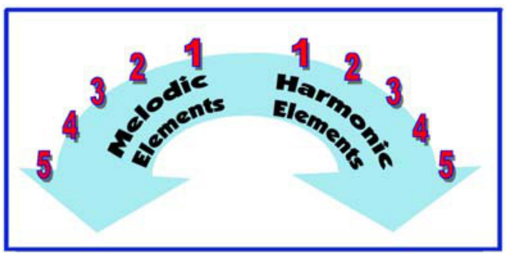
EXAMPLE 1



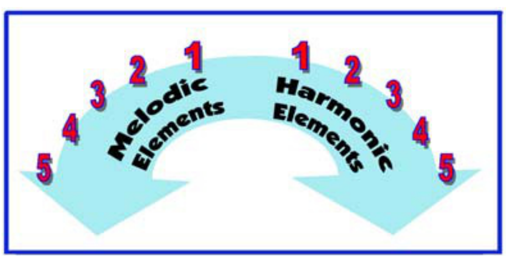

EXAMPLE 2



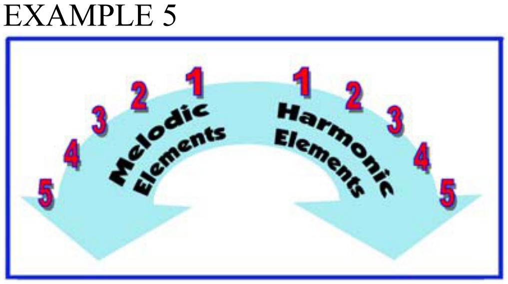

EXAMPLE 3



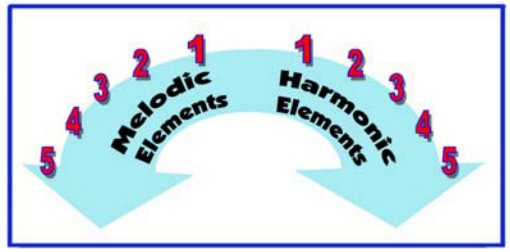

EXAMPLE 4



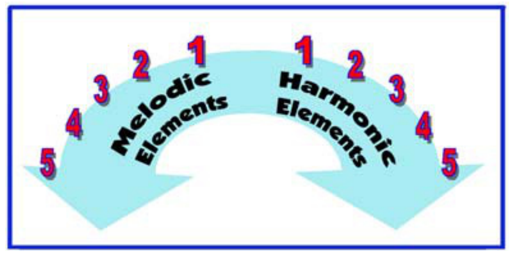

EXAMPLE 5



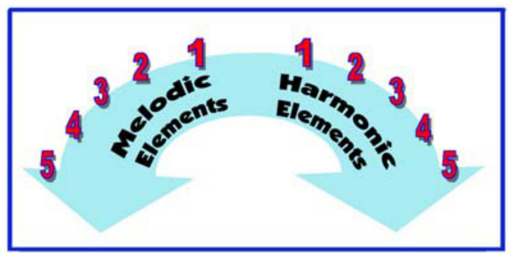

EXAMPLE 6



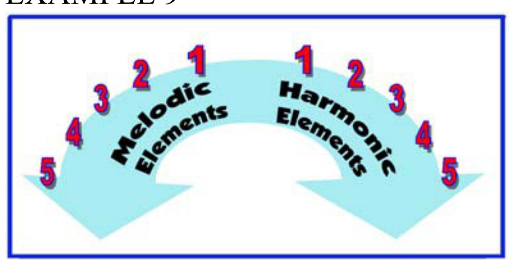

EXAMPLE 7



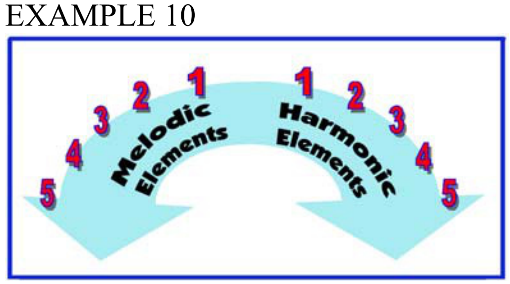

EXAMPLE 8



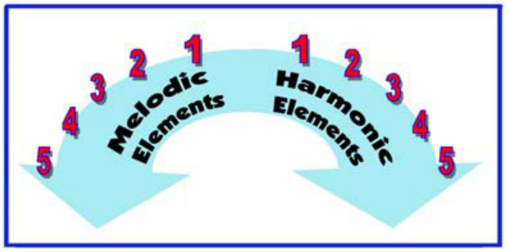

EXAMPLE 9



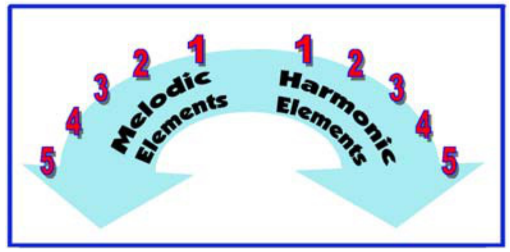

EXAMPLE 10



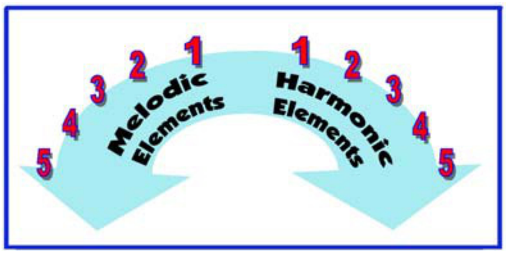
EXAMPLE 11



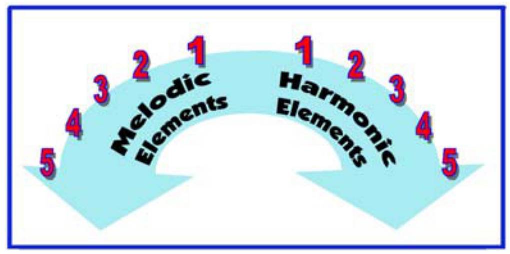

EXAMPLE 14



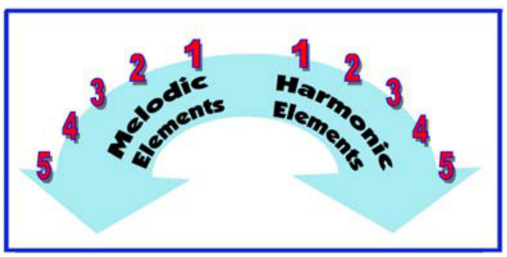

EXAMPLE 12



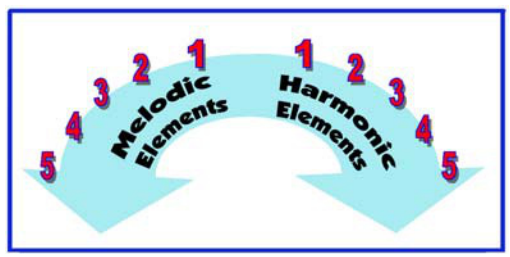

EXAMPLE 15




EXAMPLE 13




EXAMPLE 16



On the scale below, please mark where you feel that you tend to focus your attention when listening to music. The far left suggests that you focus on "melody only" and the far right suggests "harmony only."

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Melody | | | | | | | | | Harmony |

# APPENDIX H

# MELODIC COMPLEXITY LEVELS

MELODY 1 (M1) – least complex

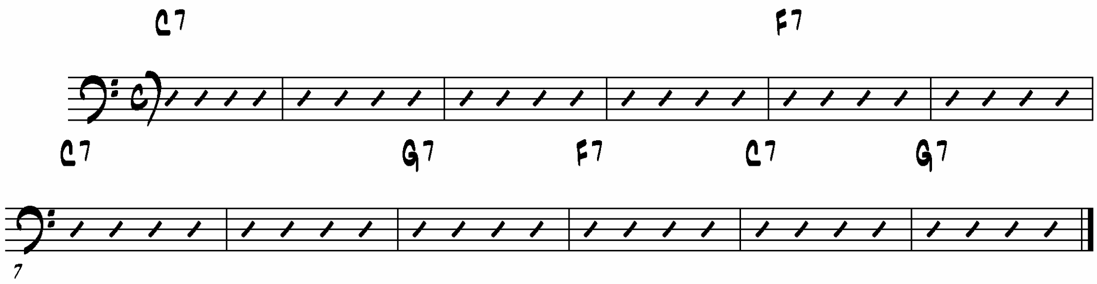

MELODY 2 (M2) – less complex


MELODY 3 (M3) – more complex

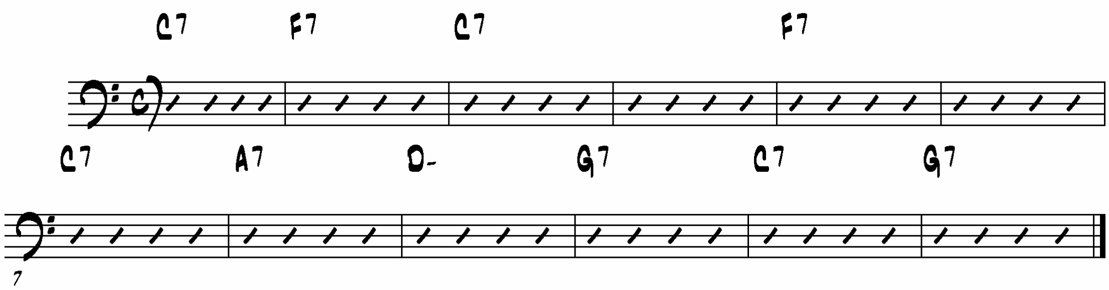

MELODY 4 (M4) – most complex

# APPENDIX I
# HARMONIC COMPLEXITY LEVELS

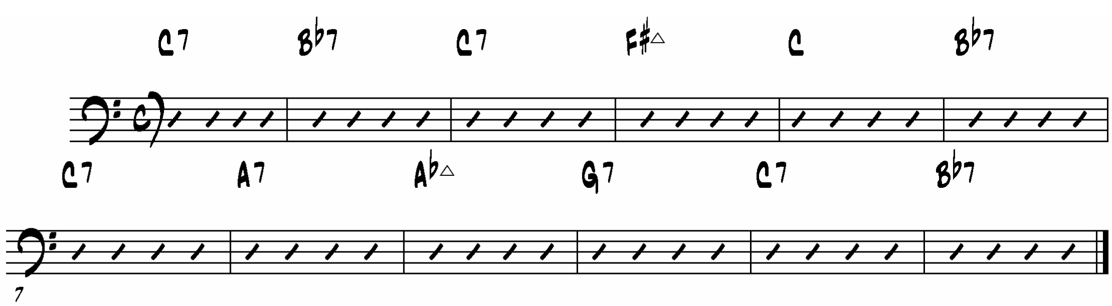
HARMONY 1 (H1) – least complex



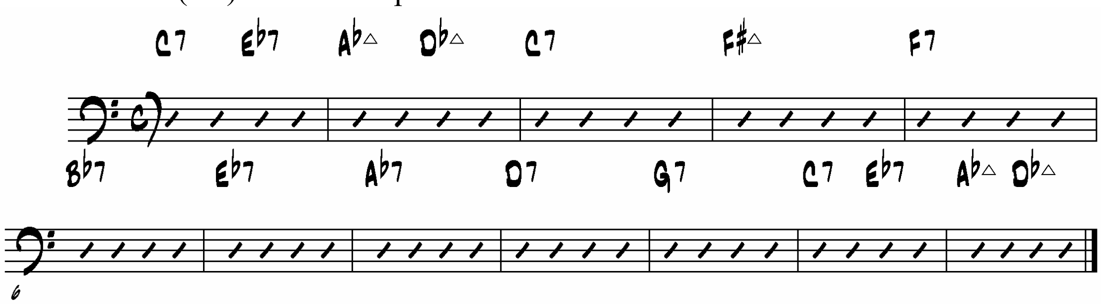

HARMONY 2 (H2) – less complex




HARMONY 3 (H3) – more complex




HARMONY 4 (H4) – most complex



APPENDIX J

STATIC PARTICIPANTS:  RESPONSE AND DEMOGRAPHIC DATA

| UM | Order | Inst. | Priv | F/M | M1H1 | M1H2 | M1H3 | M1H4 | M2H1 | M2H2 | M2H3 | M2H4 | M3H1 | M3H2 | M3H3 | M3H4 | M4H1 | M4H2 | M4H3 | M4H4 | PR1 | PR2 | Perc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | A | 6 | 6 | 1 | 5 | 4 | 6 | 8 | 4 | 5 | 7 | 6 | 3 | 6 | 2 | 7 | 2 | 5 | 2 | 7 | 3 | 6 | 5 |
| 102 | A | 3 | 10 | 1 | 4 | 8 | 7 | 7 | 7 | 8 | 4 | 4 | 4 | 5 | 3 | 5 | 5 | 6 | 5 | 3 | 8 | 8 | 6 |
| 103 | A | 2 | 8 | 2 | 5 | 3 | 5 | 6 | 4 | 4 | 4 | 4 | 2 | 4 | 2 | 6 | 2 | 4 | 3 | 3 | 8 | 5 | 3 |
| 104 | A | 11 | 5 | 2 | 8 | 7 | 5 | 7 | 4 | 3 | 5 | 4 | 7 | 4 | 4 | 6 | 8 | 8 | 3 | 2 | 6 | 4 | 1 |
| 105 | A | 3 | 9 | 2 | 5 | 7 | 6 | 9 | 5 | 6 | 9 | 10 | 4 | 4 | 1 | 8 | 4 | 3 | 4 | 7 | 2 | 1 | 9 |
| 106 | A | 7 | 6 | 2 | 7 | 3 | 9 | 5 | 1 | 4 | 5 | 9 | 6 | 1 | 10 | 3 | 1 | 2 | 3 | 1 | 8 | 3 | 4 |
| 107 | A | 3 | 6 | 1 | 8 | 9 | 3 | 7 | 8 | 5 | 4 | 4 | 10 | 6 | 1 | 3 | 1 | 1 | 1 | 2 | 2 | 7 | 4 |
| 108 | A | 12 | 7 | 2 | 4 | 8 | 5 | 8 | 8 | 9 | 8 | 4 | 1 | 3 | 7 | 3 | 2 | 3 | 2 | 2 | 8 | 4 | 5 |
| 109 | B | 3 | 9 | 1 | 6 | 5 | 7 | 8 | 5 | 5 | 8 | 7 | 5 | 5 | 7 | 5 | 7 | 5 | 3 | 4 | 7 | 5 | 5 |
| 110 | B | 3 | 8 | 2 | 3 | 6 | 8 | 6 | 8 | 6 | 3 | 5 | 3 | 4 | 3 | 5 | 5 | 5 | 4 | 3 | 3 | 5 | 5 |
| 111 | B | 11 | 5 | 2 | 7 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 3 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 3 | 4 |
| 112 | B | 12 | 9 | 2 | 5 | 3 | 8 | 4 | 4 | 2 | 5 | 5 | 1 | 1 | 1 | 4 | 1 | 2 | 1 | 7 | 5 | 2 | 4 |
| 113 | B | 8 | 8 | 1 | 6 | 5 | 8 | 8 | 5 | 6 | 8 | 9 | 4 | 3 | 2 | 2 | 5 | 3 | 5 | 6 | 7 | 3 | 3 |
| 114 | B | 3 | 7 | 2 | 10 | 7 | 8 | 5 | 8 | 2 | 1 | 5 | 4 | 5 | 4 | 2 | 1 | 3 | 5 | 7 | 7 | 5 | 7 |
| 115 | B | 6 | 10 | 2 | 8 | 7 | 4 | 9 | 8 | 8 | 7 | 4 | 5 | 7 | 4 | 8 | 4 | 4 | 4 | 5 | 7 | 4 | 7 |
| 116 | B | 3 | 9 | 2 | 5 | 5 | 8 | 9 | 4 | 4 | 8 | 7 | 2 | 2 | 6 | 8 | 7 | 3 | 2 | 8 | 3 | 5 | 4 |
| 117 | C | 8 | 9 | 2 | 4 | 4 | 10 | 9 | 3 | 8 | 2 | 9 | 8 | 8 | 7 | 9 | 3 | 1 | 8 | 9 | 2 | 3 | 5 |
| 118 | C | 12 | 9 | 2 | 3 | 2 | 5 | 5 | 4 | 3 | 5 | 6 | 3 | 3 | 4 | 5 | 3 | 5 | 5 | 6 | 4 | 5 | 3 |
| 119 | C | 9 | 2 | 2 | 9 | 3 | 2 | 2 | 2 | 2 | 9 | 3 | 2 | 4 | 9 | 9 | 8 | 3 | 3 | 8 | 3 | 9 | 7 |
| 120 | C | 3 | 8 | 1 | 8 | 8 | 9 | 8 | 7 | 5 | 5 | 8 | 4 | 5 | 5 | 7 | 4 | 4 | 5 | 4 | 3 | 5 | 3 |
| 121 | C | 3 | 9 | 2 | 9 | 8 | 7 | 9 | 6 | 7 | 7 | 6 | 5 | 5 | 6 | 4 | 6 | 4 | 4 | 3 | 2 | 9 | 7 |
| 122 | C | 10 | 9 | 1 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 1 | 6 | 5 | 5 | 10 | 5 | 5 | 5 | 5 |
| 123 | C | 3 | 8 | 1 | 8 | 9 | 8 | 9 | 6 | 5 | 4 | 6 | 3 | 8 | 8 | 4 | 4 | 6 | 4 | 2 | 7 | 5 | 4 |
| 124 | C | 8 | 5 | 1 | 8 | 8 | 6 | 8 | 8 | 8 | 6 | 7 | 7 | 7 | 7 | 6 | 9 | 6 | 6 | 6 | 6 | 9 | 8 |
| 125 | D | 11 | 6 | 2 | 8 | 7 | 8 | 9 | 10 | 6 | 9 | 8 | 4 | 3 | 4 | 1 | 2 | 2 | 2 | 3 | 9 | 4 | 7 |
| 126 | D | 12 | 1 | 2 | 9 | 5 | 9 | 7 | 6 | 3 | 9 | 7 | 3 | 6 | 1 | 5 | 2 | 2 | 3 | 10 | 8 | 3 | 5 |
| 127 | D | 6 | 1 | 2 | 4 | 3 | 3 | 3 | 3 | 7 | 3 | 4 | 6 | 8 | 7 | 3 | 8 | 3 | 7 | 8 | 4 | 6 | 4 |
| 128 | D | 1 | 6 | 1 | 8 | 10 | 9 | 8 | 3 | 3 | 8 | 7 | 2 | 3 | 2 | 1 | 9 | 2 | 2 | 4 | 9 | 4 | 5 |
| 129 | D | 7 | 4 | 2 | 9 | 5 | 8 | 4 | 3 | 6 | 6 | 4 | 5 | 4 | 6 | 6 | 3 | 7 | 2 | 4 | 2 | 6 | 5 |
| 130 | D | 9 | 4 | 2 | 7 | 7 | 9 | 8 | 5 | 8 | 7 | 9 | 4 | 3 | 2 | 3 | 4 | 3 | 6 | 9 | 4 | 6 | 8 |
| 131 | D | 10 | 5 | 2 | 9 | 6 | 9 | 8 | 9 | 10 | 9 | 7 | 8 | 5 | 9 | 9 | 9 | 7 | 8 | 9 | 3 | 9 | 8 |
| 132 | D | 3 | 4 | 2 | 9 | 7 | 8 | 6 | 5 | 4 | 7 | 7 | 4 | 5 | 7 | 6 | 7 | 5 | 3 | 2 | 8 | 6 | 6 |

| UJ | Order | Inst. | Priv | F/M | M1H1 | M1H2 | M1H3 | M1H4 | M2H1 | M2H2 | M2H3 | M2H4 | M3H1 | M3H2 | M3H3 | M3H4 | M4H1 | M4H2 | M4H3 | M4H4 | PR1 | PR2 | Perc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 301 | A | 6 | 10 | 2 | 1 | 7 | 5 | 9 | 5 | 6 | 6 | 8 | 2 | 9 | 7 | 8 | 3 | 6 | 7 | 10 | 10 | 3 | 8 |
| 302 | A | 9 | 9 | 2 | 4 | 7 | 5 | 8 | 6 | 10 | 10 | 7 | 9 | 4 | 4 | 10 | 7 | 1 | 2 | 10 | 9 | 5 | 7 |
| 303 | A | 7 | 4 | 2 | 2 | 5 | 5 | 7 | 5 | 3 | 2 | 9 | 6 | 4 | 8 | 1 | 1 | 1 | 1 | 7 | 5 | 4 | 3 |
| 304 | A | 7 | 6 | 2 | 2 | 3 | 5 | 8 | 5 | 5 | 4 | 7 | 3 | 3 | 6 | 5 | 4 | 2 | 5 | 3 | 4 | 2 | 3 |
| 305 | A | 7 | 9 | 2 | 7 | 7 | 6 | 6 | 2 | 5 | 8 | 7 | 2 | 5 | 2 | 4 | 3 | 4 | 3 | 7 | 5 | 3 | 4 |
| 306 | A | 12 | 11 | 2 | 2 | 6 | 3 | 6 | 2 | 8 | 5 | 9 | 8 | 3 | 3 | 2 | 8 | 3 | 6 | 9 | 9 | 2 | 6 |
| 307 | A | 6 | 4 | 2 | 3 | 4 | 4 | 8 | 2 | 2 | 6 | 8 | 2 | 2 | 6 | 7 | 2 | 4 | 7 | 7 | 8 | 4 | 7 |
| 308 | A | 6 | 6 | 2 | 9 | 3 | 1 | 9 | 7 | 3 | 8 | 6 | 3 | 2 | 9 | 4 | 2 | 1 | 2 | 1 | 2 | 9 | 5 |
| 309 | B | 7 | 1 | 2 | 7 | 8 | 7 | 9 | 6 | 9 | 7 | 5 | 7 | 6 | 4 | 5 | 5 | 4 | 3 | 5 | 8 | 6 | 8 |
| 310 | B | 13 | 0 | 2 | 3 | 6 | 9 | 10 | 9 | 5 | 6 | 5 | 5 | 4 | 7 | 8 | 2 | 2 | 4 | 9 | 2 | 8 | 7 |
| 311 | B | 7 | 5 | 2 | 4 | 6 | 8 | 8 | 6 | 5 | 8 | 8 | 4 | 3 | 6 | 7 | 4 | 5 | 7 | 7 | 8 | 4 | 7 |
| 312 | B | 14 | 0 | 2 | 4 | 5 | 8 | 8 | 4 | 6 | 8 | 6 | 3 | 2 | 6 | 5 | 6 | 7 | 6 | 7 | 3 | 8 | 4 |
| 313 | B | 7 | 5 | 2 | 4 | 8 | 6 | 9 | 6 | 8 | 4 | 6 | 4 | 5 | 6 | 9 | 7 | 3 | 9 | 8 | 3 | 7 | 8 |
| 314 | B | 6 | 8 | 2 | 6 | 7 | 7 | 9 | 6 | 5 | 8 | 8 | 7 | 5 | 7 | 8 | 6 | 5 | 8 | 7 | 4 | 4 | 7 |
| 315 | B | 9 | 5 | 2 | 1 | 3 | 8 | 8 | 3 | 4 | 9 | 9 | 1 | 1 | 8 | 9 | 1 | 3 | 4 | 9 | 4 | 9 | 7 |
| 316 | B | 6 | 3 | 2 | 5 | 3 | 4 | 6 | 4 | 2 | 3 | 7 | 2 | 2 | 8 | 8 | 9 | 7 | 9 | 9 | 3 | 9 | 8 |
| 317 | C | 16 | 1 | 1 | 9 | 9 | 9 | 7 | 9 | 7 | 9 | 9 | 9 | 8 | 9 | 7 | 8 | 7 | 5 | 6 | 9 | 9 | 7 |
| 318 | C | 9 | 2 | 2 | 7 | 8 | 7 | 4 | 7 | 3 | 7 | 4 | 3 | 4 | 4 | 8 | 7 | 7 | 3 | 3 | 8 | 7 | 7 |
| 319 | C | 9 | 7 | 2 | 4 | 6 | 8 | 8 | 7 | 2 | 8 | 6 | 3 | 4 | 6 | 4 | 3 | 4 | 3 | 8 | 4 | 6 | 4 |
| 320 | C | 7 | 3 | 2 | 7 | 4 | 7 | 6 | 7 | 4 | 5 | 3 | 2 | 3 | 3 | 5 | 2 | 4 | 5 | 8 | 5 | 7 | 4 |
| 321 | C | 7 | 7 | 2 | 6 | 9 | 8 | 8 | 6 | 5 | 5 | 6 | 3 | 4 | 3 | 7 | 4 | 7 | 5 | 2 | 4 | 8 | 7 |
| 322 | C | 7 | 6 | 2 | 9 | 9 | 8 | 8 | 5 | 7 | 6 | 5 | 3 | 3 | 4 | 4 | 2 | 2 | 2 | 7 | 8 | 9 | 7 |
| 323 | C | 15 | 13 | 2 | 2 | 3 | 7 | 8 | 3 | 4 | 8 | 9 | 3 | 4 | 8 | 8 | 4 | 3 | 8 | 4 | 8 | 7 | 7 |
| 324 | C | 13 | 12 | 2 | 6 | 7 | 1 | 7 | 7 | 8 | 9 | 7 | 4 | 4 | 5 | 8 | 4 | 5 | 5 | 7 | 3 | 9 | 3 |
| 325 | D | 11 | 5 | 2 | 8 | 6 | 6 | 7 | 7 | 8 | 8 | 7 | 6 | 7 | 8 | 7 | 6 | 6 | 8 | 7 | 8 | 7 | 7 |
| 326 | D | 7 | 7 | 2 | 3 | 4 | 8 | 7 | 3 | 4 | 4 | 8 | 7 | 3 | 2 | 4 | 4 | 2 | 4 | 8 | 4 | 3 | 4 |
| 327 | D | 6 | 3 | 2 | 8 | 3 | 8 | 3 | 7 | 3 | 9 | 6 | 2 | 4 | 6 | 5 | 5 | 6 | 5 | 7 | 7 | 5 | 6 |
| 328 | D | 12 | 8 | 2 | 5 | 5 | 9 | 9 | 5 | 5 | 7 | 8 | 4 | 7 | 2 | 7 | 4 | 4 | 6 | 5 | 8 | 4 | 5 |
| 329 | D | 7 | 7 | 2 | 8 | 8 | 7 | 2 | 3 | 8 | 4 | 6 | 5 | 4 | 3 | 2 | 3 | 7 | 7 | 1 | 8 | 3 | 5 |
| 330 | D | 7 | 9 | 2 | 3 | 3 | 7 | 8 | 5 | 6 | 7 | 8 | 2 | 2 | 7 | 3 | 7 | 2 | 4 | 8 | 9 | 3 | 4 |
| 331 | D | 14 | 6 | 2 | 3 | 3 | 8 | 8 | 4 | 6 | 3 | 8 | 4 | 8 | 4 | 5 | 8 | 4 | 9 | 9 | 7 | 5 | 4 |
| 332 | D | 13 | 2 | 2 | 4 | 3 | 4 | 3 | 8 | 7 | 8 | 8 | 8 | 8 | 3 | 8 | 9 | 4 | 7 | 4 | 9 | 2 | 6 |

| HS | Order | Inst. | Priv | F/M | M1H1 | M1H2 | M1H3 | M1H4 | M2H1 | M2H2 | M2H3 | M2H4 | M3H1 | M3H2 | M3H3 | M3H4 | M4H1 | M4H2 | M4H3 | M4H4 | PR1 | PR2 | Perc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 501 | A | 12 | 10 | 2 | 5 | 3 | 2 | 3 | 4 | 6 | 7 | 6 | 2 | 1 | 2 | 8 | 3 | 4 | 4 | 8 | 3 | 4 | 3 |
| 502 | A | 6 | 5 | 2 | 7 | 5 | 4 | 7 | 4 | 3 | 5 | 4 | 6 | 5 | 3 | 3 | 5 | 5 | 2 | 4 | 6 | 4 | 2 |
| 503 | A | 6 | 4 | 2 | 7 | 9 | 8 | 10 | 8 | 3 | 3 | 9 | 6 | 7 | 6 | 5 | 10 | 3 | 3 | 1 | 2 | 6 | 7 |
| 504 | A | 2 | 3 | 2 | 5 | 5 | 7 | 7 | 5 | 4 | 5 | 7 | 3 | 5 | 5 | 6 | 6 | 3 | 4 | 4 | 6 | 5 | 4 |
| 505 | A | 10 | 4 | 2 | 7 | 9 | 9 | 2 | 4 | 5 | 6 | 5 | 4 | 3 | 2 | 3 | 9 | 3 | 5 | 2 | 5 | 4 | 4 |
| 506 | A | 7 | 5 | 2 | 8 | 6 | 4 | 6 | 7 | 5 | 3 | 4 | 5 | 3 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 2 | 4 |
| 507 | A | 3 | 4 | 1 | 7 | 6 | 8 | 8 | 3 | 6 | 4 | 4 | 3 | 5 | 2 | 2 | 3 | 1 | 5 | 4 | 8 | 9 | 4 |
| 508 | A | 11 | 6 | 2 | 6 | 8 | 8 | 6 | 9 | 9 | 7 | 7 | 7 | 6 | 7 | 6 | 7 | 8 | 6 | 5 | 8 | 7 | 7 |
| 509 | B | 2 | 3 | 1 | 7 | 5 | 7 | 4 | 5 | 8 | 7 | 8 | 4 | 3 | 3 | 5 | 2 | 5 | 8 | 6 | 6 | 6 | 7 |
| 510 | B | 6 | 3 | 1 | 9 | 8 | 5 | 7 | 7 | 7 | 6 | 8 | 4 | 6 | 2 | 3 | 4 | 3 | 1 | 7 | 4 | 3 | 8 |
| 511 | B | 3 | 5 | 1 | 9 | 9 | 4 | 8 | 6 | 6 | 5 | 9 | 3 | 3 | 3 | 7 | 4 | 4 | 2 | 8 | 5 | 6 | 5 |
| 512 | B | 3 | 5 | 1 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 5 |
| 513 | B | 3 | 5 | 1 | 7 | 7 | 7 | 4 | 4 | 7 | 4 | 7 | 4 | 2 | 7 | 6 | 4 | 4 | 3 | 2 | 2 | 8 | 6 |
| 514 | B | 7 | 5 | 2 | 5 | 10 | 9 | 6 | 9 | 4 | 8 | 7 | 10 | 3 | 4 | 2 | 3 | 3 | 9 | 9 | 3 | 8 | 5 |
| 515 | B | 8 | 7 | 1 | 7 | 8 | 7 | 7 | 4 | 8 | 4 | 7 | 4 | 3 | 6 | 4 | 4 | 3 | 3 | 3 | 8 | 9 | 5 |
| 516 | B | 3 | 4 | 1 | 4 | 5 | 8 | 6 | 9 | 8 | 7 | 10 | 2 | 7 | 3 | 4 | 3 | 1 | 3 | 9 | 9 | 1 | 8 |
| 517 | C | 1 | 5 | 1 | 3 | 4 | 5 | 7 | 5 | 3 | 4 | 1 | 2 | 6 | 5 | 4 | 5 | 6 | 2 | 5 | 2 | 3 | 7 |
| 518 | C | 1 | 6 | 1 | 7 | 8 | 6 | 4 | 4 | 9 | 8 | 6 | 3 | 3 | 3 | 3 | 6 | 5 | 4 | 4 | 2 | 4 | 5 |
| 519 | C | 1 | 2 | 1 | 8 | 10 | 5 | 6 | 7 | 6 | 4 | 7 | 4 | 6 | 2 | 3 | 8 | 2 | 5 | 3 | 7 | 5 | 4 |
| 520 | C | 9 | 7 | 2 | 5 | 9 | 6 | 6 | 5 | 6 | 5 | 8 | 3 | 4 | 5 | 8 | 3 | 6 | 6 | 5 | 7 | 4 | 8 |
| 521 | C | 4 | 2 | 2 | 7 | 9 | 8 | 10 | 3 | 7 | 7 | 5 | 2 | 9 | 8 | 6 | 3 | 6 | 4 | 2 | 3 | 6 | 4 |
| 522 | C | 1 | 2 | 2 | 5 | 5 | 6 | 5 | 5 | 5 | 6 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 3 | 3 | 4 | 3 | 3 |
| 523 | C | 12 | 0 | 2 | 9 | 5 | 5 | 2 | 6 | 6 | 4 | 5 | 2 | 4 | 9 | 4 | 4 | 5 | 3 | 5 | 9 | 3 | 3 |
| 524 | C | 9 | 3 | 2 | 2 | 8 | 10 | 3 | 1 | 5 | 2 | 8 | 6 | 4 | 6 | 7 | 3 | 10 | 7 | 6 | 10 | 8 | 3 |
| 525 | D | 9 | 5 | 2 | 9 | 7 | 8 | 8 | 9 | 6 | 6 | 6 | 3 | 2 | 5 | 5 | 4 | 2 | 5 | 1 | 4 | 3 | 3 |
| 526 | D | 5 | 1 | 1 | 7 | 5 | 3 | 5 | 3 | 5 | 2 | 6 | 3 | 4 | 2 | 6 | 5 | 4 | 4 | 6 | 5 | 7 | 5 |
| 527 | D | 3 | 4 | 2 | 4 | 7 | 3 | 4 | 9 | 5 | 3 | 3 | 5 | 6 | 4 | 6 | 9 | 8 | 4 | 3 | 5 | 7 | 7 |
| 528 | D | 12 | 4 | 1 | 4 | 8 | 9 | 4 | 10 | 10 | 10 | 8 | 4 | 10 | 9 | 3 | 3 | 9 | 2 | 5 | 3 | 10 | 8 |
| 529 | D | 12 | 0 | 1 | 8 | 6 | 8 | 5 | 9 | 4 | 5 | 6 | 6 | 6 | 4 | 3 | 5 | 7 | 3 | 3 | 5 | 7 | 5 |
| 530 | D | 8 | 4 | 1 | 6 | 8 | 6 | 7 | 7 | 6 | 6 | 6 | 7 | 3 | 6 | 4 | 5 | 4 | 3 | 4 | 4 | 6 | 6 |
| 531 | D | 6 | 1 | 2 | 7 | 7 | 3 | 8 | 3 | 3 | 4 | 3 | 2 | 9 | 1 | 1 | 1 | 1 | 1 | 5 | 5 | 4 | 4 |
| 532 | D | 3 | 3 | 1 | 7 | 7 | 8 | 6 | 7 | 7 | 8 | 6 | 3 | 5 | 4 | 4 | 5 | 4 | 5 | 3 | 9 | 5 | 7 |

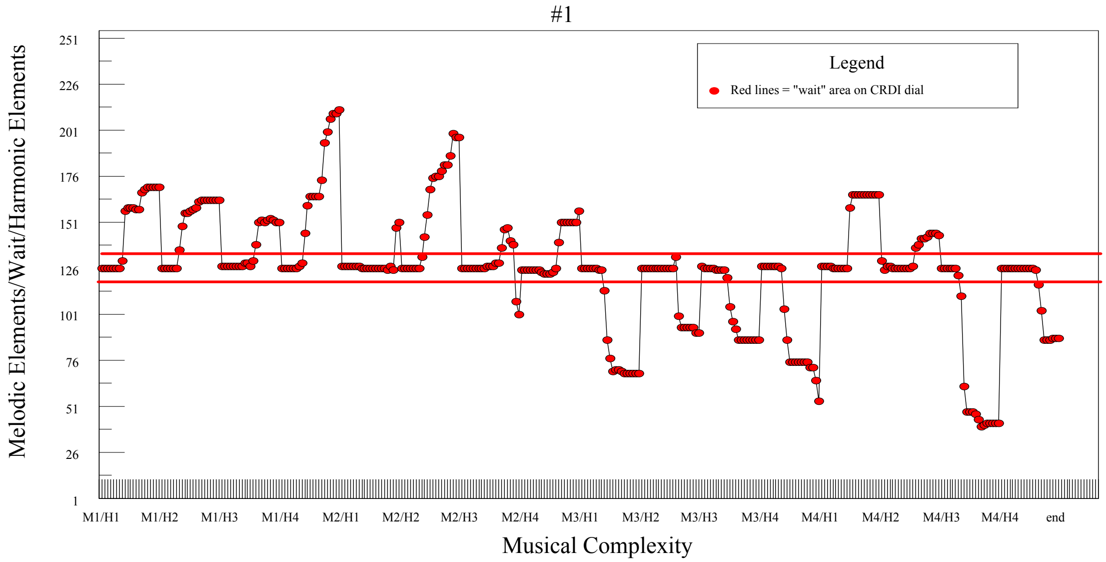
| JH | Order | Inst. | Priv | F/M | M1H1 | M1H2 | M1H3 | M1H4 | M2H1 | M2H2 | M2H3 | M2H4 | M3H1 | M3H2 | M3H3 | M3H4 | M4H1 | M4H2 | M4H3 | M4H4 | PR1 | PR2 | Perc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 601 | A | 1 | 0 | 1 | 7 | 9 | 8 | 5 | 7 | 8 | 6 | 6 | 9 | 8 | 3 | 8 | 4 | 3 | 4 | 5 | 8 | 4 | 9 |
| 602 | A | 1 | 3 | 1 | 7 | 2 | 1 | 7 | 3 | 3 | 7 | 8 | 7 | 3 | 4 | 8 | 6 | 2 | 9 | 9 | 3 | 9 | 7 |
| 603 | A | 5 | 1 | 1 | 9 | 9 | 6 | 2 | 2 | 5 | 3 | 3 | 7 | 5 | 2 | 4 | 2 | 8 | 2 | 1 | 2 | 2 | 5 |
| 604 | A | 2 | 0 | 1 | 7 | 7 | 5 | 2 | 3 | 8 | 2 | 6 | 2 | 2 | 1 | 2 | 6 | 4 | 8 | 1 | 3 | 6 | 4 |
| 605 | A | 6 | 3 | 2 | 9 | 4 | 7 | 9 | 10 | 9 | 9 | 5 | 10 | 10 | 3 | 4 | 5 | 7 | 3 | 5 | 10 | 10 | 6 |
| 606 | A | 5 | 0 | 2 | 6 | 2 | 1 | 5 | 2 | 8 | 2 | 8 | 8 | 2 | 7 | 8 | 8 | 2 | 9 | 10 | 4 | 9 | 8 |
| 607 | A | 1 | 0 | 1 | 3 | 7 | 3 | 2 | 4 | 2 | 7 | 7 | 4 | 9 | 1 | 4 | 7 | 3 | 2 | 3 | 3 | 9 | 4 |
| 608 | A | 1 | 0 | 1 | 8 | 5 | 5 | 7 | 8 | 5 | 8 | 7 | 6 | 5 | 5 | 3 | 4 | 4 | 2 | 4 | 4 | 7 | 8 |
| 609 | B | 6 | 0 | 1 | 6 | 3 | 4 | 2 | 7 | 4 | 4 | 6 | 8 | 3 | 3 | 5 | 2 | 1 | 1 | 1 | 3 | 6 | 4 |
| 610 | B | 6 | 2 | 2 | 6 | 6 | 6 | 5 | 7 | 6 | 5 | 6 | 8 | 4 | 3 | 4 | 8 | 5 | 3 | 4 | 4 | 6 | 2 |
| 611 | B | 9 | 0 | 2 | 7 | 7 | 7 | 6 | 8 | 6 | 5 | 5 | 6 | 3 | 4 | 4 | 4 | 5 | 2 | 5 | 4 | 6 | 3 |
| 612 | B | 9 | 3 | 2 | 9 | 10 | 2 | 10 | 8 | 1 | 6 | 3 | 4 | 6 | 5 | 2 | 7 | 5 | 7 | 1 | 3 | 7 | 8 |
| 613 | B | 6 | 0 | 2 | 7 | 7 | 7 | 6 | 4 | 5 | 4 | 5 | 6 | 4 | 5 | 3 | 5 | 3 | 7 | 3 | 4 | 5 | 4 |
| 614 | B | 8 | 1 | 2 | 7 | 7 | 7 | 7 | 7 | 5 | 7 | 7 | 8 | 3 | 4 | 4 | 4 | 2 | 5 | 6 | 7 | 3 | 4 |
| 615 | B | 8 | 0 | 1 | 8 | 10 | 4 | 1 | 10 | 6 | 5 | 5 | 3 | 2 | 6 | 4 | 4 | 4 | 1 | 1 | 8 | 4 | 2 |
| 616 | B | 6 | 0 | 2 | 2 | 3 | 9 | 3 | 4 | 4 | 5 | 8 | 6 | 4 | 9 | 6 | 6 | 5 | 2 | 3 | 8 | 7 | 9 |
| 617 | C | 1 | 0 | 1 | 10 | 6 | 3 | 10 | 6 | 7 | 10 | 5 | 5 | 6 | 3 | 1 | 3 | 8 | 3 | 9 | 5 | 6 | 1 |
| 618 | C | 1 | 5 | 1 | 5 | 5 | 6 | 5 | 5 | 3 | 6 | 3 | 7 | 2 | 2 | 3 | 3 | 4 | 1 | 1 | 3 | 5 | 4 |
| 619 | C | 1 | 0 | 1 | 9 | 6 | 8 | 8 | 5 | 7 | 3 | 6 | 4 | 5 | 4 | 4 | 7 | 5 | 6 | 7 | 5 | 7 | 6 |
| 620 | C | 1 | 1 | 1 | 5 | 6 | 4 | 4 | 5 | 3 | 6 | 4 | 2 | 3 | 2 | 1 | 5 | 7 | 2 | 2 | 5 | 7 | 4 |
| 621 | C | 1 | 0 | 1 | 8 | 7 | 6 | 5 | 8 | 9 | 5 | 4 | 1 | 6 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 9 | 4 |
| 622 | C | 6 | 1 | 1 | 5 | 5 | 5 | 6 | 5 | 6 | 4 | 6 | 3 | 6 | 5 | 4 | 3 | 3 | 5 | 3 | 4 | 6 | 5 |
| 623 | C | 11 | 6 | 2 | 5 | 8 | 5 | 7 | 4 | 5 | 8 | 3 | 7 | 7 | 4 | 3 | 5 | 5 | 5 | 3 | 5 | 3 | 5 |
| 624 | C | 1 | 0 | 1 | 8 | 3 | 4 | 4 | 8 | 9 | 5 | 1 | 4 | 2 | 3 | 1 | 8 | 2 | 6 | 1 | 3 | 2 | 3 |
| 625 | D | 7 | 0 | 2 | 5 | 5 | 6 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 4 | 4 | 3 |
| 626 | D | 3 | 0 | 2 | 8 | 10 | 6 | 10 | 7 | 3 | 6 | 1 | 8 | 2 | 4 | 9 | 5 | 5 | 6 | 2 | 3 | 9 | 5 |
| 627 | D | 3 | 1 | 1 | 5 | 6 | 7 | 4 | 6 | 6 | 5 | 4 | 3 | 4 | 3 | 5 | 5 | 3 | 2 | 3 | 6 | 5 | 7 |
| 628 | D | 3 | 0 | 1 | 2 | 6 | 6 | 8 | 9 | 6 | 5 | 6 | 4 | 5 | 4 | 2 | 8 | 10 | 7 | 4 | 3 | 9 | 8 |
| 629 | D | 3 | 3 | 1 | 6 | 6 | 6 | 4 | 7 | 3 | 6 | 3 | 4 | 2 | 2 | 4 | 5 | 1 | 2 | 4 | 1 | 3 | 4 |
| 630 | D | 3 | 6 | 1 | 6 | 8 | 4 | 6 | 6 | 6 | 6 | 3 | 5 | 6 | 5 | 5 | 4 | 5 | 5 | 6 | 4 | 3 | 5 |
| 631 | D | 3 | 0 | 1 | 2 | 6 | 4 | 7 | 3 | 2 | 3 | 4 | 5 | 3 | 8 | 2 | 3 | 4 | 5 | 3 | 5 | 5 | 2 |
| 632 | D | 3 | 0 | 1 | 6 | 5 | 9 | 5 | 7 | 5 | 8 | 1 | 6 | 4 | 2 | 2 | 1 | 1 | 5 | 1 | 8 | 2 | 3 |

KEY:

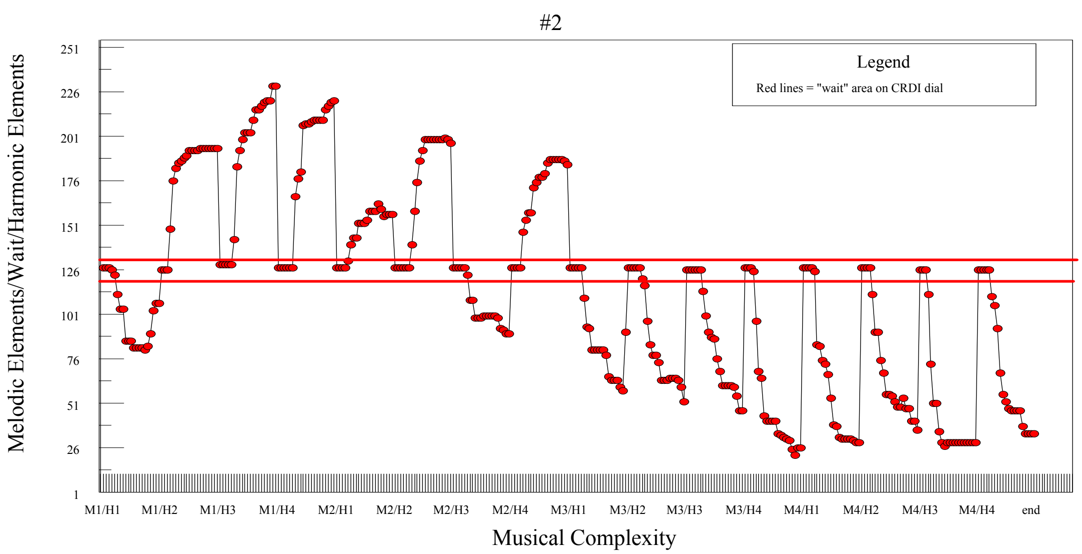
| | |
|---|---|
| UM = University Music Majors | PR = Practice Example |
| UJ = University Jazz Majors | Perc = Self-perception of Focus of Attention |
| HS = High School Instrumentalists | Inst = Instrument |
| JH = Junior High School Instrumentalists | Priv = Private Instruction (in years) |
| Order = Order of Stimuli (A, B, C, D) | F/M = Female (1)/Male (2) |

APPENDIX K

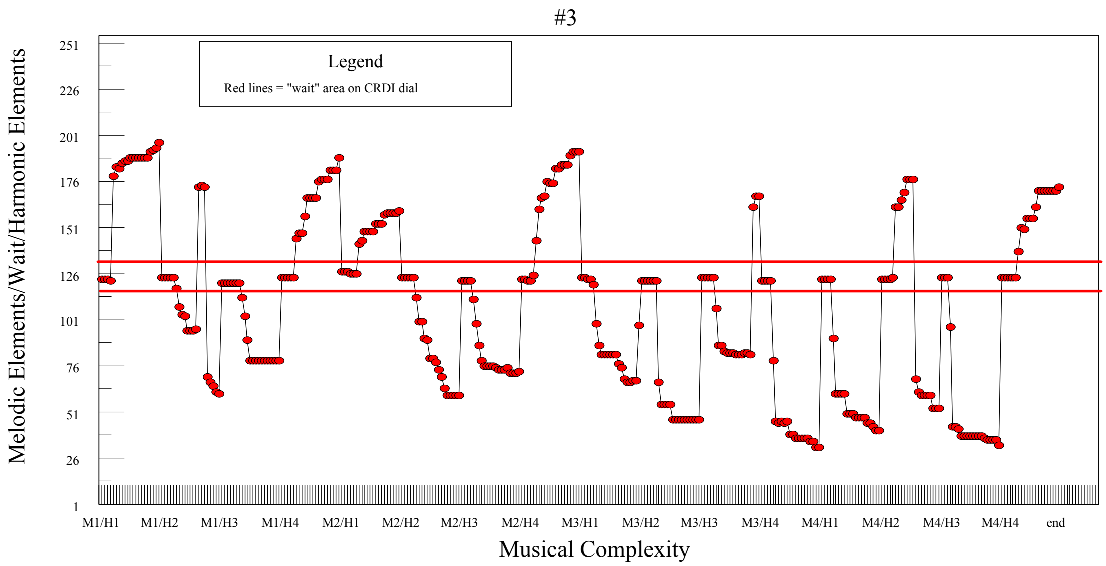
CRDI PARTICIPANTS:  INDIVIDUAL GRAPHS AND DEMOGRAPHIC DATA



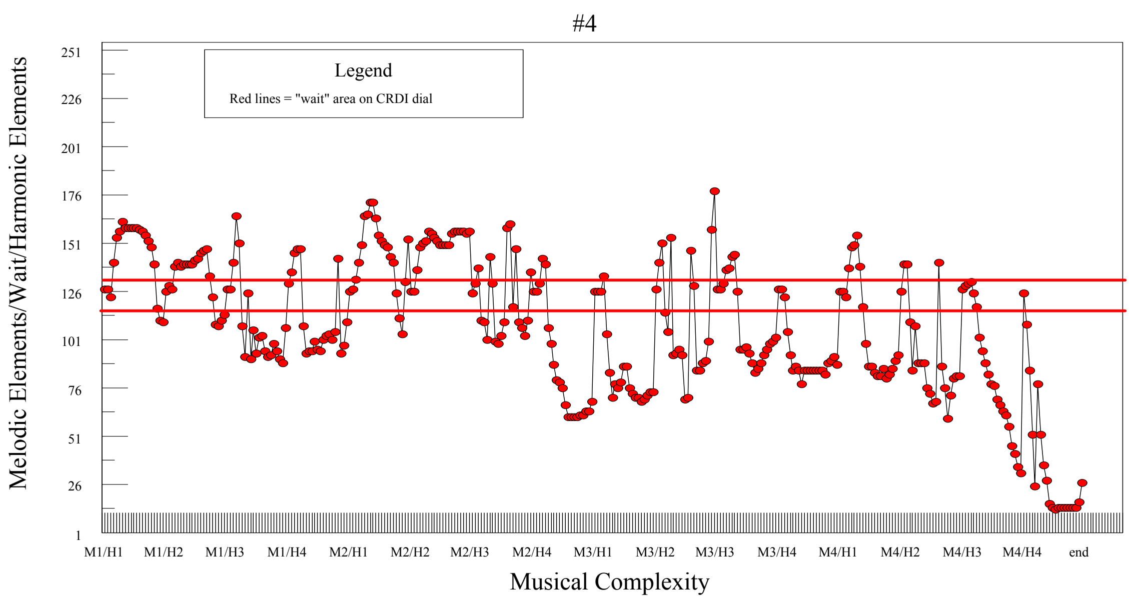

Academic status: Univ. Music Major Stimulus Order: A
Primary instrument: Trombone
Private Study (in years): 5 Gender: Male
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y




Academic status: Univ. Music Major Stimulus Order: A
Primary instrument: Clarinet
Private Study (in years): 3 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 3 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

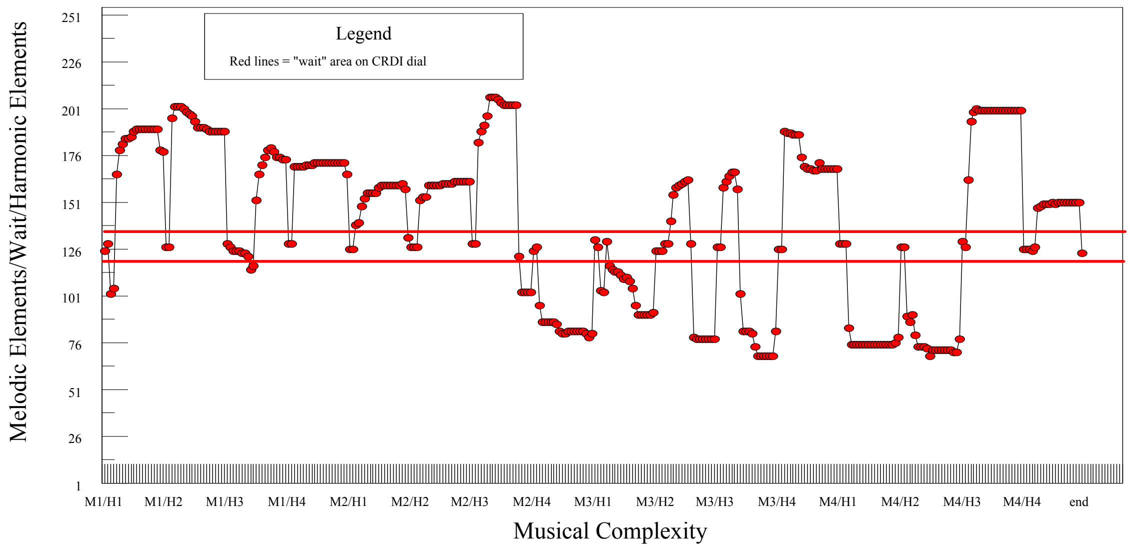



Academic status: Univ. Music Major Stimulus Order: A
Primary instrument: Clarinet
Private Study (in years): 6 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 3 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



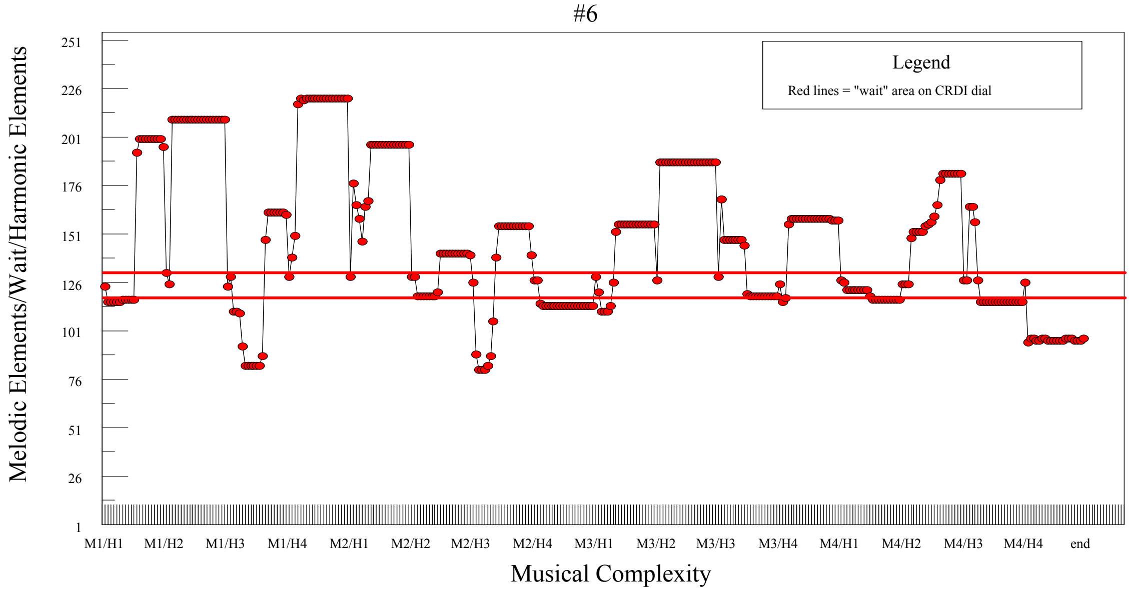

Academic status: Univ. Music Major Stimulus Order: A
Primary instrument: Trombone
Private Study (in years): 5 Gender: Male
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#5

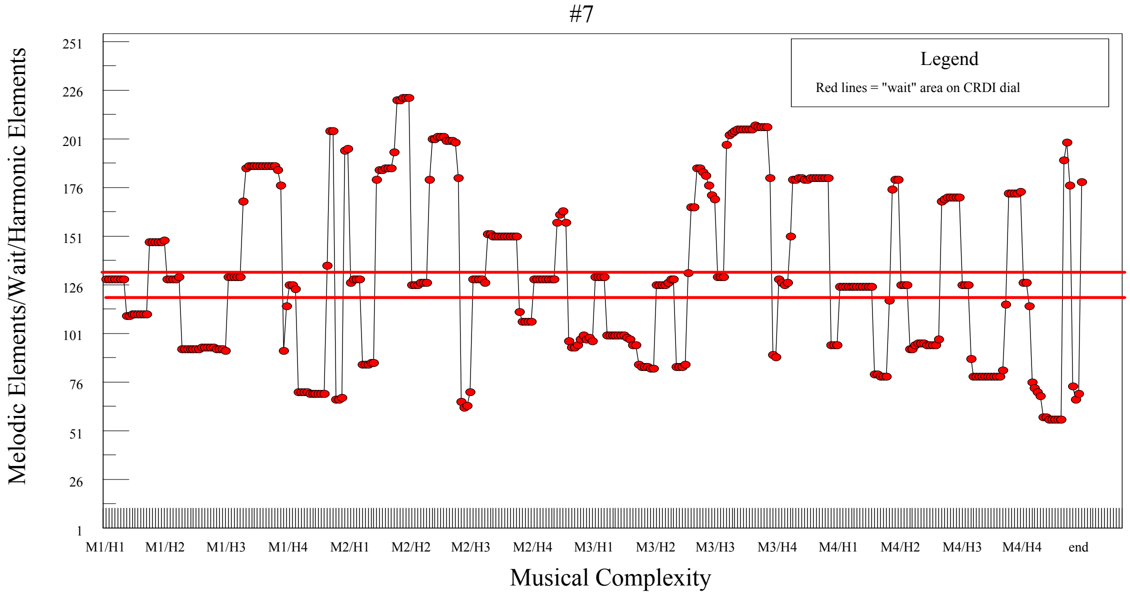



Academic status: Univ. Music Major Stimulus Order: A
Primary instrument: Trombone
Private Study (in years): 9 Gender: Female
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

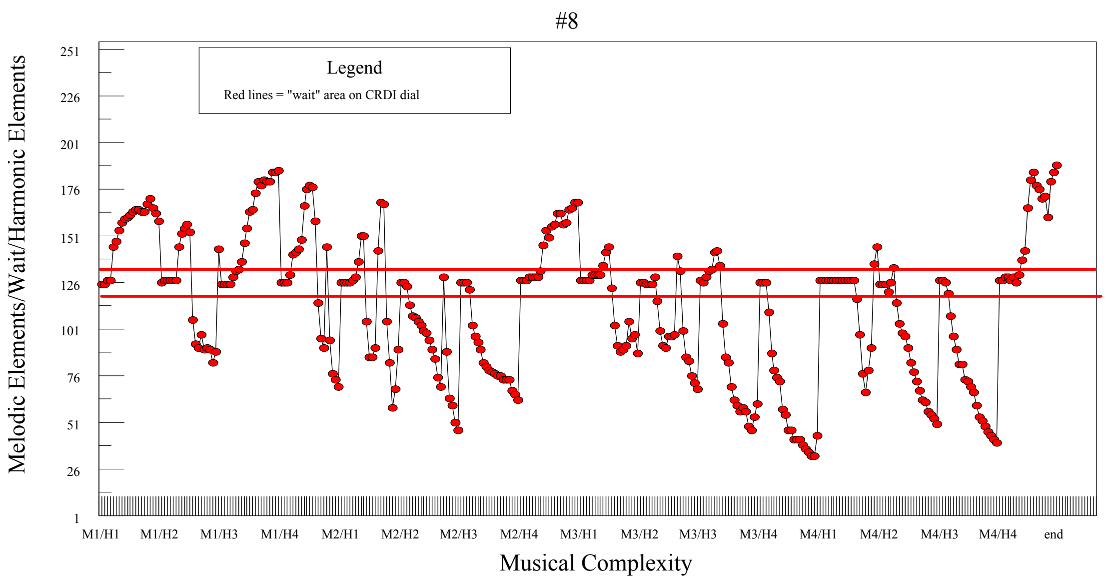
#6



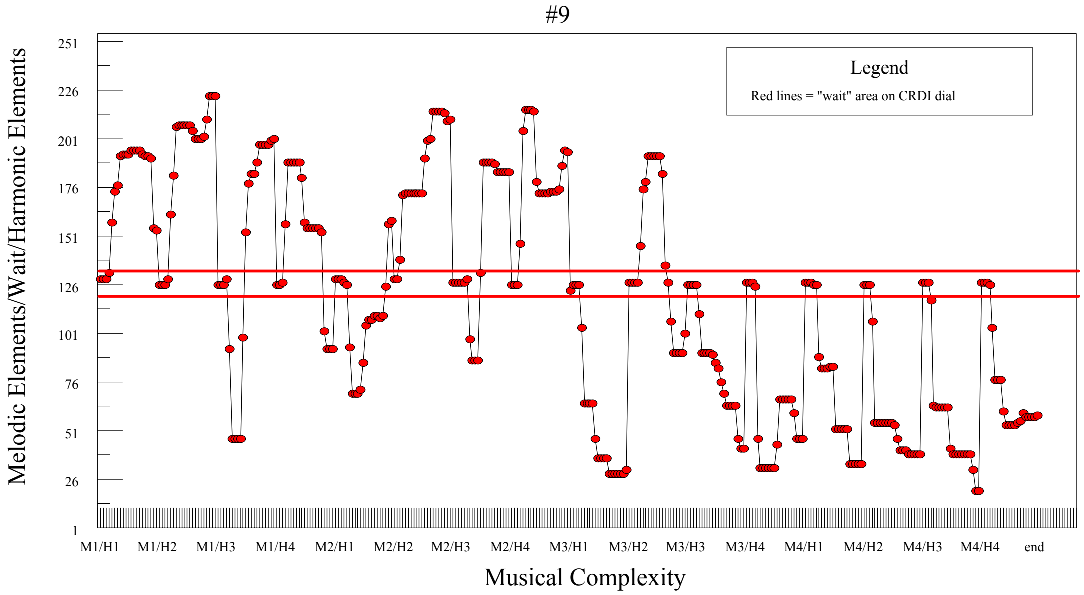

Academic status: Univ. Music Major Stimulus Order: A
Primary instrument: Saxophone
Private Study (in years): 9 Gender: Male
Previous CRDI Participation Experience (number of experiences): 2
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



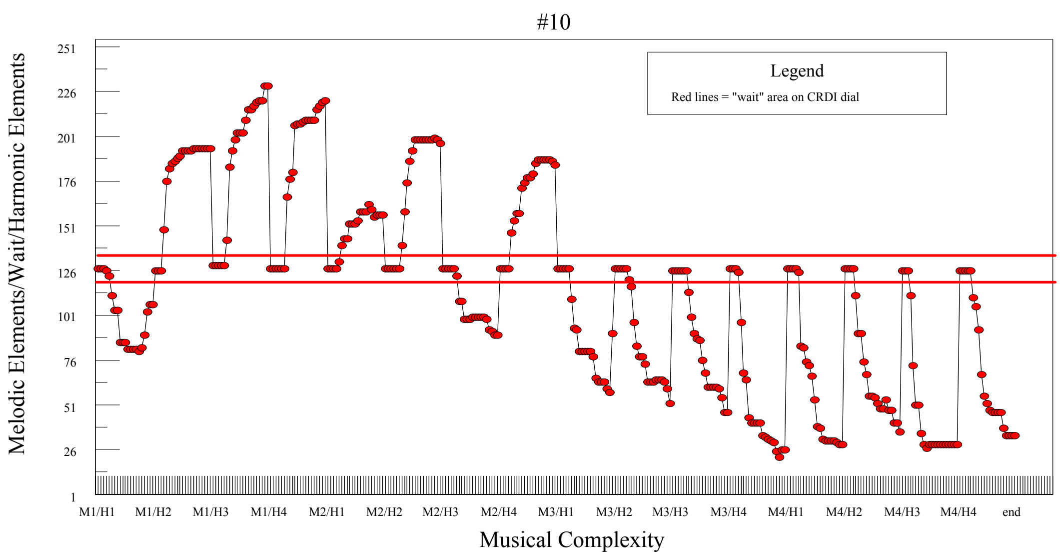

Academic status: Univ. Music Major Stimulus Order: A
Primary instrument: Violin
Private Study (in years): 25 Gender: Female
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



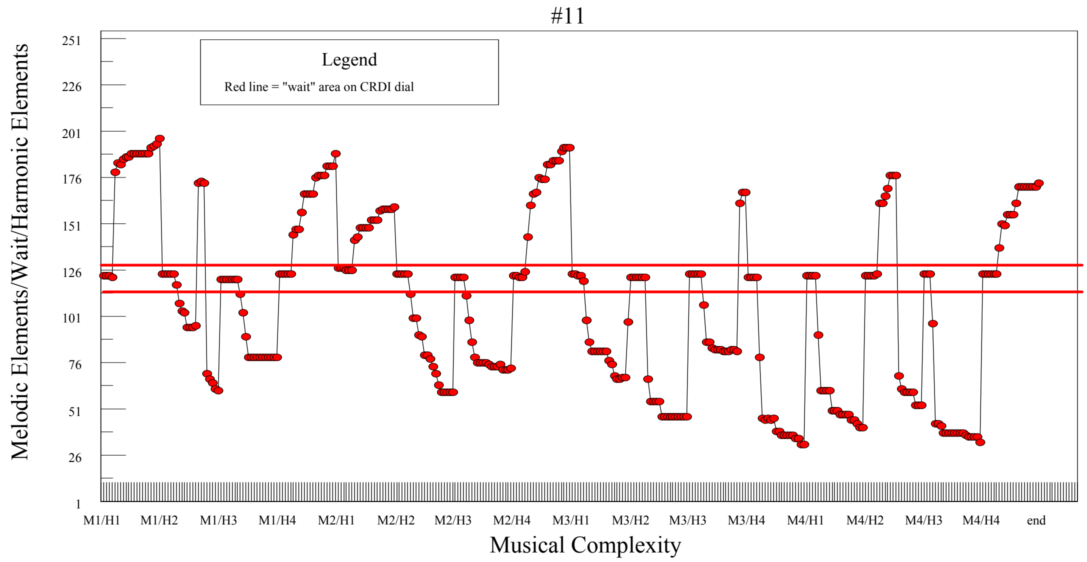

Academic status: Univ. Music Major Stimulus Order: A
Primary instrument: French Horn
Private Study (in years): 9 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



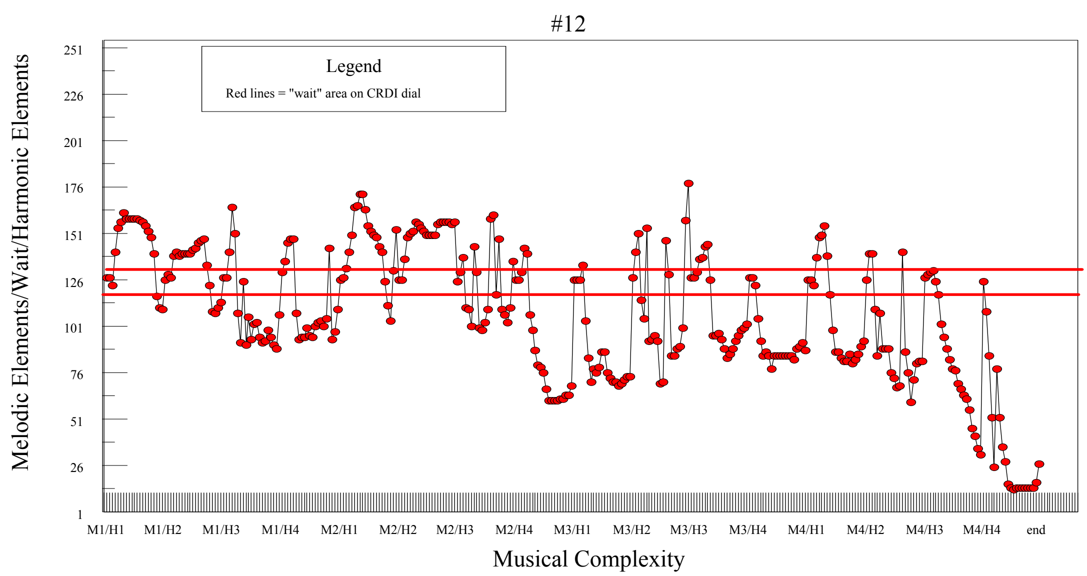

Academic status: Univ. Music Major Stimulus Order: B
Primary instrument: Double Bass
Private Study (in years): 3 Gender: Male
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



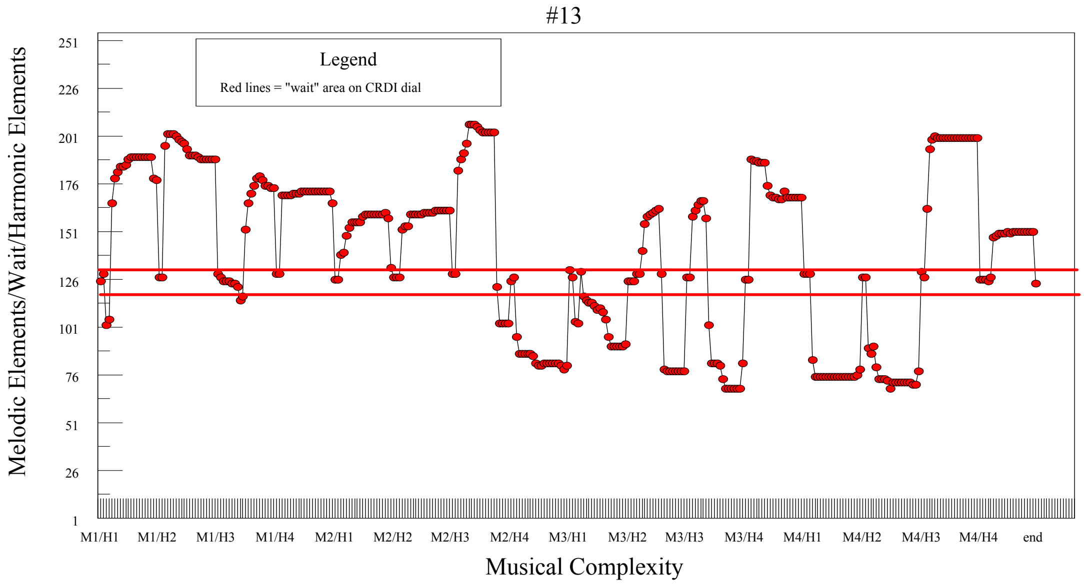

Academic status: Univ. Music Major Stimulus Order: B
Primary instrument: Percussion
Private Study (in years): 8 Gender: Male
Previous CRDI Participation Experience (number of experiences): 2
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



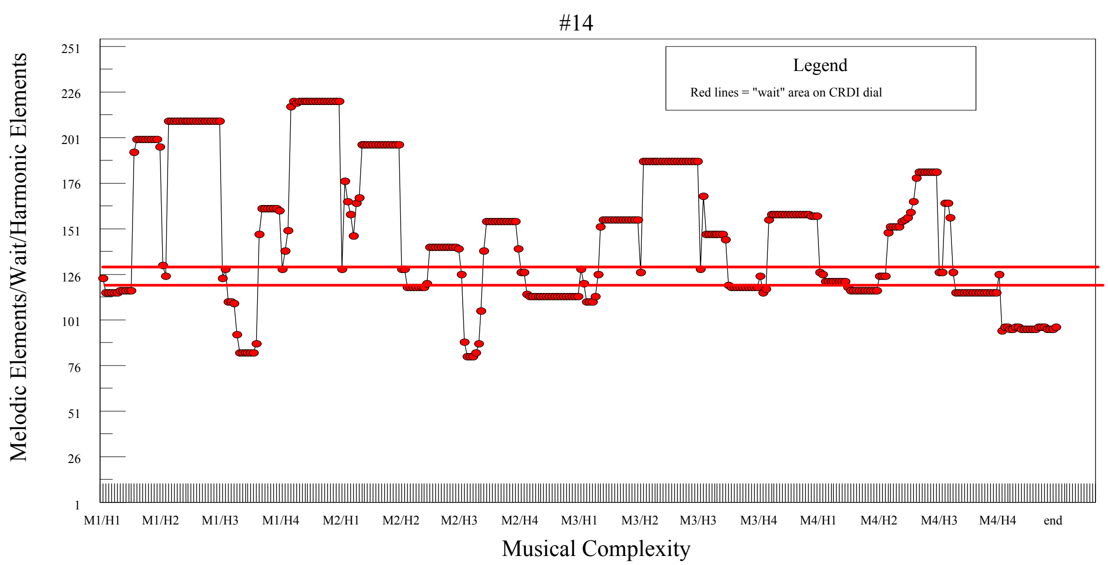

Academic status: Univ. Music Major Stimulus Order: B
Primary instrument: Saxophone
Private Study (in years): 0 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



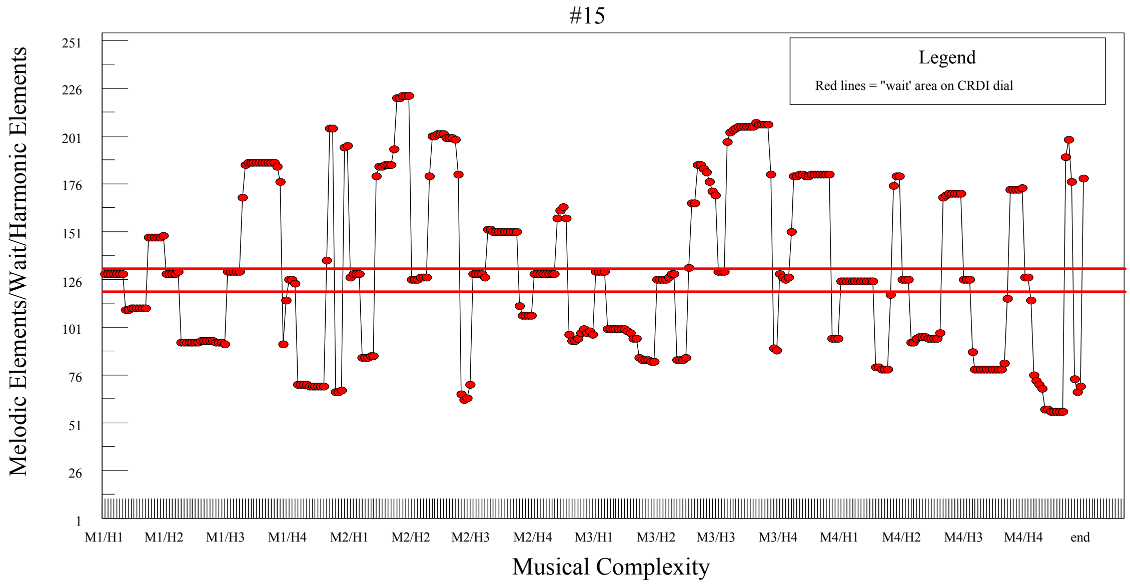

Academic status: Univ. Music Major Stimulus Order: B
Primary instrument: Percussion
Private Study (in years): 3 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



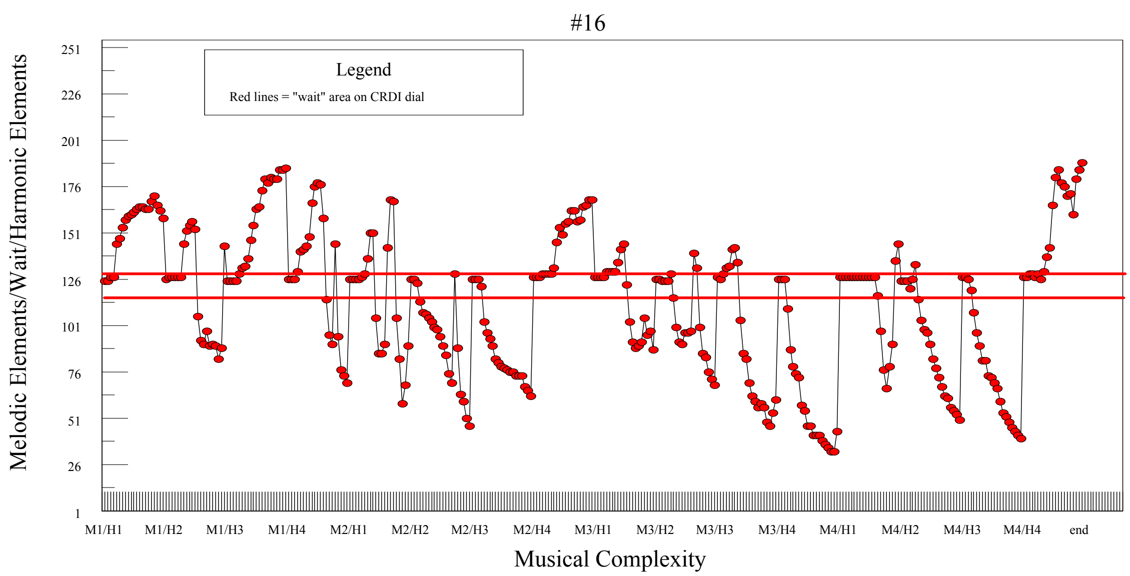

Academic status: Univ. Music Major Stimulus Order: B
Primary instrument: Saxophone
Private Study (in years): 9 Gender: Female
Previous CRDI Participation Experience (number of experiences): 2
Self-perceived Focus of Attention: 3 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



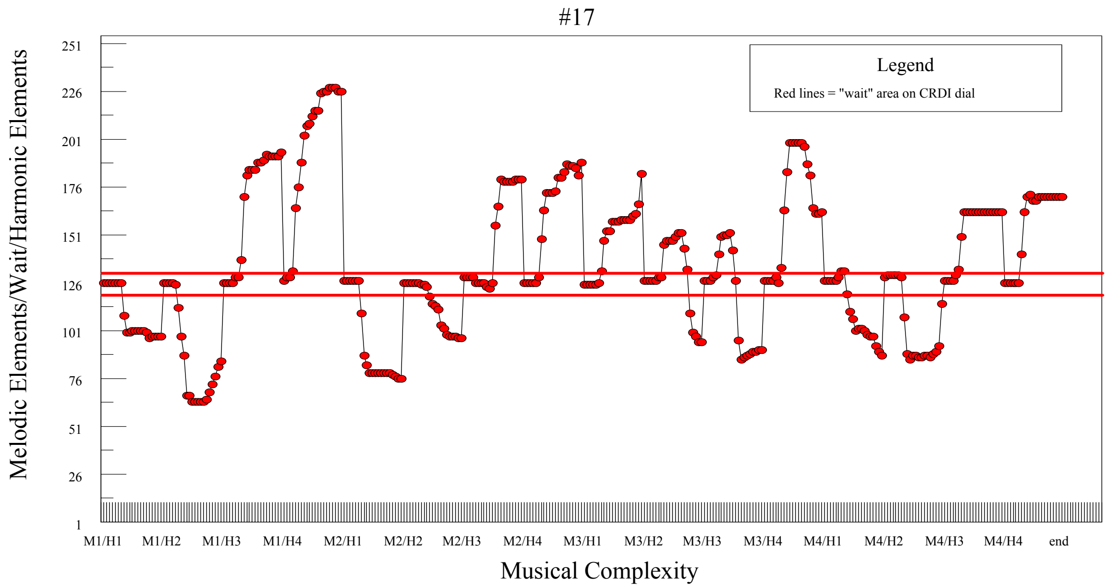

Academic status: Univ. Music Major Stimulus Order: B
Primary instrument: Oboe
Private Study (in years): 7 Gender: Male
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



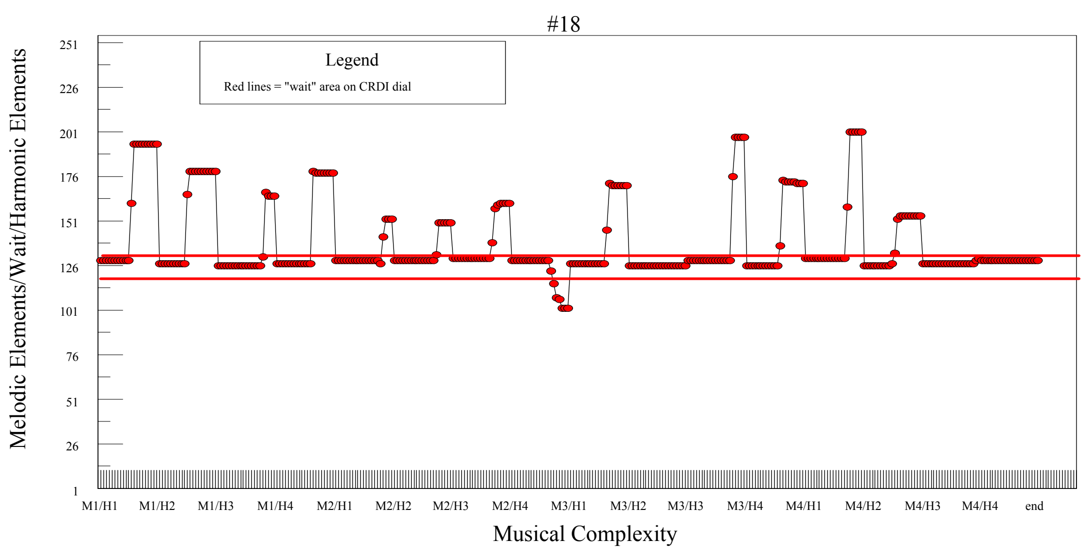

Academic status: Univ. Music Major Stimulus Order: B
Primary instrument: Saxophone
Private Study (in years): 11 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 8 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



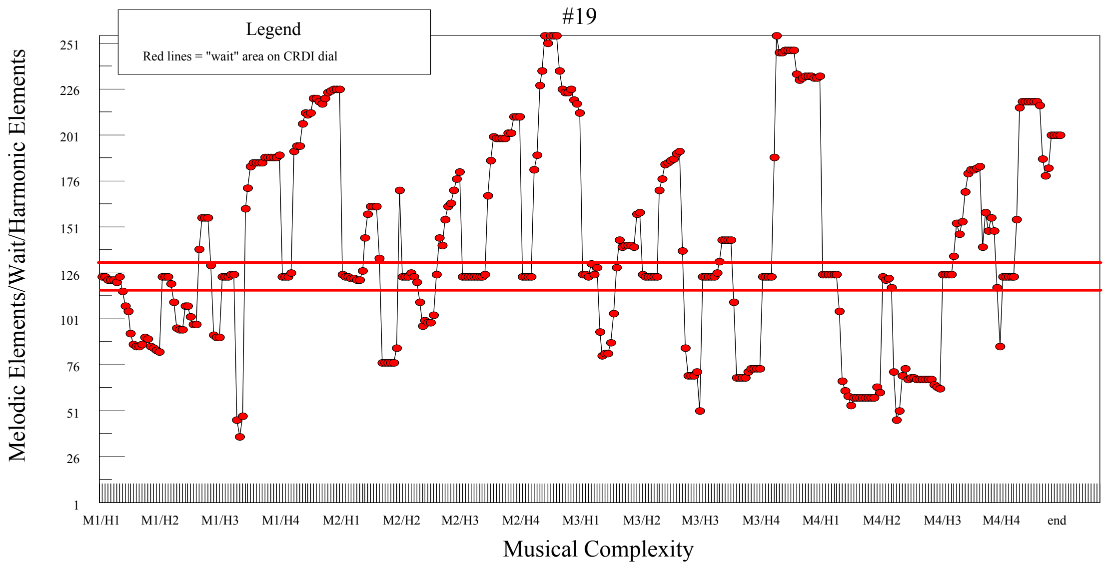

Academic status: Univ. Music Major Stimulus Order: B
Primary instrument: Piano
Private Study (in years): 0 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



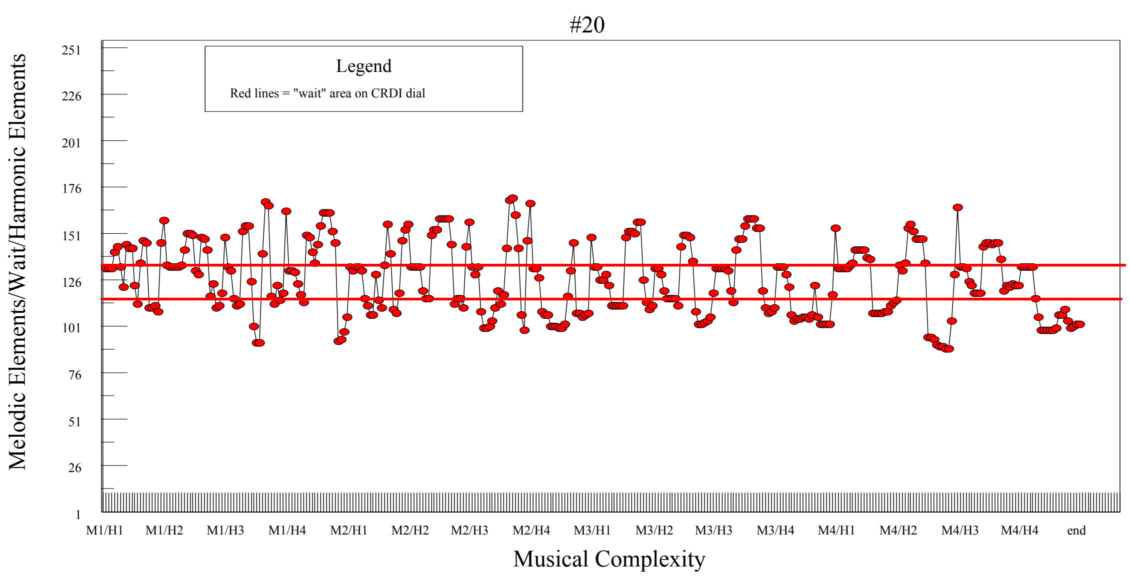

Academic status: Univ. Music Major Stimulus Order: C
Primary instrument: Flute
Private Study (in years): 7 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y




Academic status: Univ. Music Major Stimulus Order: C
Primary instrument: Flute
Private Study (in years): 10 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 8 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

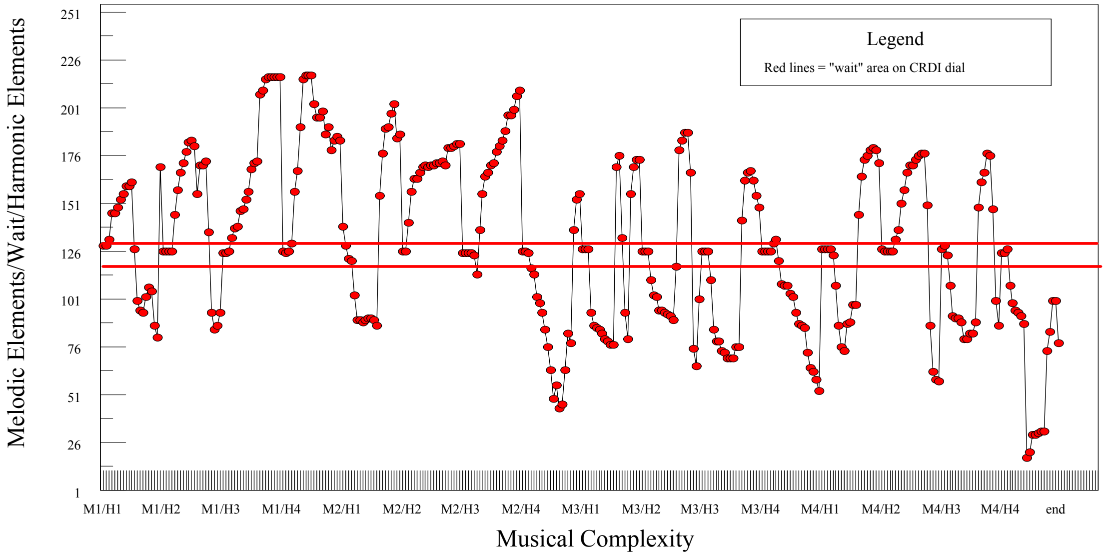



Academic status: Univ. Music Major Stimulus Order: C
Primary instrument: Euphonium
Private Study (in years): 10 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 8 1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



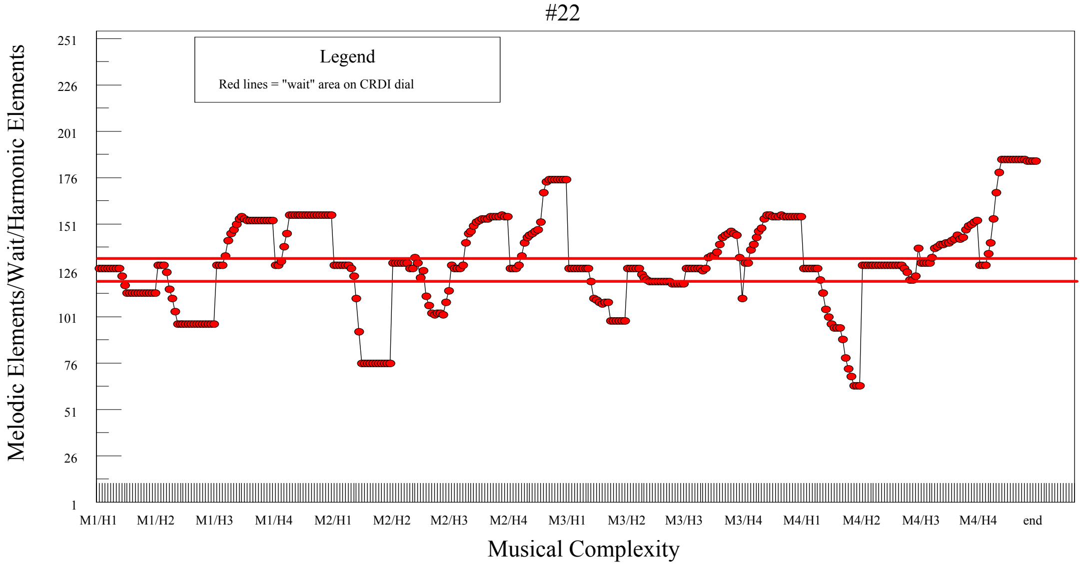

Academic status: Univ. Music Major Stimulus Order: C
Primary instrument: Bassoon
Private Study (in years): 8 Gender: Male
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#21

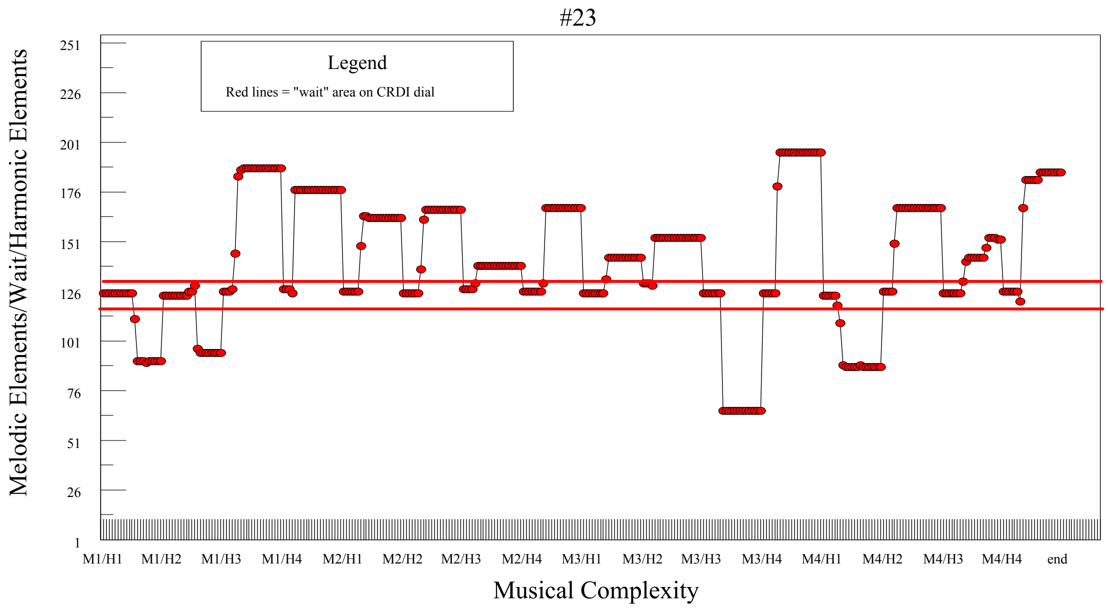



Academic status: Univ. Music Major Stimulus Order: C
Primary instrument: Trombone
Private Study (in years): 7 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

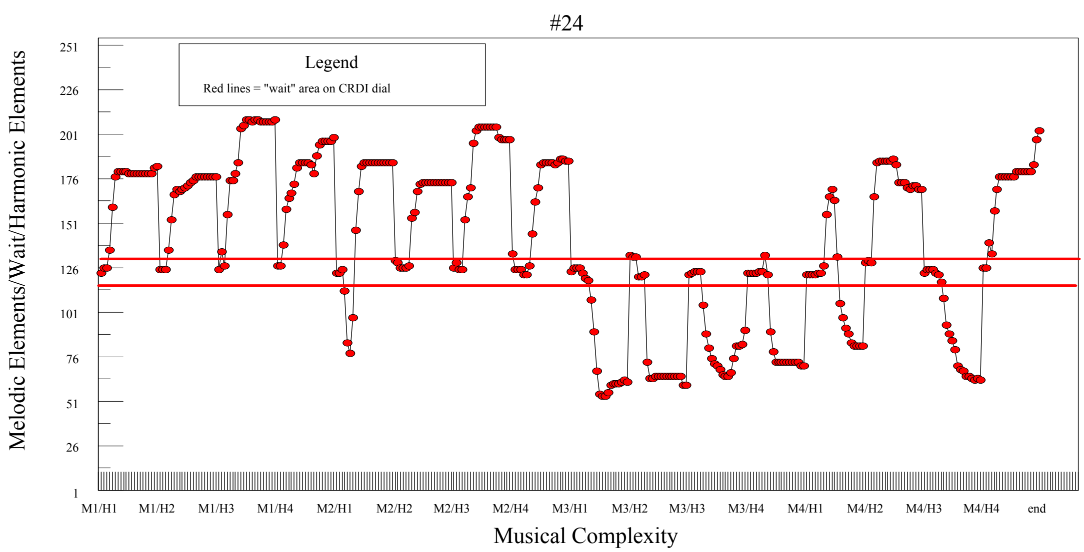
#22



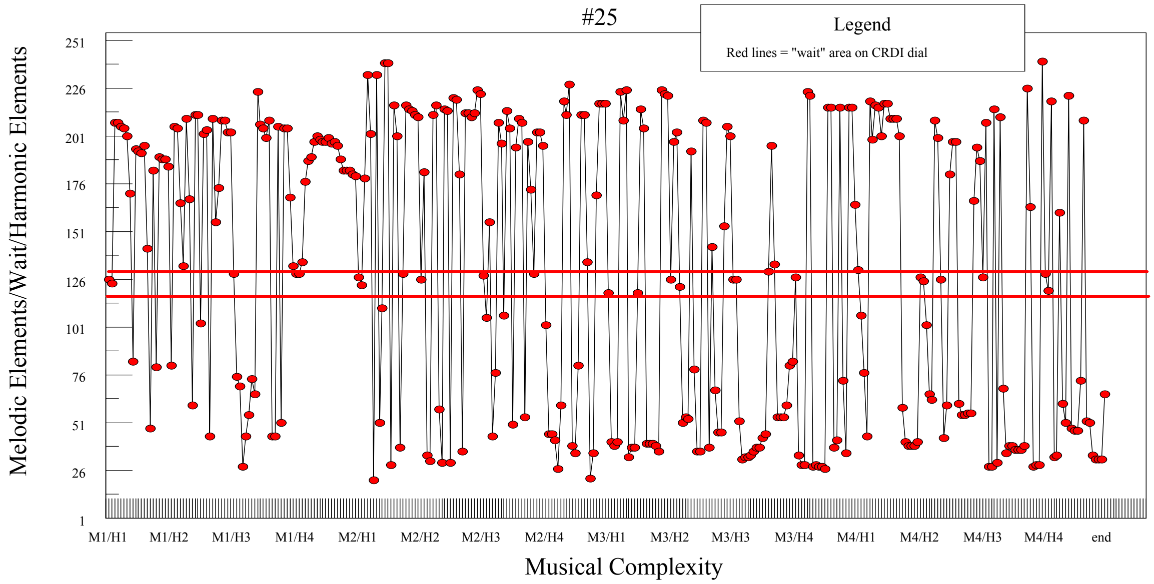

Academic status: Univ. Music Major Stimulus Order: C
Primary instrument: French Horn
Private Study (in years): 8 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



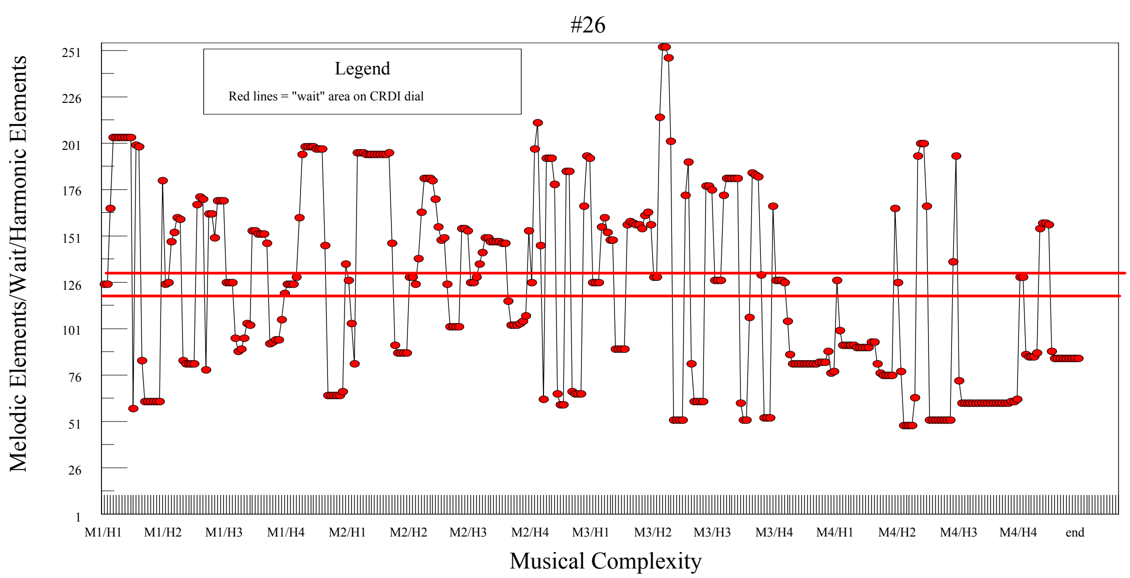

Academic status: Univ. Music Major Stimulus Order: C
Primary instrument: Cello
Private Study (in years): 8 Gender: Female
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y




Academic status: Univ. Music Major Stimulus Order: C
Primary instrument: Clarinet
Private Study (in years): 6 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

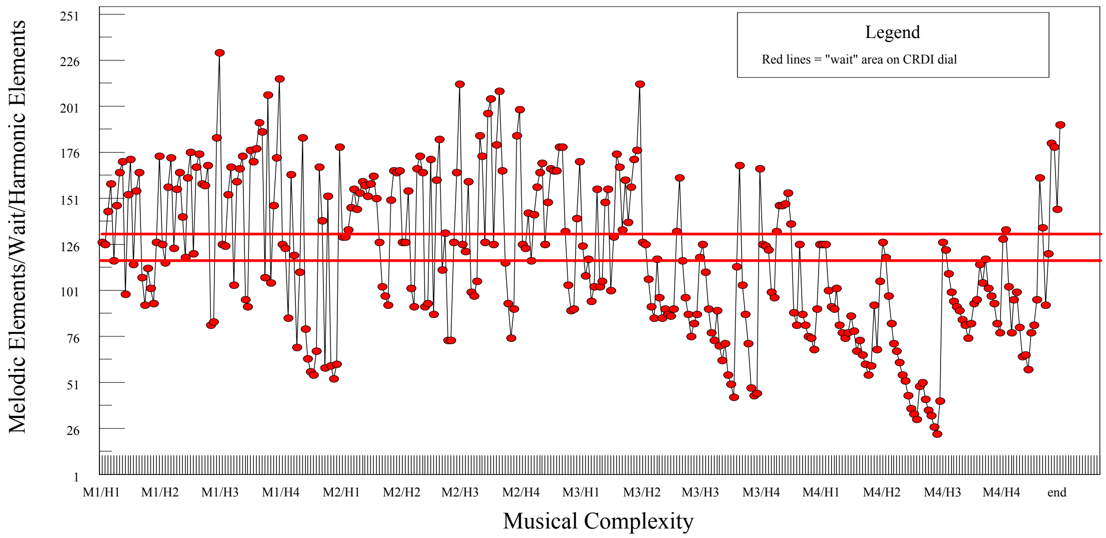



Academic status: Univ. Music Major Stimulus Order: D
Primary instrument: Violin
Private Study (in years): 8 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



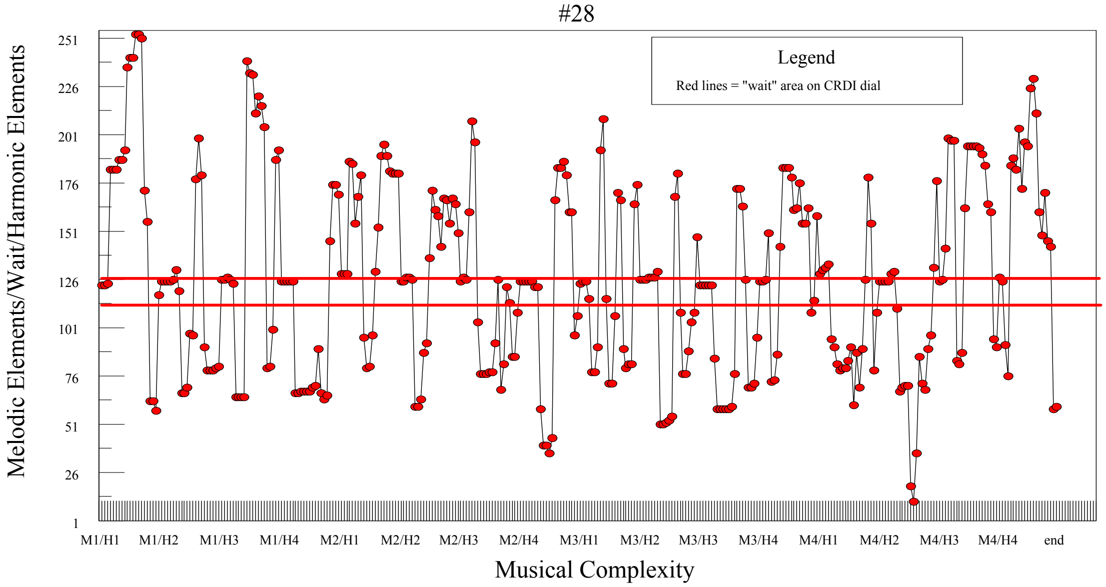

Academic status: Univ. Music Major Stimulus Order: D
Primary instrument: Violin
Private Study (in years): 9 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#27



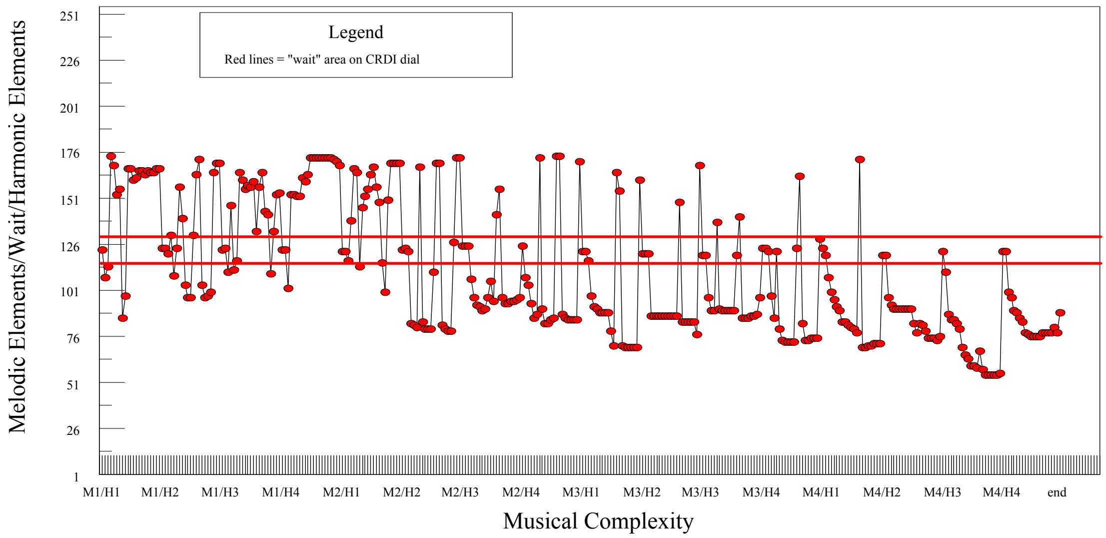

Academic status: Univ. Music Major Stimulus Order: D
Primary instrument: Percussion
Private Study (in years): 18 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#28



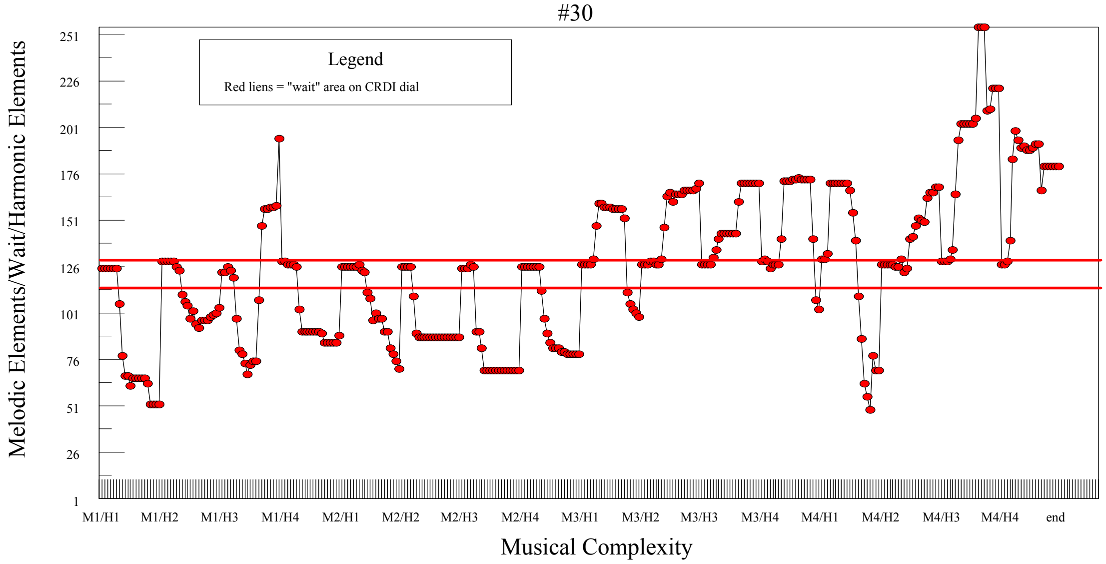

Academic status: Univ. Music Major Stimulus Order: D
Primary instrument: Cello
Private Study (in years): 0 Gender: Female
Previous CRDI Participation Experience (number of experiences):
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#29

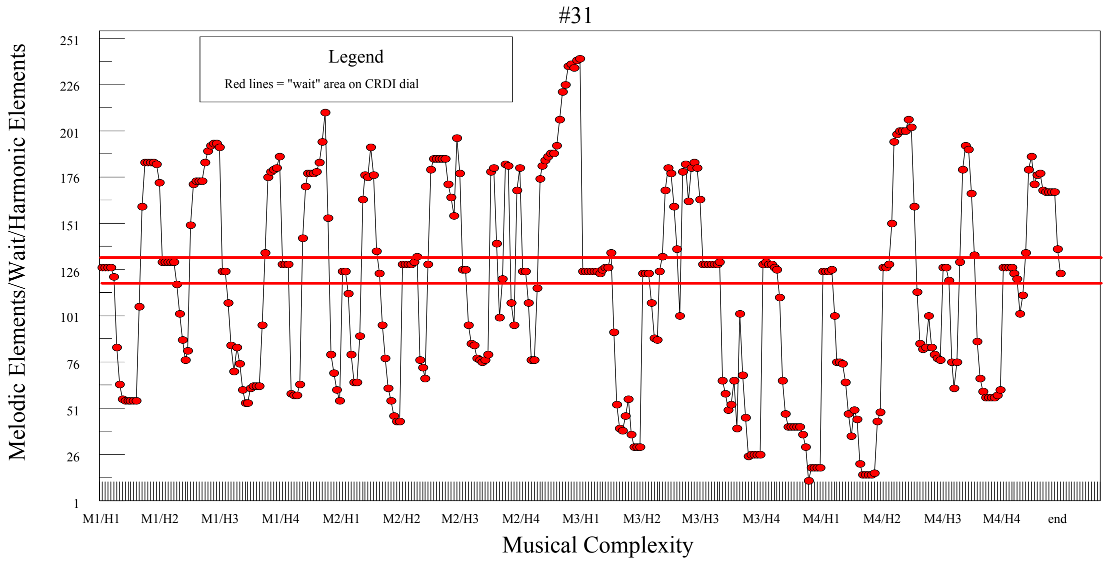



Academic status: Univ. Music Major Stimulus Order: D
Primary instrument: Cello
Private Study (in years): 7 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? N

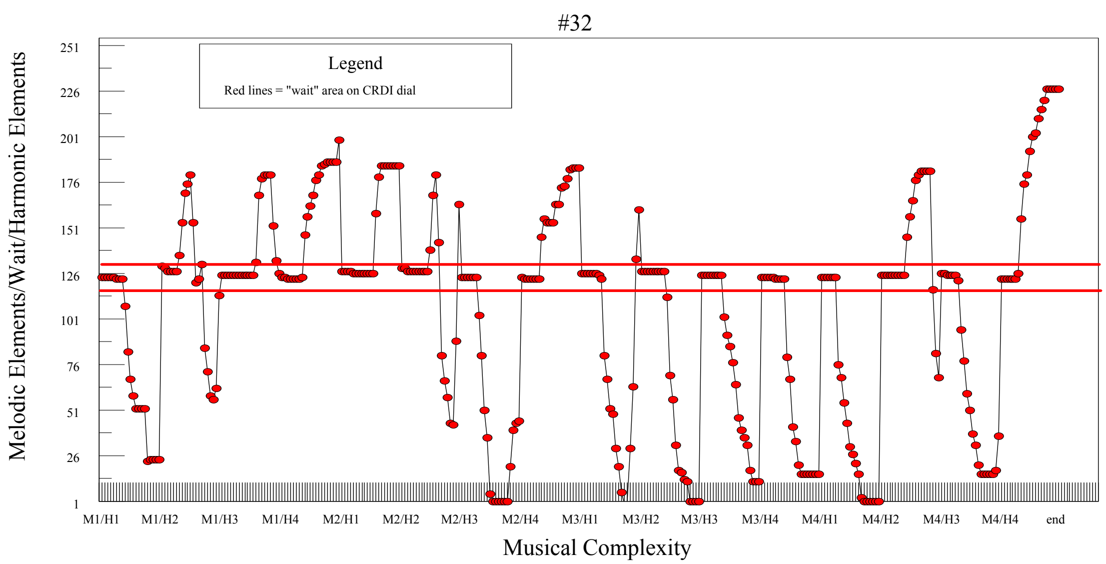
#30




Academic status: Univ. Music Major Stimulus Order: D
Primary instrument: Trumpet
Private Study (in years): 1 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

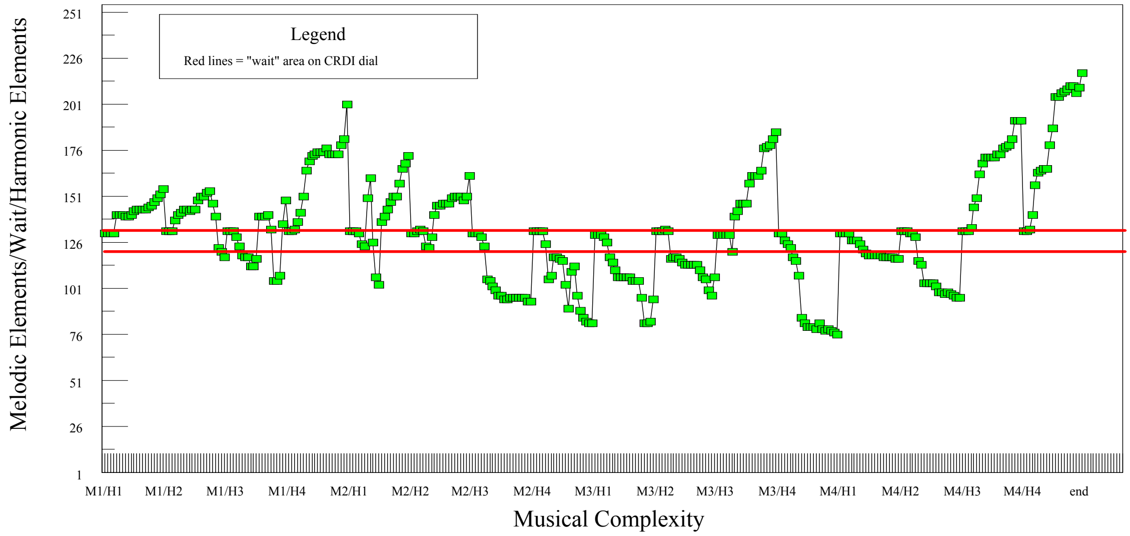



Academic status: Univ. Music Major Stimulus Order: D
Primary instrument: Viola
Private Study (in years): 28 Gender: Male
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



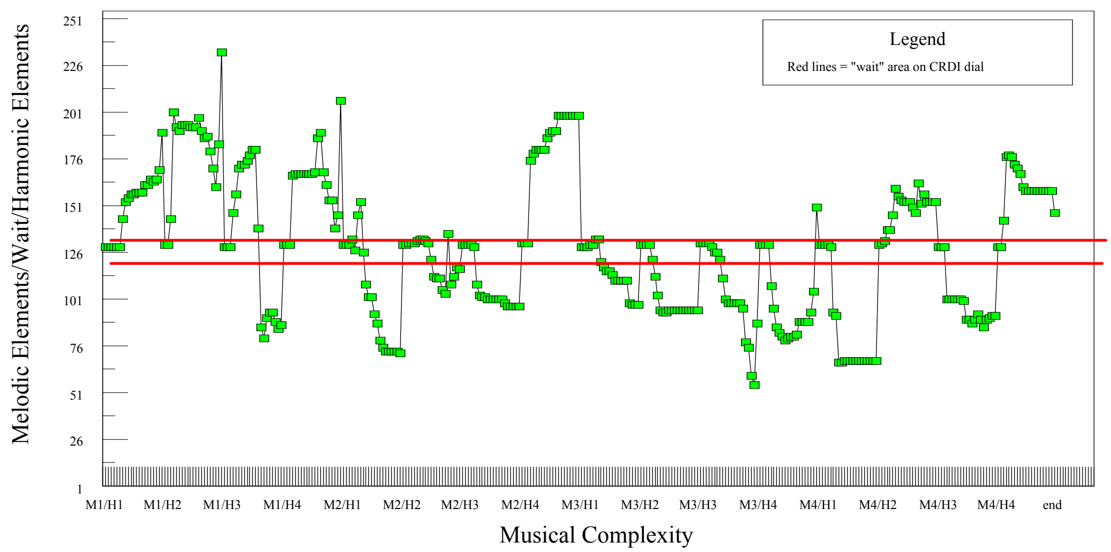

Academic status: Univ. Music Major Stimulus Order: D
Primary instrument: Violin
Private Study (in years): 28 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#33

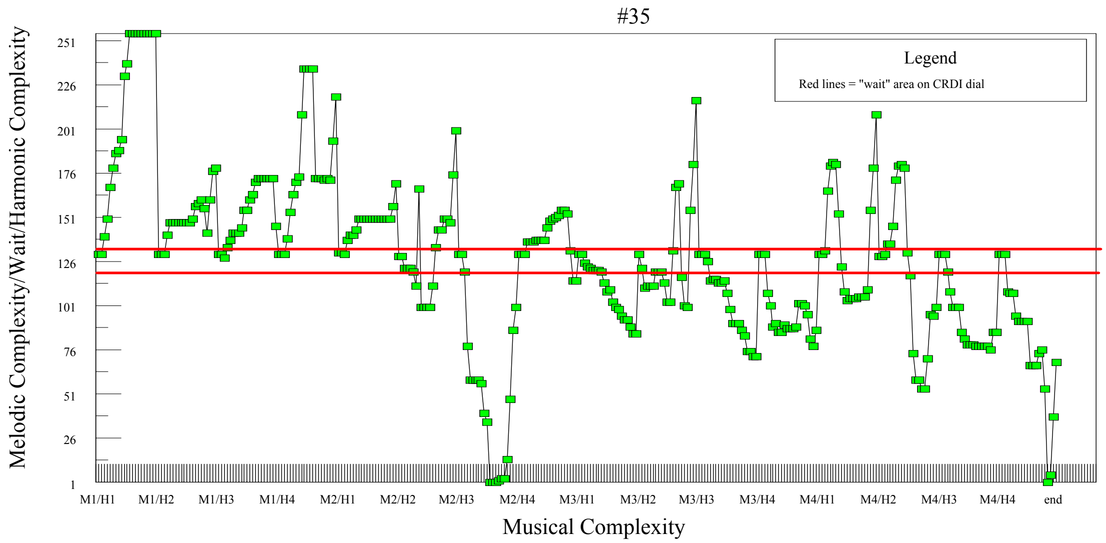



Academic status: Univ. Jazz Major Stimulus Order: A
Primary instrument: Bass Trombone
Private Study (in years): 6 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

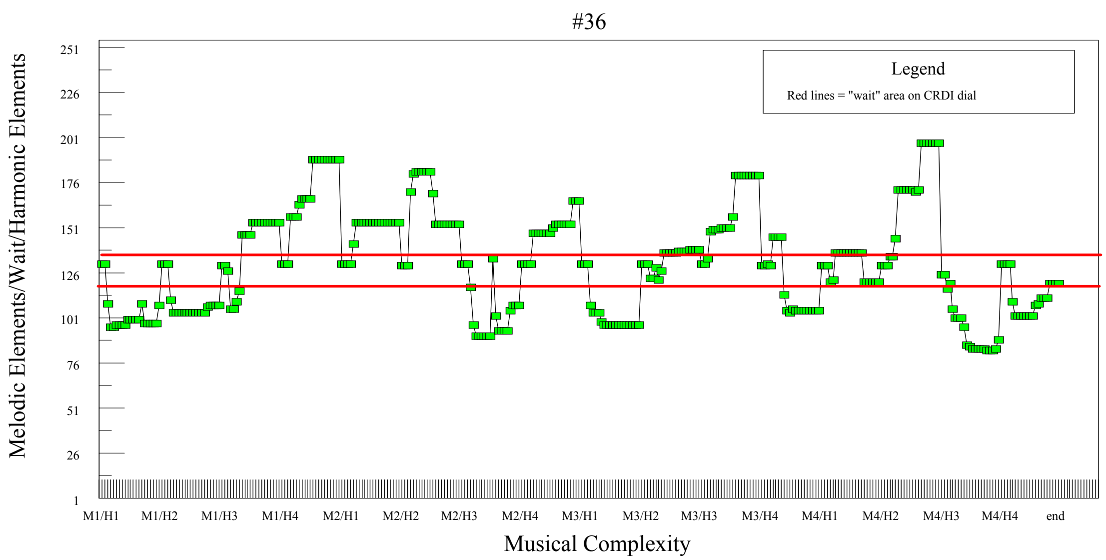
#34




Academic status: Univ. Jazz Major Stimulus Order: A
Primary instrument: Trombone
Private Study (in years): 6 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

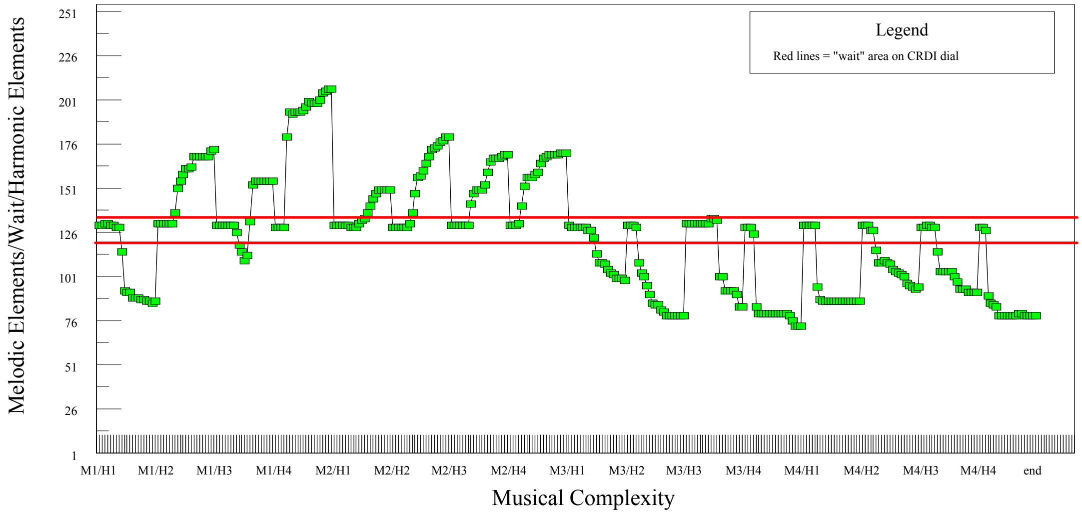



Academic status: Univ. Jazz Major Stimulus Order: A
Primary instrument: Trombone
Private Study (in years): 0 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



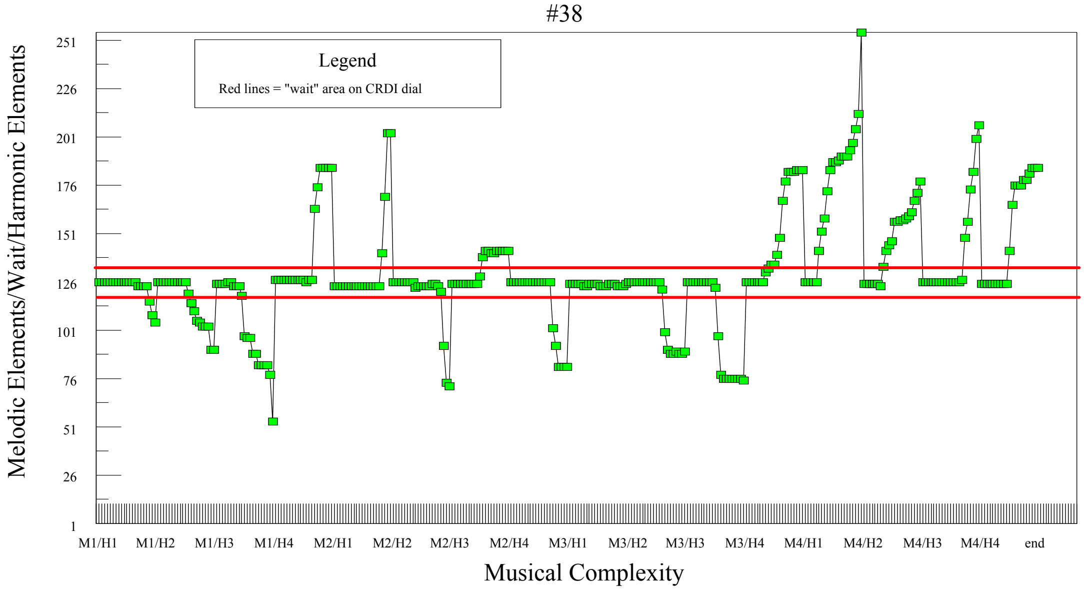

Academic status: Univ. Jazz Major Stimulus Order: A
Primary instrument: Saxophone
Private Study (in years): 10 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#37

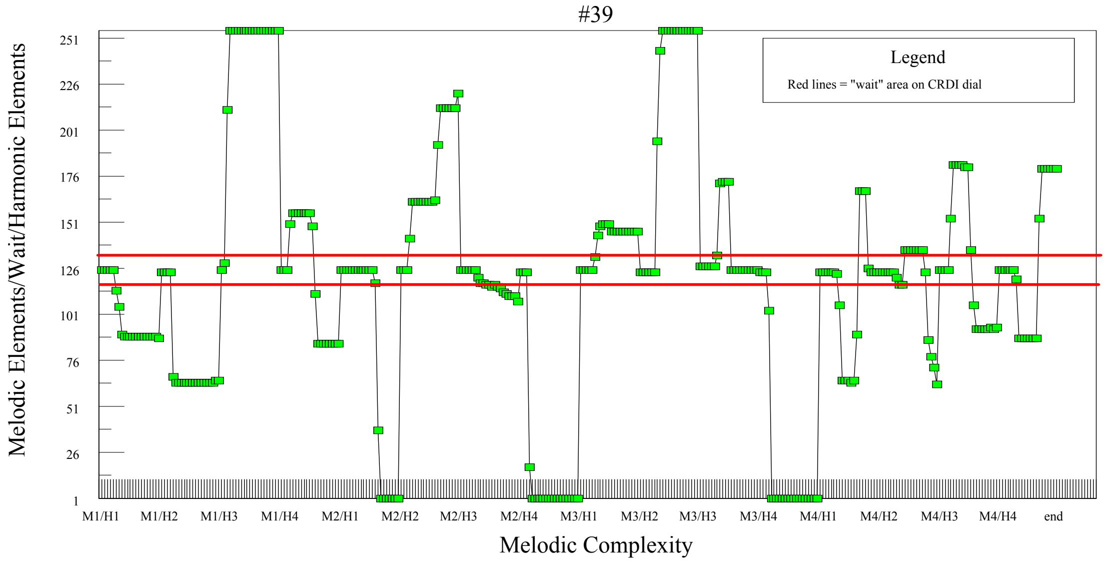



Academic status: Univ. Jazz Major Stimulus Order: A
Primary instrument: Percussion
Private Study (in years): 2 Gender: Male
Previous CRDI Participation Experience (number of experiences): N
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

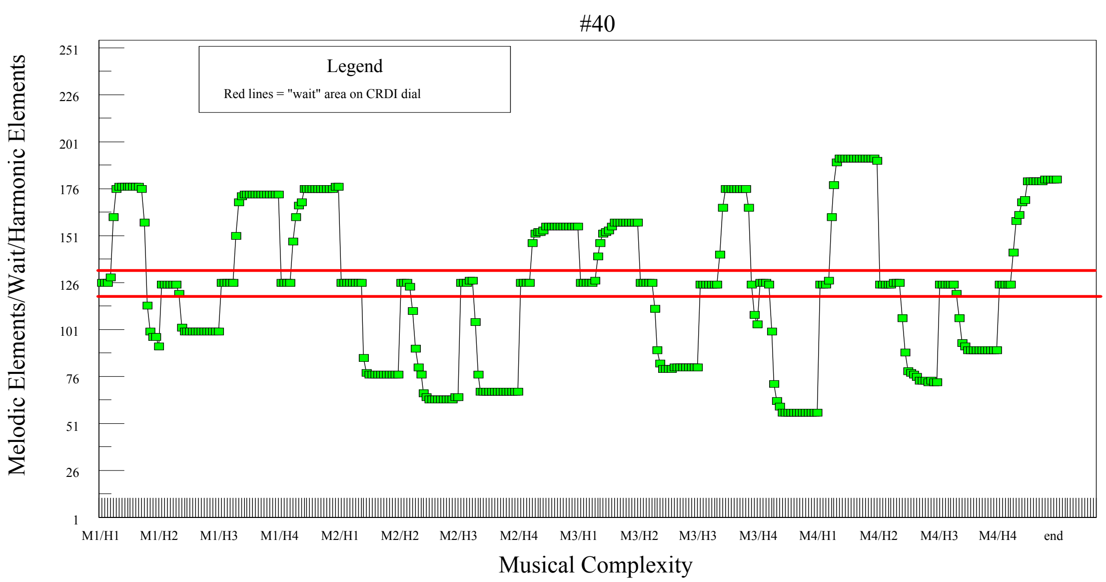
#38



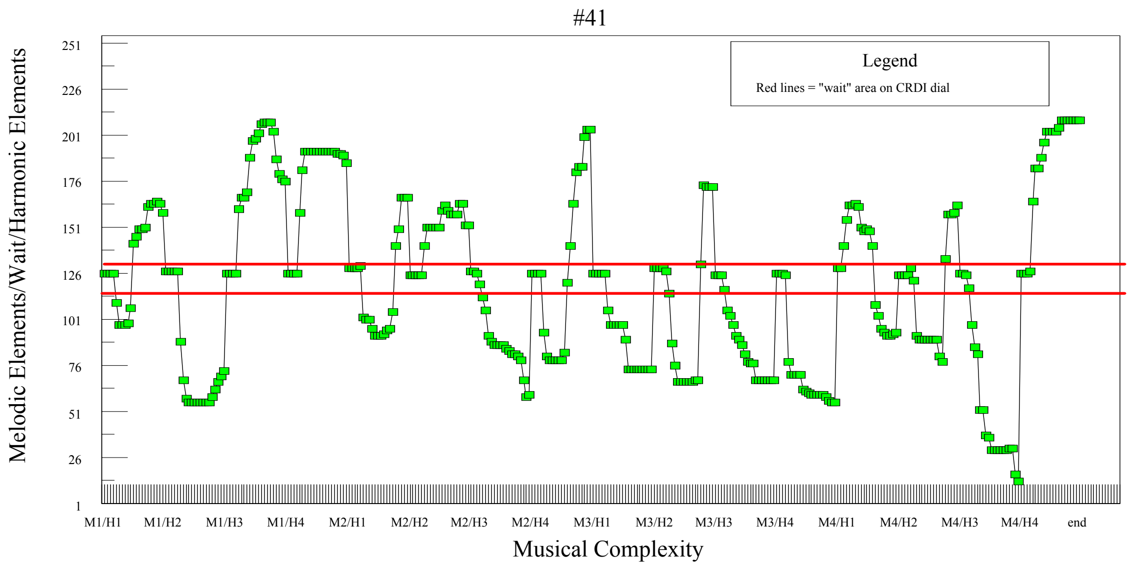

Academic status: Univ. Jazz Major Stimulus Order: A
Primary instrument: Trumpet
Private Study (in years): 0 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 3 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? N



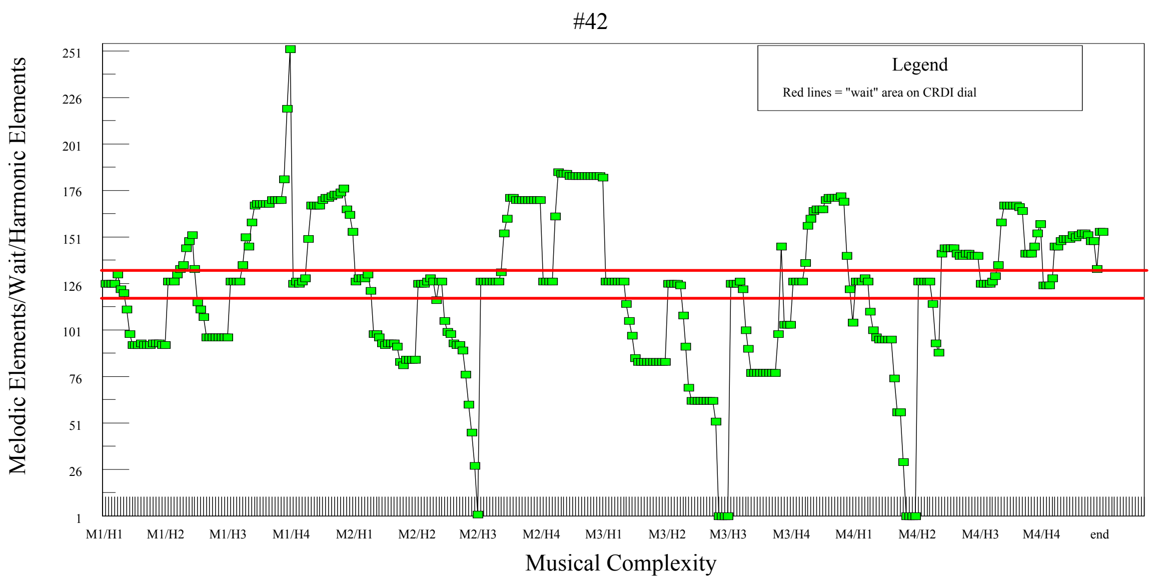

Academic status: Univ. Jazz Major Stimulus Order: A
Primary instrument: Saxophone
Private Study (in years): 10 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? N



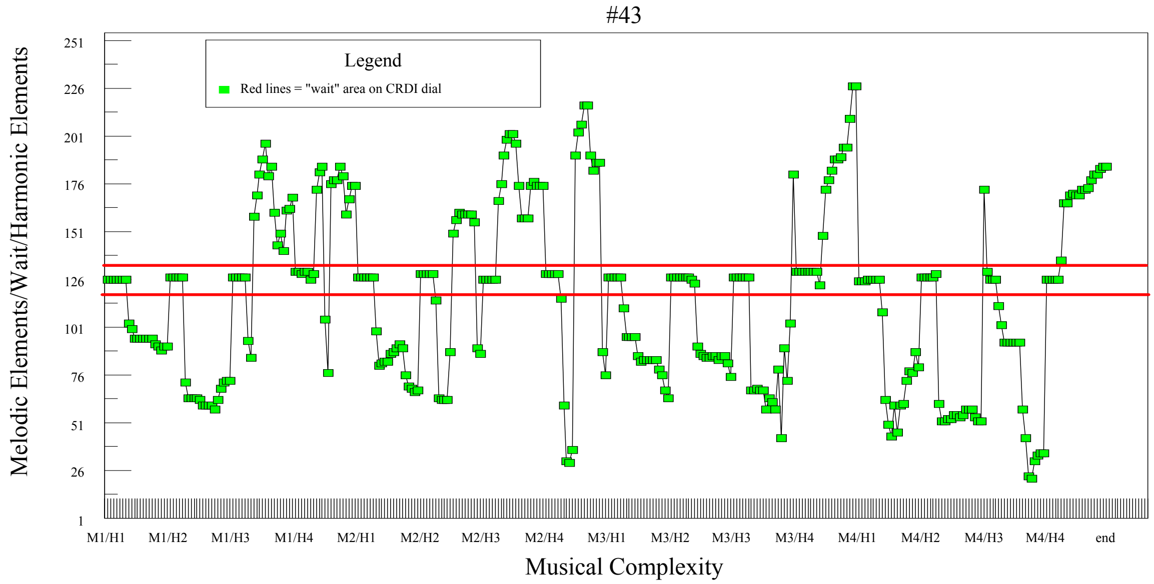

Academic status: Univ. Jazz Major Stimulus Order: A
Primary instrument: Trumpet
Private Study (in years): 5 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



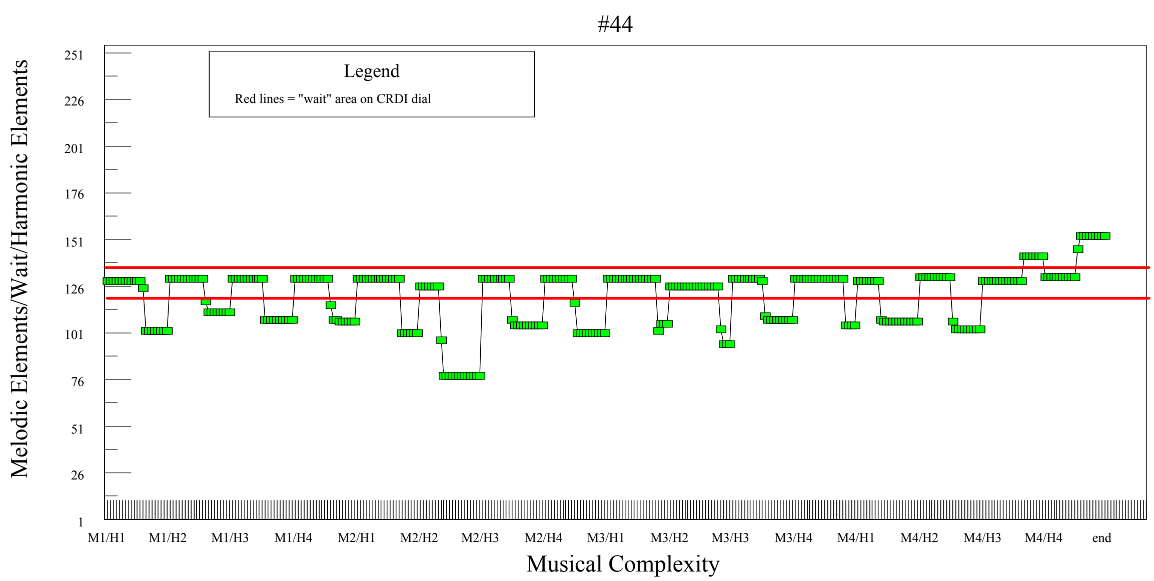

Academic status: Univ. Jazz Major Stimulus Order: B
Primary instrument: Trumpet
Private Study (in years): 0 Gender: Male
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



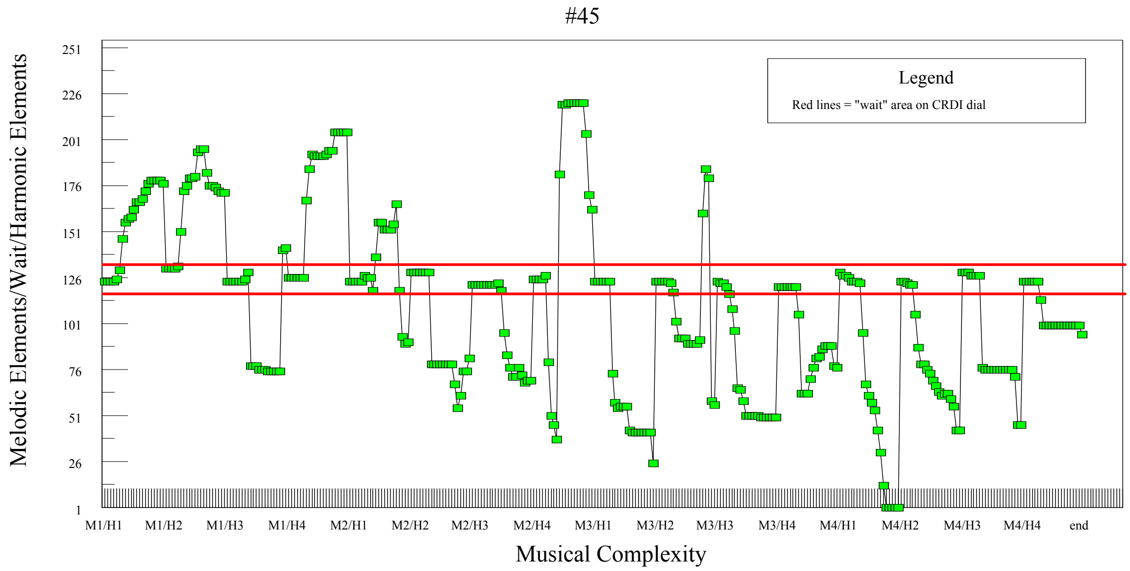

Academic status: Univ. Jazz Major Stimulus Order: B
Primary instrument: Trumpet
Private Study (in years): 9 Gender: Male
Previous CRDI Participation Experience (number of experiences): 1
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



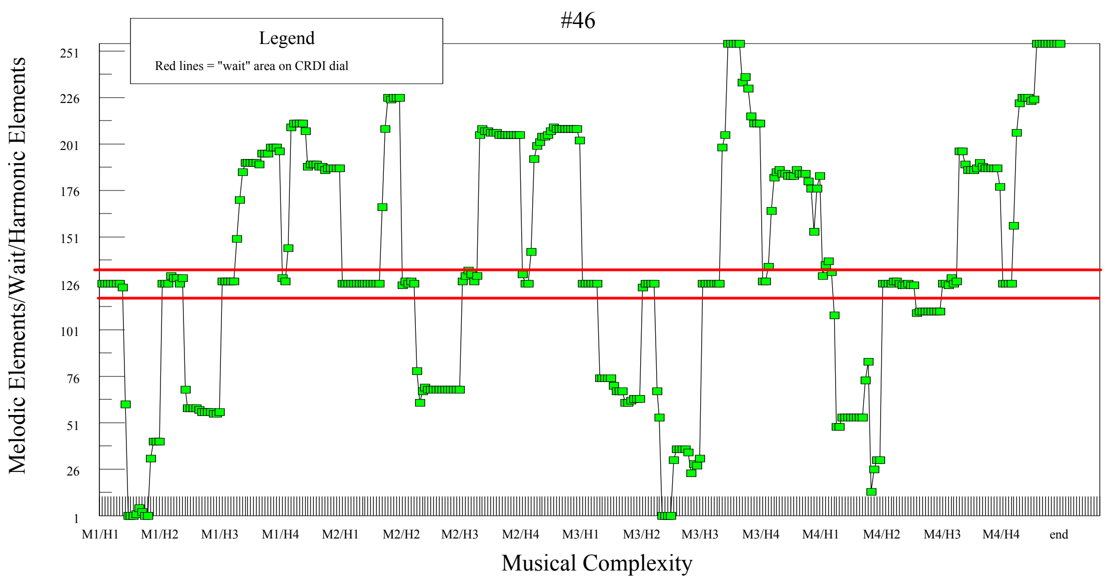

Academic status: Univ. Jazz Major Stimulus Order: B
Primary instrument: Saxophone
Private Study (in years): 10 Gender: Male
Previous CRDI Participation Experience (number of experiences): 2
Self-perceived Focus of Attention: 3 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



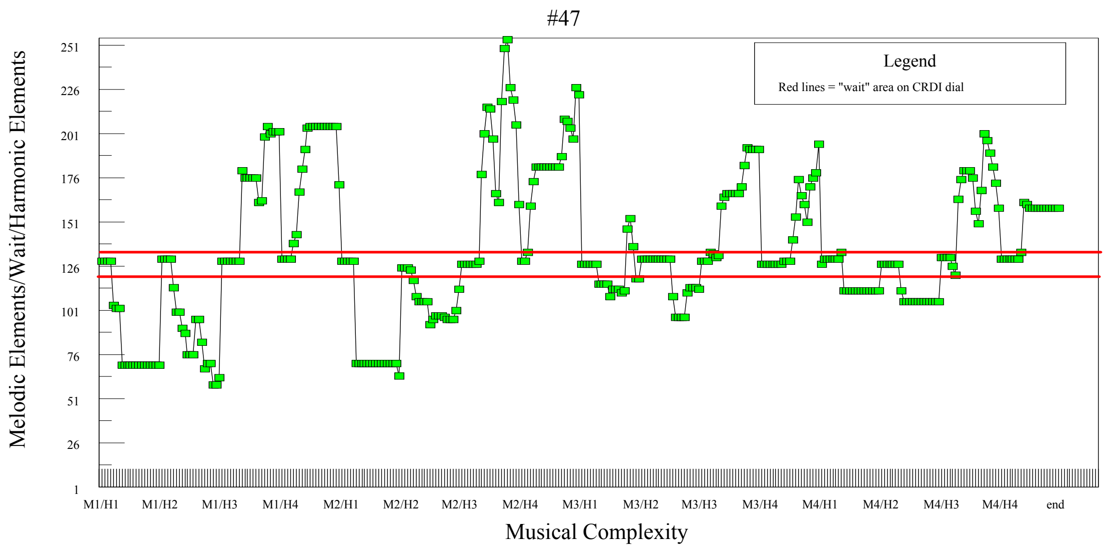

Academic status: Univ. Jazz Major Stimulus Order: B
Primary instrument: Piano
Private Study (in years): 15 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



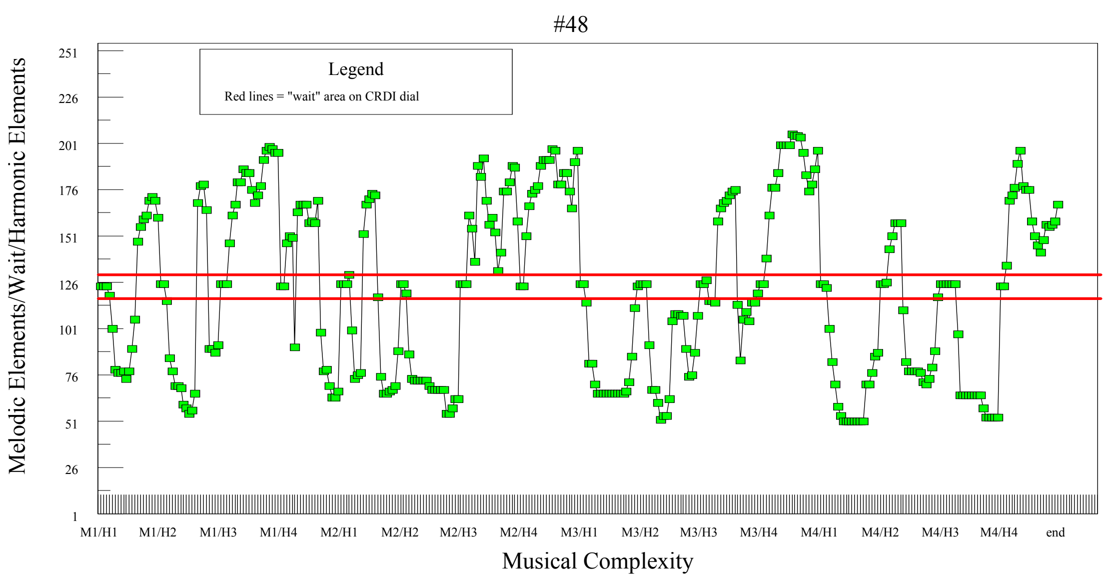

Academic status: Univ. Jazz Major Stimulus Order: B
Primary instrument: Trombone
Private Study (in years): 10 Gender: Male
Previous CRDI Participation Experience (number of experiences): 2
Self-perceived Focus of Attention: 8 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y




Academic status: Univ. Jazz Major Stimulus Order: B
Primary instrument: Trombone
Private Study (in years): 6 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 8 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

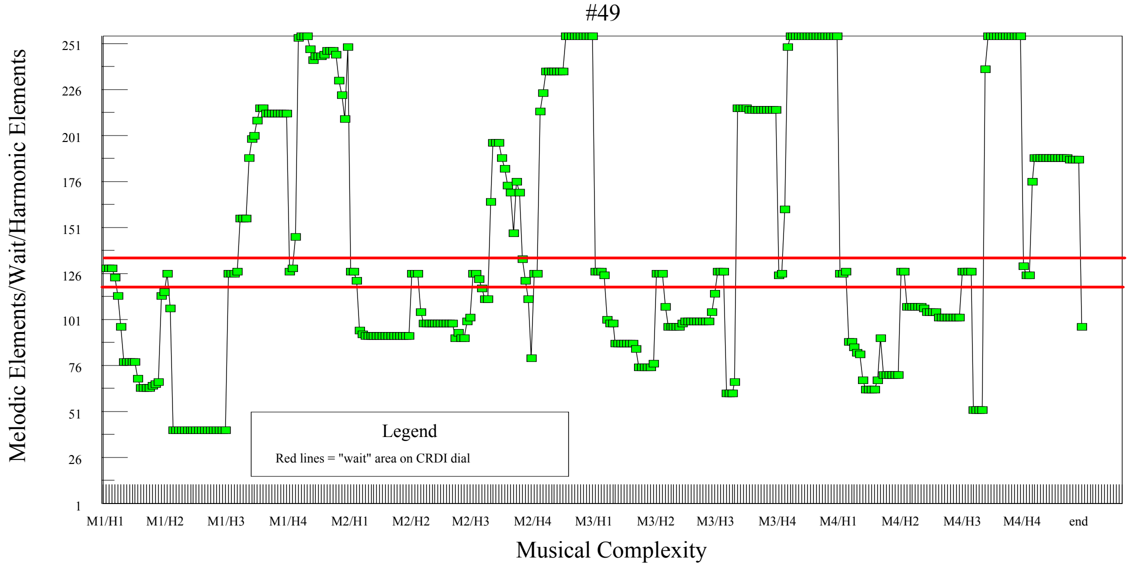



Academic status: Univ. Jazz Major Stimulus Order: B
Primary instrument: Saxophone
Private Study (in years): 2 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



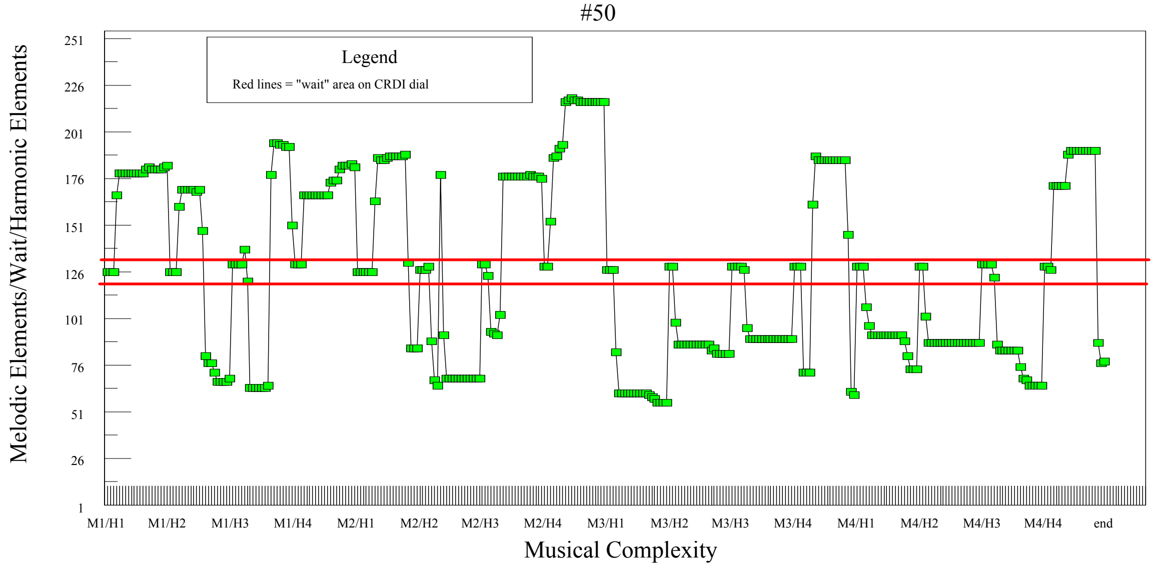

Academic status: Univ. Jazz Major Stimulus Order: B
Primary instrument: Saxophone
Private Study (in years): 2 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#49



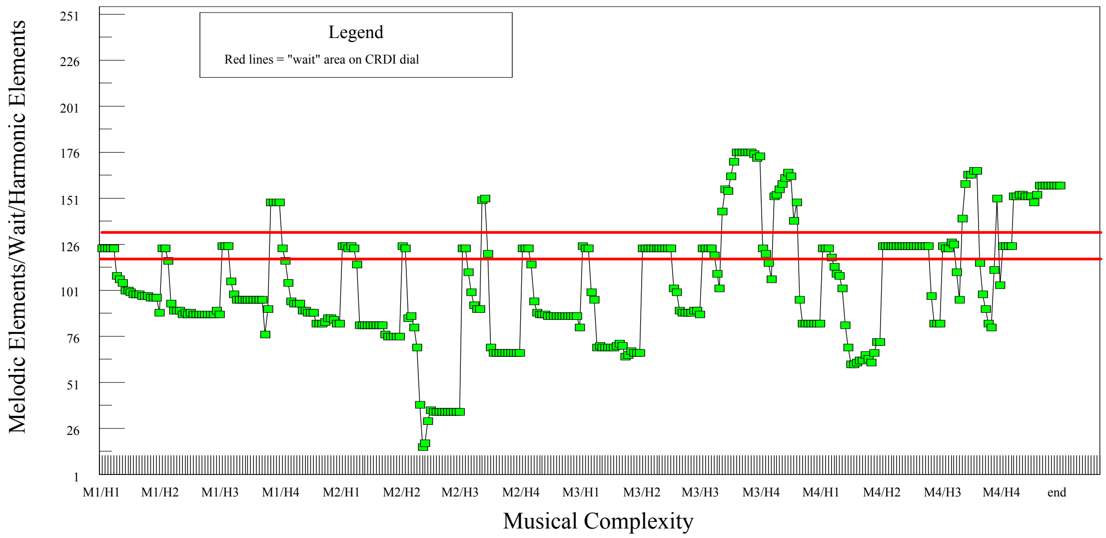

Academic status: Univ. Jazz Major Stimulus Order: C
Primary instrument: Percussion/Drums
Private Study (in years): 12 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 7 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#50



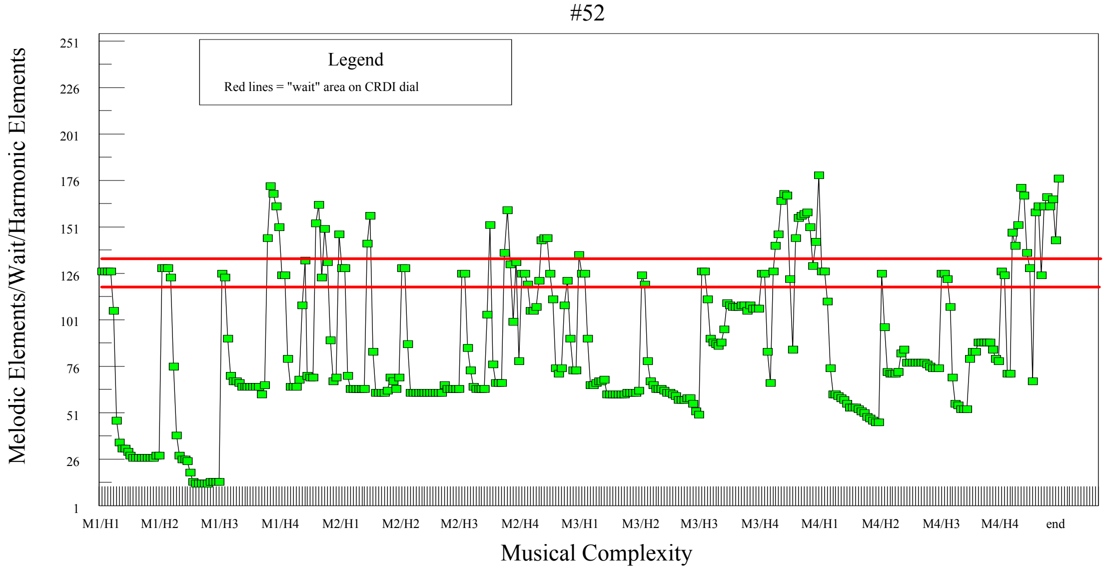

Academic status: Univ. Jazz Major Stimulus Order: C
Primary instrument: Trumpet
Private Study (in years): 15 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#51



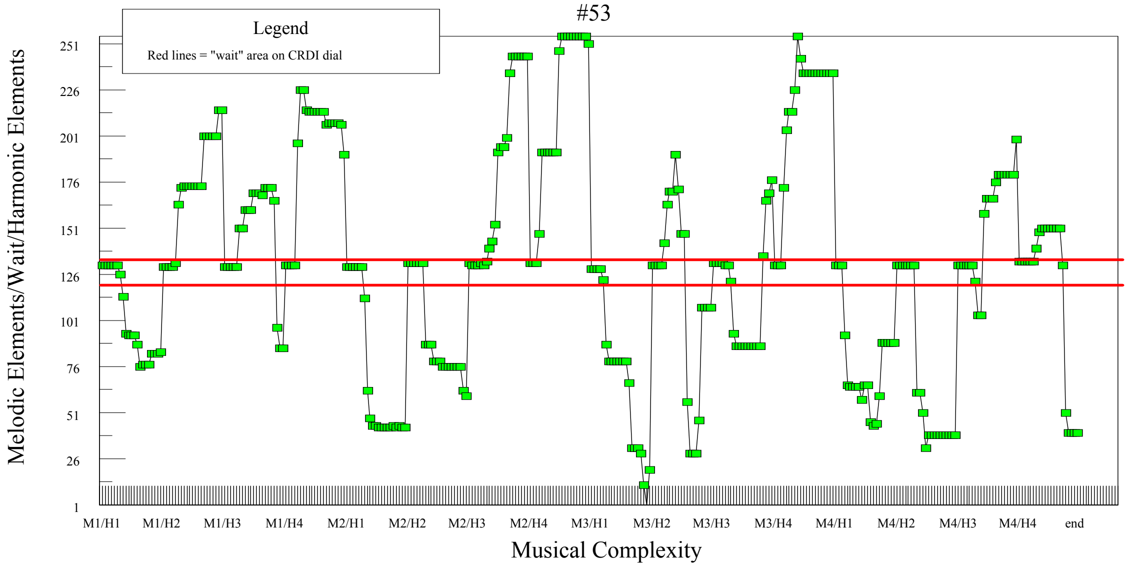

Academic status: Univ. Jazz Major                Stimulus Order: C
Primary instrument:  Trumpet
Private Study (in years):  1                     Gender: Male
Previous CRDI Participation Experience (number of experiences):  0
Self-perceived Focus of Attention:  5            (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#52



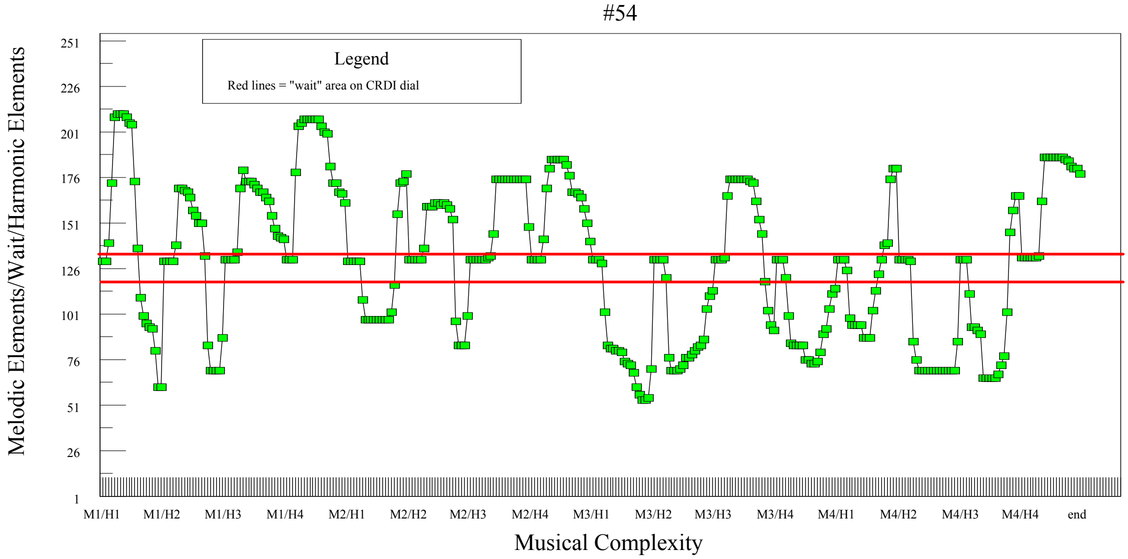

Academic status: Univ. Jazz Major                Stimulus Order: C
Primary instrument:  Drum Set
Private Study (in years):  3                     Gender: Male
Previous CRDI Participation Experience (number of experiences):  0
Self-perceived Focus of Attention:  4            (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#53

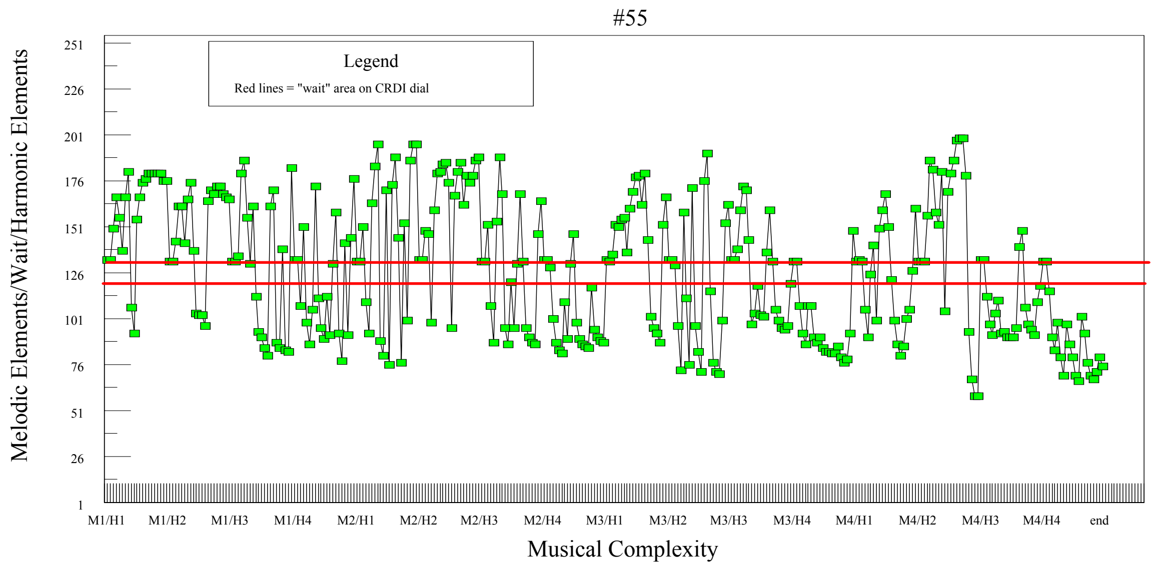



Academic status: Univ. Jazz Major Stimulus Order: C
Primary instrument: Saxophone
Private Study (in years): 3 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 8 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

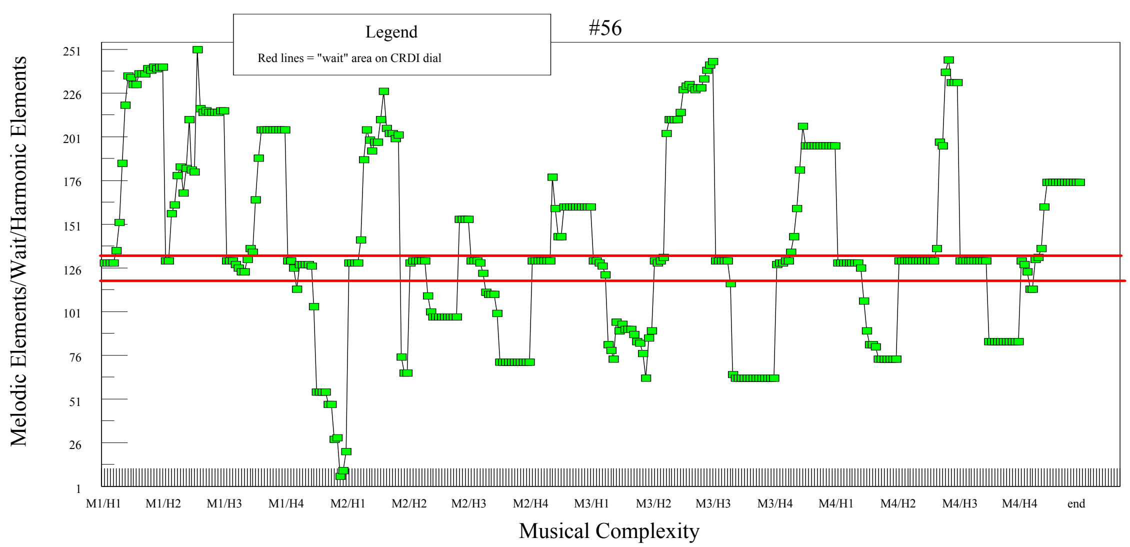
#54



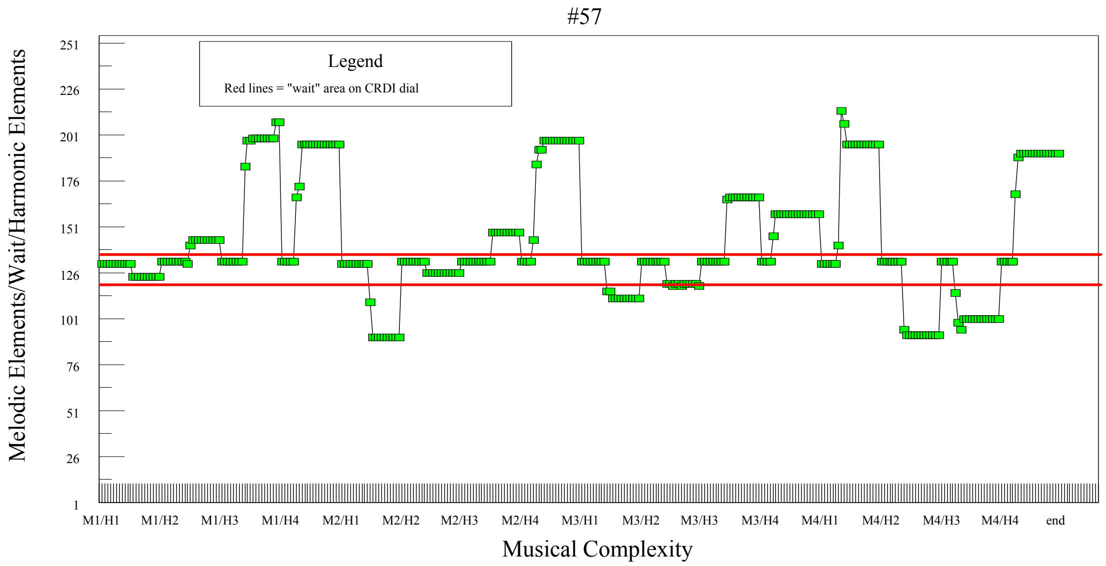

Academic status: Univ. Jazz Major Stimulus Order: C
Primary instrument: Saxophone
Private Study (in years): 4 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 6 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? N



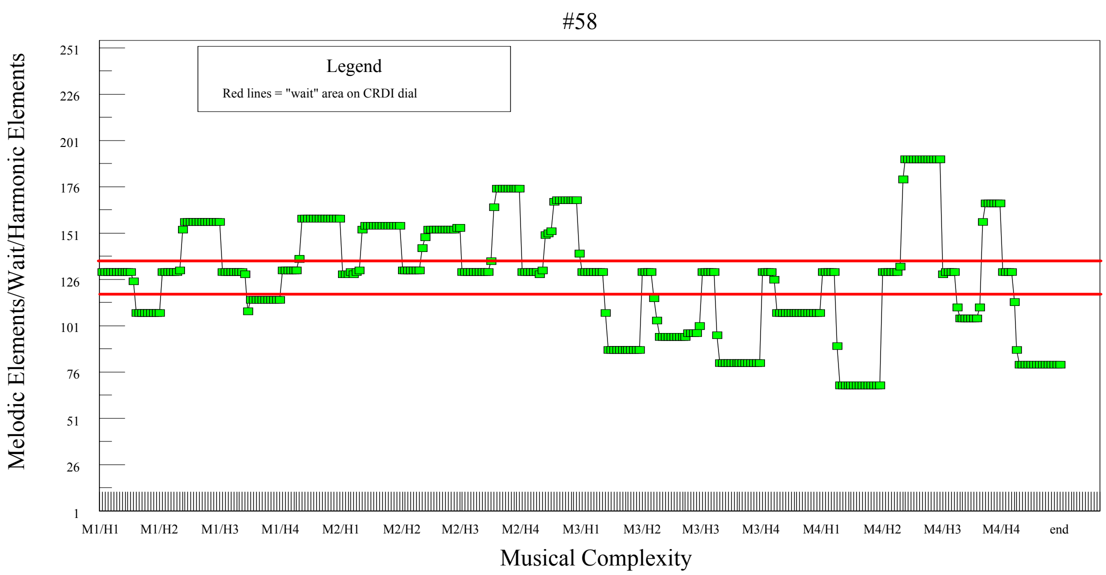

Academic status: Univ. Jazz Major Stimulus Order: C
Primary instrument: Saxophone
Private Study (in years): 9 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 3 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



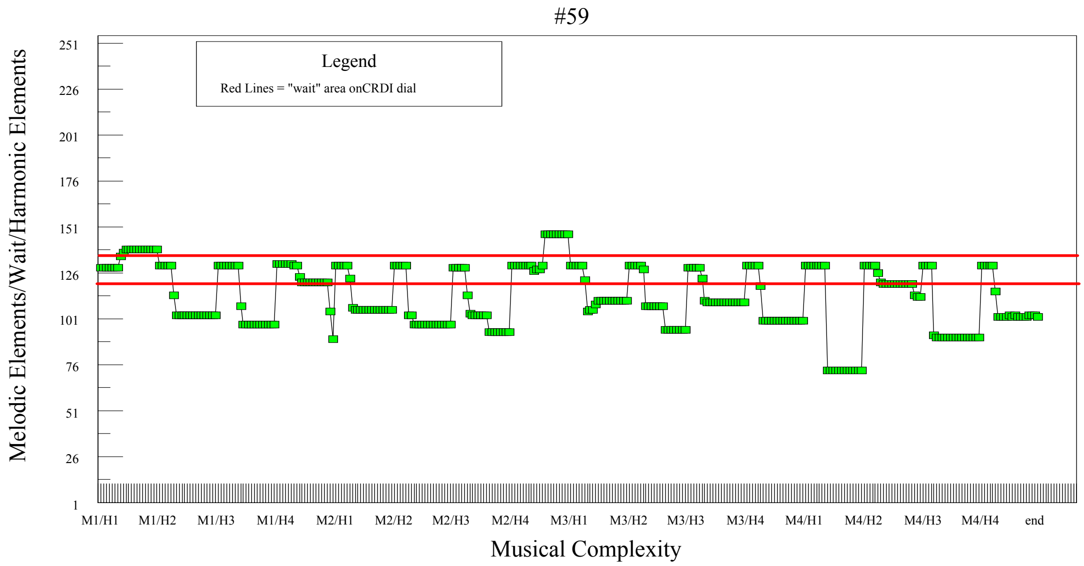

Academic status: Univ. Jazz Major Stimulus Order: C
Primary instrument: Double Bass
Private Study (in years): 4 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 8 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



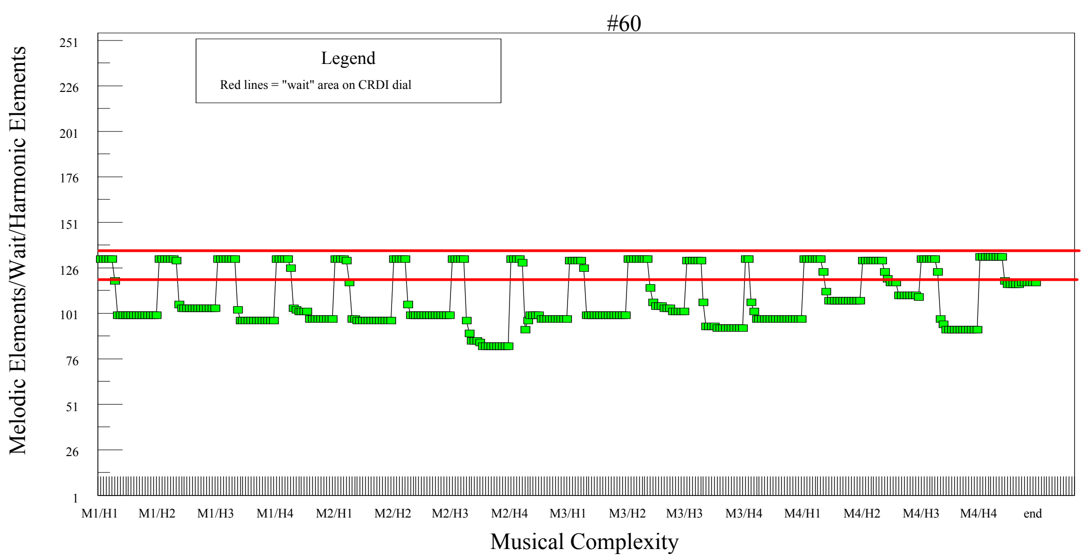

Academic status: Univ. Jazz Major Stimulus Order: D
Primary instrument: Piano
Private Study (in years): 0 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? N



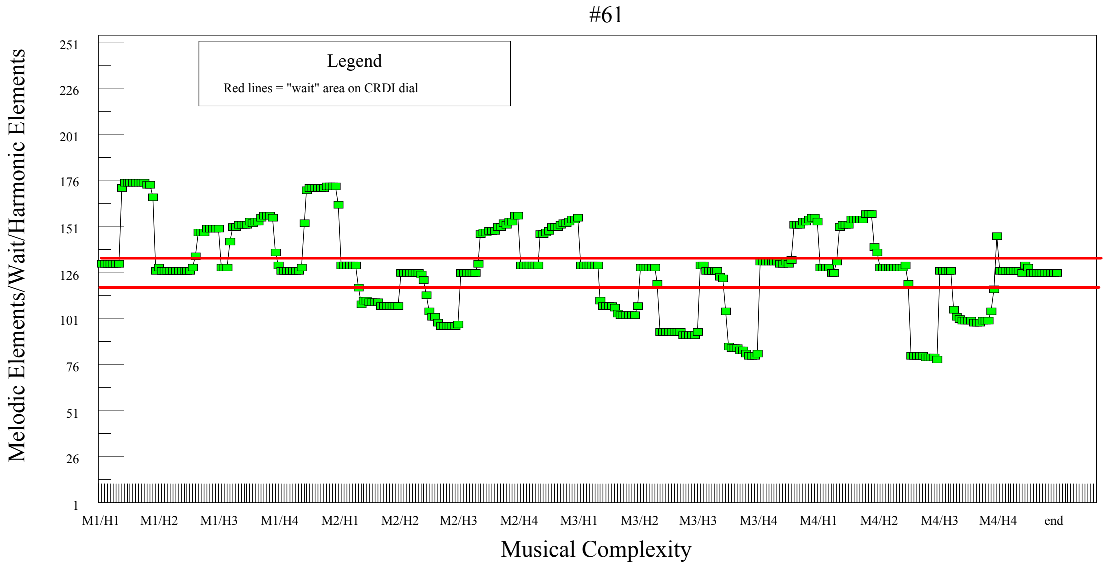

Academic status: Univ. Jazz Major Stimulus Order: D
Primary instrument: Drum Set
Private Study (in years): 13 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



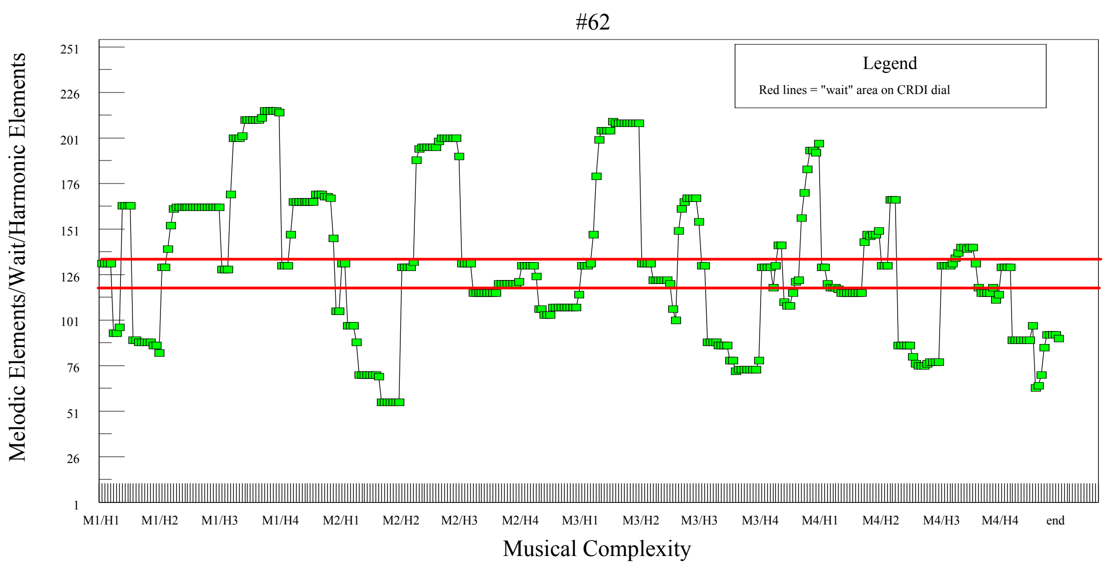

Academic status: Univ. Jazz Major Stimulus Order: D
Primary instrument: Saxophone
Private Study (in years): 7 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 3 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y




Academic status: Univ. Jazz Major Stimulus Order: D
Primary instrument: Saxophone
Private Study (in years): 8 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 4 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

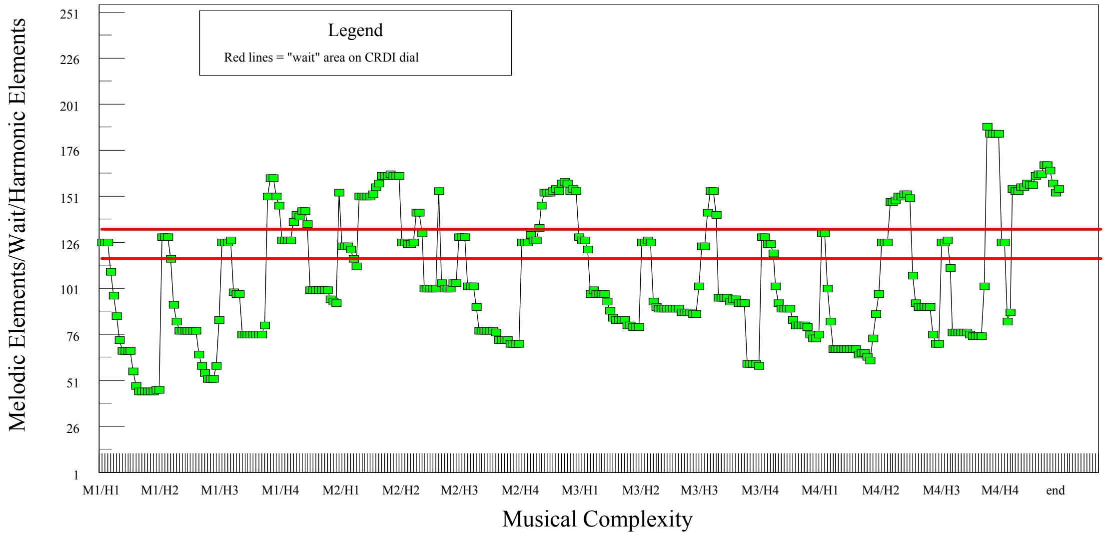



Academic status: Univ. Jazz Major Stimulus Order: D
Primary instrument: Voice
Private Study (in years): 1 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y



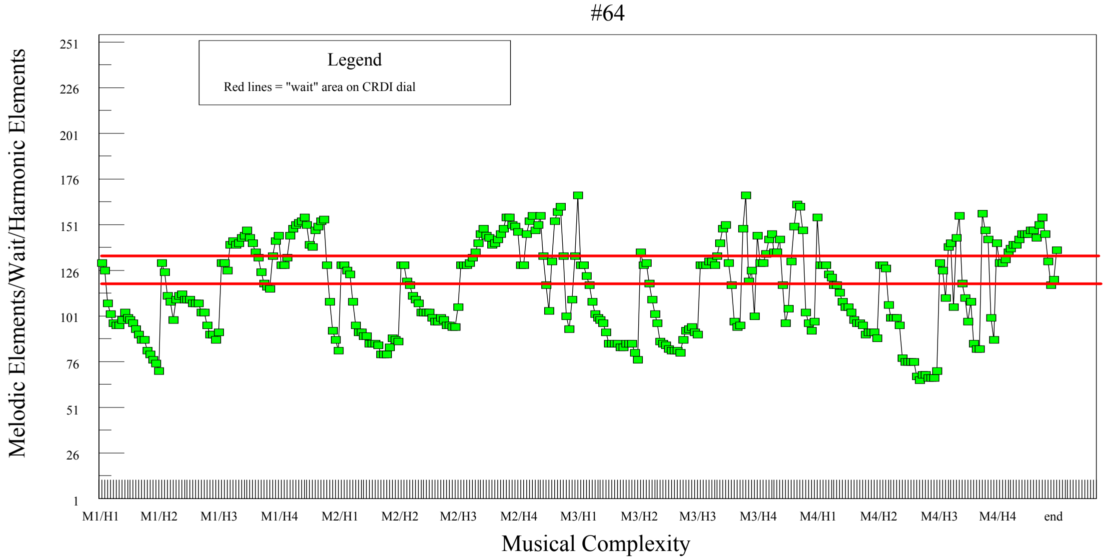

Academic status: Univ. Jazz Major Stimulus Order: D
Primary instrument: Euphonium
Private Study (in years): 6 Gender: Male
Previous CRDI Participation Experience (number of experiences): 2
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#63




Academic status: Univ. Jazz Major Stimulus Order: D
Primary instrument: Voice
Private Study (in years): 5 Gender: Female
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 5 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? Y

#64




Academic status: Univ. Jazz Major Stimulus Order: D
Primary instrument: Trumpet
Private Study (in years): 5 Gender: Male
Previous CRDI Participation Experience (number of experiences): 0
Self-perceived Focus of Attention: 8 (1=All Melody; 10 = All Harmony)
Did your dial movement correspond to your focus of attention? N

# APPENDIX L

# CRDI DATA COLLAPSED AND TRANSFORMED

| UM | Order | Inst. | Priv | F/M | M1H1 | M1H2 | M1H3 | M1H4 | M2H1 | M2H2 | M2H3 | M2H4 | M3H1 | M3H2 | M3H3 | M3H4 | M4H1 | M4H2 | M4H3 | M4H4 | Perc | CRDI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201 | A | 9 | 5 | 2 | 6 | 6 | 6 | 7 | 6 | 7 | 6 | 6 | 4 | 5 | 5 | 4 | 6 | 6 | 3 | 5 | 7 | 1 |
| 202 | A | 3 | 3 | 2 | 4 | 8 | 8 | 8 | 6 | 7 | 5 | 7 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 0 |
| 203 | A | 3 | 6 | 2 | 8 | 5 | 4 | 7 | 6 | 4 | 4 | 7 | 4 | 3 | 5 | 3 | 3 | 5 | 3 | 7 | 3 | 0 |
| 204 | A | 9 | 5 | 2 | 5 | 4 | 6 | 5 | 5 | 2 | 5 | 4 | 4 | 4 | 6 | 6 | 5 | 4 | 6 | 5 | 5 | 1 |
| 205 | A | 9 | 9 | 1 | 7 | 8 | 6 | 7 | 7 | 7 | 7 | 4 | 5 | 5 | 5 | 7 | 4 | 4 | 8 | 6 | 7 | 1 |
| 206 | A | 6 | 9 | 2 | 7 | 9 | 5 | 9 | 8 | 6 | 6 | 5 | 6 | 8 | 6 | 7 | 5 | 7 | 5 | 4 | 7 | 2 |
| 207 | A | 17 | 25 | 1 | 6 | 5 | 7 | 5 | 7 | 7 | 6 | 5 | 4 | 6 | 8 | 7 | 5 | 5 | 5 | 4 | 4 | 1 |
| 208 | A | 8 | 9 | 1 | 7 | 5 | 7 | 6 | 5 | 4 | 4 | 6 | 5 | 5 | 4 | 3 | 5 | 4 | 4 | 7 | 5 | 0 |
| 209 | B | 16 | 3 | 2 | 7 | 8 | 6 | 6 | 5 | 8 | 6 | 8 | 3 | 7 | 4 | 3 | 3 | 3 | 3 | 3 | 6 | 1 |
| 210 | B | 12 | 8 | 2 | 5 | 4 | 2 | 7 | 3 | 3 | 4 | 3 | 2 | 3 | 4 | 3 | 3 | 2 | 3 | 7 | 4 | 2 |
| 211 | B | 6 | 0 | 1 | 4 | 5 | 7 | 7 | 4 | 3 | 7 | 7 | 4 | 4 | 5 | 7 | 3 | 5 | 8 | 8 | 5 | 0 |
| 212 | B | 12 | 3 | 2 | 7 | 7 | 7 | 8 | 7 | 7 | 7 | 6 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 5 | 4 | 0 |
| 213 | B | 6 | 9 | 1 | 6 | 7 | 7 | 7 | 6 | 7 | 4 | 6 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 3 | 2 |
| 214 | B | 2 | 7 | 2 | 6 | 6 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 7 | 7 | 1 |
| 215 | B | 6 | 11 | 2 | 6 | 7 | 7 | 6 | 5 | 6 | 6 | 5 | 6 | 5 | 5 | 5 | 5 | 6 | 7 | 4 | 8 | 0 |
| 216 | B | 15 | 0 | 2 | 7 | 6 | 5 | 9 | 7 | 6 | 5 | 8 | 5 | 4 | 7 | 4 | 3 | 5 | 9 | 5 | 6 | 0 |
| 217 | C | 1 | 7 | 1 | 5 | 4 | 7 | 8 | 4 | 5 | 6 | 7 | 6 | 6 | 5 | 7 | 5 | 5 | 7 | 7 | 4 | 0 |
| 218 | C | 1 | 10 | 1 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | 0 |
| 219 | C | 10 | 10 | 2 | 5 | 5 | 6 | 8 | 5 | 6 | 7 | 9 | 5 | 6 | 5 | 9 | 4 | 4 | 6 | 8 | 8 | 0 |
| 220 | C | 5 | 8 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 5 | 6 | 5 | 5 | 5 | 6 | 5 | 6 | 1 |
| 221 | C | 9 | 7 | 2 | 6 | 6 | 7 | 8 | 6 | 7 | 7 | 4 | 5 | 5 | 5 | 4 | 6 | 6 | 5 | 3 | 4 | 0 |
| 222 | C | 8 | 8 | 2 | 5 | 5 | 6 | 7 | 4 | 5 | 6 | 7 | 5 | 5 | 6 | 6 | 4 | 6 | 6 | 7 | 5 | 0 |
| 223 | C | 19 | 8 | 1 | 5 | 5 | 7 | 7 | 7 | 7 | 6 | 7 | 6 | 6 | 4 | 8 | 4 | 7 | 6 | 7 | 7 | 1 |
| 224 | C | 3 | 6 | 1 | 7 | 7 | 8 | 8 | 7 | 7 | 8 | 7 | 4 | 4 | 4 | 4 | 5 | 7 | 4 | 7 | 6 | 0 |
| 225 | D | 17 | 8 | 2 | 5 | 4 | 7 | 8 | 4 | 5 | 6 | 7 | 6 | 6 | 5 | 7 | 5 | 5 | 7 | 7 | 5 | 0 |
| 226 | D | 17 | 9 | 2 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 |
| 227 | D | 12 | 18 | 2 | 5 | 5 | 6 | 8 | 5 | 6 | 7 | 9 | 5 | 6 | 5 | 9 | 4 | 4 | 6 | 8 | 4 | 0 |
| 228 | D | 19 | 15 | 1 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 5 | 6 | 5 | 5 | 5 | 6 | 5 | 5 | 0 |
| 229 | D | 19 | 7 | 1 | 6 | 6 | 7 | 8 | 6 | 7 | 7 | 4 | 5 | 5 | 5 | 4 | 6 | 6 | 5 | 3 | 6 | 0 |
| 230 | D | 7 | 1 | 2 | 5 | 5 | 6 | 7 | 4 | 5 | 6 | 7 | 5 | 5 | 6 | 6 | 4 | 6 | 6 | 7 | 5 | 0 |
| 231 | D | 18 | 28 | 2 | 5 | 5 | 7 | 7 | 7 | 7 | 6 | 7 | 6 | 6 | 4 | 8 | 4 | 7 | 6 | 7 | 4 | 1 |
| 232 | D | 17 | 28 | 1 | 7 | 7 | 8 | 8 | 7 | 7 | 8 | 7 | 4 | 4 | 4 | 4 | 5 | 7 | 4 | 7 | 5 | 0 |

| UJ | Order | Inst. | Priv | F/M | M1/H1 | M1/H2 | M1/H3 | M1/H4 | M2/H1 | M2/H2 | M2/H3 | M2/H4 | M3/H1 | M3/H2 | M3/H3 | M3/H4 | M4/H1 | M4/H2 | M4/H3 | M4/H4 | Perc | CRDI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 401 | A | 9 | 0 | 2 | 6 | 6 | 6 | 7 | 6 | 6 | 5 | 5 | 5 | 5 | 7 | 4 | 5 | 5 | 7 | 8 | 5 | 0 |
| 402 | A | 9 | 6 | 2 | 7 | 8 | 6 | 7 | 5 | 5 | 5 | 8 | 5 | 5 | 5 | 4 | 4 | 6 | 4 | 7 | 4 | 0 |
| 403 | A | 9 | 0 | 2 | 9 | 6 | 7 | 8 | 6 | 6 | 3 | 6 | 5 | 6 | 5 | 4 | 6 | 5 | 4 | 4 | 7 | 0 |
| 404 | A | 6 | 10 | 2 | 5 | 5 | 5 | 7 | 6 | 7 | 5 | 6 | 5 | 6 | 7 | 5 | 6 | 7 | 4 | 5 | 6 | 0 |
| 405 | A | 12 | 2 | 2 | 5 | 5 | 7 | 4 | 6 | 4 | 4 | 5 | 7 | 5 | 6 | 6 | 8 | 4 | 5 | 6 | 4 | 0 |
| 406 | A | 7 | 0 | 1 | 5 | 5 | 5 | 6 | 6 | 5 | 6 | 5 | 5 | 5 | 5 | 6 | 7 | 6 | 6 | 7 | 3 | 0 |
| 407 | A | 6 | 10 | 2 | 4 | 4 | 10 | 5 | 4 | 7 | 5 | 1 | 6 | 9 | 6 | 1 | 5 | 5 | 6 | 6 | 4 | 0 |
| 408 | A | 7 | 5 | 2 | 6 | 5 | 7 | 7 | 4 | 4 | 4 | 6 | 6 | 4 | 6 | 3 | 8 | 4 | 5 | 7 | 4 | 0 |
| 409 | B | 7 | 9 | 2 | 6 | 4 | 8 | 8 | 5 | 6 | 4 | 6 | 4 | 5 | 4 | 3 | 6 | 5 | 3 | 8 | 6 | 1 |
| 410 | B | 7 | 9 | 2 | 5 | 5 | 7 | 7 | 5 | 4 | 7 | 7 | 5 | 3 | 4 | 7 | 4 | 6 | 6 | 6 | 7 | 1 |
| 411 | B | 6 | 10 | 2 | 5 | 4 | 7 | 7 | 4 | 5 | 7 | 6 | 4 | 5 | 4 | 7 | 4 | 4 | 4 | 7 | 3 | 2 |
| 412 | B | 13 | 15 | 2 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 7 | 0 |
| 413 | B | 9 | 10 | 2 | 7 | 7 | 5 | 7 | 6 | 4 | 4 | 7 | 3 | 5 | 3 | 4 | 3 | 4 | 4 | 5 | 8 | 2 |
| 414 | B | 9 | 6 | 2 | 3 | 4 | 7 | 8 | 7 | 4 | 8 | 8 | 4 | 3 | 8 | 7 | 3 | 5 | 7 | 9 | 8 | 0 |
| 415 | B | 6 | 2 | 2 | 4 | 4 | 7 | 8 | 4 | 5 | 8 | 8 | 5 | 5 | 7 | 6 | 5 | 5 | 7 | 6 | 6 | 0 |
| 416 | B | 6 | 2 | 2 | 5 | 4 | 7 | 5 | 5 | 4 | 7 | 8 | 4 | 4 | 6 | 8 | 3 | 5 | 4 | 7 | 7 | 0 |
| 417 | C | 12 | 12 | 2 | 4 | 3 | 7 | 10 | 4 | 5 | 9 | 10 | 4 | 5 | 7 | 10 | 4 | 5 | 8 | 7 | 7 | 0 |
| 418 | C | 7 | 15 | 2 | 7 | 5 | 6 | 7 | 7 | 4 | 7 | 9 | 3 | 4 | 4 | 6 | 4 | 4 | 4 | 7 | 4 | 0 |
| 419 | C | 7 | 1 | 2 | 5 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 7 | 5 | 4 | 5 | 5 | 6 | 5 | 0 |
| 420 | C | 12 | 3 | 2 | 3 | 2 | 4 | 5 | 4 | 3 | 4 | 5 | 3 | 3 | 5 | 6 | 3 | 4 | 4 | 6 | 4 | 0 |
| 421 | C | 6 | 3 | 2 | 5 | 7 | 6 | 8 | 3 | 4 | 8 | 9 | 3 | 5 | 5 | 9 | 4 | 3 | 7 | 5 | 8 | 0 |
| 422 | C | 6 | 4 | 1 | 6 | 6 | 7 | 8 | 5 | 6 | 7 | 7 | 4 | 4 | 6 | 4 | 5 | 4 | 5 | 7 | 6 | 0 |
| 423 | C | 6 | 9 | 2 | 7 | 6 | 6 | 5 | 6 | 7 | 5 | 5 | 6 | 5 | 5 | 4 | 5 | 6 | 5 | 4 | 3 | 0 |
| 424 | C | 16 | 4 | 2 | 9 | 8 | 7 | 4 | 7 | 5 | 4 | 6 | 4 | 9 | 4 | 7 | 5 | 7 | 5 | 7 | 8 | 0 |
| 425 | D | 13 | 0 | 2 | 6 | 6 | 7 | 7 | 5 | 6 | 6 | 8 | 5 | 5 | 7 | 7 | 8 | 5 | 5 | 8 | 4 | 0 |
| 426 | D | 12 | 13 | 2 | 5 | 6 | 5 | 6 | 6 | 6 | 7 | 6 | 5 | 5 | 4 | 5 | 4 | 7 | 6 | 4 | 4 | 0 |
| 427 | D | 6 | 7 | 2 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 3 | 0 |
| 428 | D | 6 | 8 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 0 |
| 429 | D | 20 | 1 | 1 | 7 | 6 | 6 | 7 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 6 | 6 | 5 | 5 | 6 | 5 | 0 |
| 430 | D | 10 | 6 | 2 | 5 | 7 | 8 | 7 | 4 | 8 | 5 | 5 | 8 | 6 | 4 | 6 | 6 | 4 | 6 | 4 | 5 | 2 |
| 431 | D | 20 | 5 | 1 | 3 | 4 | 5 | 5 | 6 | 5 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 6 | 5 | 0 |
| 432 | D | 7 | 5 | 2 | 4 | 5 | 6 | 6 | 4 | 5 | 6 | 6 | 4 | 4 | 6 | 6 | 5 | 4 | 5 | 6 | 8 | 0 |

KEY:

| | |
|---|---|
| UM = University Music Majors | PR = Practice Example |
| UJ = University Jazz Majors | Perc = Self-perception of Focus of Attention |
| HS = High School Instrumentalists | Inst = Instrument |
| JH = Junior High School Instrumentalists | Priv = Private Instruction (in years) |
| Order = Order of Stimuli (A, B, C, D) | F/M = Female (1)/Male (2) |

# APPENDIX M
# COMPLEXITY LEVEL MEANS FOR ALL PARTICIPANTS

| Ss | Order | M1 | M2 | M3 | M4 | H1 | H2 | H3 | H4 | Perc | Inst. | Priv | F/M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | A | 5.75 | 5.50 | 4.50 | 4.00 | 3.50 | 5.00 | 4.25 | 7.00 | 5 | 6 | 6 | 1 |
| 102 | A | 6.50 | 5.75 | 4.25 | 4.75 | 5.00 | 6.75 | 4.75 | 4.75 | 6 | 3 | 10 | 1 |
| 103 | A | 4.75 | 4.00 | 3.50 | 3.00 | 3.25 | 3.75 | 3.50 | 4.75 | 3 | 2 | 8 | 2 |
| 104 | A | 6.75 | 4.00 | 5.25 | 5.25 | 6.75 | 5.50 | 4.25 | 4.75 | 1 | 11 | 5 | 2 |
| 105 | A | 6.75 | 7.50 | 4.25 | 4.50 | 4.50 | 5.00 | 5.00 | 8.50 | 9 | 3 | 9 | 2 |
| 106 | A | 6.00 | 4.75 | 5.00 | 1.75 | 3.75 | 2.50 | 6.75 | 4.50 | 4 | 7 | 6 | 2 |
| 107 | A | 6.75 | 5.25 | 5.00 | 1.25 | 6.75 | 5.25 | 2.25 | 4.00 | 4 | 3 | 6 | 1 |
| 108 | A | 6.25 | 7.25 | 3.50 | 2.25 | 3.75 | 5.75 | 5.50 | 4.25 | 5 | 12 | 7 | 2 |
| 109 | B | 6.50 | 6.25 | 5.50 | 4.75 | 5.75 | 5.00 | 6.25 | 6.00 | 5 | 3 | 9 | 1 |
| 110 | B | 5.75 | 5.50 | 3.75 | 4.25 | 4.75 | 5.25 | 4.50 | 4.75 | 5 | 3 | 8 | 2 |
| 111 | B | 6.25 | 5.25 | 4.00 | 4.50 | 5.00 | 5.25 | 4.75 | 5.00 | 4 | 11 | 5 | 2 |
| 112 | B | 5.00 | 4.00 | 1.75 | 2.75 | 2.75 | 2.00 | 3.75 | 5.00 | 4 | 12 | 9 | 2 |
| 113 | B | 6.75 | 7.00 | 2.75 | 4.75 | 5.00 | 4.25 | 5.75 | 6.25 | 3 | 8 | 8 | 1 |
| 114 | B | 7.50 | 4.00 | 3.75 | 4.00 | 5.75 | 4.25 | 4.50 | 4.75 | 7 | 3 | 7 | 2 |
| 115 | B | 7.00 | 6.75 | 6.00 | 4.25 | 6.25 | 6.50 | 4.75 | 6.50 | 7 | 6 | 10 | 2 |
| 116 | B | 6.75 | 5.75 | 4.50 | 5.00 | 4.50 | 3.50 | 6.00 | 8.00 | 4 | 3 | 9 | 2 |
| 117 | C | 6.75 | 5.50 | 8.00 | 5.25 | 4.50 | 5.25 | 6.75 | 9.00 | 5 | 8 | 9 | 2 |
| 118 | C | 3.75 | 4.50 | 3.75 | 4.75 | 3.25 | 3.25 | 4.75 | 5.50 | 3 | 12 | 9 | 2 |
| 119 | C | 4.00 | 4.00 | 6.00 | 5.50 | 5.25 | 3.00 | 5.75 | 5.50 | 7 | 9 | 2 | 2 |
| 120 | C | 8.25 | 6.25 | 5.25 | 4.25 | 5.75 | 5.50 | 6.00 | 6.75 | 3 | 3 | 8 | 1 |
| 121 | C | 8.25 | 6.50 | 5.00 | 4.25 | 6.50 | 6.00 | 6.00 | 5.50 | 7 | 3 | 9 | 2 |
| 122 | C | 5.50 | 5.75 | 4.75 | 6.25 | 5.50 | 5.50 | 5.75 | 5.50 | 5 | 10 | 9 | 1 |
| 123 | C | 8.50 | 5.25 | 5.75 | 4.00 | 5.25 | 7.00 | 6.00 | 5.25 | 4 | 3 | 8 | 1 |
| 124 | C | 7.50 | 7.25 | 6.75 | 6.75 | 8.00 | 7.25 | 6.25 | 6.75 | 8 | 8 | 5 | 1 |
| 125 | D | 8.00 | 8.25 | 3.00 | 2.25 | 6.00 | 4.50 | 5.75 | 5.25 | 7 | 11 | 6 | 2 |
| 126 | D | 7.50 | 6.25 | 3.75 | 4.25 | 5.00 | 4.00 | 5.50 | 7.25 | 5 | 12 | 1 | 2 |
| 127 | D | 3.25 | 4.25 | 6.00 | 6.50 | 5.25 | 5.25 | 5.00 | 4.50 | 4 | 6 | 1 | 2 |
| 128 | D | 8.75 | 5.25 | 2.00 | 4.25 | 5.50 | 4.50 | 5.25 | 5.00 | 5 | 1 | 6 | 1 |
| 129 | D | 6.50 | 4.75 | 5.25 | 4.00 | 5.00 | 5.50 | 5.50 | 4.50 | 5 | 7 | 4 | 2 |
| 130 | D | 7.75 | 7.25 | 3.00 | 5.50 | 5.00 | 5.25 | 6.00 | 7.25 | 8 | 9 | 4 | 2 |
| 131 | D | 8.00 | 8.75 | 7.75 | 8.25 | 8.75 | 7.00 | 8.75 | 8.25 | 8 | 10 | 5 | 2 |
| 132 | D | 7.50 | 5.75 | 5.50 | 4.25 | 6.25 | 5.25 | 6.25 | 5.25 | 6 | 3 | 4 | 2 |
| 201 | A | 6.25 | 6.25 | 4.50 | 5.00 | 5.50 | 6.00 | 5.00 | 5.50 | 7 | 9 | 5 | 2 |
| 202 | A | 7.00 | 6.25 | 3.75 | 3.00 | 4.25 | 5.50 | 5.00 | 5.25 | 3 | 3 | 3 | 2 |
| 203 | A | 6.00 | 5.25 | 3.75 | 4.50 | 5.25 | 4.25 | 4.00 | 6.00 | 3 | 3 | 6 | 2 |
| 204 | A | 5.00 | 4.00 | 5.00 | 5.00 | 4.75 | 3.50 | 5.75 | 5.00 | 5 | 9 | 5 | 2 |
| 205 | A | 7.00 | 6.25 | 5.50 | 5.50 | 5.75 | 6.00 | 6.50 | 6.00 | 7 | 9 | 9 | 1 |
| 206 | A | 7.50 | 6.25 | 6.75 | 5.25 | 6.50 | 7.50 | 5.50 | 6.25 | 7 | 6 | 9 | 2 |
| 207 | A | 5.75 | 6.25 | 6.25 | 4.75 | 5.50 | 5.75 | 6.50 | 5.25 | 4 | 17 | 25 | 1 |
| 208 | A | 6.25 | 4.75 | 4.25 | 5.00 | 5.50 | 4.50 | 4.75 | 5.50 | 5 | 8 | 9 | 1 |
| 209 | B | 6.75 | 6.75 | 4.25 | 3.00 | 4.50 | 6.50 | 4.75 | 5.00 | 6 | 16 | 3 | 2 |
| 210 | B | 4.50 | 3.25 | 3.00 | 3.75 | 3.25 | 3.00 | 3.25 | 5.00 | 4 | 12 | 8 | 2 |
| 211 | B | 5.75 | 5.25 | 5.00 | 6.00 | 3.75 | 4.25 | 6.75 | 7.25 | 5 | 6 | 0 | 1 |
| 212 | B | 7.25 | 6.75 | 3.75 | 3.75 | 5.50 | 5.25 | 5.00 | 5.75 | 4 | 12 | 3 | 2 |
| 213 | B | 6.75 | 5.75 | 4.25 | 4.50 | 5.25 | 5.75 | 4.75 | 5.50 | 3 | 6 | 9 | 1 |
| 214 | B | 6.50 | 6.00 | 6.00 | 6.00 | 5.75 | 6.00 | 6.25 | 6.50 | 7 | 2 | 7 | 2 |
| 215 | B | 6.50 | 5.50 | 5.25 | 5.50 | 5.50 | 6.00 | 6.25 | 5.00 | 8 | 6 | 11 | 2 |
| 216 | B | 6.75 | 6.50 | 5.00 | 5.50 | 5.50 | 5.25 | 6.50 | 6.50 | 6 | 15 | 0 | 2 |
| 217 | C | 6.00 | 5.50 | 6.00 | 6.00 | 5.00 | 5.00 | 6.25 | 7.25 | 4 | 1 | 7 | 1 |
| 218 | C | 6.50 | 5.75 | 6.00 | 6.00 | 6.25 | 6.25 | 6.00 | 5.75 | 8 | 1 | 10 | 1 |
| 219 | C | 6.00 | 6.75 | 6.25 | 5.50 | 4.75 | 5.25 | 6.00 | 8.50 | 8 | 10 | 10 | 2 |
| 220 | C | 6.00 | 5.75 | 5.50 | 5.25 | 5.75 | 5.50 | 6.00 | 5.25 | 6 | 5 | 8 | 2 |
| 221 | C | 6.75 | 6.00 | 4.75 | 5.00 | 5.75 | 6.00 | 6.00 | 4.75 | 4 | 9 | 7 | 2 |
| 222 | C | 5.75 | 5.50 | 5.50 | 5.75 | 4.50 | 5.25 | 6.00 | 6.75 | 5 | 8 | 8 | 2 |

| Ss | Order | M1 | M2 | M3 | M4 | H1 | H2 | H3 | H4 | Perc | Inst. | Priv | F/M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 223 | C | 6.00 | 6.75 | 6.00 | 6.00 | 5.50 | 6.25 | 5.75 | 7.25 | 7 | 19 | 8 | 1 |
| 224 | C | 7.50 | 7.25 | 4.00 | 5.75 | 5.75 | 6.25 | 6.00 | 6.50 | 6 | 3 | 6 | 1 |
| 225 | D | 6.00 | 5.50 | 6.00 | 6.00 | 5.00 | 5.00 | 6.25 | 7.25 | 5 | 17 | 8 | 2 |
| 226 | D | 6.50 | 5.75 | 6.00 | 6.00 | 6.25 | 6.25 | 6.00 | 5.75 | 6 | 17 | 9 | 2 |
| 227 | D | 6.00 | 6.75 | 6.25 | 5.50 | 4.75 | 5.25 | 6.00 | 8.50 | 4 | 12 | 18 | 2 |
| 228 | D | 6.00 | 5.75 | 5.50 | 5.25 | 5.75 | 5.50 | 6.00 | 5.25 | 5 | 19 | 15 | 1 |
| 229 | D | 6.75 | 6.00 | 4.75 | 5.00 | 5.75 | 6.00 | 6.00 | 4.75 | 6 | 19 | 7 | 1 |
| 230 | D | 5.75 | 5.50 | 5.50 | 5.75 | 4.50 | 5.25 | 6.00 | 6.75 | 5 | 7 | 1 | 2 |
| 231 | D | 6.00 | 6.75 | 6.00 | 6.00 | 5.50 | 6.25 | 5.75 | 7.25 | 4 | 18 | 28 | 2 |
| 232 | D | 7.50 | 7.25 | 4.00 | 5.75 | 5.75 | 6.25 | 6.00 | 6.50 | 5 | 17 | 28 | 1 |
| 301 | A | 5.50 | 6.25 | 6.50 | 6.50 | 2.75 | 7.00 | 6.25 | 8.75 | 8 | 6 | 10 | 2 |
| 302 | A | 6.00 | 8.25 | 6.75 | 5.00 | 6.50 | 5.50 | 5.25 | 8.75 | 7 | 9 | 9 | 2 |
| 303 | A | 4.75 | 4.75 | 4.75 | 2.50 | 3.50 | 3.25 | 4.00 | 6.00 | 3 | 7 | 4 | 2 |
| 304 | A | 4.50 | 5.25 | 4.25 | 3.50 | 3.50 | 3.25 | 5.00 | 5.75 | 3 | 7 | 6 | 2 |
| 305 | A | 6.50 | 5.50 | 3.25 | 4.25 | 3.50 | 5.25 | 4.75 | 6.00 | 4 | 7 | 9 | 2 |
| 306 | A | 4.25 | 6.00 | 4.00 | 6.50 | 5.00 | 5.00 | 4.25 | 6.50 | 6 | 12 | 11 | 2 |
| 307 | A | 4.75 | 4.50 | 4.25 | 5.00 | 2.25 | 3.00 | 5.75 | 7.50 | 7 | 6 | 4 | 2 |
| 308 | A | 5.50 | 6.00 | 4.50 | 1.50 | 5.25 | 2.25 | 5.00 | 5.00 | 5 | 6 | 6 | 2 |
| 309 | B | 7.75 | 6.75 | 5.50 | 4.25 | 6.25 | 6.75 | 5.25 | 6.00 | 8 | 7 | 1 | 2 |
| 310 | B | 7.00 | 6.25 | 6.00 | 4.25 | 4.75 | 4.25 | 6.50 | 8.00 | 7 | 13 | 0 | 2 |
| 311 | B | 6.50 | 6.75 | 5.00 | 5.75 | 4.50 | 4.75 | 7.25 | 7.50 | 7 | 7 | 5 | 2 |
| 312 | B | 6.25 | 6.00 | 4.00 | 6.50 | 4.25 | 5.00 | 7.00 | 6.50 | 4 | 14 | 0 | 2 |
| 313 | B | 6.75 | 6.00 | 6.00 | 6.75 | 5.25 | 6.00 | 6.25 | 8.00 | 8 | 7 | 5 | 2 |
| 314 | B | 7.25 | 6.75 | 6.75 | 6.50 | 6.25 | 5.50 | 7.50 | 8.00 | 7 | 6 | 8 | 2 |
| 315 | B | 5.00 | 6.25 | 4.75 | 4.25 | 1.50 | 2.75 | 7.25 | 8.75 | 7 | 9 | 5 | 2 |
| 316 | B | 4.50 | 4.00 | 5.00 | 8.50 | 5.00 | 3.50 | 6.00 | 7.50 | 8 | 6 | 3 | 2 |
| 317 | C | 8.50 | 8.50 | 8.25 | 6.50 | 8.75 | 7.75 | 8.00 | 7.25 | 7 | 16 | 1 | 1 |
| 318 | C | 6.50 | 5.25 | 4.75 | 5.00 | 6.00 | 5.50 | 5.25 | 4.75 | 7 | 9 | 2 | 2 |
| 319 | C | 6.50 | 5.75 | 4.25 | 4.50 | 4.25 | 4.00 | 6.25 | 6.50 | 4 | 9 | 7 | 2 |
| 320 | C | 6.00 | 4.75 | 3.25 | 4.75 | 4.50 | 3.75 | 5.00 | 5.50 | 4 | 7 | 3 | 2 |
| 321 | C | 7.75 | 5.50 | 4.25 | 4.50 | 4.75 | 6.25 | 5.25 | 5.75 | 7 | 7 | 7 | 2 |
| 322 | C | 8.50 | 5.75 | 3.50 | 3.25 | 4.75 | 5.25 | 5.00 | 6.00 | 7 | 7 | 6 | 2 |
| 323 | C | 5.00 | 6.00 | 5.75 | 4.75 | 3.00 | 3.50 | 7.75 | 7.25 | 7 | 15 | 13 | 2 |
| 324 | C | 5.25 | 7.75 | 5.25 | 5.25 | 5.25 | 6.00 | 5.00 | 7.25 | 3 | 13 | 12 | 2 |
| 325 | D | 6.75 | 7.50 | 7.00 | 6.75 | 6.75 | 6.75 | 7.50 | 7.00 | 7 | 11 | 5 | 2 |
| 326 | D | 5.50 | 4.75 | 4.00 | 4.50 | 4.25 | 3.25 | 4.50 | 6.75 | 4 | 7 | 7 | 2 |
| 327 | D | 5.50 | 6.25 | 4.25 | 5.75 | 5.50 | 4.00 | 7.00 | 5.25 | 6 | 6 | 3 | 2 |
| 328 | D | 7.00 | 6.25 | 5.00 | 4.75 | 4.50 | 5.25 | 6.00 | 7.25 | 5 | 12 | 8 | 2 |
| 329 | D | 6.25 | 5.25 | 3.50 | 4.50 | 4.75 | 6.75 | 5.25 | 2.75 | 5 | 7 | 7 | 2 |
| 330 | D | 5.25 | 6.50 | 3.50 | 5.25 | 4.25 | 3.25 | 6.25 | 6.75 | 4 | 7 | 9 | 2 |
| 331 | D | 5.50 | 5.25 | 5.25 | 7.50 | 4.75 | 5.25 | 6.00 | 7.50 | 4 | 14 | 6 | 2 |
| 332 | D | 3.50 | 7.75 | 6.75 | 6.00 | 7.25 | 5.50 | 5.50 | 5.75 | 6 | 13 | 2 | 2 |
| 401 | A | 6.25 | 5.50 | 5.25 | 6.25 | 5.50 | 5.50 | 6.25 | 6.00 | 5 | 9 | 0 | 2 |
| 402 | A | 7.00 | 5.75 | 4.75 | 5.25 | 5.25 | 6.00 | 5.00 | 6.50 | 4 | 9 | 6 | 2 |
| 403 | A | 7.50 | 5.25 | 5.00 | 4.75 | 6.50 | 5.75 | 4.75 | 5.50 | 7 | 9 | 0 | 2 |
| 404 | A | 5.50 | 6.00 | 5.75 | 5.50 | 5.50 | 6.25 | 5.25 | 5.75 | 6 | 6 | 10 | 2 |
| 405 | A | 5.25 | 4.75 | 6.00 | 5.75 | 6.50 | 4.50 | 5.50 | 5.25 | 4 | 12 | 2 | 2 |
| 406 | A | 5.25 | 5.50 | 5.25 | 6.50 | 5.75 | 5.25 | 5.50 | 6.00 | 3 | 7 | 0 | 1 |
| 407 | A | 5.75 | 4.25 | 5.50 | 5.50 | 4.75 | 6.25 | 6.75 | 3.25 | 4 | 6 | 10 | 2 |
| 408 | A | 6.25 | 4.50 | 4.75 | 6.00 | 6.00 | 4.25 | 5.50 | 5.75 | 4 | 7 | 5 | 2 |
| 409 | B | 6.50 | 5.25 | 4.00 | 5.50 | 5.25 | 5.00 | 4.75 | 6.25 | 6 | 7 | 9 | 2 |
| 410 | B | 6.00 | 5.75 | 4.75 | 5.50 | 4.75 | 4.50 | 6.00 | 6.75 | 7 | 7 | 9 | 2 |
| 411 | B | 5.75 | 5.50 | 5.00 | 4.75 | 4.25 | 4.50 | 5.50 | 6.75 | 3 | 6 | 10 | 2 |
| 412 | B | 5.00 | 4.75 | 5.00 | 5.50 | 5.00 | 4.75 | 5.25 | 5.25 | 7 | 13 | 15 | 2 |

| Ss | Order | M1 | M2 | M3 | M4 | H1 | H2 | H3 | H4 | Perc | Inst. | Priv | F/M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 413 | B | 6.50 | 5.25 | 3.75 | 4.00 | 4.75 | 5.00 | 4.00 | 5.75 | 8 | 9 | 10 | 2 |
| 414 | B | 5.50 | 6.75 | 5.50 | 6.00 | 4.25 | 4.00 | 7.50 | 8.00 | 8 | 9 | 6 | 2 |
| 415 | B | 5.75 | 6.25 | 5.75 | 5.75 | 4.50 | 4.75 | 7.25 | 7.00 | 6 | 6 | 2 | 2 |
| 416 | B | 5.25 | 6.00 | 5.50 | 4.75 | 4.25 | 4.25 | 6.00 | 7.00 | 7 | 6 | 2 | 2 |
| 417 | C | 6.00 | 7.00 | 6.50 | 6.00 | 4.00 | 4.50 | 7.75 | 9.25 | 7 | 12 | 12 | 2 |
| 418 | C | 6.25 | 6.75 | 4.25 | 4.75 | 5.25 | 4.25 | 5.25 | 7.25 | 4 | 7 | 15 | 2 |
| 419 | C | 4.50 | 3.75 | 5.25 | 5.00 | 4.25 | 4.25 | 5.25 | 4.75 | 5 | 7 | 1 | 2 |
| 420 | C | 3.50 | 4.00 | 4.25 | 4.25 | 3.25 | 3.00 | 4.25 | 5.50 | 4 | 12 | 3 | 2 |
| 421 | C | 6.50 | 6.00 | 5.50 | 4.75 | 3.75 | 4.75 | 6.50 | 7.75 | 8 | 6 | 3 | 2 |
| 422 | C | 6.75 | 6.25 | 4.50 | 5.25 | 5.00 | 5.00 | 6.25 | 6.50 | 6 | 6 | 4 | 1 |
| 423 | C | 6.00 | 5.75 | 5.00 | 5.00 | 6.00 | 6.00 | 5.25 | 4.50 | 3 | 6 | 9 | 2 |
| 424 | C | 7.00 | 5.50 | 6.00 | 6.00 | 6.25 | 7.25 | 5.00 | 6.00 | 8 | 16 | 4 | 2 |
| 425 | D | 6.50 | 6.25 | 6.00 | 6.50 | 6.00 | 5.50 | 6.25 | 7.50 | 4 | 13 | 0 | 2 |
| 426 | D | 5.50 | 6.25 | 4.75 | 5.25 | 5.00 | 6.00 | 5.50 | 5.25 | 4 | 12 | 13 | 2 |
| 427 | D | 5.25 | 5.25 | 5.00 | 4.50 | 5.00 | 5.00 | 4.75 | 5.25 | 3 | 6 | 7 | 2 |
| 428 | D | 5.00 | 4.75 | 5.00 | 5.00 | 5.00 | 5.00 | 4.75 | 5.00 | 4 | 6 | 8 | 2 |
| 429 | D | 6.50 | 5.50 | 5.25 | 5.50 | 5.75 | 5.25 | 5.50 | 6.25 | 5 | 20 | 1 | 1 |
| 430 | D | 6.75 | 5.50 | 6.00 | 5.00 | 5.75 | 6.25 | 5.75 | 5.50 | 5 | 10 | 6 | 2 |
| 431 | D | 4.25 | 5.25 | 4.00 | 5.00 | 4.25 | 4.50 | 4.50 | 5.25 | 5 | 20 | 5 | 1 |
| 432 | D | 5.25 | 5.25 | 5.00 | 5.00 | 4.25 | 4.50 | 5.75 | 6.00 | 8 | 7 | 5 | 2 |
| 501 | A | 3.25 | 5.75 | 3.25 | 4.75 | 3.50 | 3.50 | 3.75 | 6.25 | 3 | 12 | 10 | 2 |
| 502 | A | 5.75 | 4.00 | 4.25 | 4.00 | 5.50 | 4.50 | 3.50 | 4.50 | 2 | 6 | 5 | 2 |
| 503 | A | 8.50 | 5.75 | 6.00 | 4.25 | 7.75 | 5.50 | 5.00 | 6.25 | 7 | 6 | 4 | 2 |
| 504 | A | 6.00 | 5.25 | 4.75 | 4.25 | 4.75 | 4.25 | 5.25 | 6.00 | 4 | 2 | 3 | 2 |
| 505 | A | 6.75 | 5.00 | 3.00 | 4.75 | 6.00 | 5.00 | 5.50 | 3.00 | 4 | 10 | 4 | 2 |
| 506 | A | 6.00 | 4.75 | 4.25 | 3.75 | 6.00 | 4.50 | 3.50 | 4.75 | 4 | 7 | 5 | 2 |
| 507 | A | 7.25 | 4.25 | 3.00 | 3.25 | 4.00 | 4.50 | 4.75 | 4.50 | 4 | 3 | 4 | 1 |
| 508 | A | 7.00 | 8.00 | 6.50 | 6.50 | 7.25 | 7.75 | 7.00 | 6.00 | 7 | 11 | 6 | 2 |
| 509 | B | 5.75 | 7.00 | 3.75 | 5.25 | 4.50 | 5.25 | 6.25 | 5.75 | 7 | 2 | 3 | 1 |
| 510 | B | 7.25 | 7.00 | 3.75 | 3.75 | 6.00 | 6.00 | 3.50 | 6.25 | 8 | 6 | 3 | 1 |
| 511 | B | 7.50 | 6.50 | 4.00 | 4.50 | 5.50 | 5.50 | 3.50 | 8.00 | 5 | 3 | 5 | 1 |
| 512 | B | 6.50 | 6.00 | 5.25 | 5.00 | 5.50 | 6.25 | 5.50 | 5.50 | 5 | 3 | 5 | 1 |
| 513 | B | 6.25 | 5.50 | 4.75 | 3.25 | 4.75 | 5.00 | 5.25 | 4.75 | 6 | 3 | 5 | 1 |
| 514 | B | 7.50 | 7.00 | 4.75 | 6.00 | 6.75 | 5.00 | 7.50 | 6.00 | 5 | 7 | 5 | 2 |
| 515 | B | 7.25 | 5.75 | 4.25 | 3.25 | 4.75 | 5.50 | 5.00 | 5.25 | 5 | 8 | 7 | 1 |
| 516 | B | 5.75 | 8.50 | 4.00 | 4.00 | 4.50 | 5.25 | 5.25 | 7.25 | 8 | 3 | 4 | 1 |
| 517 | C | 4.75 | 3.25 | 4.25 | 4.50 | 3.75 | 4.75 | 4.00 | 4.25 | 7 | 1 | 5 | 1 |
| 518 | C | 6.25 | 6.75 | 3.00 | 4.75 | 5.00 | 6.25 | 5.25 | 4.25 | 5 | 1 | 6 | 1 |
| 519 | C | 7.25 | 6.00 | 3.75 | 4.50 | 6.75 | 6.00 | 4.00 | 4.75 | 4 | 1 | 2 | 1 |
| 520 | C | 6.50 | 6.00 | 5.00 | 5.00 | 4.00 | 6.25 | 5.50 | 6.75 | 8 | 9 | 7 | 2 |
| 521 | C | 8.50 | 5.50 | 6.25 | 3.75 | 3.75 | 7.75 | 6.75 | 5.75 | 4 | 4 | 2 | 2 |
| 522 | C | 5.25 | 5.00 | 4.50 | 3.50 | 4.50 | 4.75 | 4.75 | 4.25 | 3 | 1 | 2 | 2 |
| 523 | C | 5.25 | 5.25 | 4.75 | 4.25 | 5.25 | 5.00 | 5.25 | 4.00 | 3 | 12 | 0 | 2 |
| 524 | C | 5.75 | 4.00 | 5.75 | 6.50 | 3.00 | 6.75 | 6.25 | 6.00 | 3 | 9 | 3 | 2 |
| 525 | D | 8.00 | 6.75 | 3.75 | 3.00 | 6.25 | 4.25 | 6.00 | 5.00 | 3 | 9 | 5 | 2 |
| 526 | D | 5.00 | 4.00 | 3.75 | 4.75 | 4.50 | 4.50 | 2.75 | 5.75 | 5 | 5 | 1 | 1 |
| 527 | D | 4.50 | 5.00 | 5.25 | 6.00 | 6.75 | 6.50 | 3.50 | 4.00 | 7 | 3 | 4 | 2 |
| 528 | D | 6.25 | 9.50 | 6.50 | 4.75 | 5.25 | 9.25 | 7.50 | 5.00 | 8 | 12 | 4 | 1 |
| 529 | D | 6.75 | 6.00 | 4.75 | 4.50 | 7.00 | 5.75 | 5.00 | 4.25 | 5 | 12 | 0 | 1 |
| 530 | D | 6.75 | 6.25 | 5.00 | 4.00 | 6.25 | 5.25 | 5.25 | 5.25 | 6 | 8 | 4 | 1 |
| 531 | D | 6.25 | 3.25 | 3.25 | 2.00 | 3.25 | 5.00 | 2.25 | 4.25 | 4 | 6 | 1 | 2 |
| 532 | D | 7.00 | 7.00 | 4.00 | 4.25 | 5.50 | 5.75 | 6.25 | 4.75 | 7 | 3 | 3 | 1 |
| 601 | A | 7.25 | 6.75 | 7.00 | 4.00 | 6.75 | 7.00 | 5.25 | 6.00 | 9 | 1 | 0 | 1 |
| 602 | A | 4.25 | 5.25 | 5.50 | 6.50 | 5.75 | 2.50 | 5.25 | 8.00 | 7 | 1 | 3 | 1 |

| Ss | Order | M1 | M2 | M3 | M4 | H1 | H2 | H3 | H4 | Perc | Inst. | Priv | F/M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 603 | A | 6.50 | 3.25 | 4.50 | 3.25 | 5.00 | 6.75 | 3.25 | 2.50 | 5 | 5 | 1 | 1 |
| 604 | A | 5.25 | 4.75 | 1.75 | 4.75 | 4.50 | 5.25 | 4.00 | 2.75 | 4 | 2 | 0 | 1 |
| 605 | A | 7.25 | 8.25 | 6.75 | 5.00 | 8.50 | 7.50 | 5.50 | 5.75 | 6 | 6 | 3 | 2 |
| 606 | A | 3.50 | 5.00 | 6.25 | 7.25 | 6.00 | 3.50 | 4.75 | 7.75 | 8 | 5 | 0 | 2 |
| 607 | A | 3.75 | 5.00 | 4.50 | 3.75 | 4.50 | 5.25 | 3.25 | 4.00 | 4 | 1 | 0 | 1 |
| 608 | A | 6.25 | 7.00 | 4.75 | 3.50 | 6.50 | 4.75 | 5.00 | 5.25 | 8 | 1 | 0 | 1 |
| 609 | B | 3.75 | 5.25 | 4.75 | 1.25 | 5.75 | 2.75 | 3.00 | 3.50 | 4 | 6 | 0 | 1 |
| 610 | B | 5.75 | 6.00 | 4.75 | 5.00 | 7.25 | 5.25 | 4.25 | 4.75 | 2 | 6 | 2 | 2 |
| 611 | B | 6.75 | 6.00 | 4.25 | 4.00 | 6.25 | 5.25 | 4.50 | 5.00 | 3 | 9 | 0 | 2 |
| 612 | B | 7.75 | 4.50 | 4.25 | 5.00 | 7.00 | 5.50 | 5.00 | 4.00 | 8 | 9 | 3 | 2 |
| 613 | B | 6.75 | 4.50 | 4.50 | 4.50 | 5.50 | 4.75 | 5.75 | 4.25 | 4 | 6 | 0 | 2 |
| 614 | B | 7.00 | 6.50 | 4.75 | 4.25 | 6.50 | 4.25 | 5.75 | 6.00 | 4 | 8 | 1 | 2 |
| 615 | B | 5.75 | 6.50 | 3.75 | 2.50 | 6.25 | 5.50 | 4.00 | 2.75 | 2 | 8 | 0 | 1 |
| 616 | B | 4.25 | 5.25 | 6.25 | 4.00 | 4.50 | 4.00 | 6.25 | 5.00 | 9 | 6 | 0 | 2 |
| 617 | C | 7.25 | 7.00 | 3.75 | 5.75 | 6.00 | 6.75 | 4.75 | 6.25 | 1 | 1 | 0 | 1 |
| 618 | C | 5.25 | 4.25 | 3.50 | 2.25 | 5.00 | 3.50 | 3.75 | 3.00 | 4 | 1 | 5 | 1 |
| 619 | C | 7.75 | 5.25 | 4.25 | 6.25 | 6.25 | 5.75 | 5.25 | 6.25 | 6 | 1 | 0 | 1 |
| 620 | C | 4.75 | 4.50 | 2.00 | 4.00 | 4.25 | 4.75 | 3.50 | 2.75 | 4 | 1 | 1 | 1 |
| 621 | C | 6.50 | 6.50 | 2.75 | 2.00 | 4.50 | 6.00 | 4.25 | 3.00 | 4 | 1 | 0 | 1 |
| 622 | C | 5.25 | 5.25 | 4.50 | 3.50 | 4.00 | 5.00 | 4.75 | 4.75 | 5 | 6 | 1 | 1 |
| 623 | C | 6.25 | 5.00 | 5.25 | 4.50 | 5.25 | 6.25 | 5.50 | 4.00 | 5 | 11 | 6 | 2 |
| 624 | C | 4.75 | 5.75 | 2.50 | 4.25 | 7.00 | 4.00 | 4.50 | 1.75 | 3 | 1 | 0 | 1 |
| 625 | D | 5.25 | 3.75 | 3.75 | 2.25 | 3.75 | 3.75 | 4.00 | 3.50 | 3 | 7 | 0 | 2 |
| 626 | D | 8.50 | 4.25 | 5.75 | 4.50 | 7.00 | 5.00 | 5.50 | 5.50 | 5 | 3 | 0 | 2 |
| 627 | D | 5.50 | 5.25 | 3.75 | 3.25 | 4.75 | 4.75 | 4.25 | 4.00 | 7 | 3 | 1 | 1 |
| 628 | D | 5.50 | 6.50 | 3.75 | 7.25 | 5.75 | 6.75 | 5.50 | 5.00 | 8 | 3 | 0 | 1 |
| 629 | D | 5.50 | 4.75 | 3.00 | 3.00 | 5.50 | 3.00 | 4.00 | 3.75 | 4 | 3 | 3 | 1 |
| 630 | D | 6.00 | 5.25 | 5.25 | 5.00 | 5.25 | 6.25 | 5.00 | 5.00 | 5 | 3 | 6 | 1 |
| 631 | D | 4.75 | 3.00 | 4.50 | 3.75 | 3.25 | 3.75 | 5.00 | 4.00 | 2 | 3 | 0 | 1 |
| 632 | D | 6.25 | 5.25 | 3.50 | 2.00 | 5.00 | 3.75 | 6.00 | 2.25 | 3 | 3 | 0 | 1 |

KEY:
100-132 = University Music – Static
200-232 = University Music - CRDI
300-332 = University Jazz – Static
400-432 = University Jazz – CRDI
Perc = Self-perception of Focus of Attention
Inst. = Instrument
Priv. = Private Instruction (in years)
F/M = Gender (Female – 1; Male – 2)

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