The "Dear data" Project: More than Just Data-Art

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Abstract

 "Dear Data" is a graduate research project that involved collecting ethnographic and ethological data that produced some unexpected tensions. Initially, I was uncertain how I could represent the data using art. However, through trial and error, along with collaborations with my project partner, I achieved my goal of representing the data using artistic realism. An unforeseen aspect of the collaboration was the social facilitation of the writing and artistic representations of the results. Our collaboration also clarified how I was projecting my data story to her and other readers, enriching my appreciation of the importance of data representation. I noted that my interpretation of project data sets, such as my Twitter usage or observed dog behaviour, demonstrated my tendency towards reductionism. Metacognitive analyses led to the resolution that I should concentrate on the whole of a phenomenon versus a reductionist focus on minute components. The project concluded with a final data collection that required reflexivity, a process completely foreign to a fish physiology researcher, further demonstrating the educational and developmental value of the "Dear Data" project for an emerging social science researcher.

Introduction

"Dear data" was a graduate research project that examined three personal data sets collected within my home, then represented the data using art. The data sets are ethnographic and ethological in nature and, in fieldwork style; my observations were diligently documented in a black notebook. In the conduct of this project, I had no concerns with planning for observations and collecting data, but I was skeptical about artistic representations of data. At the beginning of the project I was not comfortable using art as a form of expression. I am a science teacher and biologist and come from a data representation tradition of graphing and modeling. How could I use art to represent data? My skepticism transformed into trepidation. Would my representations of the data be restricted due to my limited artistic ability? Robert Frost and "The Road Not Taken" (1916) served as inspiration.

> Two roads diverged in a yellow wood,
> And sorry I could not travel both
> And be one traveler, long I stood
> And looked down one as far as I could
> To where it bent in the undergrowth;
>
> Then took the other, as just as fair,
> And having perhaps the better claim,
> Because it was grassy and wanted wear;
> Though as for that the passing there
> Had worn them really about the same, (1-10)

I committed to the artistic path, which "wanted wear" to tackle the limits of my artistic expression. Within my basement, I set up a table and filled it with coloured-markers, pastels, coloured-pencils, brushes, and water-paints. I examined some of the data depictions found on http://www.dear-data.com/ and started to draw; however, with far less skill than Giorgia Lupi and Stefanie Posavec (2016). My art progressed from stick figures to

emojis, and culminated with water colour paintings of my dog. I appreciate Realism as an art genre and ambitiously set this form of expression as a goal for my final data representation. However, the art was not the only significant component of this project, nor were the data collection or analysis. The collaborations with my project partner and the reflections on the data helped me to address research and expression problems that have plagued me for years. This story starts with an examination of the vital collaboration which started with tension then brought clarity to why I need to change my perspective and stretch my limitations while following new paths of expression.

How Did I Benefit from the "Dear data" Process of Collaboration?

Meeting with another person to brainstorm and then produce draft data representations was more difficult than deciding how to present the science data sets from my past. As a biologist, data representation collaboration was straight forward and required little interpretation. In fish research, the variables were set before the data were collected, and the artistic presentation of data was deciding whether to use a scatter plot or bar graph. Of course, statistical evidence was included in the graphs to ensure the reader would understand how the data were analysed. If graphing data is considered an art form, then perhaps it is a form of Realism I was trained to appreciate. However, the challenge within the current collaboration was telling a story using a medium that I had not used since my childhood. I was uncomfortable and felt that art for data representation should accurately depict the subject, thus the above reference to artistic Realism. Through practice, I worked my way towards my artistic goals and produced my draft data presentations. These first attempts were presented to my project partner and lead to fruitful collaborations.

I discovered my project partner was an important audience for my work. We met several times to discuss the project and to examine our data representations, the codes, and their interpretations. These consultations allowed us to find problems or flaws in our data representations and we freely shared our thoughts. I was told on several occasions that my data representations were "very technical", and in some instances they lacked the descriptive accuracy I was trying to achieve. While I listened to the critical comments, which were not taken as negative, I grew an understanding of my partner's perspective on my data and how I was projecting my data story to her and other readers. After our meetings, I would reflect on my data representations and my partner's comments. This helped me appreciate how a reader may struggle to interpret my data representation as art. Regardless of the method of data representation, I believe there should be no struggle for interpretation. In my opinion, the seminal goal of art and writing is to convey a message from the artist or writer to the viewer or reader. In the past, I have overlooked this simple goal by using overly technical writing which muddied the clarity of my message. I have also written in a cryptic manner in an attempt to be clever, resulting in writing that was imperceptible to some readers. While I am currently addressing this problem in my writing, I failed to consider how this mindset would spill over into my art, and yet it did. However, the collaborations helped to both find and address this problem while improving my artistic representations of the data for this project. This progressed over the course of the data representation process and resulted in my highest level of satisfaction with the final data representation (Charlie in Figure 5). In Figure 5, I resolved the desire for artistic Realism with the practicality of data representation that is less challenging to interpret.

I realize the struggle to decide the best choice for data representation is ever present, yet it is greatly facilitated by collaboration. My new belief is that we should challenge ourselves and test unique data representations that will engage viewers. This strategy parallels how I want to captivate more readers by writing clearly and directly, then continually reinforcing the message I attempting to convey. My goal as a writer and artist is to produce accurate subject representations that foster both engagement and understanding.

Addressing the technical aspects of my thinking during collaboration was both a source of tension and metacognition. I reconsidered the simple question, "why am I so technical?" My training in anatomy and physiology has taught me to appreciate how these fields may blend together and foster a more sophisticated appreciation of living systems. When I reflect, I see that my thought processes for research and teaching in biology and psychology often involve building an overall understanding of a phenomenon by combining related fragments of information. I firmly believe that much of my current knowledge has grown through social constructionism and that I continually engage in constructing and reconstructing meanings (Leavy, 2017, p. 13). There is a noticeable theme in my writing and thinking where I use knowledge of the parts in an attempt to develop an understanding of the whole. This observation leads me to the next contentious issue created by the "Dear data" project. Could reductionism be a problem in my pattern of thinking? This is a serious question for a person of the interpretive ilk. To address this question I believe it is important to first review the following three sections that present three sets of data collection, data representation, interpretation, and my contemplations of the "Dear data" process. This will address the collection of data considered overly technical, the issue of reductionism, and progress into reflections of how the "Dear data" project can act as a social constructionism for an emerging social science researcher.

**Data Set 1 - Twitter Analysis of Tweeting from the Heart**
Introduction

I am intrigued by social media's power to spread messages that influence public policy, such as President Donald Trump (@realDonaldTrump), and act as a "social amplifier" (Myers& DeWall, 2017. p. 269). While President Trump's use of social media is not something I follow, I am aware that some academics tweet research findings and progress on their current projects. As a teacher-researcher, I see the value in distributing findings to fellow scholars and teachers. However, I am apprehensive about publicizing findings that have not been properly vetted. Further, I am concerned that these academic messages could become mixed with personal messages and convey attitudes (p. 315) which may be deemed inappropriate for an academic.

In the past, I have tweeted the accomplishments of my students and these messages have been well received by both parents and students. As the data for this section were collected, I had yet to include my personal beliefs or feelings in a tweet. The data collected for this section of this paper document an attempt to change my online behaviour as I start sending messages that are personally important. For seven days I tweeted from my heart, sending original tweets with images and video. In addition, I liked or retweeted any tweet from my twitter feed which I felt was significant. The twitter-community responses to my tweets, likes or retweets, were documented. Each communication was coded by the subject of the tweet and I also noted my feelings related to the subject of the tweet. The artistic representation of my social media behaviour, and community responses are found in Figure 1. The codes for the interpretation of the data of Figure 1 are found in Figure 2.

Data of my Twitter Activity

Figure 1. Seven days of tweets, retweets, likes, and responses from my twitter account
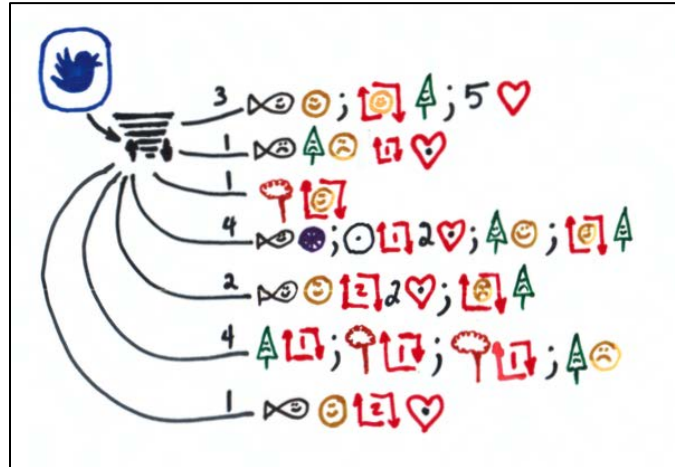
- The blue bird represents my twitter account and the Wi-Fi connection to social media.
- Each day of data collection is a line with a number indicating the number of my types of interactions .
- There were four subjects for the tweets in the seven-day period: animals, environmental causes, education, and minimalism.
- Animals and environmental causes were recorded as happy or sad using emoji faces inside the icons. For example, this fish icon represents a happy/positive animal subject and while this tree icon represents a sad/negative environmental subject .
- These icons are for education and minimalism . No emoji was used for these as they were interesting but did not evoke any emotion.
- All tweets were images with the exception of one video tweet

Figure 2. Codes for the interpretation of the data from Figure 1

My tweets, likes, and retweets all related to animals, environmental causes, education, and minimalism. Tweets or retweets depicting negative impacts on creatures or the environment evoked strong sad or negative feelings within me. However, I did not directly share those emotions in all my tweets. For example, when I reported 4 dead gannets on Oct. 17, I stated, "we need to find answers" in relation to the mystery of their deaths. My creature tweets shared my love of nature without saying this directly. Several of my tweets received "likes" but this designation is vague and without a direct message, the viewers' interpretation of my emotion is not clear. However, I liked it when my tweet was "liked" and I found this surprising. It helped me appreciate how some users find social media addictive.

What Did I Learn?

I was a new Twitter user at the time of the data collection and found reviewing my account to be similar to examining a survey. I learned that I am drawn to posts that contain animal images and news about the environment. However, I find that the characteristics of Twitter, the "likes", and the character number limitations restrict expression and result in simple data. I was unable to make interpretations and was disappointed that the simple data components failed to produce something more significant. Why do data components always need to make something bigger? At this point in the project, this question still lurks in the background.

Twitter made it difficult to determine user emotion and express my own feelings. I found "likes" to be ambiguous and wondered why users "liked" my tweets that were sad. I found "emojis" more useful as they are emotion specific. When making the artistic representation of the Twitter data, I created unique emojis to help express my feelings (see Figure 2). I concluded my observations of the responses to my tweets from the heart were limited in number, general in nature, and lacked the depth required to address my feelings. However, I determined that using an emoji could help to clarify the meaning of data and decided create "emojis" for observations in the next seven-day data collection.

Data Set 2: Social Interactions of Duke and Charlie in my Presence

Introduction

I love dogs and have lived with and trained dogs since I was 12-years old. However, I did not learn much about dog social behaviours until I was older and attending university. As a graduate student of biology, I was fascinated with social psychology and animal behaviour, and enrolled in graduate courses to further my knowledge. Through my class connections I befriended two fellow researchers who studied wild dogs. One of these friends studied wolf pack-behaviour and the other examined fox kit interactions (a young fox is called a "kit"). With my personal interest in mind I would ask my canid-researcher friends many questions, and listened intently to their explanations of wild dog social structures and behaviours. My studies, and the anecdotes from canine researchers, significantly changed my initial perceptions of dogs. I read further and I started to look for the signs of social behaviours in dogs. My increased awareness of dog behaviours informed me about each dog and the messages it is sending to those who are watching (both humans and other dogs). Reading a dog by observing behaviour is a useful skill and this knowledge helped me avoid being bitten on at least two occasions!

My personal knowledge of dog behaviour, which is supported by research, indicates that each dog's social behaviour repertoire is unique to that dog, and is influenced by the master and socialization (Řezáč, Viziová, Dobešová, Havlíček, & Pospíšilová, 2011). Some humans would suggest this is the dog's personality. However, I prefer to think of this repertoire as a collection of learned behaviours of a social animal in social situations. This knowledge, and manner of thinking, significantly influenced my data collection. I considered the importance of

social rank to the social structure of a canine pack (Faragó, Townsend, & Range, 2014), and how it would impact the social interaction data I wanted to collect. I was excited by the opportunity to examine the behaviour of my dog (Charlie), as a new puppy was introduced to the social context of our existing "pack" (the pack being my family and Charlie).

Data Collection

The collecting and reporting of data within this section mimics materials and methods used in direct behavioural observation studies, including reporting about the physical space, dog physical characteristics, and presence of other humans (Valsecchi, Barnard, Stefanini, & Normando, 2011). I collected data for a one-week period, documenting the social interactions of the two dogs, Duke and Charlie, while I was present. At the time of these observations, Duke, a 12-week old male, 7 kg, Labrador Retriever, was introduced to a new social situation within my residence. The house contained seven permanent human residents and one 9-year old, 18 kg, male Brittany Spaniel (Charlie). While Duke was new to our social environment he had experienced socialization with humans and litter mates before arrival. Duke was reportedly the largest puppy of the litter and had a history of rough pla, including an injury to a litter mate that required 12 stitches. According to my son, the current master of the puppy, Duke's 12-weeks in the previous environment lacked any controlling figures or "alpha" personalities (so Duke and his litter mates played freely and sometimes this caused injuries).

The seven days of observations were confined to a 740-square foot section of the house where the majority of dog-dog, human-dog, and human-human interactions occurred. The data collected were restricted to dyadic interactions of Duke and Charlie (dog-dog) in my presence. As stated previously, the presence of a high-ranking pack member, me, influences dog-dog interactions and can play a role in training and socialization (Roth & Jensen, 2015). Dogs will however, be dogs, and they will be social, greet each other, and may exhibit subordinate behaviour (Faragó, Townsend, & Range, 2014). Both dogs should respond and are likely to act subordinate when I strongly vocalize, stand up, or begin to train them using the rewards of operant conditioning (Meyer & Forkman, 2014). My data collection goal was to observe the dog-dog interactions (see Figure 3).

Results

Figure 3 is my artistic rendition of the data collected for the seven-day study period starting on November 13/2017. Figure 4 is the explanation of the codes found in Figure 3. A total of 31 social interactions between Charlie and Duke were recorded over a seven-day period. Seven of these interactions occurred with my direct involvement as a trainer, and the other 26 are considered dyadic interactions that were dog-dog that occurred in my presence.
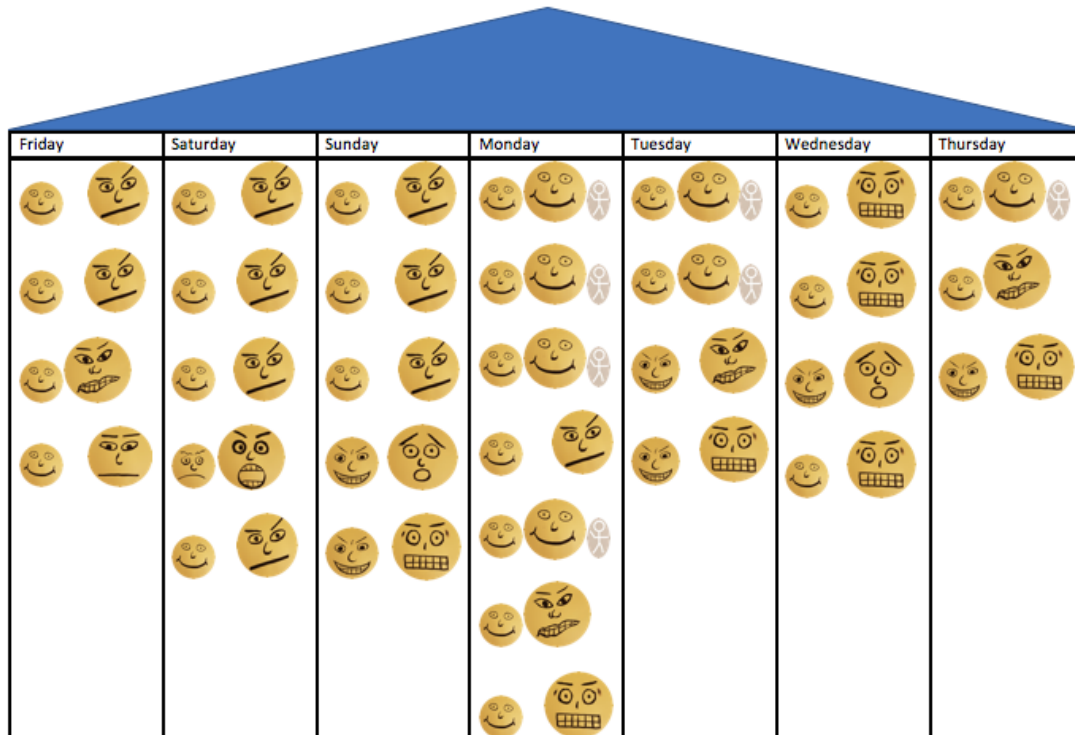
Figure 3. Dyadic Interactions of Duke the 12-week old puppy and Charlie the 9-year old dog in my House.

Duke was bold for his small size, and constantly sought to interact with Charlie. After the first two days Duke started showing the "play signal" (Bekoff, 2014. p. 64) in an attempt to socially engage Charlie in play. Charlie would not engage in play and was on alert to Duke's presence and actions from the outset of their introduction. On four occasions Charlie growled at Duke, and on the second day Charlie bit Duke on the side (teeth contact, not a strong bite). Duke seemed confused by the bite, and persisted in attempting to engage Charlie socially through play. As the week went on, Charlie would avoid Duke by retreating to places inaccessible to Duke (such as beds knowing Duke was too small to jump up). Once Charlie yelped when Duke attempted to engage in play, and then chased Charlie (Wednesday).

When a human trained the dogs the distance between the dogs became greatly reduced and both dogs were focused on the rewards. No aggression was exhibited by Charlie during training, and Duke was keenly interested in the treats and not attempting to engage Charlie in play. Once training ended, Duke would want to play and this resulted in Charlie immediately retreating on Tuesday and Thursday.
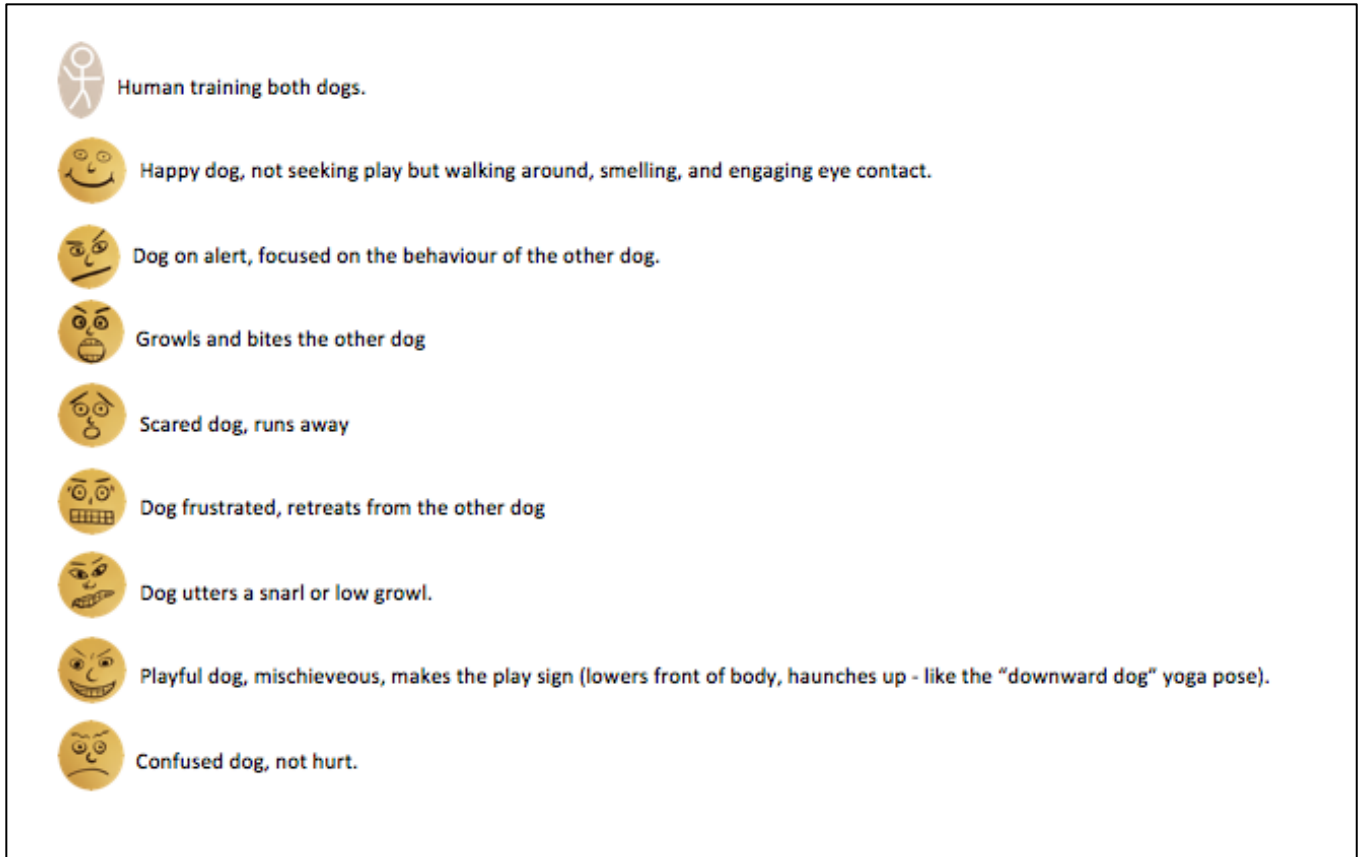
Figure 4. Code and explanations for dyadic Interations of Duke the 12-week old puppy and Charlie the 9-year old dog. A large emoji represents Charlie and the small emoji represents Duke. A 2 mm space between emojis indicates touching during behaviour and a space

Interpretation of Data

Unlike the electronic Twitter data, direct observation of the dogs was engaging for me and I collected richer data to interpret. In the first four days of data collection of the socialization of Duke in my home, Charlie demonstrated several behaviours, namely passivity and aggression, which correlate with low sociability scores (Valsecchi et al., 2011). Despite the fact that Charlie was significantly larger than Duke, Charlie consistently chose to growl at Duke or would avoid interaction by retreating to a bed inaccessible to Duke (Figure 3). The retreating behaviour is consistent with flight responses of dogs and is a strategy for resolving conflict known as active avoidant behaviour (Riemer, Müller, Virányi, Huber, & Range, 2013). What would cause Charlie to choose these behaviours? Some information on his socialization may explain his seemingly inappropriate early responses to interactions with Duke. Charlie is the dog version of an only child. He was not socialized with other litter mates as he was the only puppy not still-born in his litter. This unusual occurrence may have deprived him of important canine socialization during the first 12-weeks of his development (Battaglia, 2009). Another possibility is that Charlie's behavioural responses may have been affected by previous experiences with unfamiliar people and handling procedures. (p. 41). What is clear from training is the behaviour of both dogs during conditioning demonstrates an ability to be in close proximity and remain calm. It is unclear if the rewards or the presence of a higher-ranking pack member, the trainer, facilitated this behaviour.

What Changed in this Data Collection versus the Twitter Data

It is easy to perceive my interest in social behaviour and collecting behavioural data. The dogs' activity required

me to be more observant and attentive to the situations that were occurring as they interacted. These interpretations as data were supported by the literature, and helped me answer some questions I had about Charlie. It was rewarding to make connections to the literature and the quality of the data seemed to offer more flexibility than the superficial survey in the Twitter section. My black notebook was filled with many other observations, including those of dog behaviours that was not included in the data representation. This practice of note taking will continue when I go in the field. However, I need to exercise caution while writing notes in the presence of a research subject; a teacher conscious of my note taking may alter their behaviour. The change of behaviour in the presence of a researcher is termed the "Hawthorne effect" (Wickström & Bendix, 2000) and I want to avoid causing this effect as a social science researcher.

Data set 3: Charlie Greeting me at the Door

Introduction

Consider the following hypothetical situation. Put a human and dog in the trunk of a car. Close the trunk, drive for three hours, stop, and open the trunk. Which creature will be happy to see you? If you said the dog, you may have a basic appreciation of dog greeting behaviour and temperament. If you thought you should pop the trunk and run, you understand a human's capacity for vengeance.

Greeting behaviour for dogs is a natural behaviour (Firnkes, Bartels, Bidoli, & Erhard, 2017), and it is an important part of dog socialization with humans (Meyer & Forkman, 2014). As a member of my pack, Charlie never fails to greet me at the door, regardless of the consequences. There are however, noticeable differences in Charlie's greeting behaviour. In the past, I have simply labelled the differences in behaviour under the category of "Charlie is excited today" and have never focused on the specifics of each component of greeting behaviour in different contexts. I was aware that Charlie is usually happy to see me, and would likely be happy after the above three-hour car ride. However, there are nuances to greeting behaviour such as eye contact (Prato-Previde, & Marshall-Pescini, 2014), jumping (Řezáč, Koru, Havlíček, & Pospíšilová, 2017), and lip licking (Meyer, & Forkman, 2014) that I did not consider when watching Charlie greet me. As preparation for the data collection section of this project, I decided to select behaviours that I was able to quickly observe while recording two days of greetings with Charlie. I observed five separate greetings and decided to collect data on the following greeting behaviours: eye contact, tail wagging, body curl with spin, pawing the ground, and snorting. I did not include Charlie's other behaviours such as smelling and his stress yawn, so I could focus specifically on the chosen repertoire of greeting behaviours.

Data Collection Methods

Similar to the previous section of dog data collection, this section of this paper mimics materials and methods used in direct behavioural observation studies (Valsecchi et al., 2011). The observations occurred from December 28, 2017 to January 3, 2018. The greeting behaviours of Charlie were documented when I entered the front door of my house when no other human was within 3 meters. When I enter the door I consistently keep my voice low, I remain calm, and seek to make eye contact with Charlie. I should note that Charlie has been trained to approach me slowly and will only touch me when invited. The observations of Charlie for the seven days were confined to a 3M square section by the front door of the house where human-dog greetings typically occurred. The data collected was restricted to dyadic interactions of myself and Charlie (human-dog), and focused on previously selected greeting behaviours: eye contact, tail wagging, body curl with spin, pawing the ground, and snorting. On the second day of data collection I decided to add pupil size and noted the absence of humans in the house within the data set, due to noticeable differences in behaviour from the first day.

Results

Figure 5 is my artistic rendition of the data collected for the seven-day study period and Figure 6 is the explanation of the artistic codes of Figure 5. A total of 21 greetings occurred over the 7-day period, and the majority were very similar. On fifteen occasions Charlie approached with his eyes and ears up, tail up and wagging, he would curl and spin, then sit and paw the ground. These behaviours all occurred when people were in the house (ranging from one person to four persons).

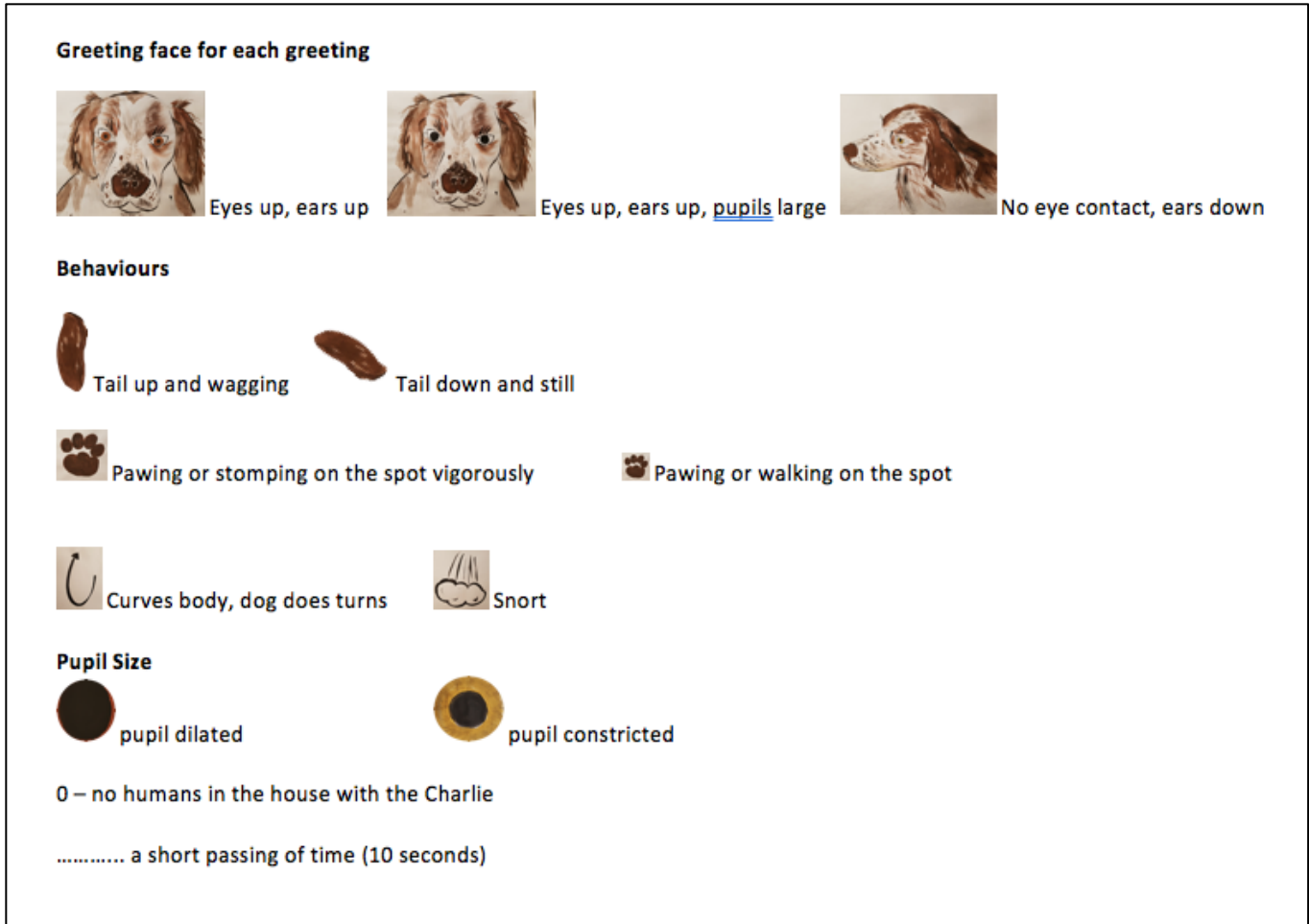*Figure 5. Charlie greeting me at the front door of my house.*

Figure 6. Code and explanations for Charlie greeting me at the front door of my house.

The six greetings when Charlie was alone in the house were different. Three of these greetings included dilated pupils, vigorous foot stomping, and snorting in addition to the eyes up, ears up, tail wags, and spins. Two of these, at home alone greetings, were different with Charlie showing tail down, ears down, looking away, and no eye contact. On one of these occasions with the tail down, ears down, greetings (December 31), I had returned home to find that Charlie had just eaten 18 moose sausages from the kitchen counter (I was not happy). The other occurrence was on January 2 when I opened the door and Charlie was in the kitchen looking up at the counter surface. At first, he avoided eye contact, and then after approximately ten seconds Charlie changed his behaviour to his regular home alone behaviours of snorting, stomping, and showed dilated pupils. There was only one day, January 2, where Charlie had dilated pupils, snorted, and stomped on the spot vigorously when people were in the house. On that day, he greeted me, then ran out the back door and started barking at other dogs from our back yard.

Interpretation of Data

Classic animal physiology studies tell us that when an animal's pupils are dilated, it is excited due to the action of the sympathetic nervous system (Schmidt-Nielsen, 1997). This response happened on every occasion when Charlie was left alone in the house and had not been active in the kitchen. The more vigorous greeting has been suggested to be a stress response as a result of the dog being alone (Scaglia, Cannas, Minero, Frank, Bassi, & Palestrini, 2013). Dog separation research related to physiology and behaviour supports my findings. Rehn and

Keeling (2011) found that leaving a dog alone for an extended period of time is stressful, and it results in a more intense greeting behaviour. In addition to behavioural observations, Rehn and Keeling (2011) also collected physiological data during their study. However, did the physiological data enhance their understanding of the dog's behaviour? In this section of "Dear data", the eyes and pupil dilation demonstrate the sympathetic nervous system activity but cannot reveal the truth about Charlie's behaviours. Another problem with the determination behaviours was the inability to observe Charlie's activities before my arrival. One of the methods to overcome this problem was addressed by Rehn and Keeling (2011)) as they collected video of their dogs for up to four hours (that was the duration of some of their experiments). I would consider the collecting video strategy for the teachers in my research if I did not believe it might change the teacher's behaviour; once again the Hawthorne effect (Wickström & Bendix, 2000).

What did "Dear data" Teach Me About Myself?

The personal data collection of this project unassumingly leads to powerful learning and metacognition for an emerging social science researcher. The inconspicuous aspect of this project is how each weekly data collection aligned with my world-view. The data from the previous three sections is considered self-data (Figure 1), field research (Figures 3 & 5), and all three data sets are qualitative and interpretive (Leavy, 2017). All three data sets address observable behaviours in an attempt to develop a coherent understanding of the whole data set. This parallels my thinking as a scientist when trying to develop an understanding of a functioning organ. As a social researcher this type of thinking, in relation to behaviour data or any type of qualitative data, remains an area of concern for me.

As a scientist I studied respiratory development of larval fish (Wells & Pinder, 1996). To study respiratory-function I examined the oxygen uptake of different parts of the fish, quantitatively described the anatomy of the fish, and developed a model of how the respiratory system functioned during development. The model was accepted and my fellow scientists liked the variability within the data set. However, the model was the key to the research, not the individual experiments conducted with each living fish. Regardless of their individual differences, the data were forged into a single model that represented how respiration worked for the species. The anatomy and physiology were broken down into steps, singular processes, cells, and molecules to make the model. I feel this was a reductionist approach to answering a problem and it has some strengths in biology. However, the use of reductionism in education to the molecular level is not appropriate, even within behavioural research. I am an education researcher more specifically and I believe in multiple realities, social construction of knowledge, and I want to study teacher knowledge. I see how this understanding should not be trivialized by addressing cognitive physiology, which is something that I cannot study, nor should I, while addressing social science research questions. In the past year, I have written papers connecting behaviour and new discoveries in neuroscience with behaviour research. I now believe this reductionism is misplaced. The "Dear data" examination of dogs, project collaboration, reflection, and reading helped to form this belief; I should not apply reductionist physiology thinking to behaviour of humans. Reading about reductionism in behaviour studies helped me understand how it can draw the focus away from the seminal aspects of a social science investigation. Reductionism has created a rift between North American and European Ethologists (von Hipple, 2008):

> European ethology emerged from a naturalist tradition that combined careful observation of the animal in its environment with experimentation in the laboratory and the field. Behaviour was viewed as adaptive, and European ethologists looked for mechanistic explanations for behaviour in the animal's physiology. In essence, behaviour and physiology were different expressions of the same phenomenon… p. 415

The division is the key. Keep the physiology and the behaviour away from each other unless you are capable of performing research that can properly connect these two forms of data. I see parallels in the division in ethology and the division between quantitative and qualitative research in education (Creswell, 2017). This follows the noted differences in terms of inductive reasoning (European naturalists) and deductive reasoning (North American Sociobiologists) (Von Hipple, 2008). I realize I need to stop reducing what I see to components of physiology and anatomy, to shift my focus to the social subject, and the story of the individual being. Charlie, the dog taught me to look at the whole pattern of behaviour and the component parts versus the physiological cause. Galbraith's (1995) description of the interpretive position through hermeneutics helps me see the human condition, "In the hermeneutic situation humans understand each other's actions not as physically caused, but as emerging as expressions from each other's projects of life." (p. 526). Humans are social animals and I believe we learn from our "projects of life" and the "Dear data" project has caused me to have "emerging expressions" I want to report.

Collecting data within this research project was a useful social learning experience for an emerging social science researcher. If you write or collect data, even in a personal diary, you are writing for an audience. This makes the process a social endeavor. To me, writing and data collection are forms of social constructionism that are relativistic (Denzen & Lincoln, 1994). While conducting these activities, all of your social-cognitive development (Vygotsky, 1978), and thus your manner of cognition, guide the pen as you write. The previous sentence serves as an example of my cognitive and social development and places me ontologically as a relativist and epistemologically as a transactional/subjectivist (Denzen & Lincoln, 1994, p. 109). Consider two examples of my social learning from my past. Thirty years ago, I was training to be a fish biologist and focused on developmental processes. My biology training process involved reading, writing, presentations, conversations, debates, and interacting with discourses, all of which are examples of social artifacts according to Vygotsky (1978). Then I learned to be a teacher of biology and psychology that required that I study the works of Darwin, Chomsky, Skinner, Vygotsky, and Piaget to understand cognitive development. Learning to be a teacher involved different social artifacts. These are two examples of my social cognitive learning experiences and these experiences, combined with all my other social learning, flow through my mind to impact my perception of reality and impact my writing. I should note that people may change their thinking as they write and in doing so, develop new ideas; yet another example of social constructionism. To formally summarize, I believe that learning is a social construction, an activity that is mediated by social artifacts that are socially shared cognitive and physical resources (Vygotsky, 1978). The "Dear data" process of the personal data collection, artistic representations, collaboration, and finally this writing, reinforces these beliefs.

Conclusion

I committed to use art within this project and this first step helped me find the joy referenced metaphorically by Robert Frost (1916) in "The Road Not Taken":

> And both that morning equally lay
> In leaves no step had trodden black.
> Oh, I kept the first for another day!
> Yet knowing how way leads on to way,
> I doubted if I should ever come back.
>
> I shall be telling this with a sigh
> Somewhere ages and ages hence:
> Two roads diverged in a wood, and I—
> I took the one less traveled by,

And that has made all the difference. (11-20)

The voyage of the "Dear data" project started with three data collections, moved to the construction data representations with art, then the examination of these representations, now cognitive and social artifacts, with a partner. As the project progressed it brought forth the issues of ontology, epistemology, and methodologies. These are the seminal issues linked to data collection and demonstrate how aspects of this project created direct connections to social science research education. This project showed how the style of data collection, such as the Twitter survey, could impact the quality of data, and that modifying data collection may improve a data set (as it did with Charlie). I learned to value the perspective of a collaborator to determine if a data representation effectively informs an audience. My future as a researcher will require me to quarrel with data representation for interpretation, to ensure the reader comprehends the final product. Humanity and research are social endeavors and without effectively connecting to the reader, research will serve no purpose. So be clear, to the point, and avoid the distraction data that are not in the realm of your study. Data require proper representation and explanation to attract readers. Research requires readers. My life as a social science researcher will make an impact in the world when readers consume my work, engage it as part of the social constructionism of knowledge, and interact with me. This is the road I have chosen and my desire is to make a difference in the minds of the travelers I meet.

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