

**THE WORKING DOG HANDLER/DOG DYAD IN SOUTH AFRICA:  
A STUDY OF VARIABLES INFLUENCING WORKING DOG WELL-BEING**

by

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## DECLARATION

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### **THE WORKING DOG HANDLER/DOG DYAD IN SOUTH AFRICA: A STUDY OF THE VARIABLES INFLUENCING THE WORKING DOG WELL-BEING**

I declare that the above dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged using complete references.

I further declare that I submitted the dissertation to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.



.....  
**Anton Coetzee**

2022-01-31

.....  
**Date**

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## ABSTRACT

This study was conducted in the South African Working Dog Environment. Working Dog Handlers (WDH's) ( $n = 389$ ) from different state and private institutions participated in the study. The study population comprised of two groups. Population A ( $n = 265$ ) comprised of South African Police Service (SAPS) WDH's whom participated in the study and Population B ( $n = 124$ ) included all other WDH's i.e., Department of Correctional Services (DCS), South African Revenue Service (SARS), Tshwane Metro Police Department (TMPD), Cape Town Metro Police Department and Private Security Services.

The study population comprised of ( $n = 71$ ) female and ( $n = 313$ ) male WDH's. The purpose of the study was to assess and evaluate the WDH's demographic variables i.e., gender, educational attainment and annual income to determine their influence on the interaction the WDH has with his/her Working Dog (WD) and the perception the WDH has of Animal Welfare. The following instruments which were employed by Anthropologists in companion animal studies were adapted i.e., the Monash Dog Owner Relationship Scale (MDORS) Dwyer, Bennett & Coleman (2006) and the Animal Welfare Scale *Zalaf & Egan (2015)* for this study. A third instrument, a General Knowledge Scale was developed, to determine what animal husbandry knowledge was considered essential for WDH's.

The findings in this study showed no significant differences in gender and annual income ( $p > 0,05$ ) in both the study populations. The variable "educational attainment" in Population B was significant ( $p = 0,03277$ ) in the General Knowledge Scale. Significant differences were noted with dog owner interaction in Population A ( $p = 0,00084$ ) and Animal Welfare ( $p < 0,0001$ ). Both the study populations showed significant differences towards general knowledge, ( $p < 0,001$ ) in Population A and B.

With the Kruskal-Wallis analysis the Five Freedoms of Animal welfare also showed significance differences in Population A (chi-squared = 14,994,  $p = 0,01039$ ) with the demographic variable educational attainment. Kruskal-Wallis tests were performed using the total scores for the MDORS, Animal Welfare and General

Knowledge sections respectively as dependent variables and all demographic variables in Section A (MDORS) as independent variables. Significant results were investigated further using a post-hoc Dunn test with significant pairwise comparisons. The demographic variables indicated significant differences in both populations. In conclusion, the focal point of future research should be on the development of the WDH to ensure the physical and psychological well-being of the WD.

## OPSOMMING

Hierdie studie was in die Suid-Afrikaanse Werkhond-omgewing uitgevoer. Hondehandteerders ( $n = 389$ ) van verskillende staats- en privaatinstanties het aan die studie deelgeneem. Die studiepulasie het uit twee groepe bestaan. Bevolking A het bestaan uit Hondehandteerders van die Suid-Afrikaanse Polisie Diens (SAPD) en Bevolking B het alle ander WDH's ingesluit, dit wil sê, Departement van Korrektiewe Dienste (DKD), Suid-Afrikaanse Inkomstediens (SAID), Tshwane Metro Polisie Departement (TMPD), Kaapstad Metro Polisie Departement en Privaat Veiligheidsdienste.

Die studiepulasie het bestaan uit ( $n = 71$ ) vroulike en ( $n = 313$ ) manlike WDH's. Die doel van die studie was om die WDH se demografiese veranderlikes, naamlik geslag, opvoedkundige prestasie en jaarlikse inkomste te assesser om hul invloed op die interaksie wat die WDH met sy/haar Werkshond het en die persepsie wat die hondehandteerder het van diere welvaart te bepaal.

Die volgende instrumente wat deur antropoloë in geselskapsdierstudies gebruik was, was aangepas in die huidige studie byvoorbeeld die "Monash Dog Owner Relationship Scale" (MDORS) (Dwyer, Bennett & Coleman, 2006) en die "Animal Welfare Scale" (Zalaf & Egan, 2015). 'n Derde instrument, 'n Algemene Kennisskaal, was ontwikkel om te bepaal watter kennis van diere versorging word as noodsaaklik vir Hondehandteerders beskou.

Die bevindinge in hierdie studie het geen betekenisvolle verskille in geslag en jaarlikse inkomste ( $p > 0,05$ ) in beide die studiepulasies getoon nie. Die veranderlike "opvoedkundige bereiking" in Bevolking B was in die Algemene Kennisskaal betekenisvol ( $p = 0,03277$ ). Beduidende verskille is opgemerk met interaksie met hondehandteerders in Bevolking A ( $p = 0,00084$ ) en Dierewelsyn ( $p < 0,0001$ ). Beide die studie populasies het beduidende verskille teenoor algemene kennis, ( $p < 0,001$ ) in Bevolking A en B getoon.

Met die Kruskal-Wallis analise het die Vyf Vryhede van Dierewelsyn ook betekenis getoon in Bevolking A (chi-kwadraat = 14,994,  $p = 0,01039$ ) met die demografiese

veranderlike opvoedkundige prestasie. Kruskal-Wallis-toetse was uitgevoer met behulp van die totale tellings vir die MDORS, Dierewelsyn en algemene kennis afdelings onderskeidelik as afhanklike veranderlikes en alle demografiese veranderlikes in Afdeling A (MDORS) as onafhanklike veranderlikes. Beduidende resultate is verder ondersoek met behulp van 'n post-hoc Dunn-toets met beduidende paarsgewyse vergelykings. Die demografiese veranderlikes het beduidende verskille in beide populasies aangedui.

## OKUYINGQIKITHI

Lolu cwaningo lwenziwe Ezemvelo ZaseNingizimu Afrika Ezisebenza Ngezinja (WDH's). Abantu Abasebenza Ngezinja ( $n = 389$ ) ezivela ezikhungweni ezahlukene zikahulumeni nezizimele zibambe iqhaza ocwaningweni. Isibalo socwaningo sakhiwe amaqoqo amabili. Isibalo sabantu A ( $n = 265$ ) sakhiwe Ezamaphoyisa ZaseNingizimu Afrika (SAPS) Ezemvelo ZaseNingizimu Afrika Ezisebenza Ngezinja zibambe iqhaza ocwaningweni kanti inani labantu B ( $n = 124$ ) lalihlanganisa zonke ezinye Ezemvelo ZaseNingizimu Afrika Ezisebenza Ngezinja okungukuthi, uMnyango Wezokuhlunyeleliswa Kwezimilo (DCS), uMnyango Wezentela eNingizimu Afrika (SARS), uMnyango wamaPhoyisa kaMasipala waseTshwane (TMPD), uMnyango wamaPhoyisa kaMasipala waseKapa kanye noMnyango Wezokuphepha Ezizimele.

Isibalo socwaningo sakhiwe ( $n = 71$ ) abesifazane kanye ( $n = 313$ ) nama-WDH abesilisa. Injongo yocwaningo bekuwukuhlola nokubheka okuguququkayo kwezibalo zabantu be-WDH okungukuthi, ubulili, ukuzuzwa kwezemfundo kanye nemali engenayo yonyaka ukuze kutholwe ithonya labo ekusebenzeleni i-WDH enayo Nenja Yakhe Esebenzayo (WD) kanye nombono i-WDH enawo ngeSilwane. Inhlalakahle. Amathuluzi alandelayo asetshenzisiwe Izazi zesayensi yemfundo ngomuntu oyisilwane esiphilayo ezifundweni zezilwane ezihambisanayo ashintshwa okungukuthi, i-Monash Dog Owner Relationship Scale (MDORS) Dwyer, Bennett & Coleman (2006) kanye ne-Animal Welfare Scale Zalaf & Egan (2015) yalolu cwaningo. Ithuluzi lesithathu, i-General Knowledge Scale yasungulwa, ukuze kutholakale ukuthi yiluphi ulwazi ngokufuywa kwezilwane olwalubhekwa njengelubalulekile kuma-WDH.

Okutholwe kulolu cwaningo akukhombisi mehluko obalulekile emalini engenayo yobulili kanye yonyaka ( $p > 0,05$ ) kuzo zombili izifunda zocwaningo. Ukuhlukahluka "kokuzuzwa kwezemfundo" Kubantu B kwakubalulekile ( $p = 0,03277$ ) Esikalini Solwazi Olujwayelekile. Umehluko omkhulu uqashelwe ngokusebenzisana kwabanikazi bezinja Eqoqweni A ( $p = 0,00084$ ) kanye Nenhlalakahle Yezilwane ( $p$



< 0,0001). Zombili lezi zibalo zocwaningo zibonise umehluko omkhulu olwazini olujwayelekile, ( $p < 0,001$ ) Eqoqweni A kanye no-B.

Ngokuhlaziywa kwe-Kruskal-Wallis Izinkululeko Ezinhlanu Zenhlalakahle Yezilwane ziphinde zabonisa umehluko wokubaluleka Kubantu A (chi-squared = 14,994,  $p = 0,01039$ ) ngokuzuzwa kwemfundo eguquguqukayo. Ukuhlolwa kwe-Kruskal-Wallis kwenziwa kusetshenziswa amaphuzu aphelele ezigaba ze-MDORS, Zenhlalakahle Yezilwane kanye Nolwazi Olujwayelekile ngokulandelana njengokuhlukahluka okuncikile nakho konke okuguquguqukayo kwezibalo zabantu Esigabeni A (MDORS) njengokuguquguqukayo okuzimele. Imiphumela ebalulekile yaphenywa ngokuqhubekayo kusetshenziswa ukuhlolwa kwe-Dunn yangemva kwesikhashana ngokuqhathanisa okubalulekile kokubili. Ukuhluka kwezibalo zabantu kubonise umehluko omkhulu kuzo zombili izigaba zabantu. Sengiphetha, indawo okugxilwe kuyo yocwaningo lwesikhathi esizayo kufanele ibe ekuthuthukisweni kwe-WDH ukuze kuqinisekise inhlalakahle engokomzimba nengokwengqondo ye-WD.

## **KEY TERMS**

Five Freedoms, working dog handler, working dog, animal husbandry, animal welfare, handler/dog dyad, handler/dog interaction, handler/dog attachment, kennel environment, working dog handler demographic influences

## DEDICATION

This thesis is dedicated to all the Working Dogs in South Africa. May it serve to enlighten those to whom the care of the Working Dog is entrusted to.

"We need another and a wiser and perhaps a more mystical concept of animals. Remote from universal nature and living by complicated artifice, man in civilization surveys the creature through the glass of his knowledge and sees thereby a feather magnified and the whole image in distortion. We patronize them for their incompleteness, for their tragic fate of having taken form so far below ourselves. And therein we err and greatly err. For the animal shall not be measured by man. In a world older and more complete than ours, they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren; they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth" (Beston, 1928:24).

## TABLE OF CONTENTS

<b>DECLARATION</b> .....	<b>i</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>ii</b>
<b>ABSTRACT</b> .....	<b>iii</b>
<b>OPSOMMING</b> .....	<b>v</b>
<b>OKUYINGQIKITHI</b> .....	<b>vii</b>
<b>KEY TERMS</b> .....	<b>ix</b>
<b>DEDICATION</b> .....	<b>x</b>
<b>CHAPTER 1</b> .....	<b>1</b>
<b>INTRODUCTION</b> .....	<b>1</b>
<b>1.1 Background</b> .....	<b>1</b>
<b>1.2 Hypothesis</b> .....	<b>2</b>
<b>1.3 Problem statement</b> .....	<b>2</b>
<b>1.4 Research questions</b> .....	<b>2</b>
<b>1.5 Aim of study</b> .....	<b>3</b>
<b>1.6 Objective of the study</b> .....	<b>3</b>
<b>1.7 Limitations</b> .....	<b>3</b>
<b>1.8 Significance of the study</b> .....	<b>4</b>
<b>1.9 Dissertation layout</b> .....	<b>4</b>
<b>CHAPTER 2</b> .....	<b>6</b>
<b>LITERATURE REVIEW</b> .....	<b>6</b>
<b>2.1 Introduction</b> .....	<b>6</b>
2.1.1 What is welfare? .....	6
2.1.2 What is animal welfare? .....	6
<b>2.2 Different influences that determine the welfare of the working dog in South Africa</b> .....	<b>7</b>

2.2.1	Influences of the working dog handler .....	7
<b>2.3</b>	<b>Relationship, bond and attachment in the handler/dog dyad ...</b>	<b>17</b>
2.3.1	Relationship in the dyad.....	17
2.3.2	The bond and attachment in the dyad.....	19
2.3.3	The WDH's dogmanship .....	20
<b>CHAPTER 3</b>	<b>.....</b>	<b>22</b>
<b>RESEARCH METHODOLOGY</b>	<b>.....</b>	<b>22</b>
<b>3.1</b>	<b>Research design .....</b>	<b>22</b>
<b>3.2.</b>	<b>Participants .....</b>	<b>22</b>
<b>3.3</b>	<b>Measuring instruments .....</b>	<b>23</b>
3.3.1	Monash Dog Owner Relationship Scale (MDORS).....	24
3.3.2	Animal Welfare Scale.....	24
3.3.3	General Knowledge Scale .....	24
3.3.4	Likert Response Scale .....	24
<b>3.4</b>	<b>Data collection procedures .....</b>	<b>25</b>
<b>3.5</b>	<b>Data analysis .....</b>	<b>26</b>
<b>CHAPTER 4</b>	<b>.....</b>	<b>29</b>
<b>RESULTS</b>	<b>.....</b>	<b>29</b>
<b>4.1</b>	<b>Study sample size.....</b>	<b>29</b>
<b>4.2</b>	<b>Demographic representation of the population .....</b>	<b>29</b>
4.2.1	Gender.....	29
4.2.2	Working dog handler ethnicity.....	30
4.2.3	Working dog handler educational attainment.....	31
4.2.4	Working dog handler annual income.....	32
4.2.5	Working dog handler age.....	33
4.2.6	Working dog handler experience .....	34

4.2.7	Working dog handler function .....	34
<b>4.3</b>	<b>Descriptive statistics .....</b>	<b>35</b>
4.3.1	Monash Dog Owner Relationship Scale (MDORS).....	35
<b>4.4</b>	<b>Monash Dog Owner Relationship Scale factor analysis .....</b>	<b>41</b>
<b>4.5</b>	<b>Kruskal-Wallis results for each demographic factor .....</b>	<b>41</b>
4.5.1	Significant demographic factors and the Monash Dog Owner Relationship Scale .....	42
4.5.2	Significant demographic factors and the Animal Welfare Scale .....	42
4.5.3	Significant demographic factors and the General Knowledge Scale .....	43
<b>4.6</b>	<b>Kruskal-Wallis test results for the Five Freedoms .....</b>	<b>43</b>
4.6.1	Gender, income and educational attainment results for the Five Freedoms.....	43
4.6.2	Function of the working dog handler in the organisation.....	44
<b>CHAPTER 5</b>	<b>.....</b>	<b>45</b>
<b>DISCUSSION</b>	<b>.....</b>	<b>45</b>
<b>5.1</b>	<b>Demographics of the population .....</b>	<b>45</b>
5.1.1	Working dog handler gender.....	45
5.1.2	Working dog handler ethnicity.....	45
5.1.3	Working dog handler educational attainment.....	46
5.1.4	Working dog handler annual income.....	47
5.1.5	Age .....	48
5.1.6	Working dog handler experience .....	48
5.1.7	Working dog handler function .....	50
<b>5.2</b>	<b>Descriptive statistics .....</b>	<b>51</b>
5.2.1	Monash Dog Owner Relationship Scale (MDORS).....	51

5.2.2	Animal Welfare Scale.....	55
5.2.3	General Knowledge Scale .....	57
<b>5.3</b>	<b>The Five Freedoms .....</b>	<b>58</b>
5.3.1	Working dog handler demographics and the Five Freedoms.....	59
5.3.2	Function of working dog handler in the organisation.....	59
<b>5.4</b>	<b>Outcome of the research objectives in the study .....</b>	<b>59</b>
<b>CHAPTER 6</b>	<b>.....</b>	<b>61</b>
<b>CONCLUSION</b>	<b>.....</b>	<b>61</b>
<b>REFERENCES</b>	<b>.....</b>	<b>64</b>

## **ANNEXURES**

Annexure A	Questionnaire .....	73
Annexure B	Revised and reverse coded statements in questionnaire .....	80
Annexure C	Box Plots .....	81
Annexure D	Population A MDORS Polychoric Correlation .....	84
Annexure E	Exploratory Factor Analysis of MDORS Items of Population A ...	85
Annexure F	Dunn Test results of significant Kruskal Wallis Tests showing significant pairwise results for group comparisons .....	86
Annexure G	Polychronic Correlation Matrix for Population A .....	88
Annexure H	Mean Scores for Individual Likert Scale Responses .....	89



## LIST OF TABLES

Table 3.1	Populations in study.....	22
Table 3.2	Breakdown of the questionnaire .....	23
Table 4.1 A	Sub-Scale: Dog-owner interaction .....	36
Table 4.1 B	Sub-Scale: Emotional closeness .....	36
Table 4.1 C	Sub-Scale: Perceived costs .....	37
Table 4.2	Animal Welfare Scale.....	38
Table 4.3	General Knowledge Scale .....	40
Table 4.4	Shapiro-Wilks test results for the total scores of section C to D...	40
Table 4.5	Demographic factors: Monash Dog Owner Interaction Scale .....	42
Table 4.6	Demographic factors: Animal Welfare Scale.....	43
Table 4.7	Demographic factors: General Knowledge Scale .....	43
Table 4.8	Working dog handler demographical influences on the Five Freedoms.....	44
Table 4.9	Role players perception of the Five Freedoms in the working dog organisation .....	44

## LIST OF FIGURES

Figure 4.1	Population A: Gender.....	29
Figure 4.2	Population B: Gender.....	30
Figure 4.3	Working Dog Handler Ethnicity .....	31
Figure 4.4	Working Dog Handler Educational attainment .....	32
Figure 4.5	Annual Income of Working Dog Handlers .....	33
Figure 4.6	Working Dog Handler Age .....	33
Figure 4.7	Working Dog Handler Experience in years .....	34
Figure 4.8	Working Dog Handler Function.....	35
Figure 5.1	Two-phased model of the owner/dog relationship .....	49
Figure 5.2	Dog Owner Interaction (DOI) .....	53
Figure 5.3	Perceived Emotional Closeness (PEC).....	54
Figure 5.4	Perceived Cost (PC) .....	55
Figure 5.5	Animal Welfare Scale.....	57
Figure 5.6	General Knowledge Scale .....	58

## **LIST OF ABBREVIATIONS**

DCS	Department of Correctional Services
DMP	Durban Metro Police
DOI	Dog Owner Interaction
GSD	German Shepard Dog
HAI	Human Animal Interaction
MDORS	Monash Dog Owner Interaction Scale
OIE	World Organisation for Animal Health
PC	Perceived Cost
PEC	Perceived Emotional Closeness
RCMP	Royal Canadian Mounted Police
SA	South Africa
SAPS	South African Police Service
SARS	South African Revenue Service
SME	Subject Matter Expert
TMPD	Tshwane Metro Police Department
WD	Working Dog
WDE	Working Dog Environment
WDH	Working Dog Handler
WDO	Working Dog Organisation

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

The first working dog, a German Shepherd Dog (GSD), was introduced on the African continent by the German military and police units in South West Africa during the early 1900's (Strydom, 1998). South Africa (SA) is one of the largest employers of working dogs (WD) in a military and law enforcement environment on the African continent. The working dog environment (WDE) in SA includes state, local government, private and security working dog organisations (WDO's). State-owned organisations are the primary users of WD's, followed by the private security industry and various local government organisations (Metro Police Departments).

Very little is known about the relationship that exists in the handler/dog dyad in SA and husbandry practices of the WDH (Van der Merwe, More & Kotzé, 2016) as most past research into the human animal interaction (HAI) is done in developed countries (Wright, 2018). Minimal studies by South African researchers measure the relationship in the handler/dog dyad in a Defence and Law Enforcement environment. Past research in SA in the WDE includes studies related to breeding and selection of working dogs (Slabbert & Odendaal, 1999), management of a working dog breeding programme (Strydom, 1998), and a study that examine occupational stress experienced by WDH's (Govender, 2012).

The development of the working dog handler (WDH) in WDO's in SA includes a training and handling background of the WD. In this regard, appropriate instruction towards caring for the WD is inadequate. The adequate training of the WDH is underlined by the quality of the relationship in the WD/WDH dyad, the WD's physical and psychological well-being (welfare) of the WD and the efficiency of the WD team.

The dog handler influenced working dog performance. Dismissing the responsibility of the WDH can impede not only the efficiency of the WD team but also the welfare of the WD (Jamieson, Baxter & Murray, 2018). Anthrozoologists abroad have developed welfare and relationship scales to study and measure the level of variables that influence the welfare of the WD in the dyad. In SA, no animal welfare or interaction

scale, as described by Calvo, Bowen, Bulbena, Tobe and Fatj (2016) and Zalaf and Egan (2015), exists to study the welfare of the WD or interaction in the dyad. The Monash Dog Owner Interaction Scale (MDORS) (Dwyer *et al.*, 2006) was developed to measure the relationship in the owner/dog dyad.

The present study will employ a questionnaire based on a modified MDORS and the Animal Welfare Scale (Zalaf & Egan, 2015). This study will examine the relationship in the dyad, different demographical variables that affect husbandry practices of the WDH, i.e., gender, education and income status and the WDH's perception of animal welfare and educational needs.

## **1.2 Hypothesis**

Dogmanship, WDH demographical and lack of sufficient development are variables affecting the welfare of the working dog in South Africa.

## **1.3 Problem statement**

No research could be found to study the relationship in the handler/dog dyad in South Africa. Literature that exists includes anecdotal information. This unsatisfactory situation affects the physical and psychological wellbeing of the WD. The compromised welfare of the WD is affecting the relationship in the handler/dog dyad, the productivity of the team and the service life of the WD. In conclusion, there is a need in South Africa for a better understanding of the welfare (physical and psychological needs) of the working dog.

## **1.4 Research questions**

The working dog environment in South Africa is void of research to assess the different influences that affect the WD's physical and psychological well-being. The following research questions ought to be posed:

1.4.1 How is WD welfare perceived by the WDH in South Africa?

1.4.2 How familiar are the WDH's with the "Five Freedoms" of animal welfare?

1.4.3 How does the WDH perceive his/her interaction with the working dog?

1.4.4 How does the education of WDH influence the relationship in the dyad?

1.4.5 Does the gender of the WDH influence the relationship in the dyad?

1.4.6 Does affluent WDH's improve the relationship in the dyad?

## **1.5 Aim of the study**

The aim of the study is to develop a scientific approach to the working dog welfare in South Africa. It is based on the macro understanding of the present status quo. It also identifies the variables that affect working dog's welfare. This study also aims to aid the researcher in determining the standard of welfare.

## **1.6 Objective of the study**

1.6.1 To determine how the welfare of the WD was perceived by the WDH in a Defence and Law Enforcement environment.

1.6.2 To determine how the demographical factors of the WDH will influence the well-being of the WD in a Defence and Law Enforcement environment.

1.6.3 To determine how the interaction in the dyad influence the quality and type of the relationship.

1.6.4 To determine the development needs of the WDH in the working dog environment to improve the care of the working dog.

## **1.7 Limitations**

The study takes place in the South African Military and Law Enforcement WDE with interested volunteers within the ambit. The COVID-19 Pandemic has resulted in strict regulations put in place by the National Government to prevent the spread of the virus in the country.

Due to the restrictions imposed nationally, the researcher opted to use field workers in the selected ambit to assist in the distribution of questionnaires and collection of responses to the questionnaires.

## **1.8 Significance of the study**

The study's outcome will highlight the importance of the relationship in the handler/dog dyad. The influence of the WDH's personality on this relationship will be acknowledged to improve the welfare of the WD in a Defence and Law Enforcement environment in South Africa.

Data obtained from the questionnaire will also aid in developing a curriculum to prepare the WDH to ensure that optimal care is provided to the WD as a sentient resource.

## **1.9 Dissertation layout**

This dissertation consists of N=5 chapters, a list of references and several annexures. The theme of each chapter is outlined below.

- 1.9.1 Chapter one outlines the background against which the research will be conducted. It consists of the introduction, problem statement, research questions, aim of the study, objectives, ethical considerations, limitations, and the significance of the study.
- 1.9.2 Chapter two entails the literature review related to the study. This chapter includes literature studies relevant to the influences affecting the welfare of the WD. The term "welfare" is defined, and animal welfare related concepts are highlighted. The influence of the WDH, i.e., the personality, demographical variables and training, are discussed. The literature review also deliberates the Five Freedoms of animal welfare, the K9 Ethogram and contextual diagnosis relevant to the welfare of the WD. The importance of the relationship, bond, and attachment in the WDH/WD dyad are underlined.
- 1.9.3 Chapter three includes the research design, sampling method and sample size to be included in the research. The different experiences brought to the study by participants are listed, i.e., breeding or management experiences. The study will identify the various categories of WDO's, i.e., state-owned, private security or local government. The criteria for participation in the study by participants of the different WDO's will be discussed. The processes

followed to obtain participants are explained. Pseudonyms allocated to WDO's participating in the study will be listed. The questionnaire utilized and its different sections to obtain data is discussed. The data analysis section will include a statistical model applied to analyse the data of each objective.

- 1.9.4 Chapter four will provide the results of the data analysis. The different MDORS, perceived welfare and educational needs scores will be correlated with demographical information supplied by the WDH.
- 1.9.5 Chapter five will provide recommendations and a conclusion relevant to the relationship that exists in the handler/dog dyad. This chapter will identify groups with significantly diverse handler/dog attachment patterns and identify risk factors associated with poor dogmanship.



## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

Anthrozoologists have highlighted the global concern of how humankind interacts with animals (Bekoff, 2010). A moral conflict developed where human use of the animal results in pain, fear and harm, which prevents the animal from satisfying its own needs (Serpell, Coppinger, Fine & Peralta, 2010). In support Phillpotts, Dillon and Rooney (2019) explained that humankind is central to animal welfare due to its impact on animals/environment and maintaining the well-being of domestic animals during their life cycle is a moral duty of the owner/handler. Siddiq and Habib (2016) indicated that animal welfare aims to establish and preserve perceptions of 'well-being' for nonhumans, emphasising the actions of the guardian/owner.

##### 2.1.1 What is welfare?

The Oxford Dictionary defines welfare as "the general health, happiness and the safety of a person, an animal or a group". The Collins English Dictionary refers to welfare as "welfare of a person or group is their health, comfort, and happiness."

##### 2.1.2 What is animal welfare?

The World Organisation for Animal Welfare (OIE), Terrestrial Animal Code (2021), define animal welfare as "the physical and mental state of an animal in relation to the conditions in which it lives and dies".

The American Veterinary Medical Association (AVMA) describes animal welfare as of how an animal is coping with conditions in which it lives. An animal is in a good state of welfare if it is healthy, well-nourished, protected, able to communicate intrinsic behaviour, and not suffering from unpleasant disorders such as discomfort, fear, or anxiety, as determined by scientific evidence. Disease prevention and medical care, proper shelter, management, nutrition, and humane handling are essential for good animal welfare.

## **2.2 Different influences that determine the welfare of the working dog in South Africa**

### **2.2.1 Influences of the working dog handler**

Kotrschal, Schöberl, Schöberl and Wedl (2009) found that both the handler and dog in the dyad have unique physical and social needs, i.e. the animal's need to be cared for by its human companion. Owners expect acceptable behaviour from the animal in return.

#### **2.2.1.1 Personality of working dog handler**

Despite a plethora of studies on dog-human interactions, little is known about the impact of the owners' personalities on the dog-owner dyadic interaction (Kis, Turcsán, Miklósi & Gácsi, 2012). Hoummady, Péron, Grandjean, Cléro, Bernard, Titeux, Desquilbet and Gilbert (2016) stated that more attention is given to ensuring good operational performances of working dog-human dyads. Despite this interest, the relationships between human and dog personalities, and dog/human personality matching and dyad efficiency, have received little attention.

Significant relationships were discovered between the personality traits of the dog owner and problem behaviour displayed by the dog (Dodman, Brown & Serpell, 2018). The study by Gobbo and Zupan (2020) shows a relationship exists between the handler's personality and behavioural problems displayed by the working dog. Furthermore, Kotrschal *et al.* (2009) advised that owner/WDH personality and or attitude towards WD will influence interaction, and by doing so, the performance of the handler/dog dyad.

Kis *et al.* (2012) showed that the owner's personality influences the performance in the dyad. In this context, Hoummady *et al.* (2016) concluded that the statement by Kis accentuates the significance of the relationship between performances, handler behaviours, and their relationships with their dog, as well as matching their human and dog personality characteristics. Rehn, Lindholm, Keeling and Forkman (2014) indicated that when the dog/human dyad's relationship was evaluated, the WD/WDH's characteristics are rarely included.

Research showed that further investigation is needed to determine which attributes, such as experience, abilities, and personality types, ensure people are better suited to dog handling personality tests for handlers can help to identify people with personalities that are ideal for this type of work. As a result, personality may not be the most important factor in determining a person's suitability for working with wildlife detection dogs. Instead, a potential handler's suitability is determined by how they perceive their training and work, as well as their dog-handler relationship (Jamieson *et al.*, 2018).

Investigating the impact of human personality on dog/human relationships is crucial when thinking about dogmanship because it can distinguish unique attributes of persons who are good with their dogs. More specifically, current research suggests the Big Five Inventory (BFI) personality dimension of neuroticism may provide some preliminary indication of the dogmanship of an individual dog owner (Payne, Bennett & McGreevy, 2015). Goldberg used the Big Five human personality traits in the 1990's which have been employed to depict human nature (Curb, Abramson, Grice & Kennison, 2013).

The BFI was employed to assess the personality traits of dog trainers (Wood, 2020) and dog owners (Gobbo & Zupan, 2020). The BFI personality traits include Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (Gobbo & Zupan, 2020).

Neuroticism refers to traits, e.g., anxiety, insecurity and self-pitying. Extraversion includes traits, e.g., highly sociable, fun-loving and affectionate. Openness relates to a propensity to be imaginative, independent and enjoys variety. Agreeableness includes attributes, e.g., having a soft heart, trusting and helpful. Conscientiousness comprises traits, e.g., discipline, cautiousness, and organisation (Kis *et al.*, 2012).

Anxious tendencies in humans relate to neuroticism; WDH with high scores, i.e., neuroticism, have WD's, which are less effective at work or take longer to respond to instructions. Neuroticism is characterised by excessive anxiety, worry, and tenseness (Curb *et al.*, 2013). WDH with lower neuroticism scores also reduced WD' stress levels (Jamieson *et al.*, 2018).

Kotrschal *et al.* (2009) explained that owners with higher neuroticism were more attached and paid greater attention to their pets, who were confident and polite but distant from other humans. Payne *et al.* (2015) explained that high neuroticism in dog owners leads to weak dyadic functionality and that good dogmanship is associated with low neuroticism.

Nonetheless, owners with strong neuroticism are more socially attractive to their dogs, with these dyads as being more agreeable than other dyads. Furthermore, owners in these dyads were more likely to see their pets as social companions or partners. Surprisingly, while neuroticism is linked to poor dyadic functionality, it does not appear to harm the dyadic relationship quality. In a structured environment, assessing the working dog handlers' personality may reveal whether neuroticism plays a role in the dyad's difficulty with practical tasks (Payne *et al.*, 2015).

Being outgoing and sociable is referred to as extraversion (Curb *et al.*, 2013). The study by Kotrschal *et al.* (2009) postulated that owners who scored high on extroversion saw their dog mainly as a partner for shared tasks, as there was no direct link between dyadic accomplishments or stress levels in the dog. In specific populations, women score higher in neuroticism, while men score higher in extraversion. Men were slightly more extraverted than women, but there was no substantial difference in neuroticism.

Experience and training school knowledge relate to WDH's extraversion scores. This WDH might not have the required WD behavioural background. These WDH's may also have poor WD skills, compared to WDH's with high extraversion scores, who may employ training techniques according to personal experience. Extraversion may be indicative of overconfidence and sociability. These WDH's will also be more inclined to attend to more training interventions (Payne *et al.*, 2015).

Being imaginative, curious, and receptive to new opportunities is what openness entails. Openness (to experience) include variables, i.e., age, book knowledge, clicker and whistle use. WDH's with high openness scores will be more inclined to learn from literature and not rely on experience alone. Low openness WDH's are labelled as traditional and/or conventional WDH's (Payne *et al.*, 2015). "Owners who score higher on "openness" during a short obedience exercise use more commands. Similarly, in a

searching exercise, trainers can be more effective in reinforcing the dog's desirable behaviours, resulting in increased searching precision (Hoummady *et al.*, 2016).

The propensity to be with other humans is known as agreeableness (Curb *et al.*, 2013). Agreeableness is linked to altruism and willingness to work with other WD teams. WDH's with high agreeableness scores are less inclined to employ verbal corrections during training of the WD. These WDH's will also choose to cooperate rather than clash with their WD (Payne *et al.*, 2015).

They will also refrain from any physical corrections of the WD during training and are more inclined to using a body harness during training (inclination to use the harness). Very few WDH's with high agreeableness scores will use physical correction, including no verbal correction, WDH, N=4% who scored high on "agreeableness" used physical correction and no verbal correction, implying that "agreeableness" and the use of punishment in training are inversely related (Payne *et al.*, 2015).

Being conscientious involves being coordinated, comprehensive, and effective (Curb *et al.*, 2013). Conscientiousness 'correlates with the WDH's clicker training, training duration and reward for work. These WDH's are more careful, thorough and vigilant compared to WDH's with low conscientiousness scores. WDH's with high conscientiousness scores have longer training sessions with the WD to ensure that set objectives are obtained and reward themselves with work (Payne *et al.*, 2015).

### **2.2.1.2 Demographical influences of working dog handler**

Cultural values and norms are carried over from generation to generation, thus safeguarding traditions within a specific culture. Cultures are affected by social factors, social stressors, and socio-economic status. These influences also affect attitudes towards animals. The human/animal bond is ubiquitous in various domains (Jegatheesan, 2019).

The Christian belief system indicates not to display abusive behaviour toward animals, and to treat animals with respect. The author clarified that humans today still believe that animal lives are not sacred since the reasoning is that it may be utilised for human benefit (Szűcs, Geers, Jezierski, Sos, Sidou & Broom, 2012).

Dogs and cats are examples of companion animals found in Africa. Legislation, cultural and societal influences can be contributed to the development of standards related to the care of companion animals in some countries on the continent. Methods utilised to control stray or abandoned animals are often cruel including poisoning (strychnine or other slow-acting painful poisons), strangulation or being killed by blows to the head with a hammer (Masiga & Munyua, 2005).

A Close relationship exists between production animals (livestock) and their owners. In comparison, a similar level of care is not present relevant to companion animals including dogs and donkeys. These animals are frequently physically abused and mistreated (McCrindle, 1999).

### **GENDER OF WORKING DOG HANDLER**

Gender, past trauma, stress, lifestyle factors such as diet and exercise, education, occupation, and economic circumstances have been found to influence health and longevity in humans, and thus can influence our canine companions (Wallis, Szabó, Erdélyi-Belle & Kubinyi, 2018). Female students have been shown to gain more from therapy dog sessions than male students, indicating the need for more research into gender differences (Thelwell, 2019).

Gender discrepancies in other aspects of human behaviour should be considered when studying gender effects in human-animal interactions. Gender differences may be small, moderate, or major, according to meta-analysis, depending on the type of behaviour (Herzog, 2007). Research by Kerepesi, Dóka and Miklós (2015) indicated that human gender impacts dog behaviour as male and female owners engage differently with their dogs.

Women are more likely than men to exhibit pro-animal attitudes and behaviours (activism), Reynolds (2015) and Alleyne, Tilston, Parfitt, Butcher (2015). The study by Casey, Loftus, Bolster, Richards and Blackwell (2014) showed that women compared to men were 1.6 times less likely to report aggressive behaviour to visitors.

Wedl, Schöberl, Bauer, Day and Kotrschal (2010) referred to previous studies which indicated that gender variations in animal behaviours and attitudes have been

documented in a number of studies. Women and girls, on average, have closer emotional bonds with their pets than men and boys.

Mariti, Gazzano, Moore, Baragli, Chelli and Sighieri (2012), who in support, stated that women are more knowledgeable, more empathic and compassionate towards animals than men. Women are also more likely to oppose animal research than men. Wright (2018) explained that oxytocin levels in women increased after twenty-five (25) minutes of interacting with dogs. In contrast, men in the same test reported no difference in oxytocin levels.

The majority of military and law enforcement dog handlers are men. Furthermore, female WDH, N=76% preferred positive reinforcement training strategies over male WDH, N=54% (Alexander, Friend & Haug, 2011). To contextualise, the study consisted of N=32% WDH and N=68% female WDH. Alexander *et al.* (2011) showed that no associations were discovered between dog breed or handler regarding gender, sex and performance success.

The study by Calvo *et al.* (2016) showed that women are more inclined to participate in animal-related research due to their frequent visits to a veterinary practice. Gerber (2016) stated that (White) females have an increased attachment to animals. In contrast, Gerber (2016) also cited Herzog (2007), whose study did not report any significant differences between 'men and women's attachment to animals. However, it was found that women have a more favourable attitude to animals.

Women appear to prefer calm and obedient dogs, while men seem to like energetic, loyal, and/or defensive dogs. Both genders judge their dogs' behaviour differently, with more men than women reporting disobedience in their dogs (Calvo *et al.*, 2016).

## **SOCIO-ECONOMIC STATUS OF WORKING DOG HANDLER**

Owning a dog can profoundly impact human lifestyles; conversely, the human partner(s) can influence the dog's growth, actions, and efficiency, as well as the companionship's socioeconomic and cultural context (Kotrschal *et al.*, 2009). Income and educational level are examples of socioeconomic status variables that characterise lifestyle and social class (Pohnert, 2010). Cultural and national status seems to influence the relationship between dog ownership and socioeconomic status;

however previous research is unclear if a link occurs between dog ownership and socioeconomic status.

The frequency of vet visits were affected by various factors, including not only the animal's health but also the location and structure of the household, socioeconomic status, and other demographic variables (Kent & Mulley, 2017). There is substantial evidence that socioeconomic status influences a variety of health outcomes (Saunders, Parast, Babey & Mile, 2017). Dog owners who visit veterinary clinics regularly are likely to be of higher socioeconomic status, particularly given the current economic environment (Calvo *et al.*, 2016).

Veterinary practitioners are required to provide for their patients' emotional, social, and environmental well-being and their physical health. Veterinary professionals must do so in the face of a world that is complex in terms of socioeconomics, culture, technology, and education. Animal health approaches, abilities, and facilities differ dramatically globally.

Inaccurate and/or unscientific information from various sources may confuse or misinform well-intentioned pet owners who are unaware of the welfare problems they are causing. Availability of resources, educational backgrounds, culture, socio-economic realities, community needs, and/or social standards may all induce variations and differences. Socioeconomics and social norms can play a role in providing anecdotal information that may confuse or misinform well-intentioned pet owners who are unaware of the welfare issues they are causing (Ryan, Bacon, Endenburg, Hazel, Jouppi, Lee, Seksel, & Takashima, 2019).

Volsche (2015) investigated if the degree of aversion used in dog training is influenced by the socioeconomic status of the dog owner? The study by Volsche (2015) indicated that a significant relationship was not observed between the two variables, i.e. use of aversion in training and the socioeconomic status of the owner. The study also displayed that the owner's economic status does not influence training choices.

The study by Shih, Paterson and Phillips (2019) exposed the importance of dog owners' socioeconomic status in canine welfare issues is not well understood. Frequent animal welfare complaints included, i.e., inadequate food and/or water, a dog not being exercised, a dog being confined/tethered, failure to provide shelter or



care, overcrowding, a dog being in poor health or living in impoverished circumstances were all linked to low socioeconomic status. An increased socioeconomic status led to complaints, i.e., a dog left unattended in a hot car.

Volsche and Grey (2016) explained that given the paucity of research in this field, future studies should investigate the impact of additional owner variables such as gender, socioeconomic status, or education on dog training methods. Future studies may launch a dialogue about how pet dog training techniques influence the human-canine bond by quantifying the interaction of variables like attachment and life effect, and demographic variables like gender and socioeconomic status.

### **EDUCATIONAL ATTAINMENT OF WORKING DOG HANDLER**

Humans now have complete control over the supply, quality, and variety of food and water, and other critical features such as the space, environmental complexity, and social groupings provided for many domestic and captive wildlife species. As a result, human actions and behaviour have the capacity to both compromise and improve animal welfare. Indeed, it has been claimed that animal care providers have the most impact/control over an animal's health (Mellor, 2016).

The animal care provider must have a thorough understanding of a species' husbandry needs and species-specific behaviour to determine if their freedoms are being inhibited effectively (Koene, 2019). This is because they must be able to predict problems, recognise when issues arise and apply solutions, as well as recognise, preserve, and/or encourage good welfare. The animal care provider's experience, attitudes, abilities, training, and familiarity with the animals are significant, but more general issues include job motivation and satisfaction, working conditions, coworker behaviour, and organisational policies and regulations (Mellor, 2016).

Training, as always, is fundamental to finding solutions. By providing people with the means to de-escalate situations with dogs through their actions, education on how to perceive dog behaviour and how to interact with dogs is likely to increase contact between dogs and humans while also reducing the level of conflict and violence directed at humans (McGreevy, Starling, Payne & Bennett, 2017).

According to Philpotts *et al.* (2019), educating owners is a priority, according to veterinarians, animal rights organizations, and scholars, for improving the welfare of companion dogs. The presumption that enhancing an owner's awareness through an education initiative leads to changes in the dog's wellbeing seems rational.

The dogs' behaviour may provide indicators of their welfare state as many owners may be unaware that their dog is suffering (Philpotts *et al.*, 2019). Misconceptions exist regarding animal behaviour and treatment, and as a result, animals often suffer (Irvine, 2002). The absence of relevant knowledge and understanding by dog owners impact the welfare of the companion animal (Philpotts *et al.*, 2019).

Maximum educational attainment tends to influence the nature of the owner/dog relationship, with university-educated individuals substantially more likely to have an increasingly emotional connection with their dogs, particularly when compared to people with a high school level of maximum educational attainment (Calvo *et al.*, 2016).

Calvo *et al.* (2016) elaborated that socioeconomic status, which includes the educational level of the dog owner, has a significant impact on the nature of the dog-owner relationship. It is also possible that academic achievement influences pet ownership perceptions, with a lower educational level resulting in a more significant mismatch between expectations and the reality of dog ownership. A relationship exists between the owner's educational attainment and the perception of an ideal dog.

Sapowicz, Linder and Freeman (2016) indicated that information about the dog's owner income level and highest education is required to implement programs to improve animal welfare. As the education level in the household increases, the likelihood of dog ownership decrease. Holland (2019) referred to the study by Reese, Skidmore, Dyar, and Rosebrook (2017), which showed that individuals with tertiary education have a higher propensity to obtain/adopt a dog from a shelter/rescue centre compared to individuals without a tertiary qualification.

Dotson and Hyatt (2008) explained that dog owners with tertiary education have a higher symbiotic relationship with the dog than owners who do not have a similar educational background. In this study, the concept of a dog/human relationship was more acceptable to participants with tertiary education who consider the dog as

companions rather than dogs to be owned. Research by Gerber (2016) posed the question of whether a correlation exists between an individual with tertiary education and his/her attachment to a companion animal?

Gerber (2016) postulated that people form attachments with animals during any life stage. University students have also been known to have formed attachments to animals. No differences in attachments to animals were observed between post and undergraduate students. Turcsán, Miklósi and Kubiny (2017) found that the dogs of educated and experienced dog owners have fewer behavioural problems.

Trainers/owners of dogs employ training techniques based on their education, retrospective success with varying methods of training and morality influences. Ziv (2017) indicated that other training techniques could range from reward-based to aversive. Todd (2018) stated that applying aversive training methods, i.e. correction with electronic shock collars was more apparent with trainers with lower education attainment. Trainers with a higher attained tertiary qualification are more inclined to employ positive reinforcement as a training method.

### **2.2.1.3 WDH training influences**

WDH's in the study by Aimoe and Francis (2009) revealed that a need exists for lifelong learning as they progress in their chosen profession. This study by Aimoe and Francis (2009) involved N=35 senior working dog handlers of the Royal Canadian Mounted Police (RCMP) considered to be subject matter experts (SME) due to their years of experience and duty in the working dog environment. Aimoe and Francis (2009) conducted semi-structured interviews with respondents where N=26 (74%) of working dog handlers indicated that the need for continuous learning is critical.

A study in the wildlife detection environment by Jamieson *et al.* (2018) indicated that no research was carried out into what wildlife detection dog handlers consider valuable expertise and skills. This is valuable material for inexperienced dog handlers and experienced handlers looking to further their skills.

The only study relevant to the current study was by Strydom (1998) in South Africa. It was hypothesised by Strydom (1998) that the management of a WDO has certain responsibilities towards the care of the WD in the organisation. These responsibilities

include, i.e. provisioning of suitable accommodation that facilitates the needs of breeds kept. Provisioning of protection of dogs related to natural/artificial environmental influences and other animals and humans. Providing sufficient and appropriate exercise for animals.

Provisioning of nutrition, applicable to (specie) breed, age and health and lip access to freshwater. Protection of animals against possible illnesses and diseases, endo-/ectoparasites. Provide timeous veterinary or other applicable care to dogs in case of illness or injury. Maintaining the bio-security/hygienic status of the environment and the health of dogs. Direct or indirect supervision of daily activities related to feeding and inspection of dogs and facilities to ensure the well-being of these animals. Provisioning of sufficient and relevant training and supervision of personnel. Documenting and maintaining all records relevant to the care of working dogs (Strydom, 1998).

### **2.3 Relationship, bond, and attachment in the handler/dog dyad**

Humans have been interacting with nonhuman animals since the beginning of their human existence. Human and nonhuman beings have coexisted and shared the earth for millennia, creating multidimensional relationships. Humans share basic social tools with dogs and other higher vertebrates. This social tool includes the brain, physiological mechanisms and other evolutionary dispositions which influence social decision making. Methods/procedures to improve dog training can impair the importance of the relationship in the handler/dog dyad (Straling, 2013).

#### **2.3.1 Relationship in the dyad**

The relationship with non-human animals is complex. Humans have been interacting with nonhuman animals since the beginning of their human existence. Human and nonhuman beings have coexisted and shared the earth for millennia, creating multidimensional relationships (Siddiq & Habib, 2016). This relationship is complicated, frustrating, paradoxical (Bekoff, 2010). The handler/dog dyad relationship is multi-faceted and difficult to study (Rehn & Keeling, 2016).

"Ambiguous perceptions and ambivalent emotions are central to the relationships between humans and nonhuman animals. This confusion mixed emotions are

grounded in what Herzog (1993, 349) refers to as the "constant paradox"—the definition and treatment of animals as functional objects, on one hand, and sentient individuals, on the other" (Sanders, 2006).

A relationship is characterised as a series of interactions between two people who know each other, which are the product of a series of interactions over a fixed period, and which will take a direction influenced by both parties (Videla & Olarte, 2017).

The relationship with a dog resembles the relationship with an employee, friend or child. The human/dog dyad relationship can be described by several descriptions, e.g., master/slave, employer/worker, parent/child and friend/friend (Hens, 2009).

This relationship between humans and animals is dynamic as it influences the psychological and physiological states of both humans and dogs, which relates to a mutually beneficial relationship (Gerber, 2016). In long-term relationships, the human-animal dyad commonly adjusts to each other empathically where each social need is met, and provisioning is made for shared societal support (Kotrschal *et al.*, 2009).

Cimarelli, Marshall-Pescini, Range and Virányi (2019) revealed that the dog relationships comprise three sections, i.e., reference, affiliation and stress. Reference/information seeking relates to dog/human relationships, affiliation found in dog/dog relationships and stress alleviation, observed in dog/human relationships. Cimarelli *et al.* (2019) describe the different types of relationships dogs develop with other dogs and humans.

A Close dog/owner relationship signifies an increased level of reference and affiliation. A Tense dog/owner relationship indicates increased levels of reference. A Friend dog/dog relationship shows intermediate reference, increased affiliation and decreased stress levels. An insecure dog/dog relationship comprises intermediate reference, affiliation and an increased stress level. Cimarelli *et al.* (2019) concluded that the type of relationship determines how the dog will react in a social peril.

Furthermore, it is conceivable that owner perceptions of the dog's well-being depend on the nature of the relationship with the dog. Previously, the strength of the owner/pet relationship was recognised as a variable affecting the quality of veterinary treatment received by their pet (Packer, O'Neill, Fletcher & Farnworth, 2019). Understanding the

dynamics of human-dog interactions within human-dog dyads is important to promoting healthy relationships (Pirrone, Ripamonti, Garoni, Stradiotti & Albertini, 2017).

### **2.3.2 The bond and attachment in the dyad**

Wilshaw (2010) stated that a need exists to differentiate between a bond and attachment given the tendency of humans to bond with a dog and the tendency of dogs to attach themselves to a human, place or toy. It is problematic to objectively define this terminology (bond and attachment) in the English language.

Wilshaw (2010) explained that an attachment between human/non-human could be seen as an attachment between two or more beings (human/human or human/dog) in a social context or as an asocial attachment that includes only one being. It is suggested that the dog/human dyad comprises an attachment bond commonly found in a human caregiver/infant relationship (Packer *et al.*, 2019). Different breeds are predisposed to different attachment types due to intense selective breeding (Rehn & Keeling, 2016).

The American Veterinary Medical Association has defined the human-animal bond as a "mutually beneficial, dynamic relationship between people and animals that is influenced by behaviors that were essential to the health and wellbeing of both" Byrd (2012). Bonding can be interpreted as a link between two beings or a shared state between the two beings (Wilshaw, 2010) that includes a profound understanding that occurs between handler and dog (Engel, 2013).

Wilshaw (2010) defined the human/animal bond as "a dyadic behaviour/state between animals which is mutual and interactive. In humans, bonding is characterised by emotions such as trust and affection". Byrd (2012) indicated that the strongest bond between humans and animals might be the human/dog relationship.

Problem behaviour in the dog is a common side effect that originates in a strong bond in the human/dog dyad or a well-developed attachment between the dog and the environment. Typical problem behaviours that are observed include self-mutilation, house soiling, destructive behaviours and excessive barking (Wilshaw, 2010).

Other problematic behaviours include excitability, anxiety, nervousness, aggression/unfriendly behaviour and disobedience (Bennett & Rohlf, 2007). The bond or attachment quality can be determined by examining the animal's distress behaviour when separated from its human companion or relocated from a familiar location (Wilshaw, 2010).

The study of the factors that affect the human-dog bond will aid in the improvement of both humans and dogs' well-being in this special dyadic relationship (Payne *et al.*, 2015). The essence of the guardian-pet relationship has a profound effect on both individuals' lives (Meyer & Forkman, 2014).

### **2.3.3 The WDH's dogmanship**

Investigating the impact of human personality on dog-human relationships is especially important when considering dogmanship since it holds the promise of recognizing unique attributes of individuals who are exceptional with their dogs (Payne *et al.*, 2015). Reynolds (2015) referred to the unquantifiable nature of dogmanship, to possess an almost instinctual awareness of dog behaviour, and to establish a relationship so intimate that each can predict the other's next step.

How can dogmanship be explained? McGreevy *et al.* (2017) posed that reading a dog's behaviour and reacting appropriately, addressing dogs' behavioural needs, and encouraging them to achieve their full potential in a training environment are all part of good dogmanship. In short, the capacity to interact with and train dogs was referred to as dogmanship. Hayes, McGreevy, Forbes, Laing and Stuetz (2018) referred to skills and talents of the WDH to form the most functional bond and the ability to get the best performance out of the WD.

#### **2.3.3.1 A dogmanship user guide**

Researchers at the University of Sydney, Payne *et al.* (2017) have compiled a user guide to interpret dogmanship.

### **ADVANTAGES OF GOOD DOGMANSHIP**

Payne *et al.* (2017) listed reasons for practising good dogmanship, i.e. to prevent the emergence of canine behavioural problems such as aggression, reduce the frequency

of dog relinquishment and euthanasia, meet WD's training goals, benefit from a positive relationship with a dog.

### **WDH BEHAVIOURS THAT CONTRIBUTE TO GOOD DOGMANSHIP**

WDH behaviour that contributes to good dogmanship, according to Payne *et al.* (2017), includes Positive reinforcement, i.e. to reward good behaviour by the WD, Affiliation, i.e. appropriate behaviour by WDH to stimulate the reduction of the heart rate and stress levels of WD, the production of "feel good" hormones (oxytocin) and to improve the bond in the dyad, Capturing the WD's attention, i.e. methods employed by WDH to obtain and retain the attention of the WD, Consistency, i.e. training methods applied by the WDH must be consistent to prevent frustration and improve communication between WDH and WD.

### **VARIABLES INFLUENCING GOOD DOGMANSHIP**

Research indicated that some personality traits may predispose a person to have good (or bad) dogmanship (Payne *et al.*, 2017). The personality of the WDH, i.e., conscientious personalities (hard-working), are more inclined to comprehend relevant training principles. Neurotic WDH's performance during practical exercises is poor and tends to underestimate their dog's happiness. The WDH's emotional intelligence may influence his/her dogmanship, i.e. the capacity to recognize and react to other people's emotions. WDH's with high emotional intelligence will be more susceptible to the WD's emotional state.



## CHAPTER 3

### RESEARCH METHODOLOGY

#### 3.1 Research design

A qualitative/quantitative study design was employed. The study used convenience sampling to provide a representative sample of the population (Gerber, 2016). Qualitative and quantitative data were collected using two self-report questionnaires.

#### 3.2. Participants

Participants in the study consisted of N=400 Working Dog handlers from the different working dog organisations in South Africa. Participants were recruited through their respective organisations (gatekeepers) after approval was obtained for WDH's to participate in the study, see Table 3.1. Participants included in the study had to be trained handlers, currently employed handlers, or retired handlers. Working Dog Organisations participating in the study were grouped (N=2 groups) according to the number of responses received (A and B).

**Table 3.1: Populations in study**

No	Working Dog Organisation
1	South African Police Service (SAPS)
2	South African Revenue Service (SARS)
3	Department of Correctional Service (DCS)
4	Durban City Police
5	Cape Town Metro Police
6	City of Tshwane Metro Police (TMPD)
7	Genesis K9 Solutions
8	Braveheart Bio Dog Academy

To describe the inclusion of ethnic groups in the study, Gerber (2016) explained that different factors might affect the degree of attachment in the dyad, i.e. gender, age and ethnicity. All ethnic groups in South Africa have participated in the study. The

different ethnic groups were not identified in the study and are referred to as ethnic groups a, b, c, d or e.

### 3.3 Measuring instruments

A self-report questionnaire was selected for assessing values, behaviours, and expectations (Gerber, 2016) (see Appendix A). The structured questionnaire comprised of close-ended statements and questions. N=2 scales were utilised in the questionnaire, the Monash Dog Ownership Relationship Scale (MDORS), Dwyer *et al.* (2006) and the Animal Welfare Scale (Zalaf & Egan, 2015). The adapted questionnaire comprised five different sections (see Table 3.1).

**Table 3.2: Breakdown of the Questionnaire**

No	Section	Description
1	Section A	Demographical information of WDH
2	Section B	Demographical information of WD
3	Section C	MDORS
4	Section D	Animal Welfare Scale
5	Section E	General Knowledge

**SECTION A**, Demographical information of the WDH. WDH's were asked to report their gender, age, home language, appropriate ethnic group, educational attainment, time worked as WDH, annual income, working environment, working dog organisation, and the number of WD worked with.

**SECTION B**, Demographical information of the WD. WDH's have to indicate the gender, breed of WD, training discipline i.e., patrol dog or explosive detection, age at training, age at retirement and possible causes of retirement.

**SECTION C**, the Monash Attachment to Dog Scale (MDORS) Calvo *et al.* (2016) contains N=28 questions. The MDORS include N=3 subscales, dog/owner interaction (DOI), Perceived Emotional Closeness (EC) and Perceived Costs (PCs).

**SECTION D**, the Animal Welfare Scale (Zalaf & Egan, 2015). The Animal Welfare Scale appeared to be highly reliable, according to Zalaf and Egan (2015). This scale

is quick and easy to use, and assess attitudes to animal welfare, active, passive and ambiguous animal cruelty and the mechanisms related to the actions.

**SECTION E**, General Knowledge. The WDH is asked in the section to indicate what knowledge is required to ensure the physical and psychological well-being of the WD.

### **3.3.1 Monash Dog Owner Relationship Scale (MDORS)**

The MDORS (Dwyer *et al.*, 2006) assess the relationship in the owner/dog dyad and comprises of N=3 subscales, Dog-Owner Interaction (DOI), Perceived Emotional Closeness (PC) and Perceived Cost (PC). Rehn *et al.* (2014) indicated that the MDORS is the most accurate instrument to evaluate the relationship in the dyad from the handler's point of view.

The Dog-Owner Interaction Subscale consists of N=9 items that assess how frequently owners shared a variety of activities with their dog. The Perceived Emotional Closeness subscale comprises N=10 statements that assess how much an owner agrees or disagrees with various statements about social support, bonding, and companionship. The Perceived Costs subscale consists of N=9 statements that assess the degree to which dog ownership is perceived to be inconvenient.

### **3.3.2 Animal Welfare Scale**

The Animal Welfare Scale (Zalaf & Egan, 2015) was developed as a brief screening instrument employed by Anthrozoologists interested in animal welfare, cruelty to animals and anti-social behaviour attributed to animals. This animal welfare scale aims to identify attitudes related to abusive behaviour towards animals.

### **3.3.3 General Knowledge Scale**

The General Knowledge Scale was included to determine what knowledge WDH's consider essential to care for the working dog.

### **3.3.4 Likert response scale**

A symmetrical response scale was employed to maintain accuracy. A 5-point Likert response scale was contained within in the questionnaire consisting of responses

ranging from 1 completely disagree (CD), 2 disagree (D), 3 neutral (N), 4 agree (A), and 5 completely agree (CA) (Chyung, Barkin & Shamsy, 2018).

The symmetrical response scale necessitated the revision of some of the statements in the questionnaire (see Appendix B), i.e. “How often do you kiss your dog” to “I kiss my dog often”. WDO’s in South Africa do not allow WD’s to be kenneled at the residence of the WDH due to the risk of theft, poisoning and or injury to the WD. Reference in the original MDORS and Animal Welfare Scales to dogs or pets were changed to WD’s during this study.

Some of the closed-ended statements in the questionnaire were reverse coded to reduce the likelihood of response set bias, such as acquiescence bias, Chyung *et al.* (2018). “How often do you play games with your dog?” to “I do not often play games with my dog” (see Appendix C). This method was supported by Chyung *et al.* (2018), who explained that the assumption exists during reverse coding that to agree with the positive worded statement (CA) and to disagree with its negative worded corresponding (CD) are the same.

To avoid thoughtless/careless responses by respondents during the administration of the questionnaires, earlier studies proposed suggestions to improve the quality of data and the reporting thereof, i.e., to alert respondents of negatively worded statements and to minimize fatigue during the administration of the questionnaire or not to administer the questionnaire when the respondent is fatigued as respondents may overlook negatively worded statement (Chyung *et al.*, 2018).

### **3.4 Data collection procedures**

Permission to conduct the research was submitted to and approved by the Research Ethics Committee of the University of South Africa (UNISA). Reference number: 2020/CAES\_HREC/160. An application was submitted to different WDO’s in South Africa to include the organisation in the study. Feedback relevant to the application for participation was not received from all WDO’s who were approached.

Well known and experienced WDH’s whom the researcher knows have been appointed to recruit participants in the different WDO’s to participate in the study. This adapted questionnaire was distributed to the field workers and participants in Docx

and pdf format via email. The questionnaire was also available online on Google Forms. The questionnaires were sent via courier to the different fieldworkers at the cost of the researcher. The field workers have signed the Field Workers Confidentiality Agreement that lists their responsibilities during the research project.

Appointments were scheduled with participants, and the administration of the questionnaire took place in person. Online meetings were not required. The option was available to the researcher and field workers to provide an online link to identified participants where needed.

The field workers have included current operational WDH's and WDH's who have retired/resigned from the different WDO's to participate in the study. All participants are requested to sign the informed consent note with the administration of the questionnaire. The participants were also informed by the researcher/fieldworkers that their participation is voluntary and that they can withdraw from the study at any time in terms of the Ethics Policy of Unisa.

Once the completed questionnaire (hard/soft copies) was received from the participant or field worker via courier, email or google forms, the researcher perused questionnaires to exclude inconsistencies, i.e. incomplete, inaccurate questionnaires or informed consent note not completed. The accepted questionnaires were then allocated a reference number was captured on an Excel spreadsheet. The captured questionnaires are then filed in a secure cabinet under lock and key.

Section B did not apply to all participants. WDH's whose current duties include management, breeding and trainer responsibilities have been requested not to complete Section B. This measure was necessary as the different groups indicated that they had not been deployed operationally for a time and thus do not remember all the details required for Section B.

### **3.5 Data analysis**

Multiple statistical methods were used to analyse the data to identify significant differences between groups and possible drivers of these differences. Careful consideration should be given to the nature of the data, which consists of four data types.

Firstly, two types of categorical data are available: nominal and ordinal. The former comprises data organized into categories that do not have any order (Section A, B). The latter consists of ordered categories, as seen in the case of Likert- as well as interval scales (Section A-E). Lastly, continuous quantitative data is available in the case of demographic data (Section A).

Beyond the data type, the appropriate set of tests used would also depend on the distribution of the data and whether it is normal or non-normal, which can be tested using Kolmogorov–Smirnov, Shapiro-Wilks, or Anderson-Darling tests, among others (Stephens, 1974) which will be among the first tests performed.

The next set of tests involves examining relationships between multiple sets of variables. The simplest application may involve using Chi-Square tests (Pearson, 1900). Chi-Square tests are used to assess whether two categorical variables are related in a population. In this study, the application is varied, e.g., Identify whether one categorical variable (income) is independent of another (education). Applying a Chi-Square test would allow one to state whether there is a relationship between income and education or not. However, this result does not indicate the strength of association between the variables involved.

Test methods appropriate for testing for the strength of association between nominal and ordinal variables are the Mann-Whitney U (Mann & Whitney, 1947), Kruskal-Wallis (Kruskal & Wallis, 1952) ANOVA tests. The use of the former tests (KW and MWU) makes four assumptions: The use of categorical data (an ordinal dependent and categorical independent), similar distributions (Figure 1) and independence between groups tested as well as non-normal distributions.

ANOVA tests are more applicable if data is normally distributed. In the case of comparing the strength of association between two nominal variables, an appropriate test is Cramer's V (Cramer, 1946). Initial associations to be tested involve the relationship between the MDORS score (Section C), Animal welfare scale (Section D), General knowledge (Section E), gender, educational attainment, and income.

With regards to identifying trends in the data, applying Principal Component Analyses or Exploratory Factor Analyses to some datasets such as sections C-E is appropriate. These analyses aim to reduce the complexity or dimensionality of the data for the sake

of simplicity and has previously been employed on MDORS questionnaire datasets (Calvo *et al.*, 2016). These analyses often depend on a set of correlations (Pearson, 1901), such as the Pearson correlation, which is a parametric method of correlation. However, in the case of ordinal data types, Polychoric analyses might be more appropriate. Polychoric analyses are non-parametric clustering techniques that provide a viable option for analysis of Likert scale data and are superior to Pearson correlations in some models (Holgado-Tello, Chacón–Moscoso, Barbero–García & Vila–Abad, 2008; Choi, Peters & Mueller, 2010).

Multiple statistical methods were used to analyse the data to identify significant differences between groups and possible drivers of these differences. All tests were performed using the package *psych* in R version 1.3.1093 (Revelle, 2021) and Dunn-test (Dinno, 2015). This was done after WDO split the total population into SAPS and NON-SAPS groups, and summary statistics were calculated. When applicable, missing data were replaced by mean-point substitution or neutral-point substitution (Downey & Craig, 1998).

Shapiro-Wilks tests were conducted on the sum of scores for subscales C-E (Stephens, 1974) to assess the distributions of each. Subsequently, Mann-Whitney U (Mann & Whitney, 1947) and Kruskal-Wallis (Kruskal & Wallis, 1952) tests were conducted using the scores of section C-E and each of the demographic categories in the dataset with particular emphasis on gender, income, education and WDO. A post-hoc Dunn-test was followed up if the null hypothesis was rejected (Dunn, 1964).

Principal Component Analyses or Exploratory Factor Analyses were conducted on sections C-E. These analyses aim to reduce the complexity or dimensionality of the data for the sake of simplicity and has previously been employed on MDORS questionnaire datasets (Calvo *et al.*, 2016). These analyses were done after Polychoric analyses (Holgado-Tello *et al.*, 2008; Choi *et al.*, 2010).

## CHAPTER 4

### RESULTS

#### 4.1 Study sample size

The analysis was based on a sample of ( $n = 389$ ) Working Dog Handler (WDH) in South Africa and was divided into ( $n = 2$ ) populations, Population A ( $n = 265$ ) and Population B ( $n = 124$ ) for comparison.

#### 4.2 Demographic representation of the population

##### 4.2.1 Gender

Notable differences in the demographic variable “Gender” have been observed. The largest proportion of WDH’s in the total study population was male ( $n = 313$ ) and ( $n = 71$ ) female. Population A included ( $n = 212$ ) male and ( $n = 53$ ) female WDH’s, presented in Figure 4.1, similarly Population B presented in Figure 4.2 comprises of ( $n = 106$ ) male and ( $n = 18$ ) female WDH’s.

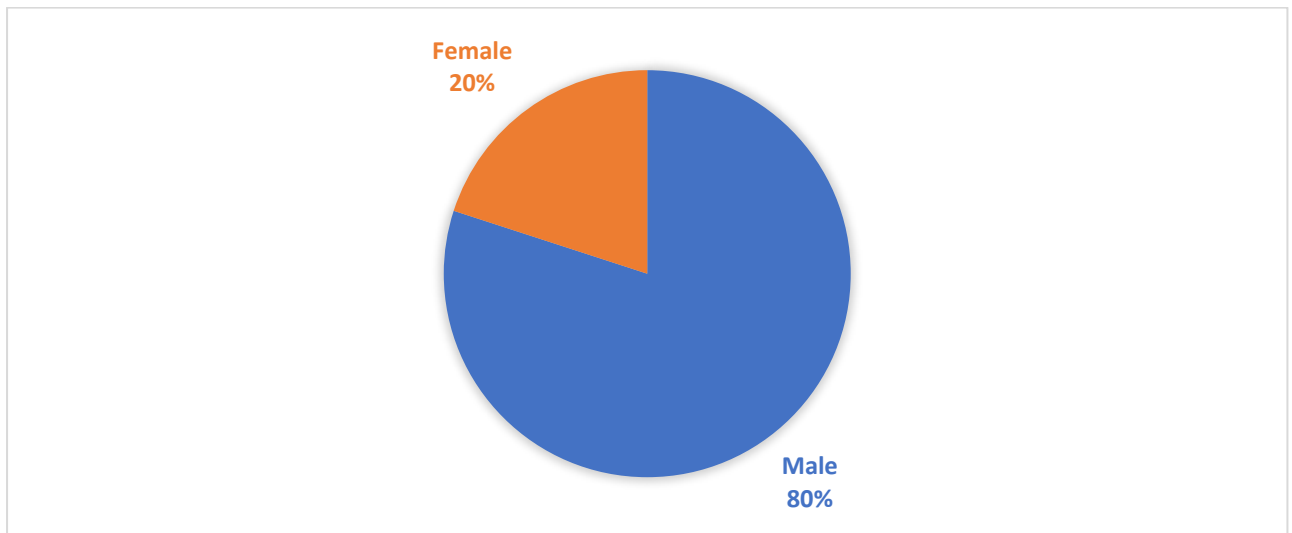
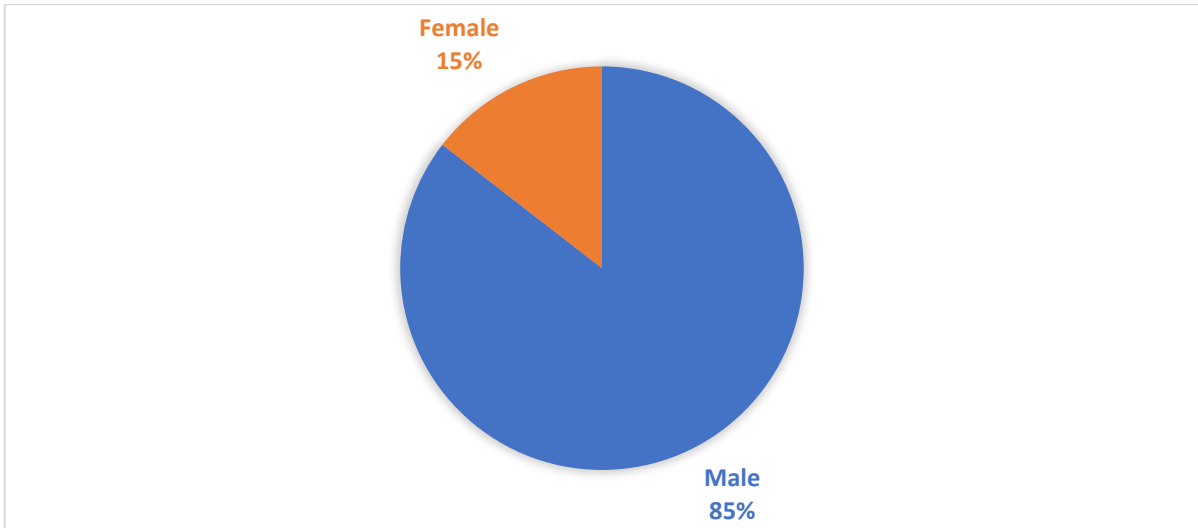


Figure 4.1: Population A: Gender





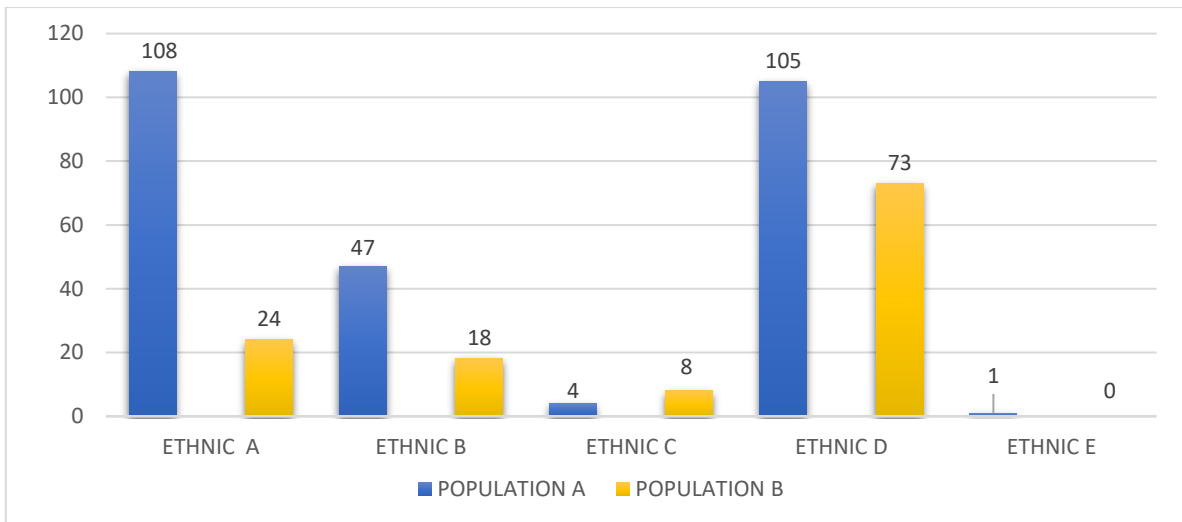
**Figure 4.2: Population B: Gender**

Insignificant differences ( $p > 0,05$ ) were found in Population A and B for “Gender” as a demographic variable influence on the Monash Owner Dog Interaction Scale (MDORS), the Animal Welfare Scale and General Knowledge Scale.

#### **4.2.2 Working dog handler ethnicity**

Notable differences were found in the variable” Ethnicity” in the study population. The largest proportion of WDH’s ethnic groups was in Ethnic groups A and D in Population A and B. In Population A, Ethnic group A included ( $n = 108$ ) and Ethnic group D ( $n = 105$ ) WDH’s. In Population B, Ethnic group A comprises of ( $n = 24$ ) and Ethnic group D ( $n = 73$ ). Ethnic Groups B and C in both Population’s WDH’s constituted smaller populations, see Figure 4.3.

In Population A, Ethnic group B included ( $n = 47$ ) WDH’s, group C ( $n = 4$ ), in Population B, Ethnic group B incorporated ( $n = 18$ ) WDH’s and in Ethnic group C ( $n = 8$ ) WDH’s.

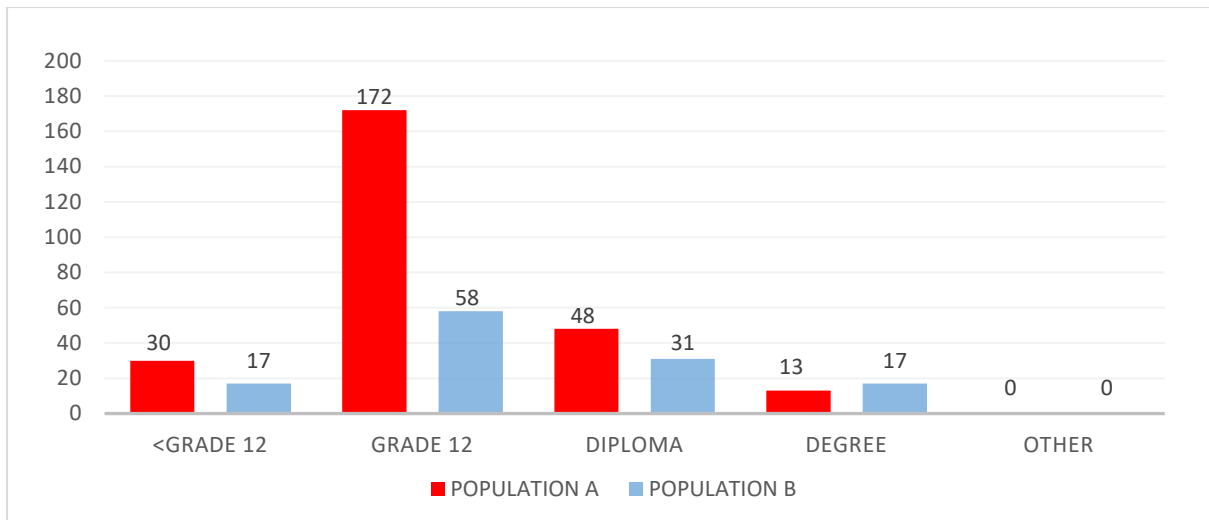


**Figure 4.3: Working dog handler ethnicity**

Significant differences were found in the demographic variable “Ethnicity” in Population A and B. The variable “Ethnicity” showed significant differences in the MDORS scale, Population A ( $p = 0,002149$ ) and Population B ( $p = 1,42E-05$ ). Significant differences were also noted with the variable “Ethnicity” in Population A ( $p = 0,000153$ ) with the Animal Welfare Scale.

#### **4.2.3 Working dog handler educational attainment**

The majority of WDH’s in Populations A ( $n = 172/$ ) and B ( $n = 58$ ) obtained only a Grade 12 qualification. High School (Grade 12) were not completed by ( $n = 30$ ) WDH’s in Population A and ( $n = 17$ ) WDH’s in Population B. WDH’s who have obtained a diploma constituted ( $n = 48$ ) WDH’s in Population A and ( $n = 31$ ) WDH’s in Population B. Degrees were obtained by ( $n = 13$ ) WDH’s in Population A and ( $n = 17$ ) WDH’s in Population B. In Population A ( $n = 2$ ) WDH’s and in Population B ( $n = 1$ ) did not state their educational attainment, see Figure 4.4.



**Figure 4.4: Working dog handler educational attainment**

A significant finding was noted with the variable “Educational attainment” in Population A ( $p = 0,01481$ ) with the Animal Welfare Scale and in Population B ( $p = 0,03277$ ) with the General Knowledge Scale.

#### **4.2.4 Working dog handler annual income**

Population A received a higher annual income than Population B, see Figure 4.5. The income group (0-to-150 000) was closely related in both Populations A and B ( $n = 28$ ) and ( $n = 24$ ) respectively. The largest income group (150 000-to-250 000) was in Population A ( $n = 81$ ) WDH’s. A similar income was reported by WDH’s in income groups 250 000-to-350 000 and >350 000 in both Populations A and B. The annual income reported in Population A for both income groups was ( $n = 51$ ) and Population B ( $n = 33$ ). A large portion of WDH’s in both Population’s A and B did not report their annual income ( $n = 54$ ) in Population A and Population B ( $n = 10$ ) WDH’s.

Insignificant differences ( $p > 0,05$ ) were found in Population A and B for “Annual income” as a demographic variable in the MDORS scale (MDORS), the Animal Welfare Scale and General Knowledge Scale.

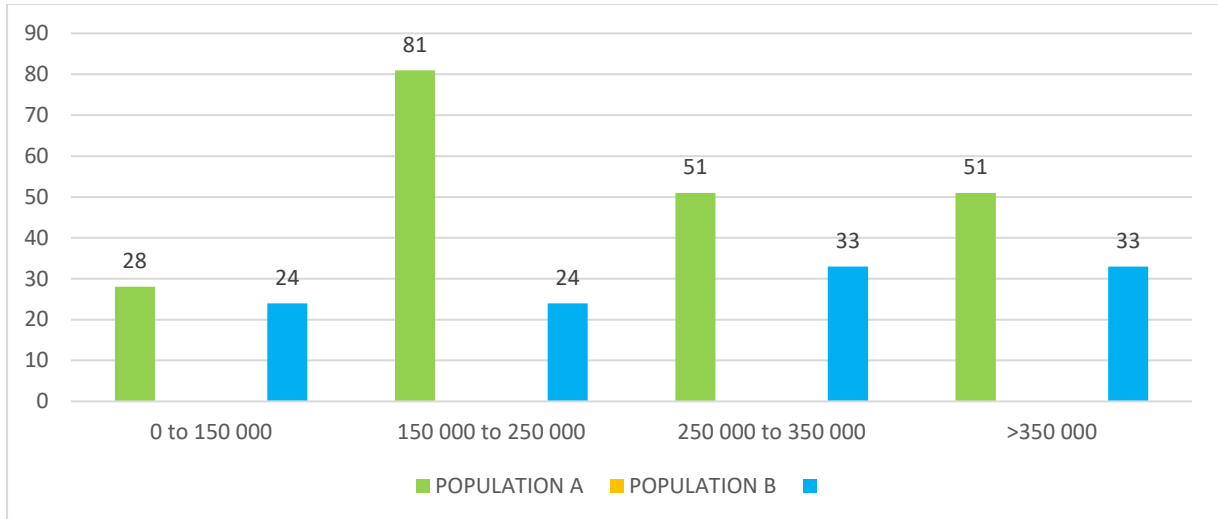


Figure 4.5: Annual income of working dog handlers

#### 4.2.5 Working dog handler age

The results disclosed that Population A in age group 26-to-35 comprised of ( $n = 41$ ) WDH's, 36-to-45 ( $n = 107$ ) WDH's and 46-to-55 ( $n = 106$ ) WDH's compared to Population B in age group 26-to-35 ( $n = 18$ ) WDH's, 36-to-45 ( $n = 36$ ) WDH's and 46-to-55 ( $n = 8$ ) WDH's, see Figure 4.6. A minor difference in the total WDH's was observed in the age group "older than 55" where Population A attained ( $n = 10$ ) WDH's and Population B attained ( $n = 8$ ) WDH's. In the age group, 18-to-25 Population B obtained ( $n = 15$ ) WDH's and Population A obtained ( $n = 1$ ) WDH's.

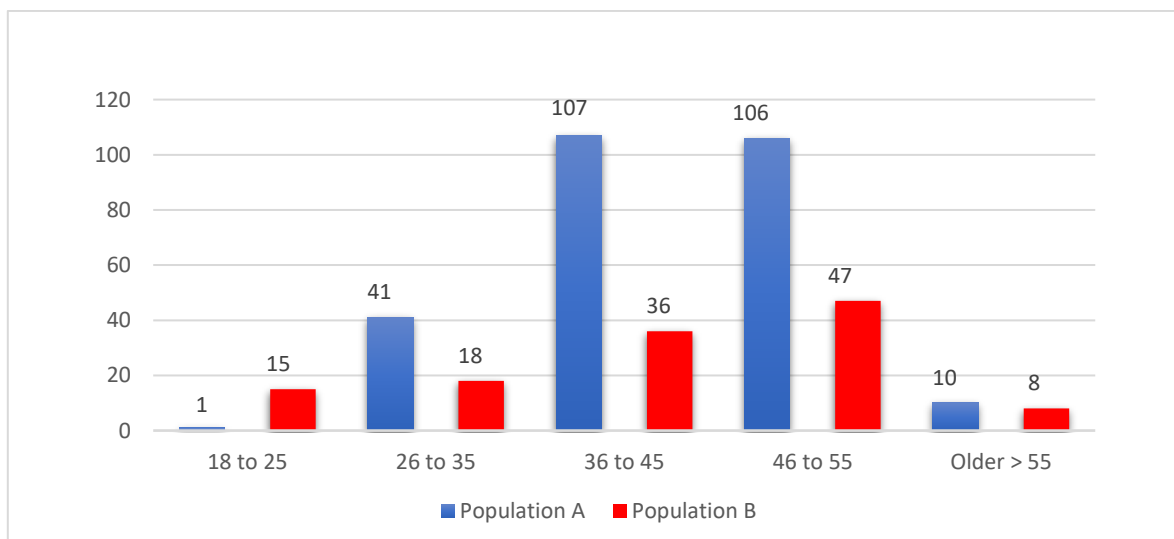


Figure 4.6: Working dog handler age

A significant result ( $p = 0,01366$ ) was found with the demographic variable "Age" in the General Knowledge Scale in Population B, see Table 4.7.

#### 4.2.6 Working dog handler experience

In the group “Novice to 5 years” both Populations A and B obtained an almost similar number of WDH’s, Population A ( $n = 48$ ) WDH’s and Population B ( $n = 45$ ) WDH’s. In groups 6-to-10 years ( $n = 49$ ) WDH’s 11-to-15 years ( $n = 71$ ) WDH’s, 16-to-20 years ( $n = 23$ ) WDH’s, 21-to-25 years ( $n = 33$ ) WDH’s and >25 years ( $n = 40$ ) WDH’s. In contrast Population B obtained in the 6-to-10 years group ( $n = 24$ ) WDH’s, 11-to-15-year group ( $n = 20$ ) WDH’s, 16-to-20-year group ( $n = 14$ ) WDH’s, 21-to-25-year ( $n = 6$ ) WDH’s and in the >25-year group ( $n = 15$ ) WDH’s see Table 4.7.

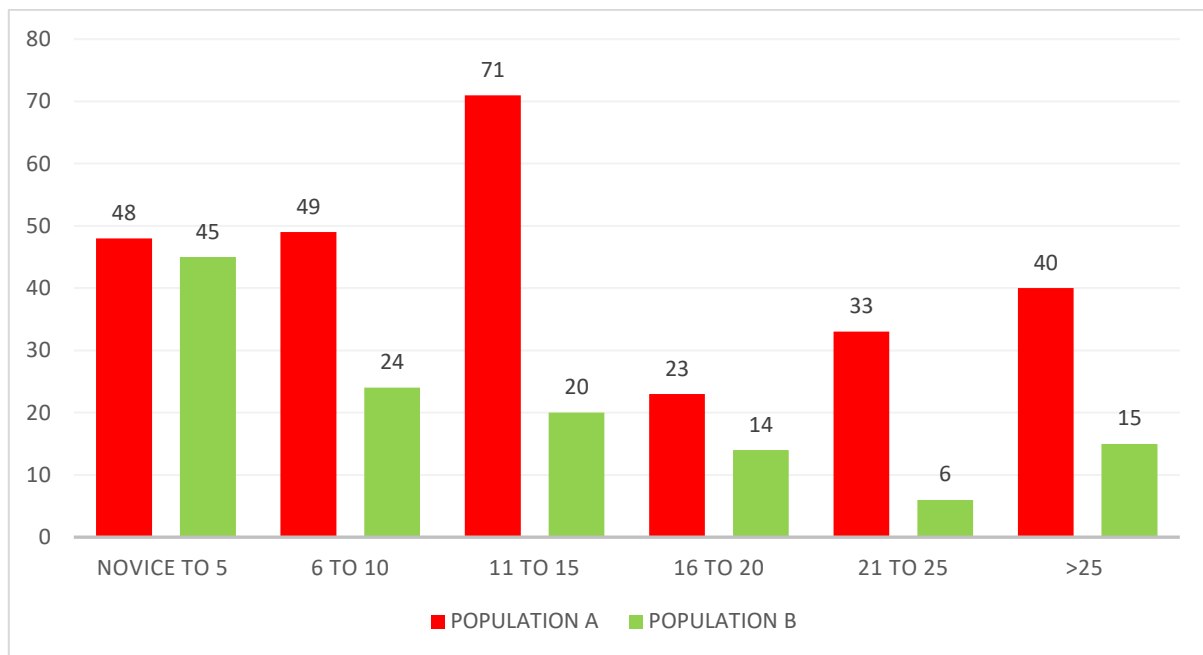
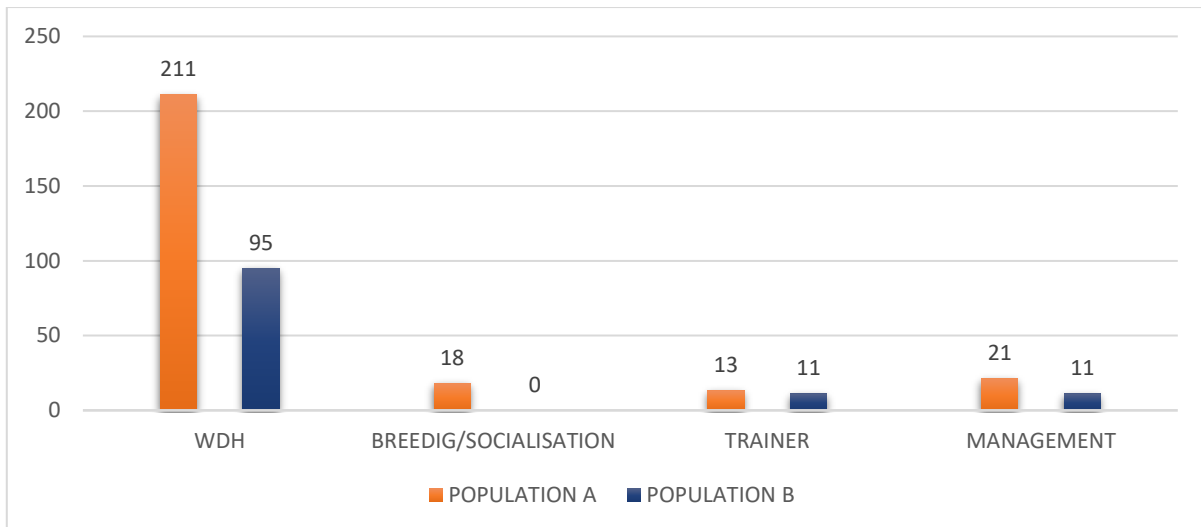


Figure 4.7: Working dog handler experience in years

Significant results were found with the variable “Experience” in Population A with the MDORS Scale ( $p = 0.001811$ ) and the Animal Welfare Scale ( $p = 0.002321$ ).

#### 4.2.7 Working dog handler function

Population A included ( $n = 211$ ) and Population B ( $n = 95$ ) WDH’s. Trainers were the smallest group represented in both populations with similar values, Population A included ( $n = 13$ ) and Population B ( $n = 11$ ) trainers. Results for management showed that values for management in Population A were slightly higher ( $n = 21$ ) trainers compared to Population B with N ( $n = 11$ ) trainers, see Figure 4.8.



**Figure: 4.8 Working dog handler function**

Significant results were found with the variable “Working Dog Handler Function” in Population A with the Animal Welfare Scale ( $p = 0,004322$ ).

### 4.3 Descriptive statistics

Multiple statistical methods were used to analyse the data and identify significant differences between groups and possible drivers. All analyses were performed using the package psych in R version 1.3.1093. Working Dog Handler responses for surveys with Likert scale items in Section’s C, D and E were analysed and summarised, see Table 4.1-to-4.3.

Descriptive statistics were employed to calculate means, standard deviation (SD) and coefficient of variance (CV) to describe questionnaire-based Working Dog Handler (WDH) data/variables. A  $CV \geq 1$  means that distributions with a coefficient of variation higher than 1 are high variance, whereas those with a CV lower than 1 are low variance. The descriptive statistics were used to compare variables in the  $n = 2$  populations in the study, i.e., Population A and Population B.

#### 4.3.1 Monash Dog Owner Relationship Scale (MDORS)

##### 4.3.1.1 Descriptive statistics of MDORS questions of section C for Population A and B

The total scores of WDH’s in Population B (Mean 3,95; SD 1,39) showed a small difference in the (CV) 0,35 in the mean score of the statement “I often play games with

my dog compared to the CV 0,28 in Population A (Mean 4,22; SD 1,22). WDH's scores in Population B (Mean 3,94; SD 1,28) indicated a slightly higher CV 0,32 for the statement "I often buy my dog presents) in contrast with CV 0,34 in Population A (Mean 4,38; SD 1,51). A higher CV 0,60 in Population A (Mean 2,42; SD 1,46) was found for the statement "I often let my dog drive with me" compared to the CV 0,56 in Population B (Mean 2,82; SD 1,59), see Table 4.1 A.

**Table 4.1 A: Sub-Scale: Dog-Owner Interaction**

	POPULATION A			POPULATION B		
	Mean	Sd	Se	Mean	Sd	Se
Kiss	3,49	1,26	0,08	3,48	1,36	0,12
Games	4,22	1,22	0,08	3,95	1,39	0,12
Visit	3,48	1,51	0,09	3,36	1,50	0,13
Buy	4,38	0,98	0,06	3,94	1,28	0,11
Give food treats	3,77	1,37	0,08	3,67	1,40	0,13
Private vehicle	2,42	1,46	0,09	2,82	1,59	0,14
Hug	4,38	1,04	0,06	4,44	1,03	0,09
Relax	2,81	1,56	0,10	2,76	1,51	0,14

Se = Standard error, Sd = Standard deviation

The coefficient of variance score in the total scores of Population A and B showed no variation in the sub scale Emotional Closeness, see Table 4.1 B.

**Table 4.1 B: Sub-Scale: Emotional Closeness**

	POPULATION A			POPULATION B		
	Mean	Sd	Se	Mean	Sd	Se
Tough Times	1,93	1,23	0,08	2,01	1,37	0,12
Comforted	4,10	1,11	0,07	4,16	1,10	0,10
Will be there for me	4,37	1,06	0,06	4,44	0,94	0,08
Dog.near.me	2,04	1,40	0,09	1,88	1,24	0,11
Constant companionship	4,26	1,07	0,07	4,31	1,04	0,09
Tell my dog things	3,32	1,47	0,09	3,28	1,45	0,13
Constant attentive	4,20	1,15	0,07	4,14	1,02	0,09

When my dog dies	1,52	1,16	0,07	1,54	1,13	0,10
Reason to get up	4,28	0,99	0,06	4,27	0,96	0,09
Never been apart	4,17	1,18	0,07	4,18	1,10	0,10

Se = Standard error, Sd = Standard deviation

The total scores of WDH's showed a slightly higher CV 0,72 for the statement "How often do you feel that looking after your dog is a chore" in Population A (Mean 1,42; SD 1,02) compared to the CV of 0,64 in Population B (Mean 1,31; SD 0,85). A slightly higher CV 0,33 for the statement "It bothers me that my dog stops me doing things I enjoyed doing before I owned it" was observed in Population B (Mean 3,96; SD 1,33) in contrast with the CV 0,29 in Population A (Mean 4,11; SD 1,23).

The statement "My dog makes too much of a mess" had a higher CV 0,62 in Population A (Mean 1,8; SD 1,12) compared to the CV of 0,56 in Population B (Mean 1,75; SD 0,98). In Population A (Mean 3,76; SD 1,54), the statement "How often do you feel that having a dog is more trouble than it is worth" also had an elevated CV 0,40 opposed to the CV of 0,24 in Population B (Mean 4,45; SD 1,08) see Table 4.1 C.

**Table 4.1 C: Sub-Scale: Perceived Costs**

	POPULATION A			POPULATION B		
	Mean	Sd	Se	Mean	Sd	Se
Dog is a burden (chore)	1,42	1,02	0,06	1,31	0,85	0,08
Change my plans	1,67	1,04	0,06	1,59	0,96	0,09
Dog stops to do things	1,70	1,06	0,06	1,76	1,16	0,10
Not any aspects	3,40	1,53	0,09	3,46	1,45	0,13
Things I have enjoyed	4,11	1,23	0,08	3,96	1,33	0,12
Expensive	3,94	1,33	0,08	3,48	1,36	0,12
Too much of a mess	1,80	1,12	0,07	1,75	0,98	0,09
Worth the trouble	3,76	1,54	0,09	4,45	1,08	0,10
Hard to look after dog	1,55	0,99	0,06	1,70	1,08	0,10

Se = Standard error, Sd = Standard deviation



#### 4.3.1.2 Descriptive statistics for animal welfare questions of section D for Population A and B

The total scores in Population B (Mean 1,54; SD 1,12) showed a small increased CV 0,72 for the statement “Working dogs cannot show their affection for their handlers” as opposed to the CV of 0,69 in Population A (Mean 1,53; SD 1,06). Population A (Mean 3,24; SD 1,58) indicated a CV of 0,48 in contrast with the CV of 0,54 in Population B (Mean 2,8; SD 1,52) for the statement “Handlers of working dogs cannot do whatever they feel like with the dog”.

WDH’s total scores in Population B (Mean 1,78; SD 1,44) and Population A (Mean 1,92; SD 1,52) showed a similar CV of 0,80 and a CV of 0,79 for the statement “Releasing your anger on the dog will not help you to feel better”. A slightly increased CV of 0,207 was also seen with the total scores of WDH’s in Population A (Mean 4,67; SD 0,97) for the statement “It is not a requirement to clean a dog’s living space daily” in relation to the CV of 0,14 of Population B (Mean 4,83; SD 0,71). Population A (Mean 4,64; SD 0,97) had a CV 0,20 for the statement “Working-dogs does not need to be kept in comfortable living conditions” opposed to the CV of 0,16 of Population B (Mean 4,73; SD 0,78), see Table 4.2.

**Table 4.2: Animal Welfare Scale**

	Population A			Population B		
	Mean	Sd	Se	Mean	Sd	Se
Fear	1,62	1,07	0,07	1,52	1,03	0,09
Show	1,53	1,06	0,07	1,54	1,12	0,10
Feel like	3,24	1,58	0,10	2,80	1,52	0,14
Treated	4,19	1,29	0,08	4,03	1,40	0,13
Releasing	1,92	1,52	0,09	1,78	1,44	0,13
Stricter	2,16	1,38	0,08	1,85	1,11	0,10
Size	1,99	1,34	0,08	2,09	1,45	0,13
Hunt	3,33	1,52	0,09	3,06	1,48	0,13
Punished	1,47	0,94	0,06	1,45	0,99	0,09
Clean	4,67	0,97	0,06	4,83	0,71	0,06

Comfortable	4,64	0,97	0,06	4,73	0,78	0,07
Animal abuse	2,16	1,45	0,09	2,38	1,52	0,14

Se = Standard error, Sd = Standard deviation

#### **4.3.1.3 Descriptive statistics for general knowledge questions of section E for Population A and B**

The WDH in Population B (Mean 4,29; SD 1,04) showed a slight increased CV 0,24 for the statements “The handler must have knowledge of the 5 Freedoms” compared to the CV of 0,18 in Population A (Mean 4,49; SD 0,84). The statement “Knowledge of K9 Behaviour is an important tool for handlers” obtained a CV of 0,12 in Population B (Mean 4,79; SD 0,58) and a CV of 0,10 in Population A (4,77; SD 0,51).

Population A (Mean 4,57; SD 0,70) and Population B (Mean 4,56; SD 0,73) obtained a similar CV of 0,15 and 0,16 for the statement “The handler must have knowledge of dog anatomy and physiology”. In Population A (Mean 3,97; SD 1,21) the statement “Knowledge of husbandry practices is important” also showed an increased CV 0,30 in relation to the CV 0,29 in Population B (Mean 3,85; SD 1,13).

WDH’s scores in Population B (Mean 1,47; SD 1,04) found a slightly increased CV of 0,70 for the statement “Nutrition of the working dog is of no concern to the handler” opposed to the CV of 0,63 in Population A (Mean 1,37; SD 0,87). A, almost similar CV of 0,2 in the total scores of WDH’s in Population A (Mean 4,65; SD 0,93) and a CV of 0,18 in Population B (Mean 4,70; SD 0,86) was found for the statements “It is required of the handler to have knowledge of signs of ill health of the dog”. In Population A (Mean 1,75; SD 1,41), a CV of 0,80 was found for the statement, “It is not important to know first aid for a working dog” compared to the CV of 0,78 in Population B (Mean 1,76; SD 1,39).

Population A (Mean 2,29; SD 1,47) showed a slightly increased CV of 0,64 for the statement “Knowledge of basic medications and treatments should lie with veterinary personnel instead of handlers” in contrast with the CV of 0,58 in Population B (Mean 2,52; SD 1,47). Population B (Mean 2,79; SD 1,57) also showed a lower CV of 0,56 for the statement “Internal and external parasite control is the responsibility of the kennel manager/official opposed to the CV of 0,62 of Population A (Mean 2,50; SD 1,57).

**Table 4.3: General Knowledge Scale**

	POPULATION A			POPULATION B		
	Mean	Sd	Se	Mean	Sd	Se
Animal Protection Act	1,63	1,21	0,07	1,66	1,19	0,11
Five Freedoms	4,49	0,84	0,05	4,29	1,04	0,09
K9 behaviour	4,77	0,51	0,03	4,79	0,58	0,05
Anatomy and Physiology	4,57	0,70	0,04	4,56	0,73	0,07
Husbandry	3,97	1,21	0,07	3,85	1,13	0,10
Nutrition	1,37	0,87	0,05	1,47	1,04	0,09
Body Condition Score	1,49	0,93	0,06	1,75	1,14	0,10
Basic examination	1,59	1,19	0,07	1,56	1,19	0,11
Ill health	4,65	0,93	0,06	4,70	0,86	0,08
First Aid	1,75	1,41	0,09	1,76	1,39	0,12
Diseases and conditions	4,60	0,94	0,06	4,62	0,96	0,09
Medication's treatments	2,29	1,47	0,09	2,52	1,47	0,13
Parasites	2,50	1,57	0,10	2,79	1,57	0,14

Se = Standard error, Sd = Standard deviation

The Shapiro-Wilks tests for normality were conducted on the total scores for each participant shown in Table 4.4. Significance was observed with the Section C: MDORS in Population A ( $p = 0.00084$ ) and Section D: Animal Welfare Scale ( $p = 1.01E-06$ ). Both Population A ( $p = 1.04E-07$ ) and B ( $p = 6.25E-05$ ) indicate significant results for Section E: General Knowledge Scale.

**Table 4.4: Shapiro-Wilks's test results for the total scores of section C to D**

SECTION	POPULATION	W	P-VALUE
Section C-MDORS	A	0,97987	0,00084*
	B	0,98908	0,4308
Section D-Animal Welfare Scale	A	0,95988	1,01E-06*
	B	0,98244	0,1075
Section E-General Knowledge Scale	A	0,95153	1,04E-07*
	B	0,94416	6,25E-05*

W = Coefficient of Concordance

#### **4.4 Monash Dog Owner Relationship Scale factor analysis**

The adapted Monash Dog Owner Relationship Scale (MDORS) for Population A and B were considered for Factor Analysis (FA). The question regarding grooming was poorly answered (>38% missing data) and thus excluded from the analysis. Other missing data (<5% per question) was imputed using mean point replacement. A Shapiro-Wilks test was performed on, each participant's total score, and significantly differed from a normal distribution for Population A whilst accepting the normal distribution for Population B as seen in Table 4.4. Bartlett's test of sphericity was applied on both Population A and B and reached significance for Populations A ( $p = 9,989972e-160$ ) and B and ( $p = 2,563155e-38$ ).

This was followed by Kaiser-Meyer-Olkin factor adequacy tests and yielded MSA scores of 0,53 for Population A and 0,43 for Populations B, respectively. MSA scores below 0,5 are considered unacceptable for FA, whilst values below 0,6 are considered poor. Factor Analysis was attempted on the MDORS responses of Population A following Polychoric correlations, see Annexure D. Parallel analysis with a minimum residual solution suggested 7 factors accounting for 48,9% of the observed variance.

This was followed by FA using a ProMax rotation. Factor loadings are summarised in Annexure E.

The identified factors did not correspond to the MDORS subscales except for factors 6 and 7, which had the highest loadings for items in the subscale regarding Dog Owner Interaction and accounted for 5% and 9% of the overall variation. Factor 1 was exclusively associated with the subscale regarding Emotional Connection and accounted for 13% of the total variation. No clear pattern of subscale subdivision was further evident. Subsequent clustering analysis of the Polychoric Correlation matrix showed a single cluster for Population A (Cluster fit = 0,72, Pattern fit = 0,91, RMSR = 0,1) shown in lower-order clusters did not correspond to MDORS subscales, see Annexure D.

#### **4.5 Kruskal-Wallis results for each demographic factor**

Kruskal-Wallis tests were performed using the total scores for the MDORS, Animal welfare and general knowledge sections respectively as dependent variables and all

demographic variables in Section A: (MDORS), Section B: Animal Welfare, and Section C: General Knowledge as independent variables. Significant results were reported in Tables 4.5 – 4.7. Significant results were investigated further using a post-hoc Dunn test with significant pairwise comparisons shown in Annexure F. Categories showing significant differences were plotted for visual comparison with some examples, see Annexure C.

#### 4.5.1 Significant demographic factors and the Monash Dog Owner Relationship Scale

The MDORS were influenced by ( $n = 3$ ) demographic factors in both Population A and B. The factor “language” showed significance in both Population A ( $p = 0,01$ ) and Population B ( $p = 0,002149$ ). Significance was also indicated with the factor “ethnicity” in both Population A ( $p = 0,01$ ) and in Population B ( $p = 1,42E-05$ ). Only in Population A ( $p = 0,001811$ ) the factor “experience” showed significant differences, see Table 4.5.

**Table 4.5: Kruskal-Wallis results for the demographic factors and the Monash Dog Owner Interaction Scale (MDORS)**

Section	Demographic Factor	Population	Kruskal-Wallis Chi-Square	df	p-value
Section C MDORS	Language	A	23,4059	11	0,01
		B	16,5889	4	0,002149
	Ethnicity	A	22,5004	11	0,01
		B	27,728	4	1,42E-05
	Experience	A	22,7157	6	0,001811

Df = Degrees of Freedom

#### 4.5.2 Significant demographic factors and the Animal Welfare Scale

In Population A, significant differences in Animal Welfare were shown by the factor’s “language” ( $p = 0,002512$ ), ethnicity ( $p = 0,000153$ ), “education” ( $p = 0,01481$ ), “experience” ( $p = 0,002321$ ) and “function” ( $0,004322$ ), see Table 4.6.

**Table 4.6: Kruskal-Wallis Results for the demographic factors and the Animal Welfare Scale**

Section	Demographic Factor	Population	Kruskal-Wallis Chi-Square	df	p-value
Section D Animal Welfare	Language	A	28,716	11	0,002512
	Ethnicity	A	22,5914	4	0,000153
	Education	A	15,81	6	0,01481
	Experience	A	22,2273	7	0,002321
	Function	A	15,1903	4	0,004322

Df = Degrees of Freedom

### 4.5.3 Significant demographic factors and the General Knowledge Scale

General knowledge in Population A was influenced by significant differences with the factors “age” ( $p = 0,05299$ ), “experience” ( $p = 0,07418$ ) and “environment” ( $p = 0,03246$ ), see Table 4.7. In Population B, significant differences for general knowledge were showed by the factors “age” ( $p = 0,01366$ ), “language” ( $p = 0,03422$ ) and “education” ( $p = 0,03277$ ).

**Table 4.7: Kruskal-Wallis results for the demographic factors and the General Knowledge Scale**

Section	Demographic Factor	Population	Kruskal-Wallis Chi Square	df	p-value
Section E General Knowledge	Age	A	9,3467	4	0,05299
		B	12,557	4	0,01366
	Experience	A	12,916	7	0,07418
	Environment	A	8,7736	3	0,03246
	Language	B	20,919	11	0,03422
	Education	B	13,733	6	0,03277

Df = Degrees of Freedom

## 4.6 Kruskal-Wallis test results for the Five Freedoms

### 4.6.1 Gender, income and educational attainment results for the Five Freedoms

Insignificant results found with “Gender” in both Population A (chi-squared = 0,019883,  $p = 0,8879$ ) and Population B (chi-squared = 0,37352,  $p = 0,5411$ ) with the Five

Freedoms. Likewise, “Annual income” was insignificant in Population A (chi-squared = 2,6964,  $p = 0,4408$ ) and Population B (chi-squared = 3,7155,  $p = 0,2939$ ) with the Five Freedoms. Educational attainment as a demographic variable result indicated significance in Population A (chi-squared = 14,994,  $p = 0,01039$ ) with the Five Freedoms, see Table 4.8.

**Table 4.8: Working dog handler demographical influences on the Five Freedoms**

DEMOGRAPHIC VARIABLE	POPULATION A	POPULATION B
Gender	$p = 0.8879$	$p = 0.5411$
Ethnicity	$p = 0.73$	$p = 0.7216$
Education	$p = 0.01039$	$p = 0.959$
Annual income	$p = 0.4408$	$p = 0.2939$
Age	$p = 0.02775$	$p = 0.4106$
Experience	$p = 0.3766$	$p = 0.2173$

#### 4.6.2 Function of the working dog handler in the organisation

The function of the WDH in the different WDO in SA was also examined to determine if a significant difference ( $p < 0,05$ ) can be observed with the different functions i.e., (WDH, Breeding/Socialisation, Trainer and Management) and the Five Freedoms in the study. Insignificant results were found for “Function” as a demographic variable with the Five Freedoms in Population A ( $p = 0,06189$ ) and Population B ( $p = 0,7113$ ), see Table 4.9.

**Table 4.9: Role players perception of the Five Freedoms in the working dog organisation**

	Population A			Population B		
	N	Mean	SD	N	Mean	SD
Working Dog Handler	211	4.49	0.81	95	4.32	1.06
Breeding/Socialisation	18	3.94	1.39	N/A	N/A	N/A
Trainers	13	4.69	0.48	11	4.23	0.98
Management	21	4.81	0.51	11	4.09	1.14
	$p = 0.06189$			$p = 0.7113$		

## CHAPTER 5

### DISCUSSION

#### 5.1 Demographics of the population

##### 5.1.1 Working dog handler gender

A significant gender bias was noted in the ( $n = 2$ ) WDH populations in the present study that was not unique to the WDE globally (Alexander, Friend and Haug, 2011). Research showed, Kotrschal, Schöberl, Bauer, Thibeaut and Wedl (2009) that gender and personality influenced interaction, behaviour and productivity of the handler/dog dyad. Lefebvre, Diederich, Delcourt, Stevens, and Giffroy (2007) also referred to the importance of the relationship in the handler/dog to prevent behavioural problems.

Herzog (2007) showed no differences between men and women's attachment to animals, which corresponds to the current study's findings. The statement by Herzog was underlined by Bartone and Blazina (2016), who stated that behavioural differences between men and women as a "result of genes and hormones" was overstated and were most likely due to "social norms and socialisation".

##### 5.1.2 Working dog handler ethnicity

The demographic variable "ethnicity" showed significant differences in both the study populations, see Annexure F. In this regard, Risley-Curtiss, Holley and Wolf (2006) elucidated that the relationships with animals were complex. However, no research can be found exploring the effect of ethnicity in the relationship with animals.

The study by Baderoon (2017) explained that complex history of forging unpredictability with racialised ideologies surrounding dogs illustrates what kind of relationship some ethnic groups have with dogs, see Annexure F. Baderoon (2017) referred to the comments of a prominent political figure in South African politics at Impendle in KwaZulu Natal during December 2012 "[s]pending money on buying a dog, taking it to the vet and for walks belonged to Ethnic 4 culture and was not the Ethnic group 1 way, which was to focus on the family" (South African Press Association, 2012).



Jegatheesan (2019) rationalised the statement by President Zuma and said that the human/animal bond was perceived differently among cultures and religious groups. The findings in Annexure F showed that interaction in the dyad and animal welfare were perceived differently by the various ethnic groups in South Africa. In support the abuse and maltreatment of companion animals on the African continent were highlighted in the study (Masiga and Munyua, 2005). However, a study by Wright (2018) explained that all animal guardians from all levels of society, cultures, income groups and ages in South Africa provide care to their pets.

### **5.1.3 Working dog handler educational attainment**

Several researchers referred to the advantages of tertiary education. Irvine (2002) explained that animals might suffer because of misconceptions about animal behaviour and care. To this regard, the majority of WDH's in Population A ( $n = 173$ ) and Population B ( $n = 58$ ), see Table 4.4, only obtained a grade 12 qualification.

The findings in Annexure F supported the statement by Irvine (2002) as it showed significant differences with animal welfare in Population A and general knowledge in Population B. The findings in the study of Shih, Paterson and Phillips (2019) indicated a probable link between non-tertiary educational attainment and companion animal welfare concerns. This was due to the lack of knowledge of animal welfare and the care of animals (canine). The study by Lefebvre et al. (2007) in the Belgium army supported Shih et al. (2019), who explained that WDH's "loved their tool job" but continue to kennel their WD for extended periods because "they think they have to".

Training methods can be influenced by the education of the WDH (Ziv, 2017). Aversive training methods were more visible with WDH's with lower educational attainment than trainers with a higher educational background who were more inclined to employ positive reinforcement training methods. Previous research explained that socioeconomic differences might influence knowledge attainment with education (Baatz, Anderson, Casey, Kyle, McMillan, Upjohn & Sevenoaks, 2020).

It was concluded by McGreevy, Starling, Payne and Bennett (2017) that education would improve knowledge about animal behaviour, improve communication between dog/owner. Education will also reduce conflict/aggression by providing tools to dog owners to improve their behaviour around dogs.

#### 5.1.4 Working dog handler annual income

The annual income of the WDH as a demographic covariate exhibited no differences in the total scores of both Population A and B in the MDORS, Animal Welfare and General Knowledge Scales. To explain this finding, Shih *et al.* (2019) pointed out that little was known about the significance of the socioeconomic status of the dog owner. The role of dog owners' socioeconomic level on canine welfare concerns was not fully explored. Different welfare complaints were associated with socioeconomic status both in low and high-income groups.

explanation One might explain that the annual income of the WDH in SA was not a factor to consider when employed as a WDH, nor was it required by the WDH to provide any financial resources, i.e. food, water, accommodation and veterinary care for the WD. WDO's in SA provides the necessary resources for the care and maintenance of the WD, the only responsibility for the WDH in SA was to take responsibility for the daily care of the WD.

It was indicated in the current study that the annual income of the WDH was not crucial to the care of the WD. However, Lefebvre *et al.* (2007) found that the WD's obedience increased when it was taken home or exercised. Demographic information such as annual income was a sensitive subject, Gideon (2012) hence the observation that the annual income was not reported by  $n = 64$  of participants in the study.

Gideon (2012) also explained that demographic information was considered sensitive by the participant as the information can identify an individual. To explain this phenomenon, Gideon (2012) explained that demographical information was considered sensitive when it can be employed to identify a participant in a research project as it was believed that norms and preferences differ between cultural groups. In this context, De Schrijver (2012) also elaborated that income and religion were considered as sensitive when it is about a taboo, a subject unfitting to converse about, to support Gideon (2012) said that lower socioeconomic participants were distrustful of interviews.

### **5.1.5 Age**

During this study, an important observation was that the bulk of WDH's in both Population A and B were between 18 and 35 years of age ( $n = 75$ ) and 36 years of age and older ( $n = 314$ ). The study by Bouma, Vink and Dijkstra (2020) discovered that age had an overall effect on perceptions of benefits and drawbacks. With advancing age, participants reported more disadvantages and fewer benefits of dog ownership. In the study by Holland (2019), Bir, Widmar and Croney (2016), age was a critical demographic feature connected to perceptions of the various dog acquisition sources.

The beliefs of older respondents (aged 55-88 years) were frequently different from those of the other two, younger age groups (18-34 and 35-54 years). The findings in the age groups comparisons might be explained by Bouma *et al.* (2020) that age had an overall effect on perceptions of benefits and drawbacks. With age comes experience, the study by Aimoe and Francis (2009) involved ( $n = 35$ ) senior working dog handlers of the Royal Canadian Mounted Police (RCMP) considered to be Subject Matter Experts (SME) due to their years of experience and duty in the WDE. During semi-structured interviews with the ( $n = 35$ ) SME's, Aimoe and Francis (2009) found that ( $n = 26$ ) of SME's indicated that the need for continuous learning was very important.

### **5.1.6 Working dog handler experience**

Differences were observed in the interaction, animal welfare and general knowledge of WDH's in Population A, see Table 4.4. Multiple factors influence owners' behaviour towards their dogs, including the owner's attitudes and beliefs about dogs, previous experiences with dogs, perceptions of society and peers, and biased perspectives on personal knowledge and talents, as well as self-efficacy, which may vary over time (Bouma *et al.*, 2020). What role does experience play in the WDE? A study by Van Herwijnen, Van Der Borg, Naguib and Beerda (2018) showed that no differences were observed between experienced and inexperienced dog owners (first-time owners). The expectations and behaviour of the dog/pet were reported to be a concern of first-time dog owners.

The findings by Van Herwijnen *et al.* (2018) can also be rationalised in a South African WDH context. Novice WDH's frequently found the close working conditions with the

WD challenging. The behaviour of the WD, together with muddy uniforms, constant dog hair, can dissuade novice WDH from continuing with a career as a WDH with the corresponding compromised welfare of the WD. To explain, Bouma *et al.* (2020) referred to the development process of the owner/dog relationship, see Figure 5.2.

In the two-phase model of the owner/dog relationship, Bouma *et al.* (2020) explained the different stages of experience. The different levels of expertise might also shed light on the behaviour of the novice WDH in the contexts of the present study.



**Figure 5.1: Two-Phased Model of the owner/dog relationship (Bouma *et al.*, 2020)**

The first phase of the dog/owner relationship is comprised of expectations about a dog (WD) and the relationship with the dog (WD). This expectation culminated in the decision to achieve the envisioned working dog handler’s programme. In the second phase, the envisioned relationship with the WD was experienced, which influenced an adjustment of earlier cognitive expectations.

This Two-Phased Model design enabled reviewing the social cognitive elements of the novice WDH over a period, i.e. before completing the working dog handler’s programme (motivational phase) to working with the WD for a period of six months (from T0-to-T1, the early experience phase) and again from six months to 12 months (from T1-to-T2, the extended experience phase) (Bouma *et al.*, 2020).

WDH perceptions may change in the experience phase due to the WD's relationship with the novice WDH. Dog owners' (WDH) views of their investments concerning the benefits they have received may lead to (dis)satisfaction with the dog (WD) and a sense of just how demanding it is to own a dog (work with a dog). Furthermore, the K9 behavioural issues may arise (or dissipate) over time. The transitions between inexperienced and expert dog owners (WDH) will be different throughout time because the latter can draw on previous or current experiences with dogs (WD) (Bouma *et al.*, 2020).

In the current study's findings, Bouma *et al.* (2020) revealed that changes in beliefs mainly occurred in the initial months of dog ownership (during the early experience phase) and did not change much in the subsequent year (the extended experience phase). Furthermore, a few changes were observed during the extended experience phase regarding perceived costs, dog happiness, and canine behavioural issues.

The study's findings imply that after six months of living (working) with the dog (WD), a more or less stable relationship developed. Bouma *et al.* (2020) also indicated that experienced owners (WDH) are less forgiving of misbehaviour exhibited by the dog (WD). A decrease in canine behavioural challenges among current dog owners (more experienced) was discovered, which could be attributed to their capacity to mitigate behavioural issues effectively.

### **5.1.7 Working dog handler function**

The results showed that the WDO in South Africa comprised primarily of WDH's in both study populations, see Figure 4.8. Although managers, trainers and personnel responsible for breeding/socialisation in the WDO were all considered working dog handlers in the study, only current operational WDH 's were considered WDH's in the study. To explain the significance of this finding, Jamieson *et al.* (2018) stated that the dog handler may be the most influential aspect in working dog performance and welfare. The working dog's performance and welfare can be compromised if the dog handler's role is disregarded.

## 5.2 Descriptive statistics

### 5.2.1 Monash Dog Owner Relationship Scale (MDORS)

The incorporation of the MDORS was instrumental in assessing the WDH perception of owner/dog interaction, perceived emotional closeness. Calvo *et al.* (2016). To explain the decision, the motivation by Payne *et al.* (2015) must be considered. Payne *et al.* (2015) noted that the MDORS is the ideal instrument/scale to examine the human/dog relationship with the benefit of the exclusion of canine variables. Rehn *et al.* (2014) included that the MDORS evaluate the relationship in the owner/dog dyad from the owner's perspective.

Calvo *et al.* (2016) indicated that the MDORS scale was developed based on the social exchange theory. This theory dictates that each relationship outcome was a balance between cost and benefit provided to individuals in a relationship. The MDORS scale assesses both cost and benefit in the dog/owner relationship, and Balcazar Soto (2016) included that the MDORS scale also considers the positives and negative factors of dog ownership.

The MDORS consists of three subscales: i. Owner-dog interaction (ODI) refers to more intimate activities, Videla and Olarte (2017) and Balcazar Soto (2016), i.e., to take care of the dog, kissing and hugging, ii. Perceived emotional closeness (PEC) subscale refers to social support, bonding, companionship and unconditional love and iii, Perceived costs (PC) consider the cost attributed to caring for the dog, monetary influences, responsibilities and restrictions on the owner as a result of the dog. The MDORS findings in Calvo *et al.* (2016) study was incorporated in the current research for comparison.

Höglin, Van Poucke, Katajamaa, Jensen, Theodorsson and Roth (2021) noted that research showed the MDORS subscale ODI could be associated with the Big Five Personality traits, i.e., neuroticism, PEC with Conscientiousness and PC with Conscientiousness, to compare Jamieson *et al.* (2018) explained that research was lacking to highlight the knowledge, skills and personality traits of future WDH's.

Research indicated that some personality traits might predispose a person to have good (or bad) dogmanship (Payne *et al.*, 2017). The personality of the WDH, i.e.

conscientious personalities (hard-working), are more inclined to comprehend relevant training principles. Neurotic WDH's performance during practical exercises is poor and tends to underestimate their dog's happiness. The WDH's emotional intelligence may influence his/her dogmanship, i.e. the capacity to recognise and react to other people's emotions. WDH's with high emotional intelligence will be more susceptible to the WD's emotional state.

The study by Jamieson *et al.* (2018) showed that high scores were obtained by WDH's for the Agreeableness trait, low scores for the Neuroticism trait. An average score was obtained for the Conscientiousness and Openness personality traits. Jamieson *et al.* (2018) concluded that the large ranges observed in total scores of WDH's showed that WDH's personality might not be as important as the training and bond in the handler/dog dyad.

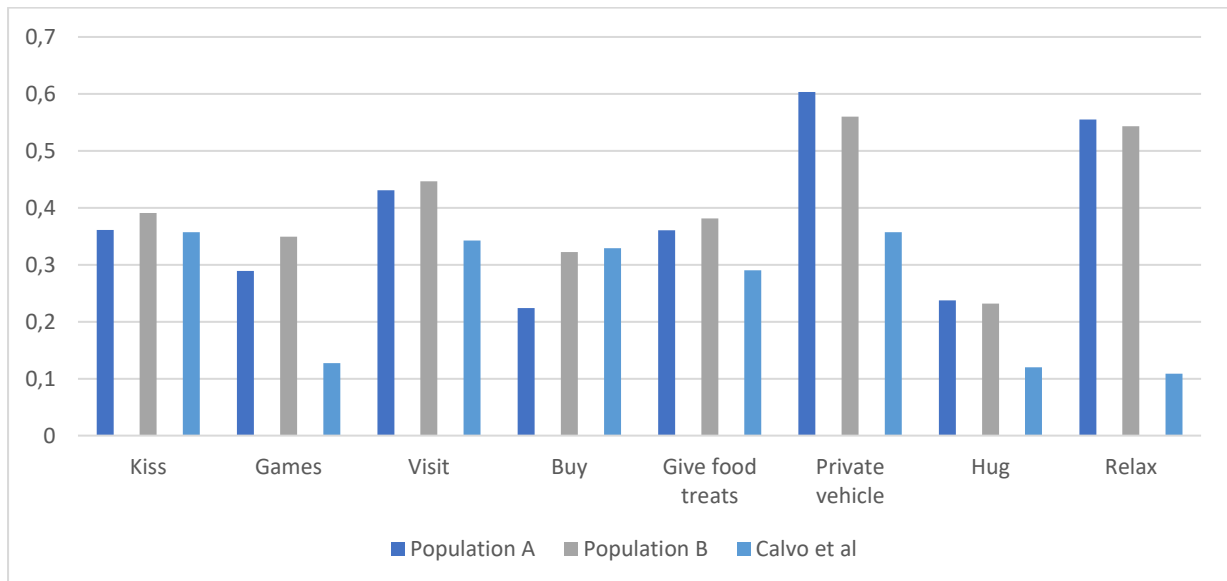
The present study did not include a summary of the total scores for each subsection. Calvo *et al.* (2016) explained that no studies are available to indicate the quality (i.e., high, medium or low) of the relationship in the handler/dog dyad. Scores can only be compared in specific groups of WDH's. High scores in the subscale, ODI showed a high level of dog-owner interaction and a more developed emotional closeness in the subscale PEC, in contrast, a high score in the subscale PC meant a low perceived cost to the WDH.

To this regard, Handlin, Nilsson, Ejdebäck, Hydbring-Sandberg and Uvnäs-Moberg (2012) asked what constitutes an average, high, or low score? and stated that the MDORS scores "have no absolute value" thus the CV (mean and SD) values of both the ( $n = 2$ ) SA study populations and that of Calvo *et al.* (2016) was calculated to make comparisons. Significant differences were found in the total scores of the WDH's for the MDORS in both Population A and Population B, see Table 4.4.

#### **5.2.1.1 Owner-dog interaction (ODI)**

The WDH population in SA included 82% male (♂) and 18% female (♀) WDH's, see Figures 4.1 and 4.2. Since the subscale comprised of intimate actions, i.e. kiss the dog, hug the dog, a low variance (mean and standard deviation values) was noted in the total scores of the  $n = 2$  populations in the study for the ODI subscale, see Figure 5.4.

To provide a possible explanation for this finding, it must be noted that South African WDH's (Population A and B) were not generally allowed to take the WD home during off duty time, the WD remains at the kennel complex of the WDO, Lefebvre *et al.* (2007) and Polgár, Blackwell and Rooney (2019). In contrast, it must also be stated that the study by Calvo *et al.* had a primarily female population and was conducted in a domestic environment, e.g. the dog was at home and/or had frequent access to the owner/guardian.



**Figure 5.2: Owner-dog interaction (ODI)**

### 5.2.1.2 Perceived emotional closeness (PEC)

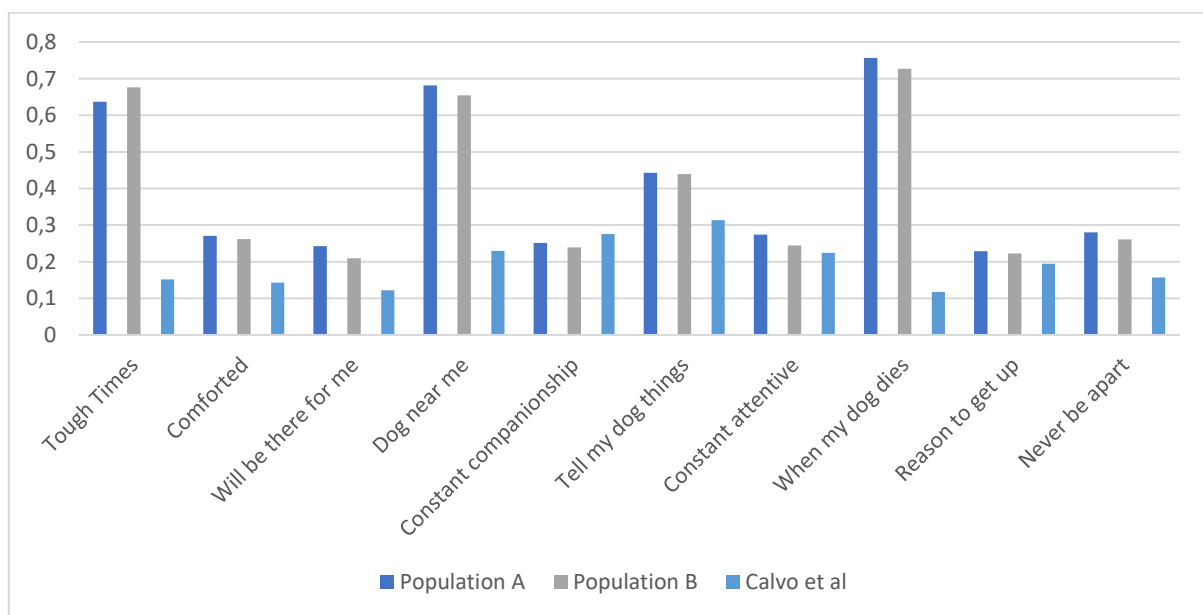
This subscale assessed social support, bonding, companionship and unconditional love in the owner/dog dyad. The analogous CV (mean and SD) scores of WDH's in both Population A and B would indicate that a shared perception of the subscale PEC exists in the WDH population in South Africa, see Figure 5.3.

The statements “My dog doesn’t help me to get through tough times”, “My dog is there whenever I need to be comforted”, “If everyone else left me, my dog would still be there for me”, “I would not like to have my dog near me all the time”, “It will not affect me when my dog dies”, displayed that dog owners in the study by Calvo *et al.* (2016) had a more profound emotional bond with their dogs compared to Population A and B in the current study, see Figure 5.3.



To explain, Bouma *et al.* (2020) elucidated that the quality of the relationship in the owner/dog dyad will influence the owner's satisfaction with the dog. Negative consequences can also be ascribed to dog ownership, i.e., the dog's death that would influence the dog owner's well-being.

The results showed that women were more likely to exhibit pro-animal attitudes and behaviours, Reynolds (2015) and Alleyne *et al.* (2015) and that women have higher involvement with dogs (Calvo *et al.*, 2016). This finding can also be explained by Gichanga (2015), who explained that the employees in the private security environment were sometimes “enticed” by clients or management to be trained as a WDH, which would indicate that the WDH did not have a well-developed emotional bond with the WD.



**Figure 5.3: Perceived emotional closeness**

### 5.2.1.3 Perceived Costs (PC)

Ownership costs are viewed in terms of effort and financial costs, and shared activities between the owner and the dog. The CV results exposed that WDH's in Population A, in contrast with Population B, demonstrated a lower PC with the statements “Looking after my dog is a burden” and “My dog makes too much of a mess”. Population B showed a lower perceived cost with the statements “My dog stops me from doing

things I want to do”, “My dog does not stop me from doing things that I enjoyed before I started to work with it”, “my dog stops me doing things I enjoyed doing before I owned it” and “It is not too expensive to keep/maintain my dog”. Both Population A and B established a lowered PC with the statement, “It is often hard to look after my dog”. The statement “It is not too expensive to keep/maintain my dog” displayed an almost equal lower perception of PC between Population A and dog owners in the study by Calvo *et al.* (2016), see Figure 5.4.

The dog owners in the study by Calvo *et al.* displayed a higher corresponding perception of PC with all nine (9) statements in the subscale PC. This finding was in stark contrast with the outcomes as noted in the subscales ODI and PEC, where results disclosed that the participants in the study by Calvo *et al.* exhibited an increased dog-owner interaction and emotional closeness. Van Herwijnen *et al.* (2018) explained that the nature of owner-dog relationships varies. Dogs, for example, can be viewed as devoted companions or merely as toys or status symbols, affecting the degree to which both parties gain from the relationship, see Figure 5.4.

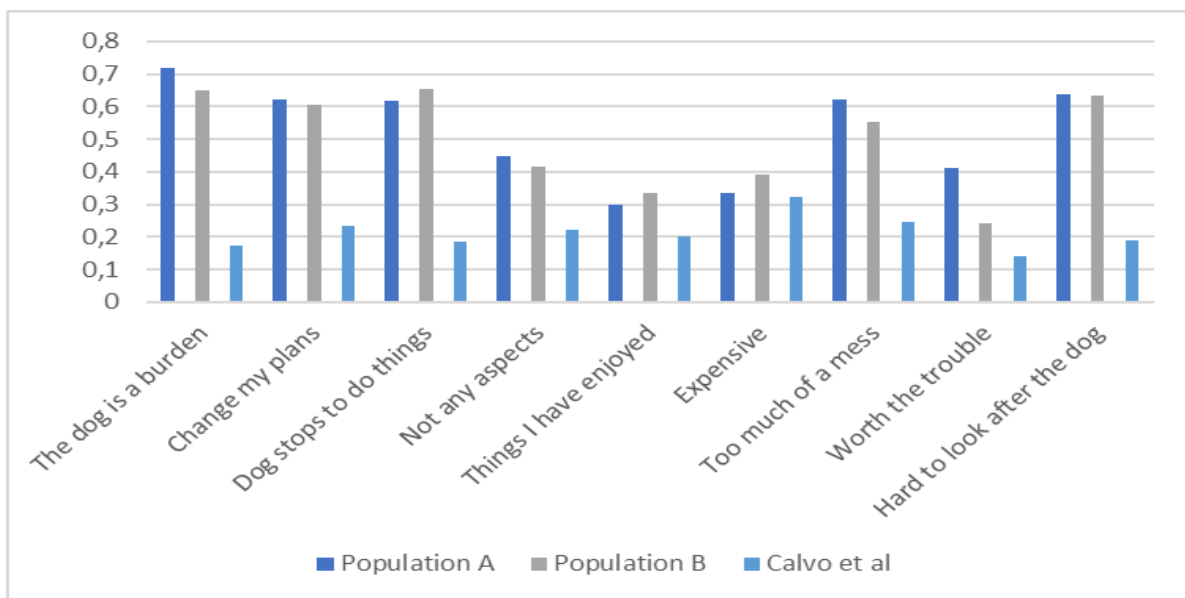


Figure 5.4: Perceived cost

### 5.2.2 Animal Welfare Scale

Rooney, Gaines and Hiby (2009) examined what animal welfare is and described that welfare was a part of the animal, something that cannot be given to an animal? The

quality of the animal's life might range from excellent to appalling. The Animal Welfare Scale by Zalaf and Egan (2015) was included in the study because it is quick, reliable and brief, as well as appropriate for the WDE in SA, see Figure 5.5.

This instrument was aimed at dogs and cats in the original research population (UK and Cyprus). Zalaf and Egan (2015) explained that animal welfare research outside English-speaking countries was unusual, even though human/animal relationships, whether based on farming, companionship, or as part of a shared ecosystem, are ubiquitous. In the present study, the scale was utilised in the WDE in South Africa to assess how the WDH perceived animal welfare in SA.

The animal welfare CV (mean and SD) scores for the ( $n = 2$ ) populations in the study were computed, and minor differences were noted. The different outcomes indicated that not all WDH's in SA interpret animal welfare the same. Population A in the study demonstrated a higher perception of animal welfare, except for the statements "The bigger the dog is, the stricter you should be", "It is not a requirement to clean a dog's living space daily", and Working-dogs does not need to be kept in comfortable living conditions" including "What people call animal abuse cannot be considered playing", see Figure 5.7.

The study by Lefebvre *et al.* (2007) in the Belgium army disclosed that WDH might regard the WD as nothing more than tools to be utilised with little regard for their welfare to explain these different perceptions of animal welfare displayed by WDH's in the study. Jamieson *et al.* (2018) rationalised that improved working dog welfare and operational abilities can be achieved by the improvement of WDH selection. Significant differences were found in the total scores of the WDH's for the Animal Welfare scale in both Population A and Population B.

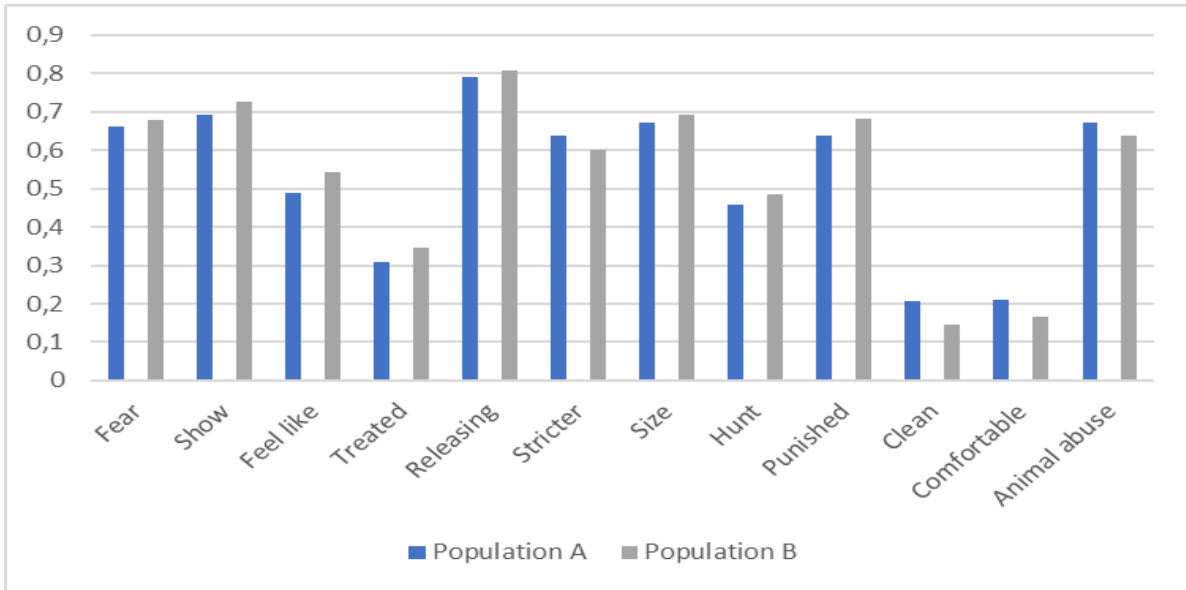


Figure 5.5: Animal Welfare Scale

### 5.2.3 General Knowledge Scale

Knowledge of the Animal Protection Act, Act 71 of 1962 was considered important by both Population A and B in the study. The statements in the General Knowledge section require the WDH to indicate via Likert scale response what topic/s must be included in a hypothetical training intervention. A small difference in the CV values of both Populations A and B was observed in the General Knowledge Scale, see Figure 5.6. This was an important finding as Act 71 of 1962, Section 2 (a)-(s) was very specific about offences in respect of animals.

Specific reference to Section 2 (r) “by wantonly or unreasonably or negligently doing or omitting to do any act or causing or procuring the commission or omission of any act, causes any unnecessary suffering to any animal”. Rooney *et al.* (2009) included that those users of dogs have a legal and ethical responsibility to augment their canines’ welfare and avoid psychological distress.

Jamieson *et al.* (2018) explained that no research could be found on what wildlife detection dog handlers consider valuable expertise and skills. WDH’s in the study by Aimoe and Francis (2009) showed that a need exists for lifelong learning as they progress in their chosen profession. This study by Aimoe and Francis (2009) involved ( $n=35$ ) senior working dog handlers of the Royal Canadian Mounted Police (RCMP) considered to be subject matter experts (SME) due to their years of experience and

duty in the WDE. During semi-structured interviews with the SME's, Aimoe and Francis (2009) found that  $n=26$  (74%) of SME's indicated that the need for continuous learning was very important. Insignificant differences were found in the total scores of the WDH's for the General Knowledge Scale in Population A and Population B, see Figure 5.6.

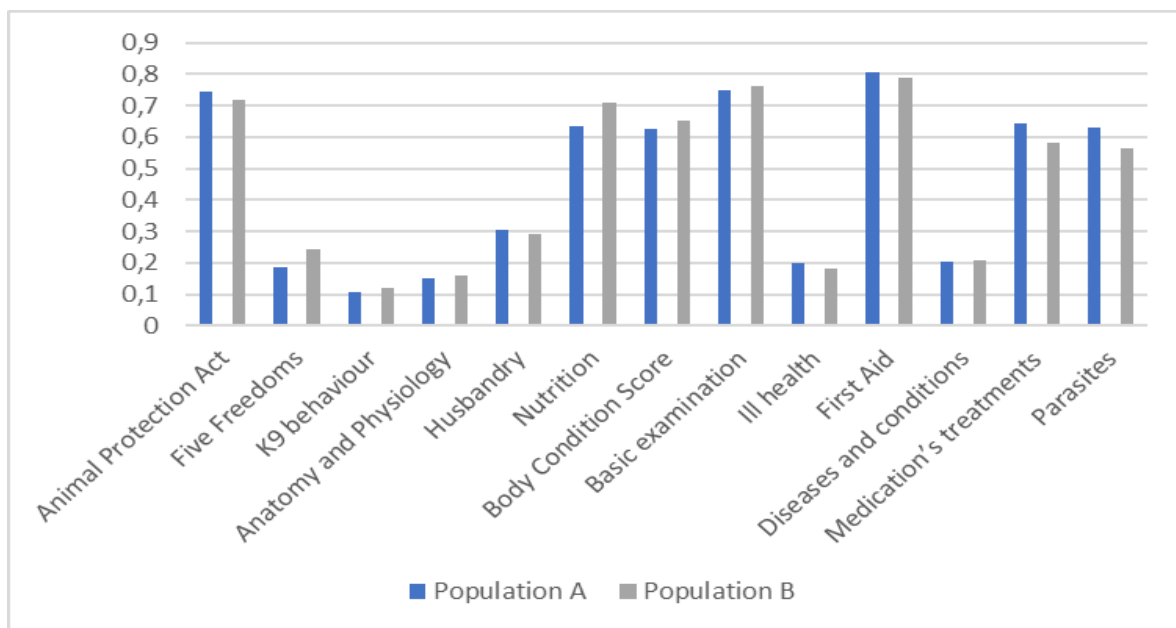


Figure 5.6: General Knowledge Scale

### 5.3 The Five Freedoms

What are the Five Freedoms? Research indicated that the Five Freedoms defined good husbandry practices (Webster, 2001). McCulloch (2013) explained that the Five Freedoms defined the factors that influence the ideal welfare state as experienced by animals. WDH's must know the Five Freedoms to evaluate the dog's welfare (Rooney *et al.*, 2009).

To do so, the question must be posed, was the animal's Five Freedoms addressed? i.e. freedom from hunger and thirst; freedom from discomfort; freedom from pain, injury and disease; freedom from fear and distress; freedom to express normal behaviour. Importantly, many breeds of dogs were born with a high probability of being denied at least one, if not more, of the Five Freedoms (Rooney & Sargan, 2010).

### **5.3.1 Working dog handler demographics and the Five Freedoms**

The findings in this study established that the WD's Five Freedoms were influenced by the WDH's demographics. Significant differences were noted between Population A with the demographic variable education ( $p = 0,01039$ ) and age ( $p = 0.02775$ ) and the Five Freedoms.

### **5.3.2 Function of working dog handler in the organisation**

Population A displayed a slightly higher interest in the Five Freedoms, see Table 4.9. This study also examined the different role player's perceptions of the Five Freedoms in the WDO. The WD was utilised since the early 1900s in South Africa (Strydom, 1998), however, the Five Freedoms of animal welfare were only formulated in the 1990s (Mellor, 2016).

Today no research is available in South Africa to corroborate the findings in the current study relevant to the application of the Five Freedoms of Animal Welfare in the WDO except for the study by Gichanga (2015), who discussed the role of the WDO management in WD welfare in the private security industry. The current study showed no significant statistical results in the application of the Five Freedoms in the WDO by the various role players in the WDO, i.e., WDH, Breeder, Trainer and Management.

## **5.4 Outcome of the research objectives in the study**

The results in the study showed that animal welfare was interpreted differently in the  $n = 2$  populations in the study. The Shapiro-Wilks test results for the total scores showed that significant differences exist in the perception of animal welfare in Population A ( $p < 0,0001$ ), see Table 4.4. The WDH's demographics (i.e. education and age) appeared to influence the Five Freedoms of animal welfare, see Table 4.8. Animal husbandry was considered by both WDH populations as important, see Figure 5.6.

Initially, the influence of three (3) WDH demographic factors (gender, educational attainment and annual income) were examined in the study. The Kruskal-Wallis tests identified educational attainment as a significant influence on the Animal Welfare of Population A ( $p = 0,01481$ ), and the General Knowledge ( $p = 0,03277$ ) of Population

B excluded gender and annual income as influential demographic factors. The Kruskal-Wallis tests highlighted other significant WDH demographic factors, i.e., language, ethnicity, experience, function, and age, which might influence the well-being of the WD, see Table 4.5.

The interaction in the handler/dog dyad was measured with an adapted Monash Dog Owner Relationship scale (MDORS) in the study. The Shapiro-Wilks test indicated significant differences in the perception of interaction in the handler /dog dyad in Population A ( $p = 0,00084$ ), see Table 4.4.

The WDH in SA had the opportunity in Section D of the questionnaire (see Annexure A) to indicate with Likert scale responses variables what general knowledge relevant to the care of the WD was important. All CV (mean and SD) values were all low variance. Total scores for WDH's in Population A ( $p < 0,001$ ) and Population B ( $p < 0,001$ ) indicated significant differences in the different populations, see Table 4.4.

The hypothesis was proved in the study. The following differences were noted in the study: Perception of animal welfare, WDH demographic variables, handler/dog interaction and development of the WDH in the WDH populations.

## CHAPTER 6

### CONCLUSION AND RECOMMENDATIONS

The relationship that must exist in the Working Dog team was the focal point of different retrospective studies, Jamieson, La Toya and Baxter (2018) who highlighted the importance of a partnership in the Working Dog team. To examine this relationship/partnership in this study, the dogmanship (husbandry practices) of the South African Working Dog Handler was scrutinised in this study, i.e., their perception on the interaction in the dyad, animal welfare and the Five Freedoms of animal welfare.

The Anthrozoologists, Calvo, Bowen, Bulbena, Tobe and Fatj (2016) considered the influence/impact of three ( $n = 3$ ) Dog Owner demographic variables in their study i.e., gender, educational attainment and annual income (financial status) on the care of the house dog. Consequently, this  $n = 3$  demographic variables were included in the current study to examine its importance in a Working Dog Environment (WDE) in South Africa (SA). These demographic variables underscore the influence that the WDH has on the welfare of the working dog.

The demographic variables of the Working Dog Handler (WDH), i.e., gender, annual income and educational attainment, were initially examined to determine the influence thereof on the well-being of the Working Dog (WD). Results showed that the well-being of the WD was not influenced by the demographic variables, i.e., gender and annual income. Other critical demographic variables were identified in this study that influenced the relationship, the welfare of the WD and general knowledge in the dyad. An interesting finding in the study data showed that these demographic variables, i.e., ethnicity, language, experience, environment, function, and age of the WDH, were significant in one or both the study populations.

The question arises: Is the WD's welfare being compromised in South Africa? Differences in the perception of animal welfare were noted in both the study populations. Research by Shih, Paterson and Phillips (2019) confirms the findings in the study, i.e., that few WDH's in South Africa had any tertiary education, which was directly proportional to the lack of knowledge the WDH had on animal welfare.



Future research may shed light on the probable link between WDH experience and WD welfare. The absence of research in the Working Dog Environment (WDE) abroad and South Africa contributes to a paradigm where the Five Freedoms of animal welfare (how the WD is feeling and doing) has been overlooked.

In the context of this study, the research by Baderoon (2017) highlighted the different perceptions of ethnic groups in respect of companion animals in SA. Given the differences in two of the ethnic groups in the study, i.e., ethnic group 1 and ethnic group 4, the demographic variable “ethnicity” was considered a critical finding in the study. The current political climate in South Africa does not allow for an open discussion on the influence of the variable “ethnicity” on the care of the WD. Future research may elaborate on the impact of ethnicity and other WDH demographic variables on the well-being of the WD.

Globally, the WDH is influential in WD performance. The current study found significant differences in the study population related to the interaction/relationship in the dyad. In this context, the education of the WDH (management), Strydom (1998) is of the utmost importance as retrospective research, Rooney, Gaines and Hiby (2009) indicated that the welfare of the WD might be compromised in the WDE. The study by Aimoe and Francis (2009) also suggested the need for continuous professional development (CPD) of the WDH. The absence of relevant research in the WDE creates a void in which skills and knowledge are perceived to be crucial for the care of the WD.

The outcome of the study suggest that cognisance must be taken of the following i.e., the selection of the WDH with appropriate personality and educational attainment, appropriate instruction, and continuous development. Given the animal welfare challenges identified in the study, the dogmanship of the prospective WDH must be continuously developed, evaluated (scrutinised), corrected and monitored from the onset to ensure the physical and psychological well-being of the WD. The development of the prospective WDH should include subjects i.e., anatomy and physiology of the WD, nutrition, first aid, animal behaviour and animal welfare. The signs and symptoms of infectious dog diseases should also be included in the proposed training intervention.

The WD symbolises a significant amount of time human and financial resources in any WDE. Inappropriate management of the WD will impact on the welfare of the WD i.e., how the WD is “doing” and/or “feeling”. The WD with compromised welfare will be non-productive, a liability and a financial risk to the WDE due to an increased veterinary bill, shortened working life and or legal implications for the WDE.

Legislation in SA, the Animal Protection Act, Act 71 of 1962, makes it compulsory for the WDE to adhere to the prescripts about the care of animals (WD) to ensure its welfare. The Act highlights the necessity to educate the WDH as stated in Section 2 (r) “by wantonly or unreasonably or negligently doing or omitting to do any act or causing or procuring the commission or omission of any act, causes any unnecessary suffering to any animal”.

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# ANNEXURES

## ANNEXURE A

### QUESTIONNAIRE



The Working Dog Handler/Dog Dyad in South Africa: A Study of Variables influencing the Working Dog's Well-being.

**By: Anton Coetzee**

**Contact details:**

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## **Introduction**

I, Anton Coetzee, a post-graduate student of the University of South Africa is avid to submit the included questionnaire, as my MSc in Agriculture research project for your perusal and completion. I would be grateful if you could fill it in as objectively as possible and return it to the sender by 31 December 2020.

## **Purpose of the Questionnaire**

The purpose of the questionnaire is to obtain sufficient data to analyse variables to determine what the perceived physical and psychological well-being of the working/service dog is.

## **Requirements**

- You must be a working dog handler in South Africa to complete this questionnaire.

## **Confidentiality**

Please keep the following in mind for your peace of mind:

- All information provided will be treated as confidential.
- This questionnaire does not require you to include personal information which can be used to identify you.

## **Incentives**

No payment will be made or suggested for your participation in the study.

## **Other information to consider**

- If you have worked with more than one dog, please select one of the dogs that you have worked with to complete this questionnaire.

## **Tips on how to answer the statements in the questionnaire?**

- You will select 1 (completely disagree) or a 5 (completely agree) if you are 100% sure about your answer. If having doubts, please select 2,3 or 4 depending on your interpretation.
- Please ensure that you understand the statement before indicating a response.

**It will take approximately 15 minutes to complete the questionnaire.**

**Thank you for taking the time to participate in the study.**

**Section A: Demographical information of working dog handler.**

Please indicate your selection with an X.

**1. Gender**

Gender	Mark with X
Male	
Female	

**2. Age**

Age group	Mark with X
18 to 25	
26 to 35	
36 to 45	
46 to 55	
Older than 55	

**3. Home language**

Language	Mark with X
Sepedi	
Sesotho	
Setswana	
siSwati	
Tshivenda	
Xitsonga	
Afrikaans	
Engels	
isiNdebele	
isiXhosa	
isiZulu	
Other	

**4. Ethnicity**

Ethnic Origin	Mark with X
African	
Coloured	
White (Caucasian)	
Indian/Asian	
Other	

**5. Educational Qualification**

Qualification	Mark with X
< Grade 12	
Grade 12	
National Higher Certificate	
National Diploma	
National Higher Diploma	
Degree	
Other	

**6. How long have you worked as a working-dog handler?**

Years	Mark with X
Novice	
0 to 5 years	
6 to 10 years	
11 to 15 years	
16 to 20 years	
21 to 25 years	
> 25 years	

**7. What is your annual (per year) income?**

Annual Income	Mark with X
R0 – R150 000	
R150 000 – R250 000	
R250 000 – R350 000	
> R350 000	

**8. Specify your working environment below**

Environment	Mark with X
Urban	
Semi-rural	
Rural	

**9. Specify the province in which you mostly function**

Province	Mark with X
North West	
Gauteng	
Limpopo	
Mpumalanga	
Free State	
KwaZulu-Natal	
Eastern Cape	
Northern Cape	
Western Cape	

**10. Type of working dog organisation you are employed in**

WDO	Mark with X
South African Police Service	
Department of Correctional Services	
South African Revenue Service	
South African National Defence Force	
Tshwane Metro Police Department	
Ekurhuleni Metro Police Department	
Johannesburg Metro Police Department	
Cape Town Metro Police Department	
Durban City Police	
Private Security Organisations	

Service, Therapy and Medical Alert Dogs Organisation	
--	--

**11. Your function in the organization**

Function	Mark with X
Working-dog handler	
Breeding and Socialization	
Trainer	
Management	

**12. How long have you worked with the dog you have selected?**

Duration	Mark with X
1-2 years	
3-5 years	
6-10 years	
> 10 years	

**13. With how many dogs have you worked within your career?**

Number of dogs	Mark with X
1-2 dogs	
3-5 dogs	
6 - 8 dogs	
9 -10 dogs	
> 10 dogs	

**Section B: Biographical information about your working dog**

**14. Gender of working dog**

Gender	Mark with X
Male	
Female	

**15. Working/Service Dog Breed**

Breed	Mark with X
German Shepard Dog	
Belgium Shepherd Dog	
Tervuren	
Dutch Shepherd Dog	
Labrador Retriever	
Golden Retriever	
Rottweiler	
Border Collie	
Dobermann	
Bloodhound	
Doberman/Bloodhound X	
Beagle	

**16. Discipline trained for**

Discipline	Mark with X
Guarding	
Patrol dog	
Explosive detection	
Narcotic detection	
Search and Rescue	
Tracker Dog	
Patrol/Explosive	
Patrol/Narcotic	
Anti-poaching	
Guide dog/Hearing dogs	
Other	

**17. Age of your dog at the commencement of work**

Age	Mark with X
Under 1 year old	
Between 1 and 2 years	
Between 3 and 4 years	
Between 4 and 5 years	
5 years or older	

**18. Age of dog at retirement/death, if applicable**

Age	Mark with X
Between 1 and 2 years	
Between 2 and 3 years	
Between 3 and 4 years	
Between 4 and 6 years	
Between 6 and 8 years	
Between 8 and 10 years	
Older than 10 years	

**19. Reason: withdrawal from service, if applicable**

Reason	Mark with X
Declined working ability	
Medical	
Old age	
Died	



**Section C: MDORS: Questionnaire**

Below are several statements relevant to the care of the working dog. Please use the following scale to respond to the statement. Choose only one answer:

1	Completely Disagree	4	Agree
2	Disagree	5	Completely Agree
3	Neutral (No Opinion)		

Could you please circle the number that indicates your assessment of the statement? All references referring to the dog must be interpreted as the working dog

No	Statement	1	2	3	4	5
1	I kiss my dog often.	1	2	3	4	5
2	I do not often play games with my dog.	1	2	3	4	5
3	I do not take my dog to visit other people.	1	2	3	4	5
4	I buy my dog toys.	1	2	3	4	5
5	I do not often give my dog food treats.	1	2	3	4	5
6	I let my dog drive with me in my private vehicle.	1	2	3	4	5
7	I do not hug my dog.	1	2	3	4	5
8	I often relax with my dog e.g. watching TV.	1	2	3	4	5
9	My dog doesn't help me to get through tough times	1	2	3	4	5
10	My dog is there whenever I need to be comforted	1	2	3	4	5
11	If everybody has left me, my dog will still be there for me.	1	2	3	4	5
12	I would not like to have my dog near me all the time.	1	2	3	4	5
13	My dog provides me with constant companionship.	1	2	3	4	5
14	I won't tell my dog things, that I don't tell anyone else.	1	2	3	4	5
15	My dog is constantly attentive to me.	1	2	3	4	5
16	It will not affect me when my dog dies.	1	2	3	4	5
17	My dog gives me a reason to get up in the morning	1	2	3	4	5
18	I wish my dog and I never had to be apart.	1	2	3	4	5
19	Looking after my dog is a burden.	1	2	3	4	5
20	It is annoying that I often have to change my plans because of my dog.	1	2	3	4	5
21	My dog stops me from doing things I want to do.	1	2	3	4	5
22	There are not any aspects of working with a dog, I don't like.	1	2	3	4	5
23	My dog does not stop me from doing things that I enjoyed before I started to work with it.	1	2	3	4	5
24	It is not too expensive to keep/maintain my dog.	1	2	3	4	5
25	My dog makes too much of a mess.	1	2	3	4	5
26	Working with a dog is not worth the trouble.	1	2	3	4	5
27	It is often hard to look after my dog.	1	2	3	4	5

### Section D: Animal Welfare Scale

Please choose one answer from 1 to 5, where 1 is "Completely disagree" and 5 is "Completely agree"

No	Statement	1	2	3	4	5
28	Working-dogs behave only when they fear their handlers	1	2	3	4	5
29	Working-dogs cannot show their affection for their handlers	1	2	3	4	5
30	Handlers of working-dogs cannot do whatever they feel like with the dog.	1	2	3	4	5
31	Working-dogs should not be treated as part of the family.	1	2	3	4	5
32	Releasing your anger on the dog, will not help you to feel better.	1	2	3	4	5
33	The bigger the dog is, the stricter you should be...	1	2	3	4	5
34	The size of the dog does not influence how aggressive it might be.	1	2	3	4	5
35	There is no need to hunt since meat can be bought from the supermarket.	1	2	3	4	5
36	A working-dog will learn more from being punished than they will from being trained.	1	2	3	4	5
37	It is not a requirement to clean a dog's living space daily.	1	2	3	4	5
38	Working-dogs does not need to be kept in comfortable living conditions.	1	2	3	4	5
39	What people call animal abuse cannot be considered playing.	1	2	3	4	5

### Section E: General Knowledge

Please choose one answer from 1 to 5, where 1 is "Completely disagree" and 5 is "Completely agree"

No	Statement	1	2	3	4	5
40	The handler does not have to know the Animal Protection Act, Act 71 of 1962.	1	2	3	4	5
41	The handler must have knowledge of the 5 Freedoms.	1	2	3	4	5
42	Knowledge of K9 Behaviour is an important tool for handlers.	1	2	3	4	5
43	The handler must have knowledge of dog anatomy and physiology.	1	2	3	4	5
44	Knowledge of husbandry practices is important.	1	2	3	4	5
45	Nutrition of the working dog is of no concern to the handler.	1	2	3	4	5
46	Body condition scoring is not applicable to the working dog.	1	2	3	4	5
47	Knowledge of basic examination of the working dog.is not necessary.	1	2	3	4	5
48	It is required of the handler to have knowledge of signs of ill health of the dog.	1	2	3	4	5
49	It is not important to know first aid for a working dog.	1	2	3	4	5
50	The handler must have knowledge of life-threatening diseases and conditions of the dog.	1	2	3	4	5
51	Knowledge of basic medications and treatments should lie with veterinary personnel instead of handlers.	1	2	3	4	5
52	Internal and external parasite control is the responsibility of the kennel manager/official	1	2	3	4	5

**Do you want to comment on this questionnaire or make a statement?**

**Thank you for taking the time to complete this questionnaire.**

## ANNEXURE B

### REVISED AND REVERSE CODED STATEMENTS IN QUESTIONNAIRE

#### Original and revised statements

No	Column A: Original statement prior to revision	Column B: Statements after revision
<b>Section C: MDORS</b>		
1	How often do you kiss your dog?	I kiss my dog often.
2	How often do you play games with your dog?	I do <b>not</b> often play games with my dog.
3	How often do you take your dog to visit people	I do <b>not</b> take my dog to visit other people.
4	How often do you buy your dog presents?	I buy my dog toys.
5	How often do you give your dog food treats?	I do <b>not</b> often give my dog food treats
6	How often do you take your dog in the car?	I let my dog drive with me in my private vehicle.
7	How often do you groom your dog?	Daily grooming of my dog is important
8	How often do you hug your dog?	I do <b>not</b> hug my dog
9	How often do you have your dog with you while relaxing, i.e., watching TV	I often relax with my dog e.g., watching TV.
15	How often do you tell your dog things you do not tell anyone else?	I will not tell my dog things, that I do not tell anyone else
20	How often do you feel that looking after your dog is a chore?	Looking after my dog is a burden.
24	How often does your dog stop you doing things you want to?	My dog stops me from doing things I want to do.
27	How often do you feel that having a dog is more trouble than it is worth?	Working with a dog is not worth the trouble.

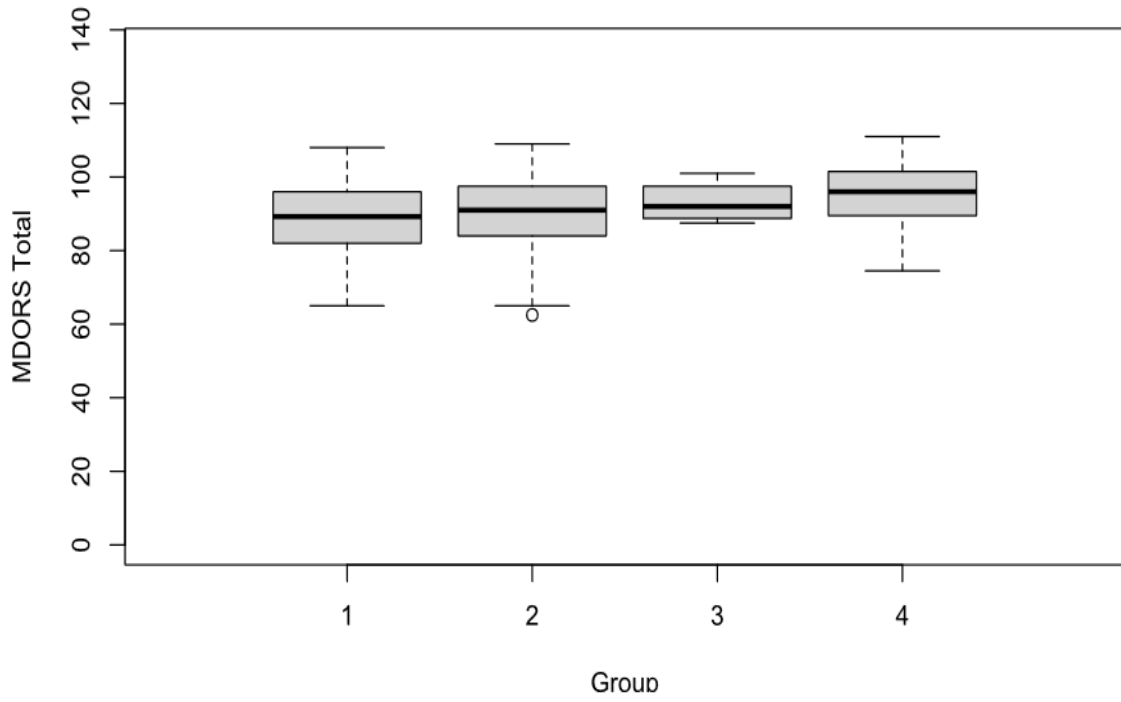
#### Original and reverse coded statements

No	Column A: Original statement prior to revision	Column B: Reverse coded Statements
2	How often do you play games with your dog?	I do <b>not</b> often play games with my dog.
3	How often do you take your dog to visit people	I do <b>not</b> take my dog to visit other people.
5	How often do you give your dog food treats?	I do <b>not</b> often give my dog food treats
8	How often do you hug your dog?	I do <b>not</b> hug my dog
15	How often do you tell your dog things you do not tell anyone else?	I will <b>not</b> tell my dog things, that I do not tell anyone else
27	How often do you feel that having a dog is more trouble than it is worth?	Working with a dog is <b>not</b> worth the trouble.
31	The owners of an animal can do whatever they like with it.	Handlers of working-dogs <b>cannot</b> do whatever they feel like with the dog.
32	Pets should be treated as part of the family.	Working dogs should <b>not</b> be treated as part of the family.
33	Releasing your anger on a pet is helpful	Releasing your anger on the dog, will <b>not</b> help you to feel better
35	The bigger an animal is the more vicious it is.	The size of the dog does <b>not</b> influence how aggressive it might be
38	A pet's living area needs to be cleaned daily	It is <b>not</b> a requirement to clean a dog's living space daily.
39	Animals need to be kept in comfortable conditions, just like people.	Working dogs does <b>not</b> need to be kept in comfortable living conditions
40	What people call animal abuse is actually playing	What people call animal abuse <b>cannot</b> be considered playing

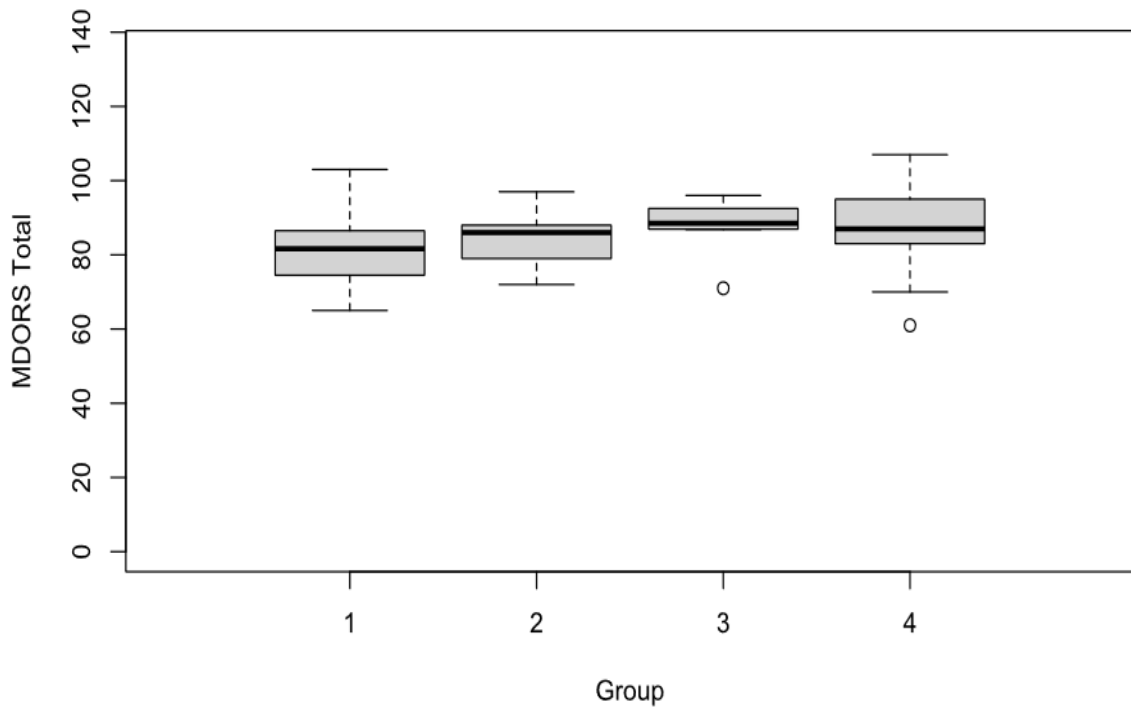
# ANNEXURE C

## BOX PLOTS

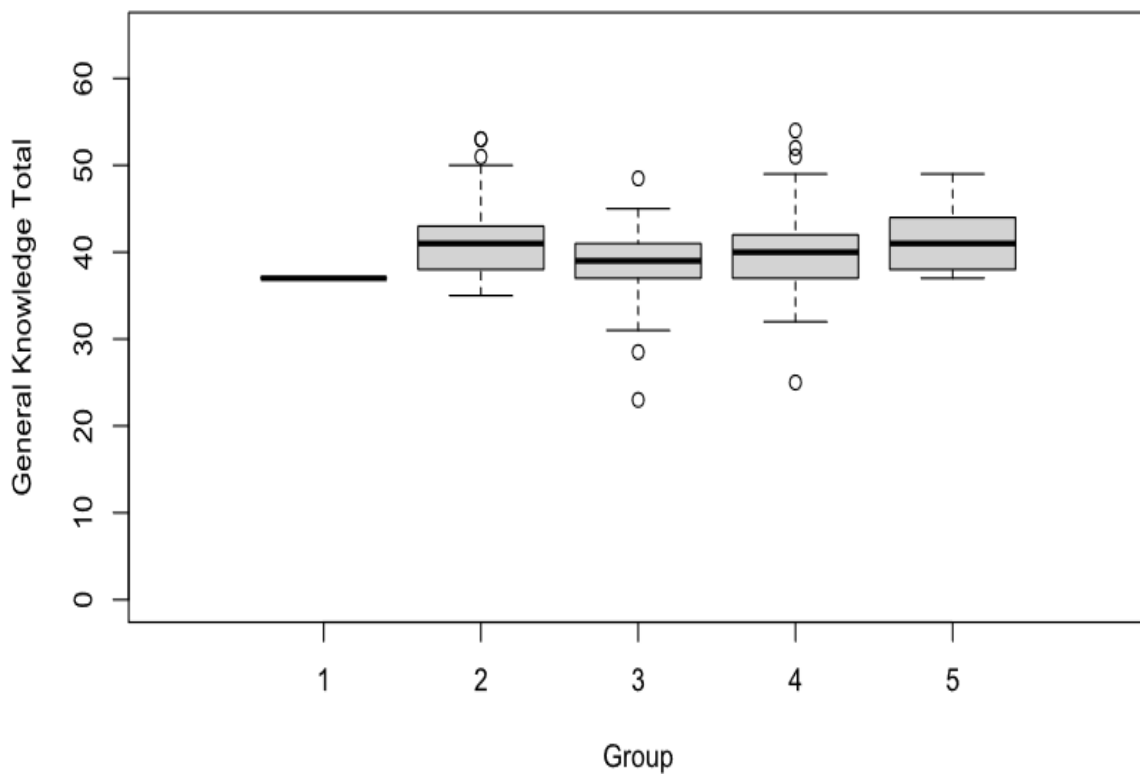
MDORS score by Ethnic group population A



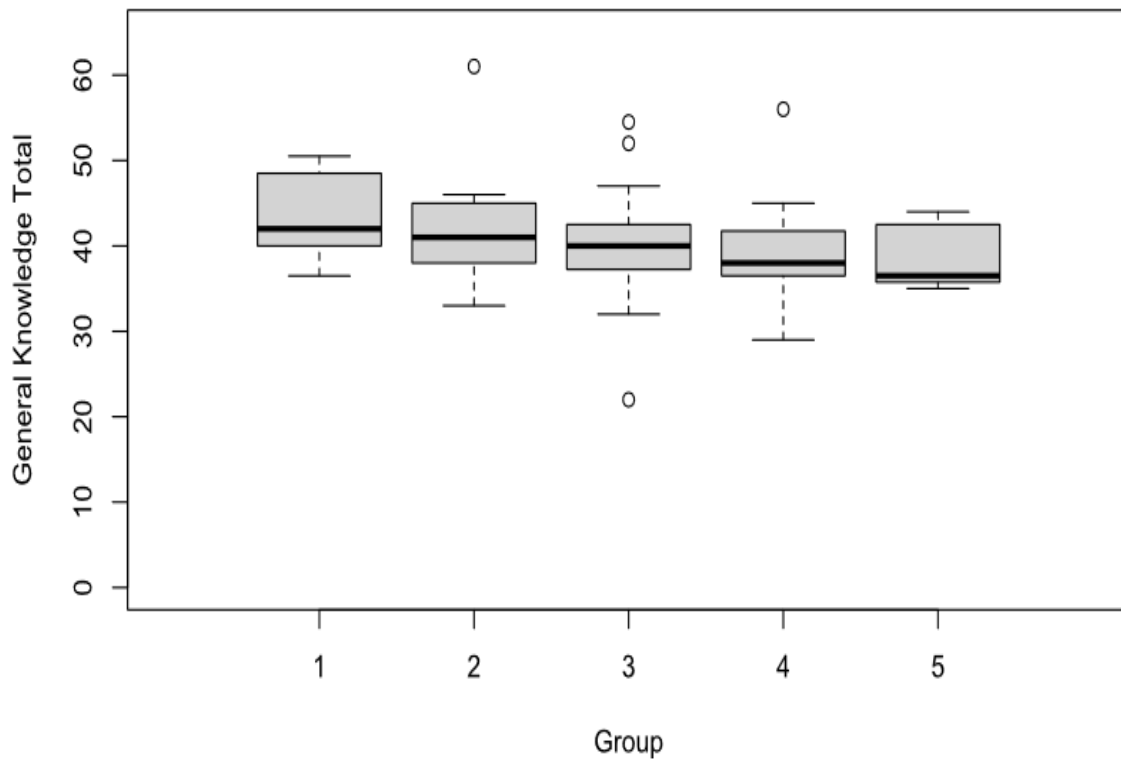
MDORS score by Ethnic group population B



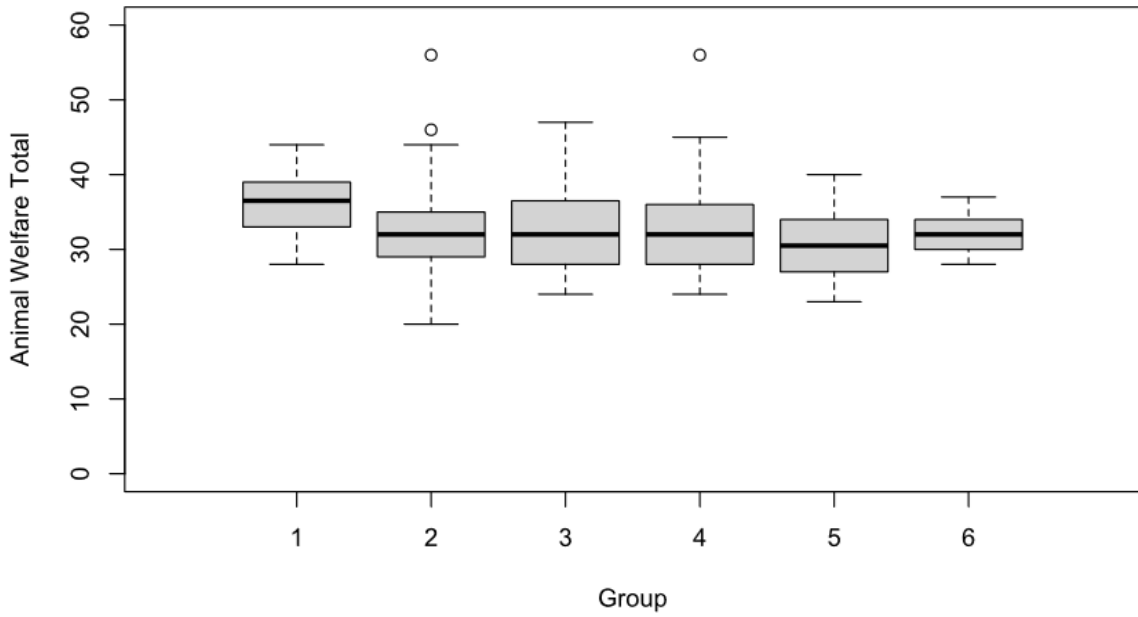
General knowledge score by Age group population A



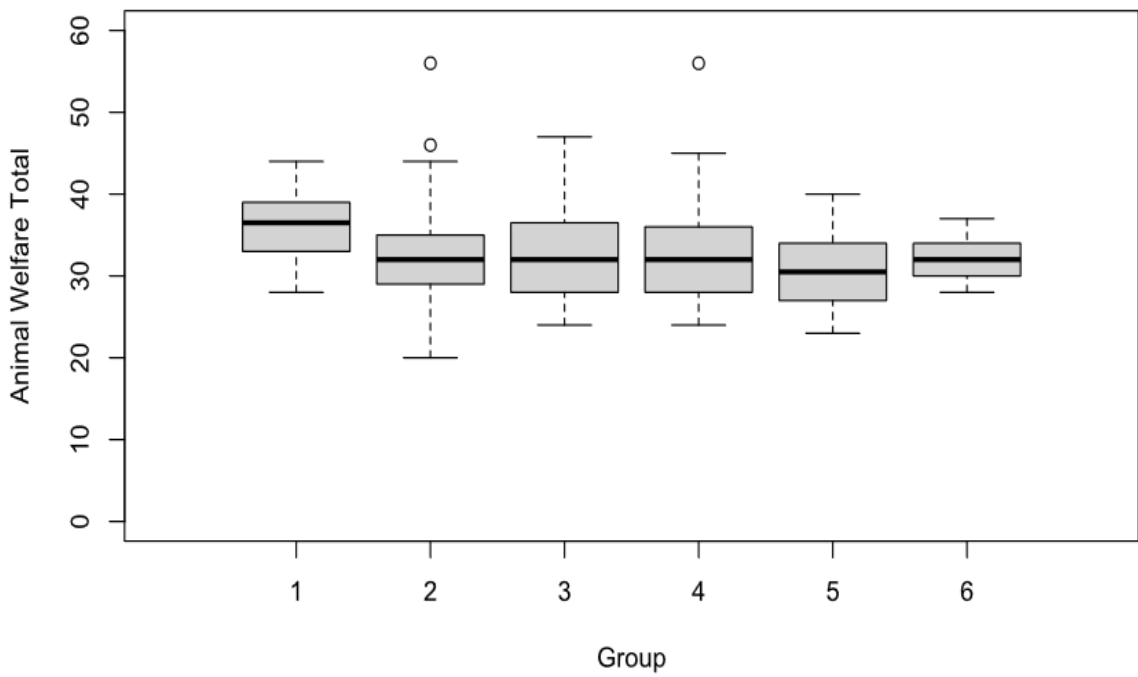
General knowledge score by Age group population B



Animal welfare score by Education group population A



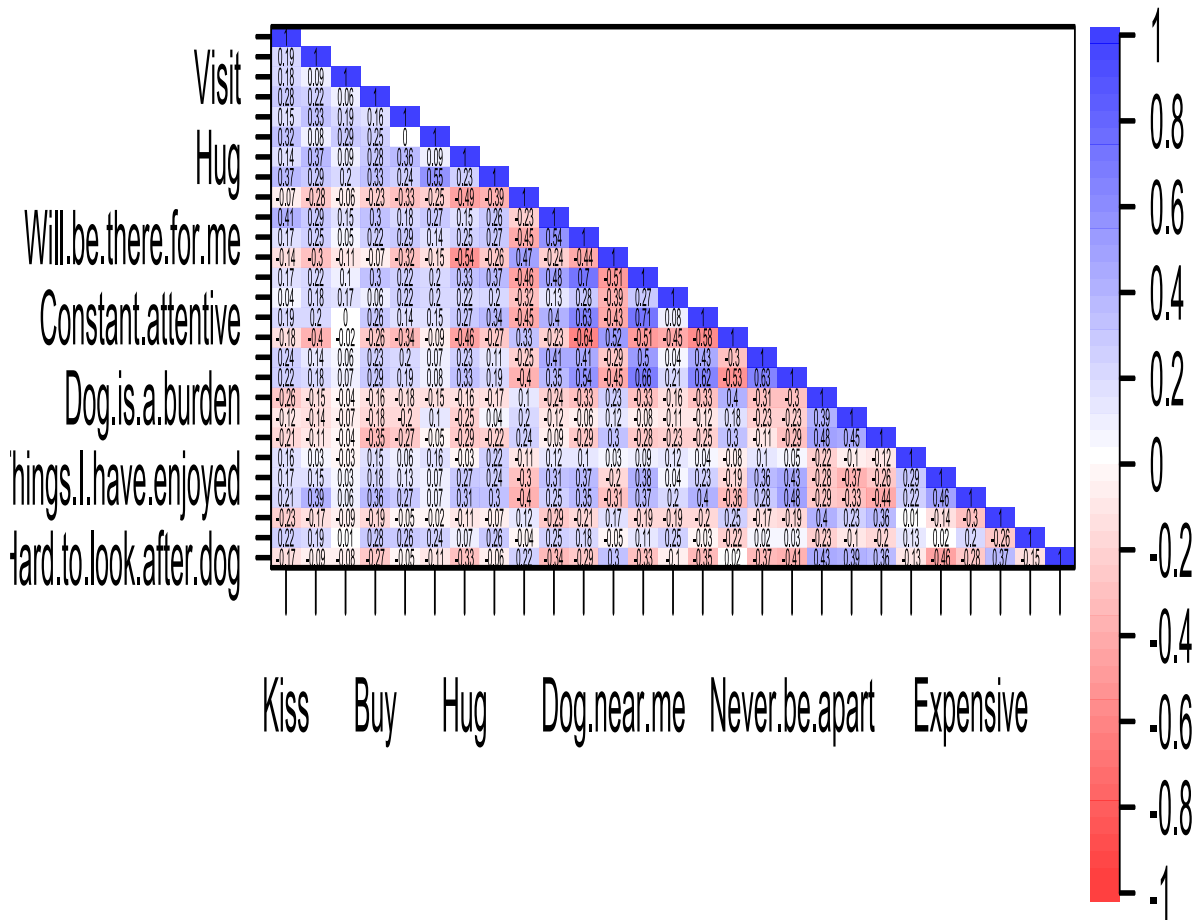
Animal welfare score by Education group population A



# ANNEXURE D

## POPULATION A MDORS POLYCHORIC CORRELATION

### Population A MDORS Polychoric Correlation



## ANNEXURE E

### EXPLORATORY FACTOR ANALYSIS OF MDORS ITEMS OF POPULATION A.

Subscale	Items	Factor						
		1	2	3	4	5	6	7
Dog owner Interaction	Kiss	0.01	-0.05	0.16	<b>0.37</b>	-0.10	0.21	0.01
	Games	-0.04	0.13	0.02	0.24	0.12	-0.09	<b>0.67</b>
	Visit	-0.11	-0.11	-0.09	0.14	0.00	<b>0.31</b>	0.14
	Buy	0.04	-0.05	<b>0.32</b>	0.16	-0.06	0.09	0.12
	Give food treats	-0.08	0.08	0.00	0.10	0.02	-0.08	<b>0.65</b>
	Private vehicle	0.03	0.00	0.22	0.10	0.01	<b>0.81</b>	-0.22
	Hug	-0.02	-0.22	-0.11	-0.08	0.08	0.05	<b>0.75</b>
	Relax	0.09	0.18	0.50	0.02	0.17	<b>0.54</b>	0.11
Emotional Connection	Tough Times	-0.25	0.10	-0.15	<b>0.17</b>	-0.20	-0.20	-0.45
	Comforted	0.39	-0.11	-0.11	<b>0.69</b>	0.02	0.12	0.03
	Will.be.there.for.me	<b>0.77</b>	0.13	-0.02	0.18	-0.10	-0.06	0.04
	Dog.near.me	-0.34	0.14	<b>0.32</b>	0.11	0.09	-0.17	-0.48
	Constant companionship	<b>0.83</b>	-0.02	0.02	0.08	0.00	0.10	-0.04
	Tel my dog things	0.06	0.11	-0.11	-0.10	-0.28	0.17	<b>0.27</b>
	Constant attentive	<b>0.85</b>	0.02	0.08	0.01	-0.03	0.00	-0.12
	When my dog dies	-0.58	-0.43	0.04	0.03	<b>0.28</b>	0.24	-0.38
	Reason to get up	<b>0.52</b>	-0.25	-0.03	0.29	0.04	-0.10	0.01
	Never be apart	<b>0.69</b>	-0.18	0.05	0.06	-0.01	-0.10	0.06
Personal Cost	Dog is a burden	-0.19	0.19	-0.12	-0.02	<b>0.68</b>	0.01	0.23
	Change my plans	0.21	<b>0.43</b>	-0.14	0.06	0.38	0.21	-0.22
	Dog stop .to do things	0.06	0.22	-0.26	0.22	<b>0.59</b>	0.01	-0.07
	Not an aspect	-0.01	0.00	<b>0.45</b>	-0.02	-0.06	0.09	-0.14
	Things I have enjoyed	0.18	-0.37	<b>0.36</b>	0.03	0.03	-0.05	0.06
	Expensive	0.11	-0.09	<b>0.43</b>	-0.01	-0.07	-0.14	0.34
	Too much of a mess	-0.04	0.18	0.10	-0.19	<b>0.55</b>	0.04	0.05
	Worth the trouble	-0.17	0.15	0.10	<b>0.27</b>	-0.33	0.10	0.11
	Hard to look after dog	-0.10	<b>0.75</b>	0.06	-0.10	0.39	-0.17	0.14



## ANNEXURE F

**Dunn Test results of significant Kruskal Wallis Tests showing significant pairwise results for group comparisons.**

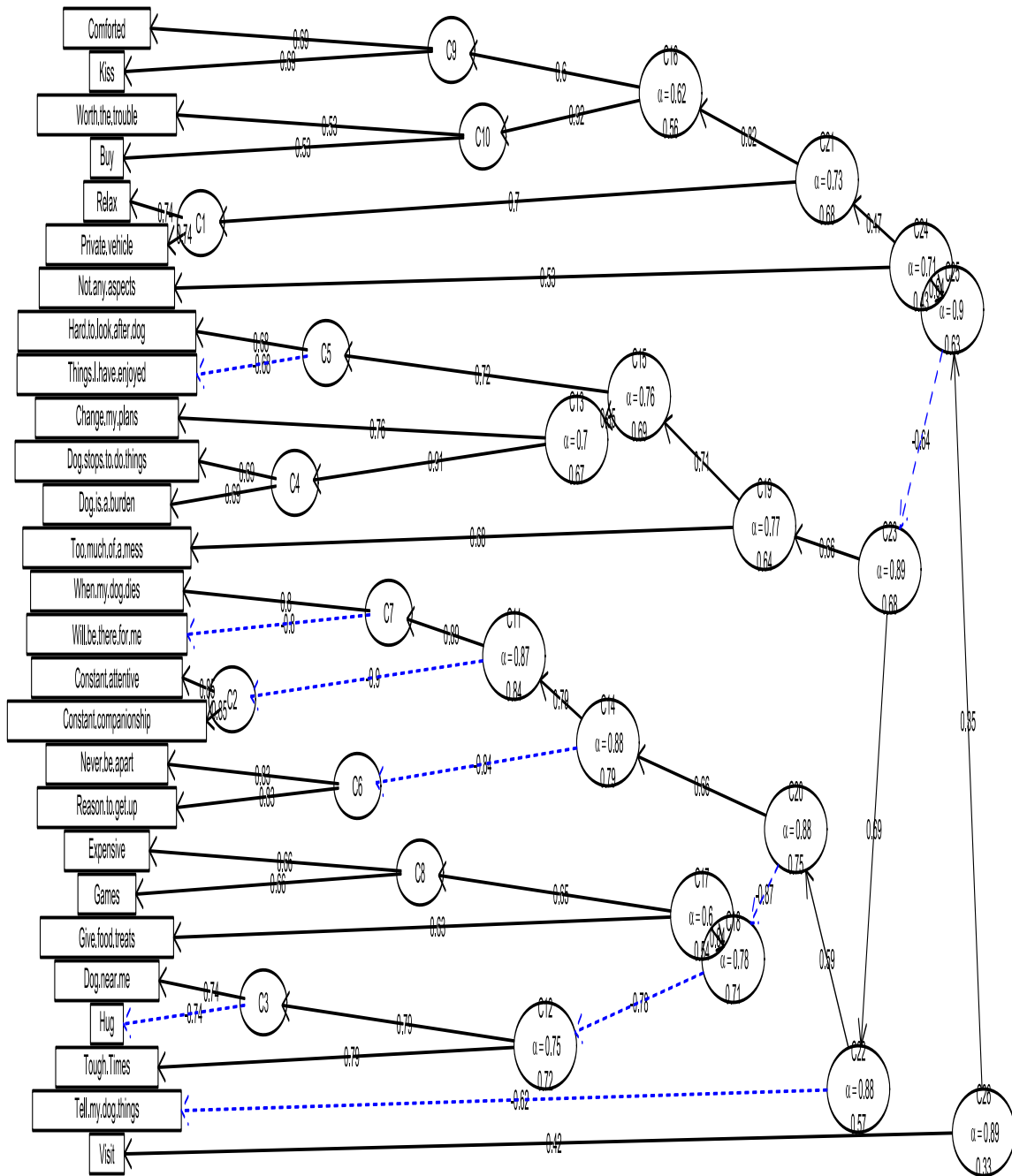
Section	Population	Demographic Factor	Groups Compared	p-value	
C	A	LANGUAGE	7&3	0.0253	
			7&1	0.0248	
			7&10	0.0053	
			7&11	0.0071	
			7&6	0.0073	
			8&6	0.028	
			8&7	0.0124	
			8&9	0.0237	
	B		7&3	0.0168	
			7&1	0.0128	
			7&4	0.0199	
			8&3	0.0081	
	A		ETHNICITY	8&1	0.0051
				8&4	0.0097
	B		ETHNICITY	1&4	0
				1&2	0.0018
A	EXPERIENCE	1&3	0.0086		
		1&4	0.0001		
		2&4	0.0181		
		7&1	0.0016		
		7&2	0.0044		
		7&3	0		
		6&4	0.007		
		4&3	0.0043		
D	A	LANGUAGE	1&4	0	
			1&3	0.015	
			1&2	0.0212	
			1&5	0.0021	
			1&4	0.0011	
			1&6	0.0126	
		EDUCATION	1&3	0.0062	
			1&2	0.0002	
			5&4	0.0228	
			1&5	0	
		EXPERIENCE	1&4	0.0024	
			1&7	0.0001	
			1&6	0.0008	
			5&3	0.007	
			1&3	0.0147	
			3&7	0.0242	
			2&7	0.0164	
			1&4	0.0011	
		FUNCTION	2&4	0.0001	
			2&3	0.0054	

E	A	AGE	5&3	0.0388
		EXPERIENCE	1&3	0.007
			1&5	0.0046
			1&6	0.0224
			7&3	0.0237
			7&5	0.0154
		ENVIRONMENT	1&2	0.007
	B	AGE	1&3	0.0219
			1&4	0.0013
			1&5	0.0068
			2&4	0.0199
		LANGUAGE	1&12	0.0188
			1&2	0.0175
			1&3	0.0079
			1&4	0.0081
			4&6	0.0103
			4&8	0.0229
			11&12	0.022
			11&2	0.0194
			11&3	0.009
			11&4	0.0092
			6&12	0.0159
			6&2	0.0234
			6&3	0.0102
			8&3	0.0223
		EDUCATION	1&3	0.0199
			1&4	0.003
1&6	0.008			
2&4	0.0148			

# ANNEXURE G

## TREE DIAGRAM OF CLUSTER ANALYSIS

ICLUST



## ANNEXURE H

**MEAN SCORES FOR INDIVIDUAL LIKERT SCALE RESPONSES FOR EACH OF THE MDORS QUESTIONS FOR BOTH POPULATIONS A AND B.**

Question	POPULATION A		POPULATION B	
	Mean	SD	Mean	SD
Kiss	3.49	1.26	3.48	1.36
Games	4.22	1.22	3.95	1.38
Visit	3.48	1.50	3.36	1.50
Buy	4.38	0.98	3.94	1.27
Give food treats	3.77	1.36	3.67	1.40
Private vehicle	2.42	1.46	2.82	1.58
Hug	4.38	1.04	4.44	1.03
Relax	2.81	1.56	2.76	1.50
Tough Times	1.93	1.23	2.01	1.36
Comforted	4.10	1.11	4.16	1.09
Will be there for me	4.37	1.06	4.44	0.93
Dog near me	2.04	1.39	1.88	1.23
Constant companionship	4.26	1.07	4.31	1.03
Tell my dog things	3.32	1.47	3.28	1.44
Constant attentive	4.20	1.15	4.14	1.01
When my dog dies	1.52	1.15	1.54	1.12
Reason to get up	4.28	0.98	4.27	0.95
Never be apart	4.17	1.17	4.18	1.09
Dog is a burden	1.42	1.02	1.31	0.85
Change my plans	1.67	1.04	1.59	0.96
Dog stops to do things	1.70	1.05	1.76	1.15
Not any aspects	3.40	1.52	3.46	1.44
Things I have enjoyed	4.11	1.23	3.96	1.33
Expensive	3.94	1.32	3.48	1.36
Too much of a mess	1.80	1.12	1.75	0.97
Worth the trouble	3.76	1.54	4.45	1.07
Hard to look after dog	1.55	0.99	1.70	1.08
<b>Total</b>	<b>90.73</b>	<b>9.40</b>	<b>89.13</b>	<b>8.81</b>