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1. Zusammenfassung

Den Beziehungen die Menschen zu Tieren, insbesondere Hunden, pflegen wird immer mehr Interesse zuteil. Obwohl jedoch Natur und Auswirkungen ebenjener auf Hund und Halter zunehmend erforscht werden, sind Studien zum Spaziergang, einem der wichtigsten Bestandteile des täglichen Lebens beider, rar. Die täglichen Spaziergänge befriedigen verschiedene Verhaltensansprüche beider Partner und sind einer der meistgenannten Beiträge zur Gesundheit von Hundehaltern. Des Weiteren ermöglichen sie die Knüpfung vielfältiger Kontakte und bieten Hunden Gelegenheit verschiedenste Reizsituationen der Umgebung kennenzulernen. Außerdem bietet der Spaziergang die Möglichkeit die Kooperation/Interaktion von Hund und Halter in einem „natürlichen“ Setting zu beobachten und Einblicke in die Mensch-Hund Beziehung zu erlangen.

Das Ziel meiner Diplomarbeit war einen Einblick in die Eigenschaften der Besitzer-Hund Paare und ihrer Beziehung zueinander während Spaziergängen in Wien zu bekommen. In einer Art Feldstudie beobachteten wir daher 572 Besitzer mit ihren Hunden in einem Beobachtungsraum von 100m während dreier unterschiedlicher Zeitfenster (morgens: 6:00-9:00; mittags 11:30-14:30; abends 16:30-19:30) an fünf verschiedenen Orten. Die insgesamt 60 Beobachtungen fanden von Dezember 2011 bis April 2012 ausschließlich an Wochentagen statt. Zwei stationäre Beobachterinnen zeichneten mittels Checksheet und Diktiergerät demographische Daten sowie alle gezeigten Verhaltensweisen des Paares miteinander und gegenüber ihrer Umgebung auf. Außerdem wurde der Aufenthaltsort des Hundes in Relation zu seinem Besitzer aufgenommen. Später wurden die gewonnenen Daten in ein SPSS Datenblatt eingetragen.

Mehr als 80% aller Besitzer und Hunde waren normalgewichtig und wie erwartet zeigten sich Einflüsse gewisser Eigenschaften (z. B.: Geschlecht, Alter und Gewicht) des Besitzers, sowie der Leine, auf den Hund sowie sein Verhalten. Mehr als die Hälfte aller Hundehalter hielten ihre Hunde angeleint und entfernten den Kot ihres tierischen Begleiters. Wir verzeichneten keinen einzigen Fall von Schnappen oder Beißen und nur einen einzigen Fall von defensiver Aggression einem fremden Menschen gegenüber.

Mehrere Ergebnisse stimmen mit Erkenntnissen überein, die bereits in anderen Studien, die in kontrollierterer Umgebung stattfanden, gefunden wurden. Dies spricht dafür, dass auch eine

Methodik wie diese, welche mit nur wenigen Ressourcen durchgeführt wurde, für weitere Untersuchungen zur Erlangung solcher Überblicke, sowie zur Beantwortung detaillierterer Fragen zum Thema Mensch-Hund Beziehung in Städten geeignet wäre.

2. Abstract

The human- animal relationship and especially the human- dog relationship is gaining interest and are being increasingly well researched. Nonetheless, the daily walk, a very important and beneficial part of the life of both owner and dog, as it satisfies various needs of the dyad, is scarcely researched. It is not only supposed to be one of the main reasons for the beneficial influence dogs have on their owner's health, but also plays an important role in desensitizing and habituating dogs towards their environment. Furthermore, the behaviors shown by the owner, as well as the dog might provide us with further insight into the relationship between the two.

The aim of my diploma thesis was to gain insight into the characteristics of owner- dog dyads during their walks in Vienna. In a field study we observed 572 owner- dog dyads in observational areas of 100m at five different locations and within three different time windows (morning: 6:00-9:00; midday 11:30-14:30; evening 16:30-19:30), resulting in a total of 60 observational sessions. Observations took place on weekdays from December 2011 to April 2012, with two stationary observers present at all times. All occurring behaviors of owner and dog towards each other as well as towards their environment, demographic data concerning owner and dog and the whereabouts of the dog in respect to its owner were rated visually and noted using check sheets and voice recording. The data was later on transcribed into an SPSS data sheet.

More than 80% of the owners as well as their dogs were normally weighted and certain traits of the owner, namely gender, age and weight, as well as the use of a leash were found to influence demographic, as well as behavioral traits of the dogs. Generally, dog owners acted according to the law, therefore restraining their dogs and removing the droppings of their animal companion. Lastly, but importantly, no snapping or biting behavior was observed at all and only one single instance of threatening behavior towards a stranger occurred.

Several of the found results are consistent with studies that were conducted in a much more controlled environment. That indicates, that though the procedure is rather general it could be suitable for investigating further basics, as well as more detailed questions on a cities situation concerning dogs and their owners.

3. Introduction

3.1. A brief history of dog and man

It remains highly controversial when exactly humans started domesticating wolves, therefore setting a path towards the evolution of the domestic dog. Due to the variability of wolves, the determination of discovered bones is difficult, making it nearly impossible to tell whether wolf or domestic dog bones were found (WACHTEL 2002). Even within its lifespan, variability in a wolf is huge, which further complicates discriminating between an early form of dogs and captive wolves. For example, wolves that have been born in the wild, but were held in captivity, show differences to their wild conspecifics, that increase with every human-associated generation (ZIMEN 1988). It therefore seems probable that once a selection for tameness started, the physiology and morphology of the following generations changed in a similar way to Belyaev's famous silver foxes (BELYAEV 1979, TRUT et al. 2009, ZIMEN 1988).

However, it seems that for at least 10 000, more likely even for 15 000 to 135 000 years, wolves and then dogs have been men's companions (PANG et al. 2009, SAVOLAINEN et al. 2002, WAYNE 1993 VILÀ et al. 1997) which leaves them as the first domesticated animal.

In more recent times dogs were bred for many other characteristics, so that today different breeds of dogs exist which vary quantitatively in their behavioral dispositions, as well as in their appearance (KING et al. 2009).

The most pristine dog breeds, as new genetical evidence suggests, originated in Africa and Asia and include "nordic" breeds (such as the Alaskan Malamute, Siberian Husky or Samoyed) as well as the physically very different Afghan Hound and Saluki (PARKER et al. 2004).

3.2. Why do we keep pets in the first place?

First of all, it seems that humans are genetically programmed, our brains hardwired to take interest in our environment and especially in the wildlife surrounding us. The neurons of the human amygdala for example react stronger to pictures of animals than landmarks, objects or even persons (MORMANN et al. 2011). According to Wilson (1984) this kind of innately emotional affiliation towards nature and animals was evolutionarily selected for. "Biophilia", as Wilson named this trait, supposedly enhanced men's chances of survival, because individuals who were interested in their environment were more likely to survive and reproduce, therefore passing the genes responsible to the next generation (WILSON 1984, 1993).

However, this interest in nature alone does not explain why we are able to engage in a relationship with animals, nor does it provide an explanation for the question why, of all animals, the wolf was the first one to be domesticated. Nowadays it is believed that the most likely reason humans started living with tame animals were spiritual believes. As animals were considered equally animated as humans, which upon killing them resulted in guilt, one had to reconcile the spirit of said animal by raising its offspring for example (KOTRSCHAL 2012, JULIUS et al. 2012). The underlying mechanisms enabling humans to understand other animals and dogs in particular are both physiological and psychological and first and foremost caused by our shared heritage as vertebrates: A conservative, social brain as well as hormonal system resulting in similar behavioral output (GOODSON 2005, O'CONNELL & HOFMANN 2012, KOTRSCHAL et al. 2009). Especially Mammals share the same set of basic emotions such as fear, anger, curiosity and play (PANKSEPP 2004, PANKSEPP 2011) the display of which is based on “instinctual-behavioral” neural pathways and therefore does not have to be learned (PANKSEPP 2011). The recognition and interpretation of emotions in others however, is a skill that has to be “fine-tuned” at an early stage of childhood/puppyhood and is generally known as “socialization”. It seems that this process can furthermore be used to familiarize oneself with the behavior of other species, resulting in enhanced abilities to predict others actions, and therefore an increased social capability. On the other hand, if dogs do not have enough opportunities to socially interact with other dogs or humans during these critical times of development, they are likely to behave insecurely towards them, due to an impaired ability to read the other's body language (JULIUS et al. 2012).

An important factor concerning our caregiving behavior towards other species is the innate reaction of brood caring species to the schema of childlike features which instantly evoke the desire to care for another being featuring these characteristics (JULIUS et al. 2012). Oxytocin, the “bonding hormone” rewards us with positive feelings for these behaviors (CURLEY & KEVERNE 2005) and seems to be one of the main underlying factors in the formation of relationships (BEETZ et al. 2012).

Thus, the human-animal bond is comparable to a human-human bond, for example the bond of parent and child, (KOTRSCHAL et al. 2009, ZILCHA-MANO et al. 2011) and the quality of the relationship influences spatial closeness of dog and owner as well as their orientation towards

each other and the dyads performance in tasks (WEDL et al. 2010, SCHÖBERL 2009, ALIABADI 2010).

3.3....and why dogs?

Dogs are seen as uniquely adapted to our ways of communication as well as social behavior (FEDDERSEN-PETERSEN 2008, TOPAL 2009). The substrate for the association of wolf and men may have been the great similarity between the social systems and skills of their ancestors, the wolves, and humans (TOPAL 2009). Both species live in a cooperative, family based social system with the parents as leading “alpha” figures since they control resources and offer guidance (MECH 1999). Nevertheless, dogs differ from their ancestors in some respects, because they have been, consciously or unconsciously, selected for living with humans and understanding communicative cues of their human partners (FEDDERSEN-PETERSEN 2008, TOPAL 2009). For example dogs establish eye contact with humans more readily than wolves and are more capable of controlling their aggressions as well as to interpret human (distal) pointing gestures from a very early age (GÁCSI et al 2005, GÁCSI et al 2009, VIRANYI et al.2008). However, in contrast to our closest relatives, chimpanzees, well- socialized adult wolves are able to interpret pointing gestures (BRÄUER 2006, GÁCSI et al. 2009, KIRCHHOFFER 2012). Some scientists even go as far as to talk about a co-evolution of dogs and men (SCHLEIDT & SHALTER 2003).

3.4.Man’s best friend

Many people see their dogs as full- fledged family members (ALLEN 2003). Dogs furthermore support us in finding drugs, locating missing people, detecting cancer (MC CULLOCH et al. 2006) and aid people with special needs in various ways (UDELL&WYNNE 2008). In addition, what seems to be even more important given our modern society, dogs play an essential role as companions since they facilitate contact to other people (GUEGEN & CICOTTI 2008). Being with a dog that is perceived as friendly enhances the chance of being addressed by strangers in an amicable way (HART et al. 1987, WELLS 2004) and can even be a valuable advantage in courtship behavior. Guegen and Cicotti (2008) found, that the presence of a dog increased the probability of women giving their phone number to a stranger. Moreover, a dog in the classroom increased the homogeneity of the class as well as the attention the children paid to

their teacher (KOTRSCHAL & ORTBAUER 2003). In stressful tasks dogs were even found to be better social supporters than close friends, spouses or friendly people in general, because other people were perceived as judgmental and therefore rather increased the stress level of the tested individuals (ALLEN et al. 2002; ALLEN 2003, BEETZ et al. 2011).

3.5.Dogs, health and the walk

Moreover, it seems that the presence of dogs enhances the physical as well as the psychological well-being of people who interact with them in several ways (FRIEDMANN et al. 1980, BEETZ 2012). First, interactions with dogs reduce depressions (SOUTER & MILLER 2007), contribute to a positive mood and increase perceived quality of life, especially regarding social contact (KAMINSKI et al 2002, VILLALTA-GIL et al. 2009). Secondly, they reduce stress (namely the release of cortisol in most studies) and influence correlated factors such as heart rate, heart rate variability and blood pressure. The presence of a friendly dog lowers blood pressure (ALLEN 2002, FRIEDMANN et al. 1983, VORMBROCK & GROSSBERG 1988) and heart rate (HANDLIN et al. 2011) and increases heart rate variability while walking (MOTOOKA et al. 2006), which is thought to be associated with a relaxed state (BEETZ et al. 2012). Overall these effects are independent of whether or not the subjects knew the dog and are mostly associated with physical interaction such as petting the dog (BEETZ et al. 2012, ODENDAAL 2000, ODENDAAL & MEINTJES 2003), but also occur in the mere presence of the animal (DEMELLO 1999).

As these effects overlap hugely with the functions the “bonding hormone” oxytocin is associated with, this small peptide is one of the most likely reasons for the positive effects of human-dog interactions. It is mainly released in response to the sensory stimulation of physical touch - e.g.: stroking; and is responsible for the formation of bonds with children, as well as partners. Thus it seems that a similar mechanism is at work in the formation of relationships with pets. In addition, oxytocin dampens stress (especially in social situations) and causes blood pressure and heart rate to decrease (BEETZ 2012).

Through studies involving Oxytocin measurements, scientists were able to show, that the positive effects of interaction do not only affect humans, but are present in the dog too (HANDLIN et al. 2011, ODENDAAL & MEINTJES 2003). These stress dampening effects together with the daily

exercise dog owners get by walking their dog might contribute to the health of pet owners and dog owners in particular. The daily walk is supposed to be a mild but efficient exercise that might help preventing common lifestyle diseases such as diabetes, cardiovascular problems and other health deficiencies commonly associated with being overweight (SERPELL 1991, CUTT 2008, KOPELMAN 2007).

Besides the beneficial effect of the exercise on the health of owner and dog both, going on walks also holds the possibility to explore the environment and encounter other dogs, people or even other animals as well as experiencing new stimuli and events. Therefore it provides the possibility to habituate and desensitize to stimuli the environment holds, contributing to the dogs' socialization and welfare (DEFRA 2009, WESTGARTH 2010). Especially dogs that lack the opportunity to socialize with their environment during critical stages of development, for example during puppyhood and puberty, are at risk for development of problematic, stress and fear related behaviors in everyday life (FEDDERSEN-PETERSEN 1992). However, even though the walk is considered to be an important part of the owners as well as the dog's life, very little literature can be found concerning this topic (DEFRA 2009, WESTGARTH 2010).

According to Auer (2010) and Hesze (2012) a leash walk can be considered as a cooperative performance of humans and wolves, as well as dogs, by means of the three criteria (congruence, synchrony and spatial coordination) established by Naderi. et al. (2001) and based on the definitions used by Boesch and Boesch (1989) and Chalmeau and Gallo's (1996). They perform actions similarly, thus complying with the criteria of congruence, as well as being coordinated within close proximity (spatial coordination) and are furthermore synchronized in parallel regarding the timing of their actions (AUER 2010).

Westgarth (2010) showed that dog-dog interaction can vary widely (behaviors such as sniffing, play and aggression) and that using a leash reduces the number of those interactions. They might as well be affected in their behavior by how frequently their owners walk them, their owner's habits concerning said walks and the dog's personality (WESTGARTH 2010).

Not only may a dog interact with other dogs while walking, but also with other people and not all of these interactions lead to a positive response. Many people in urban areas are concerned with health risks due to aggressive or disobedient behaviors of dogs (ARHANT 2008). Additionally, dog feces seem to create conflicts between dog owners and non-dog owners that sometimes

escalate into verbal, as well as physical attacks on owners or poison attacks on dogs (WACHTEL 2002).

As different as many dog trainer's methods and opinions on dog handling and schooling are, most of the trainers agree about the daily walk being a necessary and important element of dog keeping and the owner-dog relationship. In urban environments, where gardens are rare, it is a vital part of an appropriate life for a dog, which, in return, is more able to be a "society friendly dog" (WACHTEL 2002).

3.6.Aim of the study

The aim of the study was to gather information on the dog owners of Vienna to see what the average Viennese dog owners walking habits were in terms of which locations he/she walks, their demographic features and the behaviors owner and dog show towards each other and towards their environment. An emphasis was put on whether or not the popular saying "Wie der Herr so s' Gscher" (Like owner like pet) would show in this setting, if the behavior of the owner influenced the dog and how the use of a leash contributed to the expression of different behaviors.

In addition, a special interest was put on whether or not owners acted according to the law- which would require them to keep their dog muzzled or leashed at all times and if they would dispose of their dogs' feces.

Furthermore assessing how often disputes between people, as well as dogs, take place in dependence of age, gender and other demographic traits of dog owners and dogs was an aim of this study. A special interest was taken in whether dogs listed by the Vienna City council (Bullterrier, Staffordshire Bullterrier, American Staffordshire Terrier, Mastino Napoletano, Mastin Espanol, Fila Brasileiro, Mastiff, Bullmastiff Tosa Inu, Pitbullterrier, Rottweiler, Dogo Argentino (Argentinischer Mastiff) and their crossbreeds, which are considered to be more dangerous to people than other breeds and who's owners are required to have a "dog licence" (WIEN.at 2012), are more aggressive towards people or dogs than their non-listed con-specifics.

3.7.Hypotheses

We expected that dog owners in general would be rather healthy (HEADEY & GRABKA 2007, HEADEY 1999); therefore we expected that the majority of dog owners would be of normal weight.

We further expected different (demographic) traits of the dogs to relate to those of their owner as well as different demographic and behavioral patterns for the various locations of Vienna.

Especially gender, age and weight of the owner as well as the use of a leash and muzzle were thought to influence dog behavior and demographic traits (e.g. KOTRSCHAL et al. 2009, ALIABADI 2011, PETZL 2011, REZAC et al. 2011).

For example, it would be expected that overweight owners have overweight dogs more often (PETZL 2011) and that sniffing would be amongst the most popular ways of dog-dog interaction. Moreover, dogs of male owners, as well as leashed dogs were expected to be more likely to show aggression (as found by REZAC et al. 2011).

4. Methods

Observations of owner- dog dyads took place in the (inner) city of Vienna at five different areas, within four different precincts, from December 2011 to April 2012. Two of our observational sites were at the Donaulände near Friedensbrücke on opposite sides of the river and therefore different precincts (Friedensbrücke 1: 9th precinct; Friedensbrücke 2: 20th precinct), two at the Donaulände near Urania (Urania 1: 1st precinct, Urania 2: 2nd precinct) also on opposite sides and one area at Prater Allee (2nd precinct).

Both areas near Urania were rather artificial with an asphalted walkway and no access to the river, except for an occasional stairway down a wall of approximately two meters in height. Urania two had more grassy areas and trees, as well as park benches and a little vegetable patch which seemed to be part of a “public gardening” project. The two Friedensbrücke areas were more natural, with access to big, lawn like areas at either one (Friedensbrücke 2), or both sides of the asphalted walkway with access to the river. The Prater Allee had a large, main asphalted walkway where most of the sporting activities as well as some car traffic took place, but additional natural walkways were also available plus large areas of lawn together with many trees for shade. The Prater is a huge park containing an amusement park, large grassy areas, trees and artificial ponds. It is used for sporting and other recreational activities by a considerable variety of people. Furthermore it contains one of the larger, non- fenced in dog zones, but our observational area was at a significant distance from the latter. The assortment of our observational sites somewhat represented a continuum from artificial towards natural in this order: Urania 1, Urania 2, Friedensbrücke 2, Prater Allee, Friedensbrücke 1.

In general, dogs in Vienna have to be leashed or muzzled except if they are moving in assigned “dog zones”. We chose observational areas where an owners decision whether to leash its dog or not was neither influenced by additional signs demanding to leash the dog, nor by an assigned “dog zone”. Every area was, in total, observed for two days each season, weekdays only, split into three different time windows (morning: 6:00-9:00; midday 11:30-14:30; evening 16:30-19:30) resulting in a total of 60 observations.

Interactions were recorded in sections of 100m alongside the walkway while the observers stayed at one place in the center of each area at all times and tried to be as inconspicuous as possible. All occurring behavior of owner and dog towards each other as well as towards their environment

and demographic data concerning owner and dog were noted using check sheets and voice recording and were later on transcribed into an SPSS data sheet.

Both observers were present at every observation to reduce the risk of missing behaviors by either human or dog and to decrease the conspicuity of the observers.

By noting the appearance of the owners as well as dogs we tried to avoid having doubles in our data set. If we weren't sure whether we had seen a dyad before, we recorded it and noted our suspicion to check our data set for earlier sightings.

People walking the dog were assumed to be its owner. Owners with more than one dog were excluded from observation, because keeping the owner and several dogs under observation would have been impossible.

The recorded variables were location (as above), demographic data of owner and dog, date and time, as well as the time window (morning 6:00-9:00; midday 11:30- 14:30; evening 16:30- 19:30). In addition, the time the dyad spent together in our observational area (duration in seconds) and the duration the dogs were leashed/free or muzzled was documented. Furthermore we noted where the dog was walking in relation to the owner and for how long it did so.

The stopwatch was started, as soon as both, owner and dog had entered the observational area and stopped as soon as one of them left it. If a dyad sat down on a park bench or anywhere else for more than two minutes, the observation was ceased.

The type of locomotion the owner exhibited (walk or sport) was noted, as well as any communication and interaction between owner-dog, dog-other human, dog-dog, dog-other animal and owner-other human.

The velocity of owner dog dyads could be calculated by using the duration of time they spent in our observational area. If dyads turned around inside the section they were excluded from all statistical analyses regarding the velocity.

4.1. Demographic features of owner and dog

4.1.1. Age

People who had grown out of adolescence were rated adult, whereas people who showed features of senescence such as grey hair, hunched shoulders, seemed to already have shrunk in height, had many wrinkles or age spots were rated as senior. Dog owners with juvenile or adolescent features were rated as children. In dogs, juvenile exterior was rated as “juvenile” and all others were rated adult. We did not distinguish between adult and senior dogs, because looks in this case can be very deceiving and some dogs get a grey snout or partially grey face with slightly longer hair which could be seen as a sign of senescence even at a relatively young age.

4.1.2. Stature- weight

Weight was assessed through the combination of various stature related features.

The term underweight referred to individuals who combined various features such as an overall very thin appearance, drawn face, sunken eyes, bones “shining through”, seemingly long legs and arms in proportion to the body. Dogs were rated underweight, if one could see the ribs shine through the skin even during normal movement and hollows were showing in the face with regards to the dogs breed.

Owners with normal body shape were those with a generally slender physique. Slight chubbiness at the belly, buttocks and thighs could be present, but no fat rolls and overall “good” proportions. Dogs body shapes were rated in relation to their breeds as normal if we could see a distinctive, rising curve from ribcage to abdomen.

“Overweight” in humans referred to an overall broad, if you will elliptic shape with a round face and an enlarged belly region. In men overweight can also refer only to an enlarged belly. The weight could possibly already be affecting movements, turning a “normal” walk into a slightly swaying movement. Dogs were rated overweight if their abdomen was not clearly distinguishable (in widths) from or even broader than their ribcage.

Factors for rating people “obese” were a highly enlarged belly section, an increasingly round body shape, as well as many fat rolls. Furthermore, hardly any neck section could be seen and fingers and face were chubby. The fat was increasingly making movement harder due to thighs rubbing against each other.

4.1.3. Care for appearance (only in the owner)

Another demographic factor taken into account was the dog owner's care for appearance. If appearance didn't seem to matter to the owner and was uncared for (hair unkempt or/and fatty, clothes old/worn out/ripped/dirty, discolored and/or missing teeth...), the care for appearance was rated low. If the owner's appearance was cared for (hair washed, clean, intact clothing...), it was rated average and if appearance seemed to matter highly to the person (hair clean and neatly done, expensive looking, well cared- for clothes, make up, jewelry...) it was rated high.

4.1.4. Body posture (only in dogs)

The overall body posture of the dog was rated at the end of the observation, cued through aspects in movement and posture as well as facial expression, tail root and head posture in respect to the dog's back line and the posture of the ears. "Submissive" dogs were carrying their head as well as their tail root below the back line and turning their ears slightly back and sideways giving an impression of ducking and cautious movement. "Sociopositive" dogs showed relaxed movements with long strides, swaying back and relaxed, often with an open jaw. The head and the tail root were either carried levelly or above the back line, but without tension. "Imposing" dogs walked without much movement in the back, showing pricked (as far as the shape of the ears allowed it) ears and a high (recognizably higher than the backline) held tail root and head. The front part of the body was slightly heightened. Movements of dogs rated "imposing" seemed tense.

4.1.5. Height (only in the dog)

Dogs were rated small if their estimated shoulder height was less than 30 cm, medium if they were estimated to be less than 50 cm of height and large if they were taller than 50 cm.

4.1.6. Breed

If the breed of the dog was known it was noted. Dogs were categorized as "purebred", "cross bred" "listed purebred" or "listed cross bred". For statistical tests the categories "non-listed dog" and "listed dog" were created.

4.1.7. Lawfulness

If a dog was or was not leashed (for example a dog who had a leash attached to its collar or harness, but without the owner holding the other end of the leash was rated as not leashed) or muzzled was noted and later on used to create the variable “lawful” to see whether or not there were differences in dog owner’s lawfulness due to location or demographic features.

Another variable controlled for was whether or not dog owners removed their dog’s feces, though whether they used the designated bags to do so or any other tool (i.e.: paper bags, leaves, snow...) was not noted.

4.2. Noted behaviors

Only behavior directed to somebody, either apparent through close proximity or distinct looking/orienting of the body towards or away from a person or dog was noted. In case of dog-dog encounters the behavior of the currently observed dyad’s dog was focused on.

The only exception hereof was the variable “imposing scraping”. Because of the difficulties in defining the directedness of this behavior though it was not used for statistical analysis.

4.2.1. Behaviors exhibited by either the owner or another person towards a dog

Verbal communication:

It was differentiated between talking to the dog and commands as verbal communication between a human and the dog. If the owner just verbally communicated with the dog about anything without using a known command and without obviously demanding an explicit reaction from the dog it was referred to as “talking to the dog”. Said commands as simple words or word combinations such as “No”, “Leave it”, “Sit”, “Heel”, “Stay”, “Come” or the likes.

Nonverbal command:

If a human was looking at the dog and vice versa, while the human part of the observed dyad gave a hand signal, pointed someplace or used other significant gestures it was referred to as “nonverbal command”.

Sociopositive behavior:

Positive behavior mainly was divided into two major behavioral groups. All general positive behavior such as grooming the dog, rewarding the dog and talking to the dog in one group and play behavior that was initiated by the owner in the second group. Play behavior is a sum of “tug of war” which referred to dog and human pulling on the same item, object play, which referred to throwing/kicking of objects for the dog to chase after them and other playful behavior towards the dog that could not be categorized as any of the two previous types of play. Furthermore rewards were added to this category.

Reward:

We noted if a command was executed accordingly (as far as we could tell) or not and if the dog was rewarded, though we did not differentiate between verbal praise, stroking or treats.

Orienting behavior (only within the dyad):

Looks at the partner as well as stopping when the partner stopped were summed up to create the variable “orienting behavior”.

Look:

If the owners recognizably looked or turned their head towards the dog’s body it was referred to as looking at the dog.

Negative behavior:

A sum of the observed punishments and leash tugs was termed negative “behavior”. Behaviors were referred to as punishment if they were carried out as a response to presumably unwanted behavior as well as to not reacting to given commands. No differentiation between physical punishment (such as pulling the dog away from something) and scolding the dog verbally was made.

Leash tug (only within the dyad):

If the owner jerked the attached leash backwards or sideways it was referred to as leash tug.

Non-orienting behavior (only within the dyad)

If the owner went on while the dog stopped it was termed as non-orienting behavior.

4.2.2. Behaviors exhibited by the dog owner and directed towards another person

Positive behavior- Talking

It was distinguished between “greeting”, “talking” and “talking about the dog”. “Greeting”, could be indicated by greeting phrases as well as gestures such as tipping a finger to the hat or lifting said hat, all kinds of waving as well as nodding/slightly bowing with the head or the whole body turned towards the person at the receiving end of the greeting.

If people stood facing each other they were assumed to be talking. Conversation were termed as “talking about the dog” if the conversation could be overheard the conversation and the name of the dog or questions such as “How old is he” and the likes were asked. If they could not be overheard cues on the topic via hand signals such as nodding/pointing towards the dog were used as indication. If none of these topic cues were available or the overheard subject did not include dogs the behavior was referred to as “talking”.

Negative behavior

If angry gestures or angry talking between the owner and another human occurred it was noted as negative behavior.

Evading:

If due to the behavior of the owner it was obvious that he/she was evading, namely changing direction or forgoing another human being in a bow it was noted as “evading”.

4.2.3. Behaviors exhibited by either the dyad's dog or another dog towards either the owner or another person as well as towards other animals

Vocalizations:

Under the term vocalization all sorts of barking and growling were combined.

Barking

Not every single bark, but bouts of barks were counted. If the dog stopped barking for more than two seconds and then started again it was considered a new bout.

Look:

If the dog looked at a person, turning its head towards the person, mostly pricking its ears, was termed as looking at said person.

Orienting behavior (only within the dyad):

Looks at the partner, as well as stopping when the partner stopped and reacting accordingly to commands were summed up as “orienting behavior”.

Sociopositive behavior:

All sociopositive behavior as well as play behavior was summed up in this category.

Play:

All behaviors associated with playing, such as play bow or playful facial expressions were combined for the variable play.

Sniffing:

Contact of the dogs' nose with another human being as well as sniffing behavior such as standing near or following a person with obvious direction of the nose towards said person's direction was considered sniffing.

Submissive behavior:

All submissive behaviors, mostly directed at a person's face and hands, characterized by a low held head, slightly crouching movements and put back ears were combined to the variable “submissive behavior”.

Imposing behavior:

All imposing behaviors, except for “imposing scraping”, displaying superiority towards a person, along with imposing body posture and tense movements were considered to be imposing behavior.

Agonistic behavior:

Offensive and defensive behaviors such as ruffling up, growling, the baring of teeth and other threatening behaviors were summed up as agonistic behavior.

Snapping:

All behaviors (except for playful situations) in which the dog launched open mouthed at another person or animal without closing its mouth around a body part or clothing of said person or animal.

Biting:

If the dog closed its muzzle around another dog's fur or body part it was considered as biting.

4.2.4. Behaviors exhibited by the dyads dog towards another dog

Vocalizations:

Under the term vocalization all sorts of barking and growling were combined.

Barking

Not every single bark, but bouts of barks were counted. If the dog stopped barking for more than two seconds and then started again it was considered a new bout.

Look:

If the dog looked at another, namely turned its head to face towards another dog, it was termed as looking.

Submissive behavior:

All submissive behaviors, mostly directed at another dogs face and muzzle, characterized by a low held head, slightly crouching movements and put back ears were combined to the variable “submissive behavior”.

Sociopositive behavior:

All sociopositive and playful behaviors as well as greeting behaviors (sociopositive approach, sociopositive snout contact and inspection) were summed up for the category sociopositive behavior.

Play:

All behaviors associated with playing, such as play bow or playful facial expressions were combined for the variable play.

Greeting behavior (only within dog-dog dyads):

Greeting behavior includes approach, snout contact and sociopositive inspection.

Imposing behavior:

All imposing behaviors, except “imposing scraping” behaviors displaying superiority towards another dog, along with imposing body posture and tense movements were termed imposing behaviors.

Agonistic behavior:

Offensive and defensive behaviors such as ruffling up, growling, the baring of teeth and other threatening behaviors were summed up as agonistic behavior.

Snapping:

All behaviors (except for playful situations) in which the dog launched open mouthed at another dog without closing its mouth around a body part or fur of the attacked dog.

Biting:

If the dog closed its muzzle around another dog's fur or body part it was considered as biting.

4.2.5. Behavior on leash

Strained/lose leash:

The leash was rated strained, if it was extended to its full possible length and drawing a straight line between the dogs collar/harness and the arm of its owner. Due to the tension in the leash the owners arm was not hanging loosely by its side, but is slightly or explicitly drawn in front of the body.

4.2.6. Whereabouts of the dog in reference to the owner

Close:

The dog is moving inside a circle of two meter around the owner.

Distant:

The dogs rear/head (depending on whether it is walking in front or behind its owner) is more than two meters away from the owner.

Far:

The dogs rear/head (depending on whether it is walking in front or behind its owner) is further than 20 meters away from the owner.

Front:

The dog's rear is in front of the owners legs.

Next:

The dog's body is at the same height as the owners legs.

Behind:

The dog's head is behind the legs of its owner.

4.3.Criticism concerning the method

We are well aware, that much of our data entails a measure of subjectivity no matter how hard we tried to come up with easily applicable ratings for demographic traits as well as definitions for the observed behaviors and that our findings therefore have to be interpreted cautiously. Due to our need to stay inconspicuous it was not always easy to keep the dyads in sight without disturbing them through staring. Switching from the check sheet to voice recording and observing together helped, because, as we had to acknowledge, the check sheets drew more attention than two girls on a park bench talking to one another- no matter how unfavorable the weather was. Presumably, the observed dog owners feared to be persecuted for their actions (if they left the dog unleashed or did not pick up its feces) and that we were here to report them to the city.

Furthermore, the human- dog dyads were walking by us at various distances with various velocities and in the mornings, as well as the evenings it was mostly already dawning or dark which made seeing behaviors, as well as taking demographic data difficult at times.

Though we tried to keep the variety of recorded behaviors limited it still proved to be too detailed and we had to simplify behavior definitions as well as cluster several behaviors to a create super groups in order to enable statistical analyzes.

For more accurate and detailed data videotaping, from two opposite angles would have been of great help, because some behaviors might have been missed due to the rapid changes and events. Focusing on both, owner and dog, equally to record every behavior is very hard to do by surveillance. Because videotaping people without their consent is largely restricted and asking for permission might alter the behavior of the owner due to the knowledge of being watched, observational data in association with questionnaires might be a way to get more accurate data. This might be the way to go, especially for gaining insight into the status of the walk, for the relationship between owner and dog, and findings about how accurately one can describe the quality of the relationship by means of the walk. Questionnaires on demographic data of owner and dog together with shorter versions of questionnaires allowing us to classify the owner's, as well as the dog's main personality traits to fill out after the observation of the dyad would help to interpret found data. Furthermore, it would probably be better to observe the dyads for a longer

period of time rather than to limit the observations to an area. Though this methodology would most likely lead to a lower n it would increase the reliability of the acquired data and therefore increase the quality of the study.

4.4. Statistical data analysis

Statistical analysis was executed using IBM SPSS 21 as well as Excel (Microsoft Office 2010). Non-parametric tests such as frequency analysis, Chi square tests (for demographic data) and Mann Whitney U, as well as Kruskal Wallis tests to test for differences in behaviors were applied.

5. Results

5.1. General results

The following percentages were calculated only for one sighting of a dyad. If a dyad had been observed more than once, the first sighting was used for the calculation. For statistical analysis such as Chi- squared, Fishers exact, Mann- Whitney- U and Kruskall- Wallis tests children were excluded due to a small sample size. The parameters “underweight” and “obese” were excluded due to small sample size to meet the requirements of the used testing operation.

In spring slightly more people (54, 4%, n=572) than in winter were walking their dogs. One of our observational sites, “Urania” (1st Viennese precinct), was much less frequented than the others (5, 6% n=572) and the most frequented area was „Prater Alee“(30, 2 %).

The three chosen time windows were frequented relatively evenly with 38, 5% walking at midday, 36% in the evening and fewest people walking their dog in the morning. More purebred, non- listed dogs (59, 3%) and non- listed mongrels (36, 0 %) than listed dog breeds or mongrels (4, 7%) were observed.

Surprisingly, large dogs were observed more often (37, 2%) than small (29, 9 % n=572) or medium sized ones. The vast majority of observed dogs were adult (97%) and 67, 4% were determined as male. Furthermore, most dogs showed socio- positive (56, 3%) or submissive (24, 8%) body postures (n=442). In contrast more women (61, 9%) than men (38, 1% n=572) were walking dogs and the majority of owners cared averagely for their appearance (75, 3 % n=572). Most owners were adults under the age of 70 (83, 2%). Only 16, 3% of dog owners were rated as senior and even less of the observed dyads (0, 5%) involved children.

82% of our subjects were of normal weight and if abnormal weight occurred it was most likely to be overweight (15, 7 %). Obese and underweight subjects were hardly ever observed (0, 3% and 1, 9% n=572). The same went for dogs. The vast majority of observed dogs (84, 2%) were of normal weight, whereas 14, 9 % were overweight and the number of underweight dogs was next to nothing (0, 9% n=572). Therefore these extremes were excluded for further statistical evaluation.

Most dogs were leashed (57, 5% n=572), but without a muzzle (94, 9% n=572). Therefore 60, 3 % of dog owners acted according to the law. Furthermore, the vast majority of people removed

their dogs feces (80% n=40). Most dog owners did not engage in any sporting activity with their dogs (90, 6% n=562).

On average the human-dog dyads stayed in the observational area for 122, 08 seconds (n=572) which is about 2 minutes and therefore resulting in an average velocity of approximately 4, 40 km/h. Thus, the average dyads velocity is slightly below the „walking velocity” of 5 km/h defined by the Austrian Supreme Court of Judicatur in 2007. However, the standard deviation is very high (206,67s) which is due to the fact that some dyads were exhibiting sports such as jogging or riding a bicycle, whereas others were stopping very often and therefore took more time to pass through the observational area.

Table 1: A general overview of the demographic data on the dog owners

human		absolute	percent	valid percent
age	child	3	,5	,5
	adult	476	83,2	83,2
	senior	93	16,3	16,3
	n	572	100,0	100,0
sex	male	217	37,9	38,1
	female	353	61,7	61,9
	n	570	99,7	100,0
	missing	2	,3	
weight	underweight	11	1,9	1,9
	normal	469	82,0	82,0
	overweight	90	15,7	15,7
	obese	2	,3	,3
	n	572	100,0	100,0
Care for appearance	low	88	15,4	15,4
	middle	430	75,2	75,3
	high	53	9,3	9,3
	n	571	99,8	100,0
	missing	1	,2	
total n		572	100,0	

In sum, the typical Viennese dog walker is an adult female walking a large, male dog at the Prater Allee. She is averagely spruce and, like her dog, of normal weight. The dog is leashed, but not muzzled and therefore its owner is acting in accordance with Viennese law. Furthermore, the owner removes the feces of her dog. Crossing the observational area of 100m takes her about two minutes. But naturally there are many deviations to this picture. A considerable number of walkers had their dogs off leash without a muzzle, for example.

Table 2: A general overview of the demographic data on the dogs

Dog		absolute	percent	valid percent
age	juvenile	17	3,0	3,0
	adult	555	97,0	97,0
	n	572	100,0	100,0
sex	male	236	41,3	67,4
	female	114	19,9	32,6
	n	350	61,2	100,0
	missing	222	38,8	
weight	underweight	5	,9	,9
	normal	481	84,1	84,2
	overweight	85	14,9	14,9
	n	571	99,8	100,0
	missing	1	,2	
height	small	167	29,2	29,9
	middle	184	32,2	32,9
	large	208	36,4	37,2
	n	559	97,7	100,0
	missing	13	2,3	
total n		572	100,0	

The demographic data of human-dog dyads did not vary much with location, but at Urania significantly more senior dog owners than elsewhere were observed (Chi square $p < 0,001$ $n = 569$). Moreover, the owner's care for appearance was linked with location (Chi-square test $p = 0,048$, $n = 568$). People with average care for their appearance were observed more often in "Prater Allee", whereas owners with low and high care for their appearance were more frequently

observed at Urania 2 (2nd precinct). In which location the owner chose to walk its dog was also linked to the time of day (Chi square test $p=0,002$ $n=569$). Lastly, the use of leash as well as the lawfulness of the observed owners varies significantly with location (Chi square $p<0,001$, $n=569$). At the Prater Alee owners acted according to the law significantly more often than expected, keeping their dogs leashed significantly more often than elsewhere. In the evening, significantly less female dogs were observed (Chi square test $p=0,022$ $n=348$). Male dogs showed imposing body postures significantly more often (Chi square $p = 0,015$ $n=270$) than female dogs. Although no difference could be found between body postures of same and differently sexed owner-dog dyads (Chi square $p=0,812$ $n= 269$) could be found, there was a significant difference between same sexed owner dog dyads (Chi square $p=0,005$ $n= 127$). Female dogs with female owners showed submissive body postures more often than expected whereas male dogs with male owners showed imposing body postures more often. Moreover, imposing body postures were significantly more often observed in winter than in spring (Chi square test $p=0,001$ $n=440$) and small dogs showed imposing body postures significantly more often than larger dogs (Chi square $p = 0,005$ $n=427$). In addition, they were significantly more often observed in winter, than in spring (Chi square $p = 0,008$ $n=556$), which could explain, why imposing body postures were observed more often in winter. Women were significantly younger than the men of this sample (Fishers exact $p=0,027$, $n =567$).

5.2.Factors affecting lawfulness

The location had a significant impact on lawfulness (Chi square $p<0,001$, $n=569$). At the Prater Alee owners acted according to the law significantly more often than expected. Owners of juvenile dogs acted according to the law significantly more often based on the fact that our sample (Fishers exact two sided $p=0,021$ $n=569$), all of them kept their dog leashed. In addition, overweight owners acted according to the law significantly more often than normally weighted ones (Fishers exact two sided $p=0,046$, $n=556$). Owners involved in sporting activities tended to adhere to the law less often (Fishers exact two tailed $p = 0,055$ $n=569$). Lastly, we did not find a difference in lawfulness between owners of non- listed and listed dogs (Fishers exact two tailed $p=1,000$, $n=510$).

5.3. Factors affecting weight- an indicator for health

Interestingly, there was no link found between sex of the owner and weight of the owner (Fishers exact $p=0,346$, $n=554$). Seniors, however, were overweight significantly more often than adult dog owners (Fishers exact two tailed $p=0,019$ $n=556$) and had overweight dogs significantly more often than adult dog owners as well (Fishers Exact $p < 0,001$ $n=563$). Moreover, dog owners who were overweight themselves also had overweight dogs significantly more often (Fishers exact two tailed $p=0,002$ $n=552$).

Male dog owner tended to have overweight dogs more often (Fishers Exact two tailed $p = 0,053$ $n=561$) than women. At first this was thought to be connected to the fact, that overweight owners had overweight dogs more often, that seniors were overweight more often and that women of the sample were significantly younger than male dog owners (Fishers exact two tailed $p < 0,027$ $n=567$), but senior men were not overweight significantly more often than senior women so it seems that this was not just due to the fact that overweight people have overweight dogs more often.

Furthermore, underweight dogs were never observed with a male owner, but five cases of underweight dogs with female owners were noted. However, due to the large sample size, this small amount of underweight dogs did not significantly shift the results towards any side.

In addition, people with low care for their appearance were overweight significantly more often (Chi square $p < 0,001$ $n=555$) than people who apparently cared more for their appearance.

Moreover, they tended to involve in sporting activities with their dogs less often (Chi square test $p=0,053$ $n=568$).

Overweight dogs were involved in sporting activities less often (Fishers Exact two tailed $p=0,014$ $n=563$) and large dogs were overweight significantly less often than small or middle sized dogs (Chi square $p = 0,005$ $n=550$). Purebred dogs were overweight significantly less often than crossbred ones (Fishers Exact two tailed $p=0,013$ $n=505$), which is even more interesting as neither the owner's age, weight or care for appearance, all of which had significant impact onto the dog's weight, had a significant effect on whether a purebred or crossbred dog was owned.

Interestingly, overweight dog owners tended to act in accordance with the law more often (Fishers Exact two tailed $p=0,046$ $n=556$) by keeping their dogs leashed significantly more often than normal weighted owners (Fishers exact two tailed $p=0,010$, $n=556$). Lastly, more dogs of abnormal weight (overweight or underweight) were observed in the evenings than in the mornings or during the midday observations (Chi square test $p=0,033$ $n=563$).

5.4.Factors affected by Care for Appearance

Owners who cared little for their appearance tended to own small dogs more often whereas people who cared for appearances tended to have large dogs more often (Chi square $p=0,068$ $n=555$).

Furthermore, owners whose care for their appearance was rated high, had dogs showing imposing body postures significantly more often (Chi square $p<0,001$ $n=439$) and were observed significantly more often in winter, whereas owners with average care for their appearance were observed in spring more often (Chi square $p<0,001$ $n=568$). In addition, there were significant differences in care for appearance between the locations with owners whose care for appearance was rated low being observed at Urania 2 significantly more often (Chi square test $p=0,048$ $n=568$). Lastly, owners who cared highly for their appearance had a tendency to walk large dogs more often (Chi square test $p=0,068$ $n=555$).

5.5.Behaviors

The following percentages were derived via Excel after standardizing by dividing the behavioral events by the duration the dyad stayed in the observational area. The variable “imposing scraping” was excluded because determining its directedness was too hard.

In total 2613 behavioral events were observed within the dyads as well as towards strangers, dogs and other animals. More than three quarters of these were shown between owner and dog (79, 78%) followed by dog-dog associated behaviors (10, 44%), behaviors shown in encounters of the dog (8, 24%) or owner (0, 93%) with strangers, behaviors the observed dog showed towards other animals (0, 44%) and lastly, behaviors shown between the owner and an unfamiliar dog (0, 18%). Owners showed more behaviors towards their dogs (43, 55 % $n= 2028$) than the other way around (36, 66%), which was mostly caused by the amount of leash tugs they administered to leashed dogs (27, 07%) of the behavior the owner showed towards the dog $n= 1167$). Dogs showed more behavior – or reactivity if you will- towards other dogs (10, 44 % $n= 2642$) and other humans (7, 21 % $n= 2642$) than their owners did. We never observed agonistic behavior towards the owner and only one case of agonistic behavior, namely a defensive threat, towards another human being.

A total of 2028 behaviors were shown between owner and dog. The biggest portion of dog behavior towards its owner were orienting behaviors (90, 97% $n=890$) which included looks to

the owner, reactions to given commands and stopping when the owner stopped. The high ratio was mostly caused by the high number of looks to the owner (77, 91%). In 8, 70% the dog did not stop, when the owner stopped or did not react accordingly to a given command. Furthermore 9, 91% of the observed behavior shown towards the owner were sociopositive behaviors, whereas vocalizations (0, 22%) and imposing (0, 45%), as well as submissive (1, 57%) behaviors were observed least often.

The largest part of behaviors shown by the owner towards their dog (1138 in total) were orienting behaviors (28, 67% $n=$), which include looking at the dog and stopping when the dog stopped, shortly followed by negative behaviors (28, 60%) with the leash tug (28, 25%) Looks were significantly more frequently cast by owner as well as dog if the dog was not leashed (Mann-Whitney U test $p < 0,001$ $n=567$) whereas owners stopped when their dogs stopped significantly more often, if they were leashed (Mann-Whitney U test $p < 0,001$ $n= 148$). Furthermore, owners communicated verbally with their dogs more often (12, 61%), than they gave nonverbal commands (2, 49%).

Nearly fifty percent (49, 59 %) of the positive interactions (90, 73%) of the 27 behaviors shown by the observed owner towards a stranger) the owner had with other humans were talks about the dog. Only one case of an owner evading another human being (3, 59%) and one case of negative interaction (5, 68%), which was a quarrel, was observed.

A total of 300 behaviors shown by the dog of the observed dyad were recorded in dog-dog encounters. Most of these behaviors were sociopositive (56, 51%), with greeting behaviors (approach, snout, inspection) (62, 53%) and play (37, 47 % $n= 189$) showed the most within this category. Another substantial portion of the observed behaviors were looks directed towards other dogs (29, 17 %). Only 7, 77 % of all observed behaviors were imposing or threatening gestures and 3, 62% were submissive gestures. Mostly, communication between dogs was nonvocal. Vocalization from one dog to another occurred in only 4, 83% of observed behaviors whereas vocalizations from the dog owner to the dog were more than double this figure (12, 61%). No biting or snapping behavior was observed at all.

If the owner showed behaviors towards an unfamiliar dog, which was only observed 9 times in total, they were most likely to be sociopositive behaviors (51, 21%). Only one look at another

dog (24, 18%) and one negative behavior (24, 18%) towards another dog was noted. Even less behaviors of an unfamiliar dog towards the observed owner, all of which were sociopositive (3) were observed (3).

In total, 11 behaviors of the observed dog towards other animals (such as pigeons and other wildlife) were noted. The vast majority of these were sociopositive 82, 31 %, namely playful actions., followed by agonistic, chasing behavior (9, 09%) and looking at another animal (9, 09%).

For statistical analyzes adequate non parametric tests such as the Mann-Whitney U test as well as the Kruskal-Wallis test were used to see whether there were differences between the dyads due to demographic factors or breed of the dog.

Most behaviors were seldom ever shown and there only were 24 dogs categorized as “listed” in contrast to 489 dogs categorized as “non-listed” therefore statistical tests would not have been seriously interpretable.

However, looks were one of the behaviors frequently shown by owner (217 times) and dog (570 times) towards the other. Owners (Mann- Whitney U test $p < 0,001$ $n = 567$), as well as dogs (Mann- Whitney U test $p < 0,001$ $n = 567$) looked for the other one significantly more frequently, if the dog was not leashed.

6. Discussion

More women than men were found to be walking dogs and there were significantly more male than female senior dog owners. The cause for this cannot be determined by means of the used methodology. The higher number of female dog owners might lead to the assumption, that there are more female than male dog owners in general (compare PETZL 2011). According to statistical data of Vienna's citizens in 2011 almost the same number of men and women inhabited the city (47, 92% men, 52,08% women STATISTIK AUSTRIA 2011); therefore, together with the findings of Petzl in 2011 the probability of women owning dogs more frequently than men seems to be very high. However this effect could also be caused by women walking the family dog more often than men.

Surprisingly there was no distinctive height preference in dogs. The percentual ratio of large dogs however was the highest although one might have suspected that small dogs would be more common due to space issues in the city. It might be that the limited quantity of small dogs is caused by people walking these dogs less far or less often than larger breeds (SCHOFIELD et al. 2005). Moreover, no significant connection between gender and height preferences in dogs could be found although there seems to be a common prejudice regarding women having small dogs more often.

All in all there were no great differences in the demographic traits of dog owners and their pets depending on their choice of location for walking the dog. However, the location termed "Urania" (1st Viennese precinct), was much less frequented than the others, whereas the other locations were frequented more or less equally and the largest part of observed dyads was found at „Prater Alee“. It may be that the features a certain location has to offer are important to dog owners and that they prefer natural environments with lawn, trees and open space to walk their dogs rather than paved streets with very few grassy areas. However, Cutt and colleagues (2008) found that although the access to parks and nature reserves was more important to dog owners than non-dog owners, the access to public spaces with dog supportive features was not a significant factor for up taking dog walking itself. On the other hand they found that perceived dog related - barriers were decreasing the probability of dog owners walking their dogs (CUTT et al. 2008).

Which location the owner chose to walk his dog at depended on the time of day and the age of the owner. In addition, the owner's care for appearance varied with location. People with either high or low care for their appearance were more often seen at Urania two, whereas people with average care for their appearance were observed at Prater Alee significantly more often. These findings could be related to the habits of the owners as well as the different traits of the locations. The Prater for example is a recreational area for many Viennese citizens and is probably not as surrounded by flats or business buildings as Urania or the Friedensbrücke area. Therefore it would be more likely that people deliberately go there to walk their dog at prolonged leisure times of their days (mainly evenings), whereas at the Urania and Friedensbrücke locations owners might go for shorter walks before work or during their lunch breaks. Thus people might care less for their appearance if they are just quickly walking their dogs before going to work and therefore be dressed casually (some people were still wearing their pajamas underneath the jacket) or on the other hand might come from or go to work taking their dog out and therefore be "overdressed" for a dog walk.

Most of the owners in this sample, as well as their dogs were of normal weight. According to a health questionnaire of Statistics Austria in 2006/07 47, 3% of Viennese people were normal weighted, which leaves room for the assumption that dog owners are healthier than people who do not own a dog. Furthermore the percentages of overweight owners as well as dogs of this sample are very low (<20%) even compared to other studies conducted in Europe and Austria (COLLIARD et al. 2006 France, 38, 8 % overweight 15% obese; PETZL P. 2011 Austria 34, 1%). Senior dog owners were found to be overweight significantly more often than adult ones. Nevertheless only a quarter of senior dog owners observed were overweight whereas Statistics Austria found 63, 1% of their sample of Austrian citizens over 60 years to be overweight or obese (STATISTIK AUSTRIA 2006/07) further underlining that dog ownership might be a suitable way to prevent overweight and therefore contribute to a healthier lifestyle. This might also indicate that people were rather rated normal weighted than over weighted, which could have been influenced by the mostly thick winter clothing. Nevertheless, one would have thought that thick clothing would rather lead to the opposite result, namely that more people would have been rated overweight rather than normal weighted. The hypothesis that dog owners, in general, would be rather healthy considering weight is therefore supported by this data.

Also, overweight owners were found to have over weighted dogs significantly more often, which is consistent with the results of former studies (KIENZLE et al 1998, NIJLAND et al. in 2009

PETZL 2011). Petzl (2011) conducted a study on parameters influencing overweight in dogs by means of a questionnaire as well as measurements of the dog's bodies in several veterinary clinics in eastern Austria around Vienna and in Burgenland. Interestingly there was no difference in weight between male and female dog owners of our sample. However, men showed a tendency to have overweight dogs more often that could not just be explained by overweight owners having overweight dogs more often. Nevertheless this finding is supported by Petzl's research in 2011. However, in contrast to our study she found a trend for male owners to have more underweight dogs than female dog owners, whereas in our study we only had five underweight dogs and all of those were owned by women. In further contrast to her study we did not find a difference in weight between female and male dogs, which could be due to the fact that female dogs in our sample were underrepresented. This is most likely a result of the used methodology. Because female dogs were harder to determine visually as they were walking by, they were probably rated "missing" more often than male dogs. The weight correlation in owner and dog could be due to the fact that people who are overweight themselves fail to recognize if their pet has breached the threshold to overweight, because they do not perceive themselves as overweight either (BURKE et al. 2009). Studies show, that owners often estimate their dogs weight correctly, but nonetheless do not perceive their pet as overweight, even if a veterinarian does (HOLMES et al 2006, PETZL 2011).

Senior dog owners were found to be significantly more likely to have an overweight dog as well as to be overweight themselves, which could be due to an increasing disability to exercise, although there was no significant difference found between adult and senior dog owners of this sample regarding their engagement in sporting activities. As older dog owners had older dogs in Colliard's study and older dogs, aged between 7,5 and 9,9 years, were found to be overweight more often (HOLMES et al. 2009) that might be the reason for the association of dog weight and age of the owner (COLLIARD et al. 2006, HOLMES et al. 2009). Furthermore, owners of overweight dogs were involved in sporting activities significantly less often than owners of normal weighted ones. In a study conducted by Nijland and colleagues (2009) the time spent walking seemed to have an influence on the degree of overweight in dogs and their owners, whereas overweight in cats- who are not as dependent on their owner as dogs in regards to exercise- did not correlate with their owner's weight (NIJLAND et al. 2009). Therefore, putting an emphasis on the importance of the walk and providing Vienna's dog owning citizens with a more welcoming environment might even further reduce the risk of overweight in owners as well

as dogs. Interestingly, large dogs of this sample were found to be overweight significantly less often than small or middle sized ones and there was a tendency of owning large dogs for people with high care for their appearance, whereas owners with low care for their appearance walked small dogs more often. As overweight is seldom seen as a desirable trait and oftentimes evokes associations with negative stereotypes (HARRIS et al. 1982) people who want to seem better situated could be minding their weight more than others as well as choosing dog breeds which grow rather large and are therefore supposedly more impressive. Nevertheless the causes for people being overweight are manifold and questioning the owners as well as their dogs' lifestyles and backgrounds would have exceeded the scope of the study.

Curiously overweight owners tended to act in accordance to the law more often than normal weighted ones, which in this case means, that they kept their dogs leashed during walks significantly more often than normally weighted dog owners. One could argue that this might be one of the reasons for the correlation of weight between owners and dogs. If it is leashed the dog is forced to keep the same pace of movement as their owner instead of running back and forth at various paces, exploring and exercising at the same time. Owners who were involved in sporting activities tended to stick to the law less often than those who were just walking their dogs, which might be because the leash poses risks when biking or skating and furthermore forces the dog owner to stop every time the dog stops or risk dragging it behind. Lastly, at the Prater Alee owners acted according to the law significantly more often than expected, keeping their dogs leashed significantly more often than elsewhere. This might be because owners were considerate of the higher number of other people, as well as occasional horse carriages and vehicles that could have been encountered at this location.

Male dogs showed imposing body postures significantly more often than female dogs, which, due to the subjectivity of this variable has to be interpreted cautiously and might well be an effect of the high number of missing values in the variable "sex of the dog" and a therefore larger portion of male dogs in our sample. Female dogs with female owners showed submissive body postures more often whereas male dogs with male owners show imposing body postures more often, which might be a result of subconscious training. Maybe men like their dogs to show "proud" body postures and unconsciously reward their dog for showing it therefore increasing the probability of the dog further showing it. On the other hand, it might be a result of our samples

structure because, as we mentioned above, male dogs were overrepresented in the sample and more likely to show imposing body postures.

As expected, most of the observed behavioral events were shown within the dyad, which most probably is a result of the closer bond the owners shared with their dogs, as well as the sizeable amount of leash use, which obstructed interactions with other people, dogs and animals and the fact that there were not always other people, animals or dogs around that either one could have interacted with. Owners showed more behaviors towards their dogs, than the other way around, which was mostly caused by the high number of leash tugs administered by owners who restrained their dogs.

Another large portion of within-dyad behavior was orienting behavior (looks to each other and stopping, when the partner stopped and reactions to given commands by the dog). More than three quarters of the dog's behavior towards the owner could be defined as orienting behavior in contrast one quarter of the behaviors the owner exhibited towards the dog. This indicates that in general the owners were the ones leading the walk and making all the decisions, whereas the dogs largely oriented themselves towards them, repeatedly checking for the whereabouts of their owners (also see SCHABMANN 2013). About one quarter of the owner's behavior towards the dog were leash tugs. It seems that owners still view this method as an effective way to correct various unwanted behaviors of dogs (HERRON et al. 2009). As aversive training methods, such as tugging the leash, may present health hazards for the dog (PAULI 2006), are thought to even worsen behavioral problems (HIBY et al. 2004) and tugging the leash naturally is only possible if the dog is leashed, we would suggest that off-leash time increases the need for other, more friendly ways of interaction and training. This is supported by the fact that the frequency of looks for each other was significantly higher if the dog was unleashed (also see SCHABMANN 2013). In dog-dog encounters most behaviors displayed were positive, peaceful ones such as greeting behaviors (including snout contact and sniffing) and play. Less than ten percent of the displayed behaviors were imposing or threatening gestures, which indicates that problems between dogs are not that usual. Furthermore, the dog was the topic of conversation in most cases of human interaction, which is further supporting the important role dogs play as a social lubricant (HART et al. 1987, WELLS 2004). However, there were rather few dog- dog and even fewer human-human interactions observed and the results therefore have to be interpreted cautiously. Aggressiveness towards the owner never occurred and only one case of a defensive threat towards another human being, which occurred with a male owner and a leashed dog, was

observed. Both of the latter characteristics are supposed to cause a higher potential for aggressive behavior in dogs (REZAK et al. 2011), but with only one case in a sample of 572 dyads it is merely an anecdote and cannot be seriously interpreted in any way, except that it is rare in dyads where the dog is walked.

Although the design of the study was rather simple and the field study like setting complicated the determination of causes for the found results, due to the ever changing circumstances under which the observations took place (weather, other people...), some interesting relationships between traits of owner and dog were found. These can be confirmed by findings of other researchers, which implies that the study design is suitable to gain an overview of owner-dog dyads. Foremost women were walking dogs and certain parameters, such as age and care for appearance or lawfulness differed for locations. Furthermore owners as well as dogs were generally normal weighted and owners who were overweight themselves had overweight dogs more often, therefore their dogs seemed to resemble them concerning weight. Factors accompanying overweight in owners were high age and low care for appearance, whereas factors contributing to overweight in dogs seemed to rather depend on their owners age and willingness to engage in sporting activities, as well as their own height. As the number of “listed dogs” was very low in comparison to the number of “non-listed dogs” statistical tests concerning differences between these categories would not have been seriously interpretable. Generally, dog owners acted in accordance with the law therefore restraining their dogs, foremost by the use of a leash and removed the droppings of their animal companion. Lastly, but importantly, we never observed any snapping or biting behavior and only one single threatening behavior towards a stranger. This supports the fact that most dog bites occur in private settings and dog walking imposes a low risk to others (PURTSCHER 2001, KIZER 1979). However, the results have to be interpreted cautiously due to the high risk of subjectivity and the difficulties that come with acquiring data in “the field”.

We hope that our study can contribute to a better understanding of dog owners in Vienna and to further efforts to inform them about appropriate keeping and training of their companion animals. Evident in our study there seems to be a huge preference for leash tugs rather than positive reinforcement on the daily walk which is worth addressing for the sake of animal welfare.

There will be another study by my fellow student Carina Schabmann based on this data set focusing especially on which conclusions can be drawn from the walking style and owner dog interactions onto synchrony and relationship of owner and dog as well as a more detailed view on the influence of the leash on the behaviors of owner and dog.

It would be interesting, to extend this study to the outskirts of Vienna or conduct a similar study in other cities, such as Salzburg, Graz or Innsbruck, or other countries to see whether or not specific dog walking characteristics are representative of their cities.

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9. Appendix

Table 3: A more detailed description of behaviors we were looking for in dogs translated and derived from Feddersen-Petersen (2008) pages 152-318.

Sociopositive behavior	
Approach	A shows a relaxed posture diminishing the distance between itself and B. This approach doesn't show any further signs of A's intentions. This action can be followed by play, grooming or any other socio - positive behavior.
Headbrushing	A brushes its head up against the lower jaw of B. Its ears are laid back, but it shows a relaxed posture.
Inspection	A sniffs on one or more body parts of B (i.e.: Anal/genital region, muzzle, fur).
Grooming	A licks or nibbles its own or an interaction partners fur. It uses its incissivi and canines comb-like to clean/brush it.
Snout contact	A sniffs on B's muzzle or puts its own muzzle inside B's fang.
Sociopositive pushing	A pushes B, who is in the way, to the side without showing imposing or threatening gestures.
Stand over	A stands over B and both show a relaxed posture. B is either not changing its behavior or showing convenience behavior
Brushing up	A rubs itself against B's sides/flanks. In a dog-human interaction it brushes against the humans legs.
Displacing	A is jostles B out of the way using its own body weight, but doesn't show imposing or threatening behavior.
Looking	
Looking	A looks at B
Submissive behavior	
Pawing	A is lifting a front paw towards B or even touching B with it.
Licking	A is licking B's muzzle, especially the corners of B's mouth in submissive posture. With the human interaction partner, the hand is taken as an alternative, but if the human is in a crouching/sitting position or the dog very large, the dog will try to reach the face.
Licking intention	If the partner is out of reach the intention to lick it is shown by the

	submissive individual by licking its own muzzle.
Jumping up	A puts both front paws onto B or showing the intention to do so but not actually touching B.
Turning away	A turns its head and body away from B in a crouching position. It avoids eye contact and its ears are drawn back. The Tail is tucked between its legs.
Passive submission	The individual rolls itself on its back and tucks the tail between its legs.
Submissive evade	A passes B swiftly in submissive posture, avoiding eye contact
Submissive smile	As lips are long stretched and their corners slightly crouched upwards. Its face shows a very puppy like expression with smooth face.
Play behavior	
Play bow	A lowers the front part of the body down, looking at B with its front legs stretched forward and slightly angled apart. Its tail is wagging. Sometimes the playful character is underlined by a slight tilting of the head.
Play face	A play face is characterized by exaggerated facial features. Very characteristic are widely opened eyes with the white sclera showing.
Play fight	In a play fight exaggerated signs of aggression - wide opened snout, showing all teeth, play look (widely opened eyes in which the white is visible); attacking behavior and defensive behavior - are sequentially shown. The play partners are alternating their roles and defensive behavior is not shown particularly effective so that the “attacker” has a chance of actually breaking through.
Running game	A chases B and the other way round. The chased individual repeatedly looks over its shoulder and shows a play face. Its galloping strides are relaxed and energetic. Sometimes runs are interrupted by play bows.
Hopping	The individual is jumping stiff legged, lifting all four feet at the same time. This behavior can either occur once or serial.
Circling	A trots or gallops around B.
Front paw jump	The individual jumps up lifting the front paws.

Head tossing	The individual tosses its head ferociously from side to side.
Playful stalking	A fixates B with bended legs (mostly followed by a playful attack)
Playful approach	A approaches B with its body recognizably swinging from side to side. It shifts the body weight onto one of the front legs while the other one is lifted stiffly and slightly sideways in trot

Imposing behavior

Imposing trot	The dog is trotting with its tail lifted high, pricked ears and lifting the front legs stiffly while moving.
Imposing scraping	A's head, gaze, ears and other bodily expressions are directed at B, while A is scraping the ground with its hind legs, sometimes this behavior follows urination or defecation of the same dog.
Imposing approach	A approaches B in an imposing way

Offensive aggressive behavior

Biting Face	As bodyweight is shifted onto the front paws and it is showing a very tense posture. Its tail is up, it's back straight and head stretched forward or upwards. It is showing front teeth (incisive, canines) with slightly opened fang while its gaze is fixated on B.
Chin down	A places its chin onto B's back, shortly behind B's neck or shoulders ("T position").
Hair bristling	As a sign of strong aggression and/or insecurity the hairs above the dog's spine are bristled. This can especially be observed in the neck and shoulder area. A "brush" is building itself.
Baring front teeth	The dog shows its front teeth by pulling its under lip down and the upper lip up, baring its incissivi and canines. If the threat is intense, gum can be visible. The muzzle is slightly opened. The line of the lips is short.
Stand over	B is lying and A is standing over it with bared teeth and intensive growling. If B moves, it is bitten lightly.
Stalking	A is fixating and approaching its opponent, showing a slightly crouched posture with bent legs. This behavior may be interrupted by short stops during which one front paw is lifted.

Bite fight	The opponents are growling and direct short bites at each other that normally are not doing any damage.
Reared fight	Dogs rear to their hind legs and fight in that position, biting one another and wrestling against each other.
Mounting	A puts its front legs on back of B, biting B's neck, threatening it. Tossing movements of the head towards the neck can be shown.
Pushing down	A pushes B down using the front paws.
Hustling	A is shoving B with lowered head and sudden biting movements are shown.
Jostling	A is turning the hind part of the body against B to push the opponent.
Forward push	A's lowered head suddenly advances towards B, A then bites and quickly pulls back.
Hammering down	A jumps onto B who either is rolling onto its back or already lying on its back. A then bites neck or throat of B and threatens it by standing over.
Chase	A is pursuing fleeing B, sometimes biting it.
Biting	A is clasping fur or another body part of B with its teeth.
Muzzle bite	A is covering B's muzzle with its own. During this behavior all of A's teeth are shown.
Bite shake	A bites fur of B and shakes its head from side to side while holding the grip on B.

Defensive aggressive behavior

Defensive threat	The animal mostly bares its teeth in various intensity. With low intensity only the bridge of its nose is wrinkled. With rising intensity the corners of its mouth are drawn back and the mouth is opened wider.
Defensive tossing	Defensive tossing is often shown with defensive snapping and biting. The attacked individual is jumping towards its attacker in a quick move and then quickly withdraws again.
Flight	The attacked individual quickly moves away from the attacker. It tries to keep its distance to the aggressor or to hide from it.
Baring all teeth	The dog shows its front teeth by pulling its under lip down and the upper lip up and the corners of its mouth backwards baring all teeth and opening

	the muzzle widely. The bridge of its nose is wrinkled. This behavior is sometimes accompanied by high pitched, short barks.
Defensive snapping	The dog launches quick snaps without touching the aggressor.
Defensive biting	The attacked individual launches quick bites, mostly aiming for the sides of the neck or the ears of the aggressor.

Prey oriented behavior

Stalking	The dog walks/trots slowly with slightly bended legs and slightly lowered head. Its ears are pricked and its eyes wide open. Prey is fixated with high concentration.
Charging	Approximately one meter before reaching the prey, the dog starts showing some short, high gallop jumps.
Chasing	The dog pursues prey with long gallop strides and high tension in its body.
Grabbing	To grab prey the dog is using its front paws, hurling it to the ground to bite its neck.
Neck bite	The prey is pressed to the ground with the front paws and killed by biting its neck.
Carrying	The dog bites around the preys back and carries it in its muzzle.
Mouse jump	The dog thrusts itself into the air and lands with all four paws at the same time.
Mouse jolt	The individual rears on hind legs and keeps front legs close to belly while crouching the back and pointing to the ground with its head, ears pricked, afterwards it hits the ground with force.

10. Curriculum Vitae

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Seit 2008S Diplomstudium Zoologie seit 2008S
2005W- 2007W Diplomstudium Biologie
1997- 2005 Bundesrealgymnasium mit naturwissenschaftlichem Schwerpunkt in
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Fließend Englisch in Wort und Schrift
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Computerbezogene Kenntnisse:

Sehr gutes Verständnis von Microsoft Office TM (Word, Excel, Access,
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2006 Englisch- einwöchige Sprachreise nach Edinburgh
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