CHAPTER 3

METHODOLOGY AND RESEARCH DESIGN

3.1 INTRODUCTION

This chapter presents information on the empirical study. This includes information regarding the research design, methodology and measuring instruments, participants, recordings, procedure, and data capturing and editing.

3.2 RESEARCH DESIGN

A two-group, mixed-method design was used, with both groups being experimental. Since this is an exploratory methodological study, it seemed best to use both qualitative and quantitative methods to obtain and analyse data. Because the participants' profiles differ, and since this study only involved a small group of formally and informally trained musicians, the research could not depend only upon statistically significant results. Furthermore, answering the research questions necessitated qualitative research methods, seeing that participants were allowed to provide free descriptions to their own experiences, and individual semi-structured interviews were conducted in order to collect data that could not be gathered through quantitative methods. By using both qualitative and quantitative methods the data can be studied from various perspectives.

3.3 BASIC OUTLINE OF METHODOLOGY AND MEASURING INSTRUMENTS

The methodology is summarised in Table 3.1. The table also shows where the measuring instruments were applied within the methodology.

Table 3.1 Methodology

<table>
<tr><th colspan="2">Methodology</th></tr>
<tr><td>Part I (Test Period 1)

Listening profiles

1. Demographic questionnaire
2. Listening test – Tomatis listening test
3. Personality test – NEO PI-R
4. (Question 1: Word sorting in Test Period 1-3)</td><td>Part II (Test Period 1, Test Period 2, Test Period 3)

Continuous measurement of self-reported emotional response to music, using Ponto Vista (computerised questionnaire)

Question 1: Word sorting (no musical track)

Question 2: With music track: word checklist, colours checklist and facial expressions checklist. Track 1: exercise track, Track 2-3: personal musical tracks, Track 4-7: prescribed music tracks

Question 3: Free description (in relation to the track just listened to)

Question 4: Rating scales (in relation to the track just listened to)</td></tr>
<tr><td colspan="2">Supplementary semi-structured interviews

1. Test Period 1, 2 and 3: Questions regarding the results of Part II
2. Only one Test Period: participants' involvement in music, performing, music education and training, musical experiences at school, recording background, emotional perceptions of own performances</td></tr>
</table>

The methodology consisted of two parts: listening profiles (Part I), and the continuous measurement of self-reported emotional response to music (Part II). Both parts were supported by supplementary semi-structured interviews. Each of these parts consisted of various tests and questionnaires – response formats based upon existing research. Data was obtained during three test periods. Test Period 1 consisted of Parts I and II together with interviews. Test Period 2 and Test Period 3 each consisted only of Part II with interviews.

Listening profiles (Part I) consisted of a demographic questionnaire, a listening test (Tomatis listening Test) and a personality test (NEO PI-R) that each participant had to complete. Part I was only conducted during Test Period 1.

The continuous measurement of self-reported emotional response to music (Part II) used a computerised questionnaire named 'Ponto Vista', consisting of various verbal and non-verbal tests and response formats to measure participants' emotional response to music. Ponto Vista was specifically designed for this study. There were four questions in Ponto Vista that participants had to complete. Question 1 consisted of word sorting. A list of 135 emotion words was provided and participants were instructed to sort these words into categories of words they think belong together. Important to note is that although Question 1 (word sorting) was part of the computerised questionnaire, it was actually also part of Part I, Listening Profiles. This question was completed without any musical tracks, which means that no continuous measurement was done since there was no music. It formed part of Ponto Vista for practical reasons, since the word checklist presented in Question 2 of Ponto Vista was derived from the results of Question 1. This is the only part of Listening Profiles that was conducted during all three Test Periods.

Question 2, during which musical tracks were played, consisted of a word checklist (using the categories sorted in Question 1 as a basis), a colours checklist and a facial expressions checklist, which participants used to indicate emotional responses to the specific musical track. Question 3 provided participants with an opportunity to describe their experience of the music they had just listened to in their own words by means of a free description. Question 4 consisted of rating scales, which participants used to rate the psychophysical parameters of pitch and volume levels, tempo, rhythmic and melodic complexity, as well as the appropriateness of a term to describe the musical track in question.

It is important to note that, although Questions 3 and 4 were not strictly speaking continuous measurement of self-report response of emotion, they were included in the discussions with Question 2. The reason for this is that Questions 2, 3 and 4 probed the same listening

experience. These two questions were part of the computerised questionnaire and were completed after the music had played.

Participants listened to seven musical tracks in total, the first track being only an exercise track to familiarise themselves with the various questions and procedures. Questions 2, 3 and 4 were completed for each track. This means that Questions 2-4 were actually answered seven times during each Test Period. Question 1 was completed only once during a questionnaire, since the results were left unchanged for the remainder of that specific Test Period.

The musical tracks can be divided into two categories, namely personal musical tracks and prescribed musical tracks. As mentioned before, the first track was only an exercise track participants used to familiarise themselves with Ponto Vista. Therefore, Track 1 was not taken into account when analysing data. Tracks 2 and 3 consisted of recordings of two pieces performed by the participants themselves. Each participant was allowed to select and record two pieces of his/her own choice. Recordings were made individually. Conditions for the selection of pieces were that the participants must have already been familiar with the pieces, and that those pieces must preferably portray different emotional contents as far as the participants were concerned. For Tracks 2 and 3 of Ponto Vista, each participant listened to his/her own recorded tracks, and not to the tracks recorded by other participants.

The prescribed musical tracks (Tracks 4-7) consisted of a Hindustani raga followed by three *alap* samples. The raga was Raga Kirwani as performed by Deepak Ram (bansuri) on his album *Samvad – Conversation* (Ram, 2004-2005). Other instrumentalists featuring on this track are Ustad Tari Khan (tabla) and Bhavani Siegal (tanpura). This raga is associated with the separation of lovers. Thus the emotion it is supposed to render can be described as sad (Sonarupa, s.a.). The pre-determined emotion of the raga was *not* revealed to the participants at the time of testing.

The three *alap* samples were performed by an unknown professional bansuri instrumentalist and were obtained for this study from Laura-Lee Balkwill and William Forde Thompson (Balkwill and Thompson, 1999:43-64). The *alap* samples were simply labelled as Hindustani samples 1, 2 and 3. All three *alap* samples were supposed to render the emotion of sadness. The pre-determined emotion of the *alap* samples was *not* revealed to the participants at the time of testing. The exercise pieces, Raga Kirwani and the three *alap* samples are provided on the compact disk included in this research report. All participants listened to the same prescribed tracks.

The semi-structured interview that supported Part I and II consisted of questions relating to participants' involvement in music, performing, music education and training, musical experiences at school, recording background, the emotional perceptions of own performances, and a discussion on the results from Part II of each of the three Test Periods.

3.4 PARTICIPANTS

The participants for this study were selected based on their involvement in music performance as well as their availability to be tested. For this study, two groups were defined: formally trained musicians and informally trained musicians. The formally trained group consisted of five pre-graduate B. Mus-students, who specialised or commenced to specialise in performing arts. The informally trained group consisted of five students who enrolled individually for different study programs excluding music, were playing in different church worship bands on a regular basis and were mostly self-taught on their instrument/s. All participants were enrolled at the North-West University, Potchefstroom Campus at the time of testing. Participants were recruited through electronic mail and individual conversations about the scope of the study. They were well informed of the expectations of the researcher regarding participation as well as the extent of their involvement in the various tests, questionnaires and interviews. It was clearly stated that their participation was completely voluntary and that any participant was free to withdraw at any moment. Signed consent forms were obtained as well as permission from parents in the case where a participant was still a minor. All information regarding the participants was treated as confidential and is therefore published under pseudonyms in this research report.

All participants originated from a South African, Western background and were Afrikaans speaking, except for Alex who was English speaking. Since one of the aims of this methodological study was to test the emotional response to music, aspects such as race, cultural background, age and gender were not considered vital. There was also no need for the groups to be identical or randomly selected since a control group was not used.

Presented in the table below (Table 3.2) are the participants for each group, their gender, their age at the time of testing, the instrument the participant played for this study, and the course for which they were enrolled at the time.

Table 3.2 Participants

Formally trained participants				
Pseudonym	**Gender**	**Age**	**Instrument played for this study**	**Course**
Alex	Male	18	Piano	B. Mus. III
James	Male	20	Bassoon, with piano accompaniment	B. Mus. III
JP	Male	21	Flute, with piano accompaniment	B. Mus. III
Mary-Jane	Female	21	Bassoon, with piano accompaniment	B. Mus. III
Susan	Female	22	Flute, with piano accompaniment	B. Mus. IV
Informally trained participants				
John	Male	24	Bass guitar, accompanied by Peter	M. Eng. (Mech.) II
Norman	Male	21	Voice and acoustic guitar	B. Eng. (Mech.) III
Peter	Male	23	Voice and acoustic guitar	M. Art. Et. II
Steve	Male	21	Voice and acoustic guitar	B. Com. III
William	Male	21	Voice and acoustic guitar	B. Eng. (Comp. and Electronic) III

Formal and informal contact with all participants was maintained throughout the study via mobile phone text messages, email and impromptu conversations. Upon completing their participation in this study, each participant received a thank-you gift to show appreciation for their involvement. Some of the participants expressed a desire to record musical pieces again and arrangements were made accordingly. These recordings were not used for this study; they were solely for the benefit of the participants.

3.5 RECORDINGS

Recordings were made on 25-26 March and 4-5 May 2009. Alex, James, JP, Mary-Jane, Norman, Susan and Steve were all recorded in the Pretorius studio of the School of Music and Conservatory of the North-West University (NWU) in Potchefstroom. John, Peter and William were recorded in one of the practice rooms of the conservatory because the Pretorius studio was not available at the time. The different recording venues in no way compromised the study, since different music was in any way recorded for each participant.

The musical pieces as performed by the participants were recorded by the researcher using self-obtained equipment such as a free digital audio editor, two microphones, a two-channel recording interface and a HP laptop. When a participant was accompanied, the accompaniment was recorded on the same audio channel as the participant's instrument, using one microphone for each instrument. This method of recording made editing of music unlikely because not all mistakes made either by the participant or the accompanist could be removed from a recording. Although various recordings of a single piece were recorded, the researcher edited the music as little as possible in order to preserve an authentic version of the piece that was true to the actual recording session. Mostly the raw, unedited version of a piece was used for Part II (Ponto Vista). For testing purposes the researcher added between 3-5 seconds of silence at the beginning and end of each recording. Thus, when played in Ponto Vista, the track starts with a few seconds of silence, followed by the actual music playing, another few seconds of silence, and then an approximately 15-second window of silence which presents the participant with a last opportunity to make selections from the various checklists. Please see the Addendum for all specifications on equipment.

3.6 PROCEDURE

This section of the research report presents summaries of information provided in Chapter 2. In Chapter 2 the studies, questionnaires and tests upon which the research design of this study was based are described and the motivation for including them in the research design is given. Information on these studies, questionnaires and tests are presented here to clarify their position and role in the research design.

3.6.1 Part I: Listening profiles

Part I was only conducted during Test Period 1 and was completed between 25 March and 20 May 2009.

3.6.1.1 Demographic Questionnaire

The demographic questionnaire served as a tool to establish an overall historical profile of the participants and was based upon a questionnaire used in a previous study (Steinberg, 2006:27, 67). Questions concerned a participant's name, age, gender, nationality, cultural background, maternal language, year of study and study program. Other questions regarding music education, musical preferences, health, and family relations to parents and siblings were added due to the nature of this study. The demographic questionnaire was given to each participant when the recordings were made. They were allowed to complete and submit it in their own time. Most of the participants submitted their completed questionnaire between 25 March and 19 May 2009. Please see the Addendum for the complete demographic questionnaire.

3.6.1.2 Listening test – Tomatis listening test

The Tomatis listening test is part of what is now simply known as the Tomatis Method. The Tomatis Method can be described as Audio-Psycho-Phonology, and is a sound stimulation program which includes audio-vocal activities supplemented by consultation. It is used to enhance listening skills, which in turn improves other skills such as control of speech and language, reading and writing, comprehension and perceptual processing, attention, concentration and memory. It also enhances psychological well-being, and has been shown to be effective in the reduction of stuttering, anxiety, depression and other pathological tendencies (Vercueil, 2010:41, 64, 65).

The listening test is an auditory perception test that combines information on hearing with the application of the need to listen. Listening strengths and weaknesses are revealed by comparing the air and bone conduction curves of the person who has been tested to the curves

of the ‘ideal good functioning ear’. This comparison therefore reveals impaired listening (Vercueil, 2010:58).

The Tomatis listening test was recommended by the Institute for Psychotherapy and Counselling, Potchefstroom. It was conducted by a speech therapist at the Institute, and evaluation reports were provided to the researcher by a clinical psychologist (with a D. Phil as highest qualification) of the Institute. Tomatis tests were completed between 28 April and 15 May 2009. Participants were instructed to make individual appointments with the speech therapist at a time that suited both.

3.6.1.3 Personality test – NEO PI-R

The NEO Personality Inventory Revised, also simply known as NEO PI-R, consists of simple sentences which describe specific behaviours or attitudes. The NEO PI-R measures the five major domains of a participant’s personality and contains six facet scales within each domain which assess more specific aspects of the domain. This presented the researcher with a comprehensive assessment of each participant’s normal adult personality (Piedmont, 1998:35). For this study, test form S, written in the first person and designed for self-reported response, was used. The personality test was completed between 19 May and 20 May 2009 under the supervision of an intern (B. Psych, M1: clinical psychology) of the Institute for Psychotherapy and Counselling, Potchefstroom, in one of the classrooms of the School of Music, NWU. Different time slots were provided for participants during which they could complete the NEO PI-R at a convenient time. The results were analysed and interpreted by the same clinical psychologist that wrote the evaluation reports for the Tomatis listening test. The NEO PI-R evaluation reports were submitted to the researcher. All tests proved valid. An example of a NEO PI-R may be viewed at the Institute; also see the Addendum for more detail on the domains and facet scales.

Important to note is that, although the results of the Tomatis listening test and NEO PI-R were analysed and interpreted by the same clinical psychologist, they were analysed *separately* from each other, and not interpreted as a whole.

3.6.2 Part II: Continuous measurement of self-reported emotional response to music

Part II was conducted over three Test Periods. For this part, Test Period 1 was completed 26-28 May 2009, Test Period 2 from 4-6 August 2009 and Test Period 3 was completed 6-9 October 2009.

Participants were instructed to arrange a suitable time with the researcher on any of the given dates of a Test Period in order to complete Part II. Participants were tested individually, and Part II was conducted with all participants in the same room at the School of Music and Conservatory, NWU. The same computer, headset, and mouse were used for Part II during all three Test Periods. The windows of the room were blacked out to ensure that lighting conditions were the same at all times. Participants were allowed complete control of the headset, both its position and its volume control. The volume control of the computer itself was set to maximum at all times. Please see the Addendum for all program, venue and equipment specifications. The questions and musical tracks were the same for each Test Period and were always presented to the participants in the same order.

To continuously measure the self-reported emotional responses to music in this empirical study, a questionnaire was developed based on several testing formats. This questionnaire was then computerised into a software program called Ponto Vista (please see Chapter 4 for a program description). The questionnaire consists of various formats which are most commonly used to continuously measure self-reported emotional responses to music, or just measure emotion, and can be described as either verbal or non-verbal (see Chapter 2 for more information). Verbal formats used for this empirical study were: the sorting of words, a word check list, free description of an experience in own words, and rating scales. Non-verbal formats used in this questionnaire were: a facial expressions checklist, and a colours checklist. The questions, instructions and formats of Ponto Vista are presented here in blocks, along with additional data to inform its description and to explain the procedure of testing.

3.6.2.1 Welcome note

After logging into Ponto Vista, the participant was welcomed by a note from the researcher. An overview of the questions is also provided (see each subsection).

Ponto Vista Welcome Note

Dear [participant's name]

Welcome to Ponto Vista! You will be part of the first group of people ever to use this program. Ponto Vista was initially developed to test and record the emotional content of listening experiences of music, with reference to self-performed music. The results from these listening experiences will be utilised for research purposes. However, our sincere hope is that these results will also provide *you* with some avenues of thought that might lead to an enrichment of your experience of, and education in, music.

The aim of this program is to provide *you, the performer,* with a tool for self-observation. We want to encourage you to use this program to your advantage; learn from it and apply it to your development as musician. You can use this tool as a way to explore and understand the dynamics involved when music is performed and perceived by the same person. We are convinced that performers must learn to become as objective as possible towards themselves in order to grow. This becomes possible when emotions, amongst other things, are not ignored or suppressed, but observed without judgment. A 'mirror', such as Ponto Vista, may allow you to see your own emotional world. Hopefully this exploration will contribute to the shaping of your performances. We believe that this tool can enable you, the performer, to help yourself to truly 'hear your own voice'.

Please relax, listen to the music and complete Ponto Vista at your leisure!

Kind regards,

Mari Louise Schutte (*née* Steinberg)

After reading the welcome note the participant advanced to Question 1, word sorting.

3.6.2.2 Question 1 – Sorting of emotion words

The instructions to participants were to organise the 135 emotion words of Shaver (Shaver *et al*, 1987:1067) according to their own individual prototypes and construct their own categories. During the listening experiences in Question 2, the participant then selected words from these individually constructed categories to describe emotional experiences. Question 1 was completed only once during a questionnaire, since the results were left unchanged for the

remainder of the questionnaire of that specific Test Period. It was also completed without music, and as mentioned before, actually also formed part of Part I, Listening Profiles. One of the purposes of Question 1 was to determine how a participant views his/her own emotional world and therefore formed part of Part I. This question was, however, included in Ponto Vista (Part II) for practical reasons. Participants were instructed to allow at least 45 minutes for completing this question. Presented below is Question 1, together with additional instructions, as well as a 'how-to' guide on using the program to be able to complete the task.

Ponto Vista Question 1

This question has to do with human emotions. Specifically, we want to find out which emotions you think are similar to each other ("go together") and which emotions seem different and therefore belong in different categories. You will be presented with a list of words, which contains the names of emotions. We would like you to sort these words into categories representing your best judgment about which emotions are similar to each other and which are different from each other. There is no right or wrong way to sort these words – make as few or as many categories as you wish, and put as few or as many words in each category as you see fit. Make sure that you are satisfied with your ordering and categorising before you continue, as you cannot go back to Question 1 once you have moved on.

Ponto Vista HELP

Rules

- You can make as few or as many categories as you want to.
- You can put as few or as many words in each category as you see fit.
- Each word can only belong to one category. All words must be sorted before you can continue.

How?

- There are two default columns: 'Not emotion' and 'Unknown'. Every word that you do not view as an emotion may be sorted into the 'Not emotion' category. Every word that you do not understand or know the meaning of may be sorted into 'Unknown' category.
- Double click on the word you want to select. Drag-and-drop it into the category of your choice OR click on the word you want to select, once, and then click on the + sign to add it to the category of your choice.
- If you want to remove a word from a category, double click on the word and then drag-and-drop it to the category of your choice OR click on the word once, click on the – sign and then click on the + sign of the category into which you want to put it.
- If you want to select a number of words simultaneously, you can press 'Ctrl' and then click once on the words you want to select.

- The words will automatically organise themselves alphabetically.
- To rename a category, click on the word that you wish to use as title for that category, and then click on the 'Untitled' heading.
- Another new category will automatically be created every time a word is put into a new column.
- To remove a category, you must move all the words from that category to another one.
- Empty categories will be removed automatically once the question has been completed.

Recommendations

Take your time with this question. Make sure that you are satisfied with your titles, ordering and categorising before you continue, as you cannot go back to Question 1 once you have moved on.

Figure 3.1 presents the words participants had to sort into their own categories in Question 1.

Figure 3.1: List of emotion words

Adoration	Bitterness	Displeasure	Fondness	Hope	Loathing	Rage	Surprise
Affection	Bliss	Distress	Fright	Hopelessness	Loneliness	Rapture	Sympathy
Aggravation	Caring	Dread	Frustration	Hostility	Longing	Regret	Tenderness
Agitation	Cheerfulness	Eagerness	Fury	Humiliation	Love	Rejection	Tenseness
Agony	Compassion	Ecstasy	Gaiety	Hurt	Lust	Relief	Terror
Alarm	Contempt	Elation	Gladness	Hysteria	Melancholy	Remorse	Thrill
Alienation	Contentment	Embarrassment	Glee	Infatuation	Misery	Resentment	Torment
Amazement	Defeat	Enjoyment	Gloom	Insecurity	Mortification	Revulsion	Triumph
Amusement	Dejection	Enthralment	Glumness	Insult	Neglect	Sadness	Uneasiness
Anger	Delight	Enthusiasm	Grief	Irritation	Nervousness	Satisfaction	Unhappiness
Anguish	Depression	Envy	Grouchiness	Isolation	Optimism	Scorn	Vengefulness
Annoyance	Desire	Euphoria	Grumpiness	Jealousy	Outrage	Sentimentality	Woe
Anxiety	Despair	Exasperation	Guilt	Jolliness	Panic	Shame	Worry
Apprehension	Disappointment	Excitement	Happiness	Joviality	Passion	Shock	Wrath
Arousal	Disgust	Exhilaration	Hate	Joy	Pity	Sorrow	Zeal
Attraction	Dislike	Fear	Homesickness	Jubilation	Pleasure	Spite	Zest
Astonishment	Dismay	Ferocity	Horror	Liking	Pride	Suffering	

Adapted from Shaver *et al*, 1987:1067. Words are presented in alphabetical order.

3.6.2.3 Question 2 - Checklists

Question 2 presented three checklists to the participant which may be used while listening to the musical tracks in order to portray his/her emotional experience of the music. These checklists were a word checklist, a colours checklist and a facial expressions checklist. Each participant listened to seven musical tracks in total, although the first track was only an exercise track used to familiarise them with the program's user interface. Presented below is Question 2, together with additional instructions, as well as a 'how-to' guide on using the program to be able to complete the task.

Ponto Vista Question 2-4

From Question 2 to Question 4, you will be listening to two recordings of your own performances, as well as four tracks of unknown music. You will, however, be permitted to acquaint yourself with the program first. Results from the exercise track (track nr 1) will not be taken into consideration. You will answer Questions 2 - 4 for each track you listen to.

Ponto Vista Checklist (Question 2)

Question 2 consists of a checklist of words, facial expressions and a range of colours. As you will notice, the categories that you constructed in Question 1 will now be used in Question 2 to provide you with your own unique list of words. Choose the words, faces and colours from the checklist that best describes YOUR emotional response to the track to which you are listening. There is no limit to the number of words, faces and/or colours that you can choose. You may also choose a word/face/colour more than once. There is no right or wrong way to use the checklist. You can only use the checklist for as long as the music is playing, so please be attentive to your emotions and respond quickly.

Ponto Vista HELP

Instructions

The loading window is a visual prompt to prepare you for the musical track which is about to play. Please take note of the duration of the track.

Rules

- Words, faces and colours may be chosen in any order or combination.
- Once the music has stopped, you have 15 seconds to make your last selections.
- You cannot return to a track once you have continued.

How?

- Double click on the face/colour that you want to select.

- It will automatically drop to a column at the bottom of the screen.
- If you want to select a word, click on the title of the category to which the word belongs. A drop-down menu with the words in that category will appear. Click on the word of your choice. Do not worry if you cannot remember into which category you've sorted a word. Just click on another title until you find the word you are looking for.
- Choose carefully! Once you have chosen a word/colour/face it cannot be removed from the column at the bottom of the screen.

Presented here (Table 3.3) are the tracks each participant listened to during Question 2. The tracks were presented in exactly the same order and were the same tracks for each Test Period. The length of each track referred to here is given in minutes and seconds and includes the few seconds of silence *before and after* the audible music *as well as* the fifteen seconds of silence at the end of each track which allowed the participant a last opportunity to make selections from the various checklists (see Chapter 4).

Table 3.3 Musical tracks

Track 1: Exercise piece (not included in the analyses)			
Formally trained participants			
Musical Piece	**Composer**	**Performer**	**Length**
Symphony nr.5, first movement	Ludwig van Beethoven (Various, 1996)	Orchestra	7:32
Informally trained participants			
Indescribable	Chris Tomlin (Tomlin, 2004)	Chris Tomlin and band	4:15

Participant	**Track nr.**	**Musical piece**	**Composer**	**Length**
Alex	2	Sonata in b minor, nr 33.	D. Scarlatti	3:17
	3	Devotion, Liebeslied	R. Schumann	4:13
James	2	Romance, opus 62	E. Elgar	6:33
	3	Sonata in B-flat major, Rondo	W.A. Mozart	3:31
JP	2	Sonata, Andante tranquillo and Molto vivace	C. Reinecke	4:03
	3	Joueurs de Flute, Mr. de la	A. Roussel	1:56

		Pejaudie, op.27, nr. 4		
Mary-Jane	2	Sonata in C major for bassoon	Devienne	4:36
	3	Sonata in e minor for bassoon	G.P. Telemann	3:32
Susan	2	La flute de pan, op.45, first movement	J. Mouquet	4:49
	3	Concerto nr.1 in G maj, second movement	W.A. Mozart	9:01
John	2	Atlantis	Koos Kombuis	3:38
	3	Psalm	Peter	4:42
Norman	2	Nothing without You	Bebo Norman	4:00
	3	Plastic Jesus medley	Jack Johnson	4:47
Peter	2	Jimmy	Own composition	4:49
	3	A world you can't imagine	Own composition	3:35
Steve	2	Romanza (d'Amour) – Spanish guitar solo	Anonymous/ Traditional	4:25
	3	Wild World	Cat Stevens	4:02
William	2	Love song	Own composition	3:05
	3	Majesty	Own composition	4:06

All participants				
Track nr.	**Musical Piece**	**Performer**	**Instrument**	**Length**
4	Raga Kirwani (Ram, 2004-2005)	Deepak Ram, Ustad Tari Khan, Bhavani Siegal	Bansuri, tabla, tanpura	17:27
5	Hindustani sample 1	Unknown	Bansuri	0:41
6	Hindustani sample 2	Unknown	Bansuri	0:42
7	Hindustani sample 3	Unknown	Bansuri	0:41

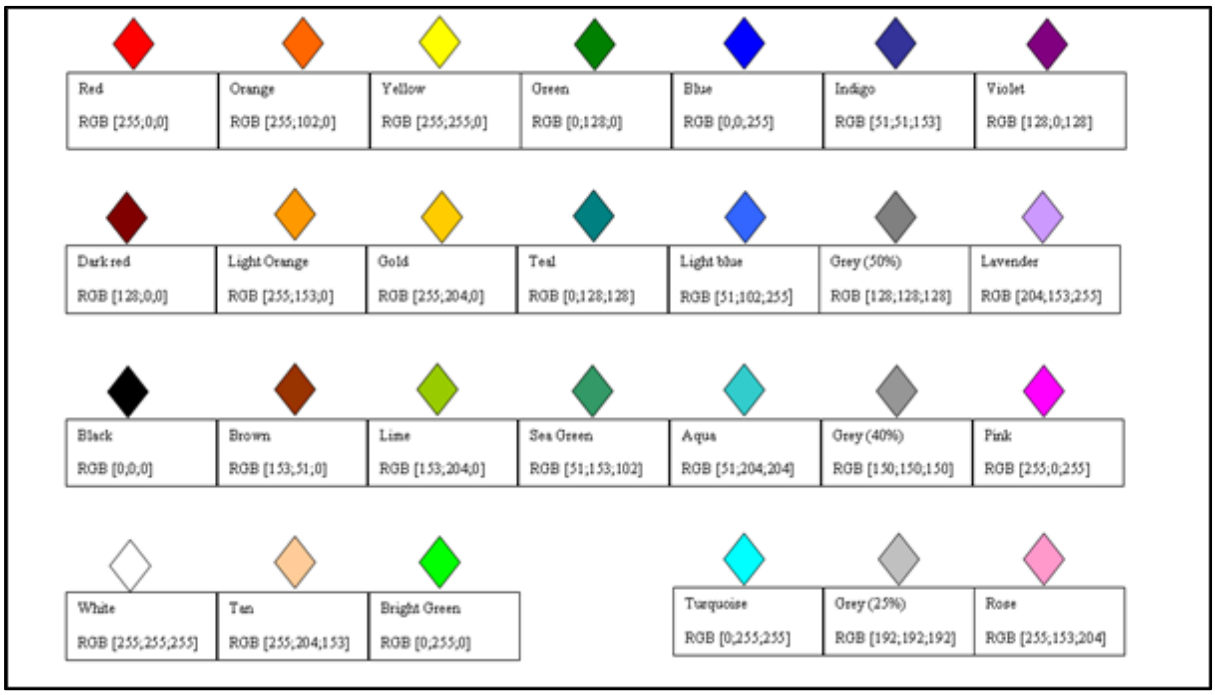
3.6.2.3.1 Emotion word checklist

As stated earlier, the word checklist presented in Question 2 was derived from the participant's sorting and categorising of the 135 words in Question 1.

3.6.2.3.2 Colours checklist

The colours checklist consists of 27 colours and was presented to the participant *without* colour names or RGB-values. The checklist consists of the seven basic colours of the rainbow, together with some additional colours, like black, brown, and white. Shades (e.g. dark red) and mixtures of certain colours (e.g. white and black that produces grey) were added to broaden the participants' scope of choice. The colours, their shades and mixtures were derived from the RGB colour space, which is most commonly used on computer monitors. Presented here (Figure 3.2) is the colours checklist, together with names and RGB-values.

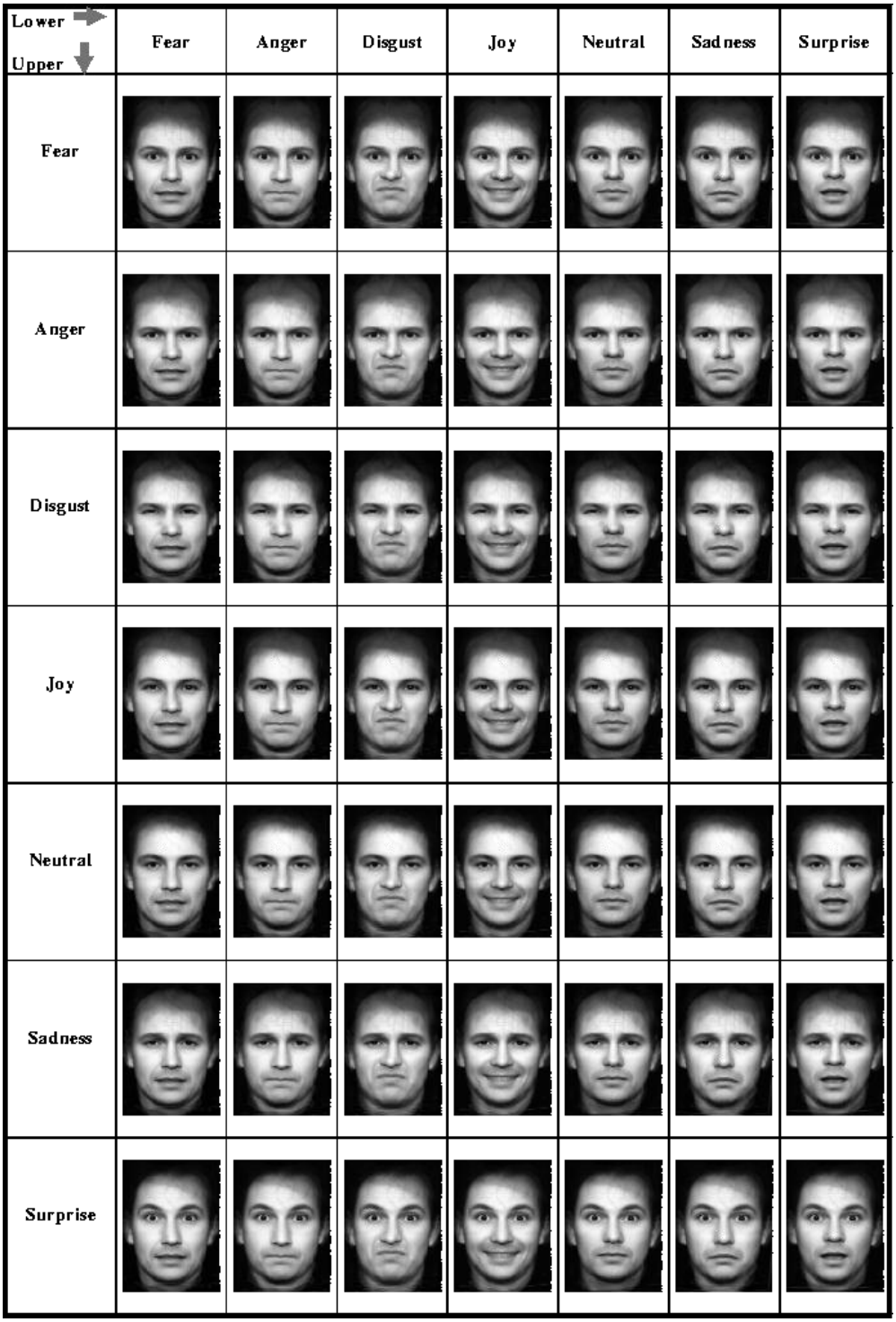
Figure 3.2: Colours checklist



3.6.2.3.3 Facial expressions checklist

The facial expressions checklist was derived from Vanger's 49 facial expressions (Vanger *et al*, 1998:35) and was also presented *without* any indication as to which emotion is being expressed by the combination of the upper and lower parts of the digitalised image. Presented here (Figure 3.3) are all the facial expressions together with a description of their intended emotional expressions.

Figure 3.3: Facial expressions



(Vanger *et al*, 1998:35)

As mentioned before, the program allowed an additional fifteen second window after the musical track has played for the participant to make any last selections from the three

checklists. After the fifteen seconds, the program automatically moved on to Question 3, during which the participant was presented with the opportunity to provide a description of the emotional experiences of the track in question in his/her own words.

3.6.2.4 Question 3 – Free description

Presented below is Question 3, together with additional instructions, as well as a 'how-to' guide on using the program to be able to complete the task. The participant was allowed to use as much time as needed.

Ponto Vista Free description (Question 3)

Question 3 will provide you with the opportunity to describe your personal, emotional experience of the music in your own words. You can type as much or as little as you like, in your own time. It is important that you understand that it must be your personal response, and NOT what you think the researcher expects of you.

Ponto Vista HELP

How?

Click anywhere in the text box provided in order to start typing.

After completing Question 3, the program allowed the participant to move on to Question 4.

3.6.2.5 Question 4 – Rating scales

The fourth question presented to the participant, before moving on to the next musical track, concerned the measurement of various psychophysical parameters of the track in question. As has been mentioned, Questions 4a-4e and the concept for Question 4f were adapted from Balkwill and Thompson's study (Balkwill and Thompson, 1999:48, 51). Presented below is Question 4, together with additional instructions, as well as a 'how-to' guide on using the program to be able to complete the task. The participant was allowed to use as much time as needed.

Ponto Vista Rating scales (Question 4)

This question consists of rating scales. You can choose a number between 1 and 5 for each scale. For Questions 4a-e you may use a number more than once. Please note that for Question 4f you must order the six provided terms according to their appropriateness to the music. Here you may only use a number once.

a. How would you describe the overall *pitch* level of the track?

1 = very low, 2 = low, 3 = average pitch level, 4 = high, 5 = very high

Answer:_____

b. How would you describe the overall *dynamic* level of the track?

1 = very soft, 2 = soft, 3 = moderate dynamic level, 4 = loud, 5 = very loud

Answer:_____

c. What is the tempo of the track?

1 = extremely slow, 2 = slow, 3 = moderate tempo, 4 = fast, 5 = whirlwind speed

Answer: _____

d. How would you describe the *rhythmic complexity* of the track?

1 = very easy

2 = A bit more complex, but still easy

3 = requires an intermediate level of skills

4 = requires a high level of skills

5 = impossible to play

Answer: _____

e. How would you describe the *melody* of the track?

1 = very easy

2 = A bit more complex, but still easy

3 = requires an intermediate level of skills

4 = requires a high level of skills

5 = impossible to play

Answer: _____

f. Please rate the following words as being *least appropriate* or *most appropriate* to describe the track you listened to, with 1 as *least appropriate* and 6 as *most appropriate*. Do not use the same number for more than one word.

a. Love ___ b. Joy ___ c. Surprise ___ d. Anger ___ e. Sadness ___ f. Fear ___

Ponto Vista HELP

How?

- A red background indicates that the particular question has not yet been answered.
- Click just above the number (1 – 5) of the scale you want to move.
- Once you have moved the scale to the number of your choice, the red background will disappear.
- For Question 4f the red background will remain until you have chosen all the numbers, each one only once.

Recommendations

Take your time with this question, especially Question 4f.

After completing all questions for a musical track, the participant progressed to the next track, where Questions 2, 3 and 4 were then completed again for the track in question.

Ponto Vista note:

After you have completed the questions for a track, you will automatically progress to the next track, and start the whole process again. *If you are uncertain of anything, please use the 'help' function provided for each question to view the instructions, or ask the facilitator to assist you.*

After the participant had completed Question 4 for the last track (Track 7), the program advanced to a thank you note from the researcher and the participant could log out of the program to end the questionnaire.

The time it took for each participant to complete this questionnaire depended on the amount of time they spent on each question. In general, participants were instructed to allow 2 hours to complete the entire questionnaire.

3.6.3 Semi-structured interview

The supplementary semi-structured interviews were mostly determined by each participant's responses during each Test Period. Test Period 1 interviews were conducted from 9-11 June 2009. Test Period 2 interviews were conducted from 11-13 August 2009. Test Period 3 interviews were conducted from 13-15 October 2009. Participants were instructed to arrange a suitable time with the researcher on any of the given dates of a Test Period in order to be interviewed. Participants were interviewed individually, and all interviews were conducted in the same room at the School of Music and Conservatory, NWU. Interviews were conducted in the maternal language of the participant and recorded using the same equipment used for recording their musical pieces.

The interviews also consisted of questions based on the work of Lucy Green (Green, 2002). At least twelve of these questions concerned participants' involvement in music, performing, music education and training, musical experiences at school, recording background, and their emotional perceptions of their own performances. The remainder of the questions concerned the results of the computer program, Ponto Vista (Part II). The results of Part II of each of the three Test Periods were discussed individually to clarify participants' answers and inquire into the manner in which he/she has completed that particular questionnaire. Presented here are the questions derived from Lucy Green's work, as well as some additional general questions that the participants had to answer.

1*Describe to me your involvement in music, basically your musical career since you've started, not *when* you started *learning* as a child, but since you've started performing, playing with bands/orchestras and doing

professional or semi-professional work.

2*Tell me about the kind of music that you play, the kind of band/orchestra you're in (if any), and the kind of venues that you perform at.

3*Think further back and tell me how you first got into performing, from your earliest memories.

4*(This question is specifically for the informally trained musicians.) Could you tell me how you learned to play your instrument? How did you start in the first place, and how did you keep yourself going?

5*Can you remember what you did in your music lessons in the classroom at secondary school?

6*Can you remember anything about the individual music lessons you had in school?

7a*Would you describe the way that you have learnt to be a performer up until today as having involved a process of disciplined or systematic study?

7b*Would you describe your process of learning the instrument and the musical knowledge that goes with it as a process of disciplined study?

8a*What do you most admire in another musician?

8b*What qualities do you value most in another musician?

* Adapted with permission from personal communication with Prof. Lucy Green.

(Green, 2008).

Additional, general questions

9. For the informal musicians who wrote their own songs: what is the story behind these songs and what do they mean to you? What do the words mean to you? For the formally trained musicians: why did you choose the two pieces that were recorded and what do they mean to you?

10a. How did you feel about your own *performance* when you heard it through the ear phones when you completed Ponto Vista a week ago? b. How did you feel about the *music* when you completed Ponto Vista a week ago?

11. What was your experience of the Hindustani music and samples?

12. How did you experience the program? Was it too long, too easy, or confusing, maybe...?

13. How do you experience your own performances in general? (Think in terms of your technical abilities and

the ability to arouse emotional reactions in listeners.)

Please note that the individual questions concerning each participant's Ponto Vista-sessions are not presented here.

3.7 DATA CAPTURING AND EDITING

Results were not revealed to the participants during their involvement in this study since the immediate disclosure thereof would have influenced subsequent Test Periods. Participants contributed individually for all tests, questionnaires and interviews. All questions and musical tracks for Part II were presented in the same order for all three Test Periods.

3.7.1 Part I

The demographic questionnaire was completed by the participants themselves. The evaluation reports of the Tomatis listening test and NEO PI-R were written by a clinical psychologist and submitted to the researcher. Important to note is that, although the results of the Tomatis listening test and NEO PI-R were analysed and interpreted by the same clinical psychologist, it was done so *separately* from each other, and not as a whole, as already mentioned before. The evaluation reports are not included in this research report due to their confidentiality. Only relevant data are made known under pseudonyms to protect the participants' privacy.

3.7.2 Part II

The Ponto Vista program was designed in such a way that it automatically captures the participant's input in terms of selection, moves, and changes, as well as the time period in which each question was completed. At the end of a session the program creates a report file in HTML-format in the folder where the Ponto Vista files are located. This provides the researcher with a consistent format for processing data (see Chapter 4 for more detail and illustrations of the HTML report). Seeing that the HTML documents generated by Ponto

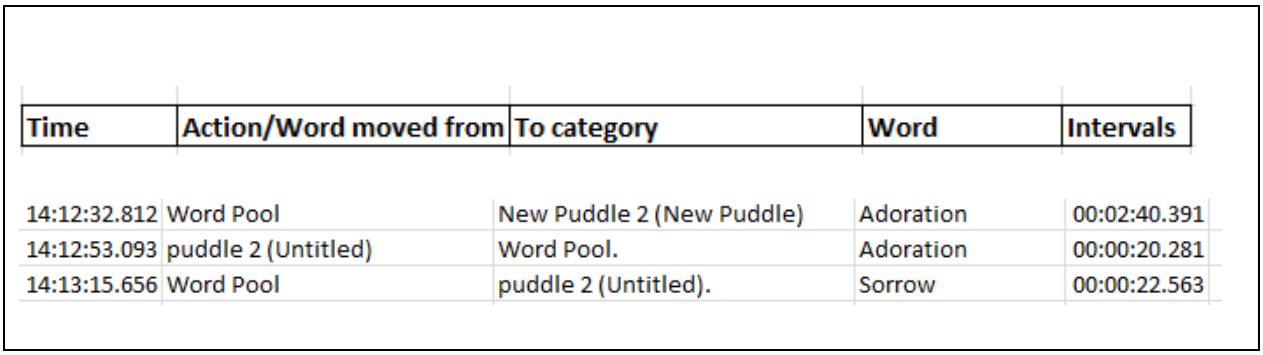
Vista could not be modified, all results were manually transferred into Excel spreadsheets to prepare it for analysis. The data was transferred into several Excel spreadsheets in accordance to the requirements of each of the four questions of Ponto Vista. The results were reworked in the same manner for each Test Period. The Excel spreadsheets are not included in this research report due to a lack of space. However, screen shots are provided to support each description.

3.7.2.1 Question 1

The data for Question 1 was divided into two spreadsheets: Word Sorting and Word Categories. The Word Sorting sheet helped to determine how the participant constructed his/her own unique categories in terms of how many times a word was moved between the Word Pool and a category or directly between categories, which word as well as how many times a word was chosen as a title to a category, any changes the participant would make to a category, which words were sorted together, and the average and total time it took the participant to complete the question. An additional spreadsheet was created to summarise the findings, called Word Sorting Summary.

The Word Sorting spreadsheet consists of 5 tables (Figure 3.4). The first table shows the exact time an action had taken place, e.g. 14:12:32.821, displayed in real-time hour, minute, seconds and milliseconds, often called a time stamp. The second table shows the point of origin of the action, e.g. the Word Pool. The third table displays the destination of the action, e.g. puddle 2. The fourth table displays the word that was part of the action, e.g. Adoration. The last table shows the time interval between two actions, e.g. 00:00:20.281.

Figure 3.4: An example of a Word Sorting sheet



Time	Action/Word moved from	To category	Word	Intervals
14:12:32.812	Word Pool	New Puddle 2 (New Puddle)	Adoration	00:02:40.391
14:12:53.093	puddle 2 (Untitled)	Word Pool.	Adoration	00:00:20.281
14:13:15.656	Word Pool	puddle 2 (Untitled).	Sorrow	00:00:22.563

Time intervals between actions were calculated as follows:

Latter time stamp – Former time stamp = Time interval between 2 actions.

To calculate the total time the participant used to complete the question:

Time completed – Time started = Total time.

Average time refers to the average time spent completing an action, and is calculated using the Excel formula [=AVERAGE(range)].

The additional spreadsheet, Word Sorting Summary (Figure 3.5), used the Word Sorting sheet as source to construct the summary. Excel formulas were used to calculate the variables. For these formulas to work, the word as well as the origin and destination of an action must all be in the same row of the Word Sorting sheet.

To determine how many times a word was moved from the Word Pool to a category, the following formula was used:

=COUNTIFS(Words_TP1,(range),From_TP1,"*Word Pool*",To_TP1,"*puddle*").

(TP: Test Period. Puddle: a category.)

To calculate how many times a word was moved from a category back to the Word Pool:

=COUNTIFS(Words_TP1,(range),From_TP1,"*puddle*",To_TP1,"*word pool*").

To calculate how many times a word was moved directly between categories:

=COUNTIFS(Words_TP1,(range),From_TP1,"*puddle*",To_TP1,"*puddle*").

To calculate how many times a word was set as a title to a category:

=COUNTIFS(Words_TP1,(range),From_TP1,"*title of*")

An additional column was added to show which words were used as titles in the final version of the constructed categories. The total to each action was calculated using the Excel summation formula [=SUM(range)].

Figure 3.5: An example of a Word Sorting Summary sheet

Susan	From Word pool to a category			From a category back to Word pool			Directly between categories			Set as title			Use of word in final categories		
Emotion word	**TP 1**	**TP 2**	**TP 3**	**TP 1**	**TP 2**	**TP 3**	**TP 1**	**TP 2**	**TP 3**	**TP 1**	**TP 2**	**TP 3**	**TP 1**	**TP 2**	**TP 3**
Adoration	2	1	1	1	0	0	0	0	0	0	1	0		Title	
Affection	1	1	1	0	0	0	0	0	0	0	0	0			
Total	141	137	140	6	2	5	0	0	0	28	16	13			

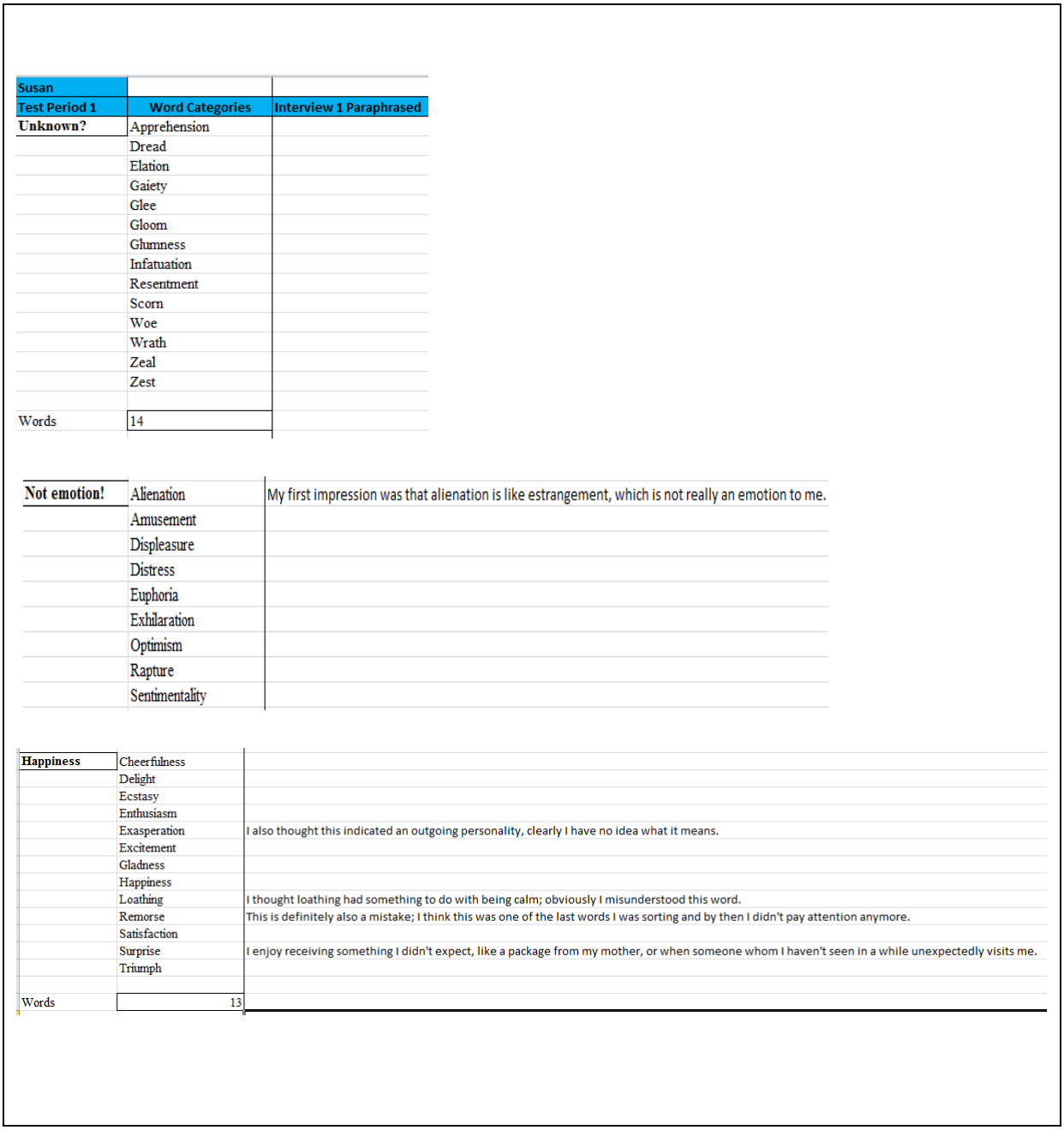
To determine how many times a participant created a new category himself (Figure 3.6), the following formula was used: =COUNTIFS(To_TP1,"*new puddle*"). To determine how many times a participant deleted a category by himself, the following formula was used: =COUNTIFS(From_TP1,"*deleted*").

Figure 3.6: Creating and deleting categories

	TP 1	TP 2	TP 3
Created new category	23	15	11
Deleted category	0	0	1

The Word Categories spreadsheet (Figure 3.7) contains all the categories a participant constructed during a Test Period, including the 'not emotion' and 'unknown' categories, together with selected parts from the interviews which informed about the participant's manner of sorting. It is also from this sheet that the 'Misunderstood' category was constructed.

Figure 3.7: An example of a Word Categories sheet



Susan		
Test Period 1	Word Categories	Interview 1 Paraphrased
Unknown?	Apprehension	
	Dread	
	Elation	
	Gaiety	
	Glee	
	Gloom	
	Glumness	
	Infatuation	
	Resentment	
	Scorn	
	Woe	
	Wrath	
	Zeal	
	Zest	
Words	14	

Not emotion!	Alienation	My first impression was that alienation is like estrangement, which is not really an emotion to me.
	Amusement	
	Displeasure	
	Distress	
	Euphoria	
	Exhilaration	
	Optimism	
	Rapture	
	Sentimentality	

Happiness	Cheerfulness	
	Delight	
	Ecstasy	
	Enthusiasm	
	Exasperation	I also thought this indicated an outgoing personality, clearly I have no idea what it means.
	Excitement	
	Gladness	
	Happiness	
	Loathing	I thought loathing had something to do with being calm; obviously I misunderstood this word.
	Remorse	This is definitely also a mistake; I think this was one of the last words I was sorting and by then I didn't pay attention anymore.
	Satisfaction	
	Surprise	I enjoy receiving something I didn't expect, like a package from my mother, or when someone whom I haven't seen in a while unexpectedly visits me.
	Triumph	
Words	13	

An additional spreadsheet, called Categories vs. Shaver, was developed using the Word Categories sheet as source. The purpose of this sheet was to compare the participants' constructed categories to the categories from Shaver's study on which this question is based. It is used to determine how similar or how different participants' categories are from that of Shaver's. The table below (Table 3.4) shows the Shaver categories, with an alphabet letter assigned to each category for identification purposes. The number next to the letter indicates the number of words in that category (also see Chapter 5).

Table 3.4: Shaver categories

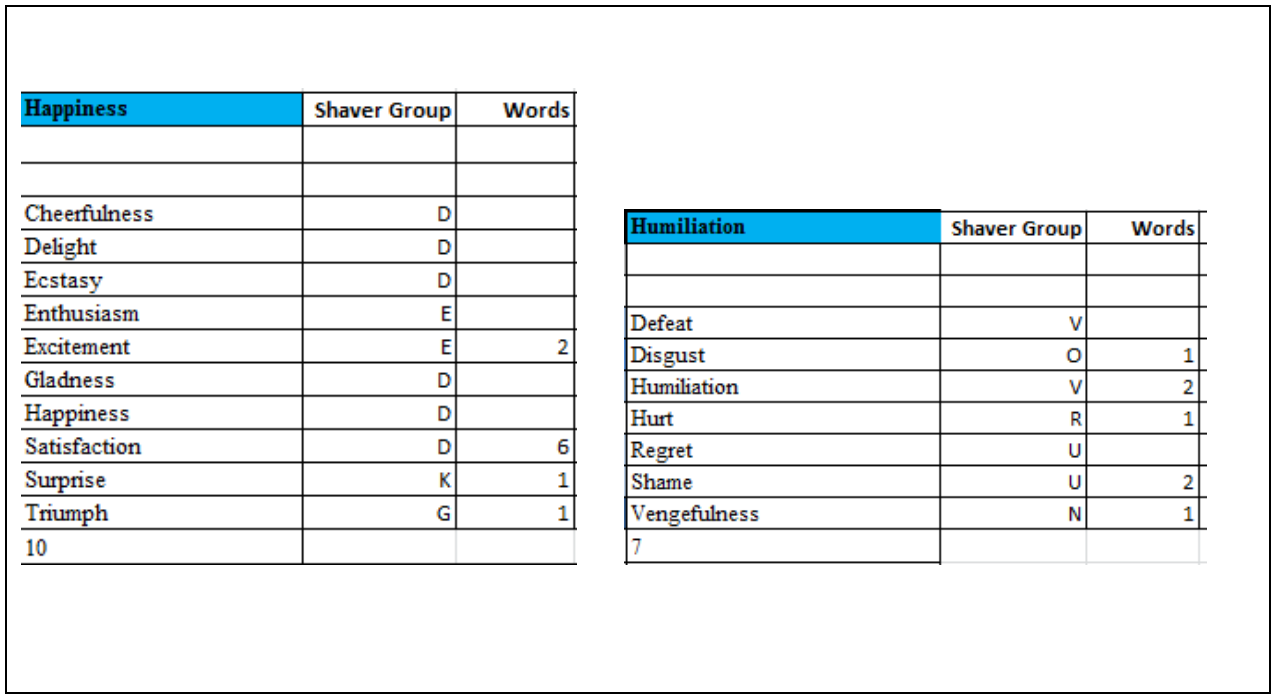
Positive words: 52 (38.518%), 11 categories					
Group A (10)	**Group B (5)**	**Group C (1)**	**Group D (17)**	**Group E (6)**	**Group F (2)**
Adoration	Arousal	Longing	Amusement	Enthusiasm	Contentment
Affection	Desire		Bliss	Zeal	Pleasure
Love	Lust		Cheerfulness	Zest	
Fondness	Passion		Gaiety	Excitement	
Liking	Infatuation		Glee	Thrill	
Attraction			Jolliness	Exhilaration	
Caring			Joviality		
Tenderness			Joy		
Compassion			Delight		
Sentimentality			Enjoyment		
			Gladness		
			Happiness		
			Jubilation		
			Elation		
			Satisfaction		
			Ecstasy		
			Euphoria		
Group G (2)	**Group H (3)**	**Group I (2)**	**Group J (1)**	**Group K (3)**	
Pride	Eagerness	Enthralment	Relief	Amazement	
Triumph	Hope	Rapture		Surprise	
	Optimism			Astonishment	

Negative words: 83 (61,481%), 14 categories				
Group L (6)	**Group M (2)**	**Group N (15)**	**Group O (3)**	**Group P (2)**
Aggravation	Exasperation	Anger	Disgust	Envy
Irritation	Frustration	Rage	Revulsion	Jealousy

Agitation Annoyance Grouchiness Grumpiness		Outrage Fury Wrath Hostility Ferocity Bitterness Hate Loathing Scorn Spite Vengefulness Dislike Resentment	Contempt	
Group Q (1)	**Group R (4)**	**Group S (12)**	**Group T (3)**	**Group U (4)**
Torment	Agony Suffering Hurt Anguish	Depression Despair Hopelessness Gloom Glumness Sadness Unhappiness Grief Sorrow Woe Misery Melancholy	Dismay Disappointment Displeasure	Guilt Shame Regret Remorse
Group V (12)	**Group W (2)**	**Group X (9)**	**Group Y (8)**	
Alienation Isolation Neglect Loneliness Rejection Homesickness Defeat Dejection Insecurity Embarrassment Humiliation Insult	Pity Sympathy	Alarm Shock Fear Fright Horror Terror Panic Hysteria Mortification	Anxiety Nervousness Tenseness Uneasiness Apprehension Worry Distress Dread	

Each word in a category was traced back to the Shaver category from which it originates and was assigned the same alphabet letter as its Shaver category. This helped to determine how a participant constructed his/her own categories. Words were also counted to establish how many words were used from a specific Shaver category to construct a unique category (see Figure 3.8).

Figure 3.8: Comparing a participant's categories to Shaver's categories



Happiness	Shaver Group	Words
Cheerfulness	D	
Delight	D	
Ecstasy	D	
Enthusiasm	E	
Excitement	E	2
Gladness	D	
Happiness	D	
Satisfaction	D	6
Surprise	K	1
Triumph	G	1
10		

Humiliation	Shaver Group	Words
Defeat	V	
Disgust	O	1
Humiliation	V	2
Hurt	R	1
Regret	U	
Shame	U	2
Vengefulness	N	1
7		

3.7.2.2 Question 2

Since Questions 2, 3 and 4 were completed for all musical tracks the data for each track was reworked in Excel in the same way.

The word checklist consists of seven columns (Figure 3.9). The first column consists of the words. The second, fourth and sixth column indicate the number of times a word was selected for a specific track during a Test Period. The third, fifth and seventh column indicate from which uniquely constructed category the word was selected during a track. Note that a participant might have selected the same word for a track in multiple Test Periods, but the

word did not necessarily belong to the same category in all three Test Periods. Any illnesses the participant experienced during any of the Test Periods were also indicated above the data.

Figure 3.9: An example of a participant's word checklist results

Q2-General Checklists			Middle ear infection TP 2			
Emotion words	TP 1	from category	TP 2	from category	TP 3	from category
Depression					1	Depression
Desire						
Despair						
Disappointment						
Disgust	1	Hysteria	1	Hate		
Dislike					1	Dislike
Dismay						

The colours checklist (Figure 3.10) consists of 4 columns simply showing the name and RGB value of each colour, with the number of times a colour was selected for a track during each Test Period.

Figure 3.10: An example of a participant's colours checklist results

		Middle ear infection TP 2	
Colour	TP 1	TP 2	TP 3
Rainbow colours			
Red RGB [255;0;0]	1		
Orange RGB [255;102;0]	1		
Yellow RGB [255;255;0]		1	2
Green RGB [0;128;0]			2
Blue RGB [0;0;255]			
Indigo RGB [51;51;153]			
Violet RGB [128;0;128]			
Shades			
Dark red RGB [128;0;0]			2
Light Orange RGB [255;153;0]			2
Gold RGB [255;204;0]			

The facial expressions checklist (Figure 3.11) also consists of 4 columns, showing the facial expression with its upper and lower related emotion, together with the number of times an expression was selected for a track during a Test Period.

Figure 3.11: An example of a participant's facial expressions checklist results

Facial Expression	TP 1	TP 2	TP 3
 U: Joy L: Disgust			1
 U: Joy L: Joy			
 U: Joy L: Neutral	1		
 U: Joy L: Sadness			
 U: Joy L: Surprise			
 U: Neutral L: Fear			
 U: Neutral L: Anger	1		
 U: Neutral L: Disgust		1	

A summary was made (Figure 3.12) to indicate the total time that was available to the participant to complete the checklists for a track (End time – Start time = Total time), as well as the total number of words, colours and facial expressions that were selected during the experience of the track.

Figure 3.12: An example of a summary

Track 2 – Sonata in C maj by Devienne			
Bassoon with piano accompaniment	headache		
	TP 1	TP 2	TP 3
Total time	00:04:36.141	00:04:36.203	00:04:36.156
Emotion words	11	10	1
Colours	13	17	32
Facial expressions	0	9	11
Total	24	36	44

3.7.2.3 Question 3

The columns made for this question (Figure 3.13) show the amount of time the participants spent to complete the question (End time – Start time = Total time), as well as the free description the participant provided to describe the experience of a track in his/her own words. The researcher added the parts from the interviews that related to the specific Test Period and track.

Figure 3.13: An example of free description results

Q3: Free description	TP 1	TP 2	TP 3
Time	00:00:57.953	00:00:37.531	00:00:13.984

	Free description	Paraphrased interview
TP 1	At the beginning a feeling of lightness and tenderness was felt but after a while dislike and disappointment because of certain mistakes.	I thought my performance was okay; it was a bit too slow and a bit heavier than I thought. I didn't think that I played so heavily. It really wasn't good at all.
headache		It is an early Classic rondo, with a very light and tender theme. There aren't many contrasts in the piece; everything is on the same level - light and tender.

3.7.2.4 Question 4

The columns for this question (Figure 3.14) show the rating scale, and the ratings the participant selected for a track during each Test Period, along with the amount of time the participant spent to complete the question for that track.

Figure 3.14: An example of rating scales results

Question 4a-e	Test Period 1	Test Period 2	Test Period 3
Scale	Rating		
Pitch level	3	3	4
Dynamic level	3	3	3
Tempo	3	3	3
Rhythmic complexity	2	1	2
Melodic complexity	2	2	3

Question 4f	Test Period 1	Test Period 2	Test Period 3
Adjective	Appropriateness		
Love	4	3	5
Joy	6	6	6
Surprise	5	4	4
Anger	3	5	1
Sadness	2	2	3
Fear	1	1	2

Q4	TP 1	TP 2	TP 3
Time	00:01:13.094	00:01:09.203	00:00:37.031

3.7.3 Interviews

All interviews were recorded and then also transcribed by the researcher into Word documents. For the purpose of this study, parts of the interviews were translated into English and paraphrased. The aim of paraphrasing a selected part of an interview was to present a summary of what the participant had said without losing the essence of it. The transcriptions are not provided in this research report due to a lack of space. Only relevant parts of the interviews are reported in this document to support the analyses.

3.8 SUMMARY

The present chapter contains information on the empirical study. This includes detail regarding the research design, methodology and measuring instruments, participants, recordings, procedure, and data capturing and editing. The next chapter provides a detailed description of the computerised questionnaire, Ponto Vista, that was used in Part II of the methodology.