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Subjectivity Filtering: Finding Cognitive Authority in Online Social Media Opinion Posts

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Introduction

Despite modern-day advances, we remain a society of hunter-gatherers (O'Connor et al., 2003). It is precisely one modern-day advance that fuels human foraging behavior; the Internet. Prolific information available via the Internet has replaced 'food' with 'useful information' as the object of foraging. Forays into the unfamiliar are a driving factor to seek information that Blair (1990) labels as a pragmatic and contingent activity. The technological explosion of information ushered in by the Internet, and more so with online social media (OSM), has infused an "undercurrent of urgency" (Blair, 1990) in information seeking. The lack of authority in this online domain, rarely before encountered in information seeking, unwittingly allows for decision-making based on opinion and misinformation rather than fact. Yet the "road to objectivity [in science] is paved with subjectivity (Root-Bernstein, 1997). Thus, I propose that personal opinion, in the form of online comments, are functional documents that inform decisions therefore placing them in the realm of use. The idea that the opinion of others, widely available via online social media (OSM), function as useful documents that inform in times of uncertainty warrants examination through a new lens to identify cognitive authority (CA).

Never before has second hand knowledge, sans identifiable CA, been more prevalent than in OSM. The experiences of others have been deemed so useful that some canny entrepreneurs have developed fee-based OSM sites to provide second hand knowledge through member opinion of community-based businesses and services. Life consists of a series of circumstances, opportunities and challenges each requiring some form of information input (O'Connor et al., 2003). A common life circumstance that leads to information foraging is geographical relocation. Lacking knowledge of community members with CA to guide identification of everyday life needs in a new locale such as finding a realtor, identifying quality schools, and locating a network of healthcare providers leaves the individual in an information deficit. Turning to local opinion in OSM, that often is less certain than it appears, can lead to a misinformed decision.

This research is limited to the testing of a newly proposed framework to identify CA in conditions where the author credentials and identity are unfamiliar to the information seeker. Wilson's theory of cognitive authority (1977) and an unnamed commonly used model used to evaluate information quality in websites informs a new framework. The proposed framework provides a lens to identify CA when personal ties between author and reader are weak to non-existent. A review of Wilson's theory and the unnamed model for identifying quality website information is appropriate to inform the study.

Literature review

Cognitive authority

Wilson's theory of cognitive authority (1983) centers on the fundamental concept that people employ two manners in the construction of knowledge; first hand knowledge (personal experience) or second hand knowledge (experiences of others). Personal experience is garnered from interpretations as a result of real world encounters. The experiences of others that are shared orally or in documents are outside the range of direct experience. Wilson (1983) posited that much of what people believe or think, beyond the narrow confines of their own experiences, is informed by second hand knowledge. However, second hand knowledge is not limited to the hearsay of others. Rather it is also informed by the expert knowledge of others. Individuals deemed as experts hold knowledge "vastly superior to those obtained by the majority of the population" (Gobet, 2015) and thus are cognitive authorities. The major factor in CA is it influences thoughts that are consciously recognized as being proper (Wilson, 1983). CA, a major influence in independent decision-making is independent of authority bestowed by hierarchical position, which is often the basis of decisions in formal organizations (Rieh, 2005).

Cognitive authority indicates that the creator of a source has qualifications and institutional affiliations that match the expectations of a given disciplinary community, not that the source is trustworthy, or even that its disciplinary community is a superior source of information (Pierce, 1991). However, information stripped of identifiable CA leaves relevance as an influential factor for decision of information use. Relevance is user-determined based in consideration of both situation and believability in context (Kwasnik, 1991; Barry, 1994). Yet relevance supported by second-hand knowledge from CA provides a sounder basis for identifying quality second-hand knowledge. The challenge with business and service evaluation in OSM is the factor of low tie strength to the community, meaning that unfamiliarity with the author of the review leaves determination of CA difficult at best (Rieh and Belkin, 2005; Gilbert & Karahalios, 2009). Hence, in a nebulous environment of prolific second hand knowledge such as OSM, identification of CA may have relevance for determining the quality of information. It is the essence of immediacy and informality of OSM that makes it attractive to the everyday information hunter and gatherer today. Some research has addressed informality in the context of learning in OSM (Dabbagh & Kitsantas, 2012; Chen & Bryer, 2012), however, there remains a dearth of information regarding identification of CA within the context of OSM which is a prolific source of second-hand knowledge.

Cognitive authority and OSM veterinary reviews

The relationship between veterinarian and pet owner establishes the nature of the bond. Known as the veterinarian-client-patient relationship (VCPR), most veterinarians understand that its cultivation is essential to a successful practice (Johnson, 2016). However, analysis of veterinarian-client communication indicates that there is a lack of consumerist consideration in the communication pattern on the part of the veterinary practitioner (Shaw, Bonnett, Adams, & Roter, 2006; Coe, Adams, & Bonnett, 2008). Breakdowns in communication lead to client dissatisfaction in the VCPR (Shaw, Adams, Bonnett, Larson, & Roter, 2004; Shaw, Adams, & Bonnett, 2004). The relationship between the veterinarian and client establishes first hand knowledge that transforms into second hand knowledge in the form of business review on OSM. Researchers have addressed online evaluation of human health care providers (Lagu et al., 2010; Ellimoottil et al., 2013). However the research literature is deplete of application of second hand knowledge gained from OSM regarding veterinary services. Yet the Internet abounds with warnings for veterinarians to pay heed to online reviews due to the fact that clients are posting about the experiences they have in the process of receiving veterinary care for their pets (Khuly, 2011; Scheidegger, 2014; Mazereeuw, 2015).

The ubiquity and availability of OSM opinion posts combined with marketing these through forums such as Yelp!, TripAdvisor, and Angie's List, makes them convenient resources of information to inform everyday decisions. Thus, I postulate that library and information science (LIS) professionals should not only be more cognizant and critical of CA, especially in OSM, but they should also provide guidance for identifying and establishing CA in OSM posts. In essence, LIS professionals should establish authority standards for determining CA when the source of authorship is vague such as in OSM opinion posts.

Theoretical Framework

Second hand knowledge begs deeper understanding of two phenomenal behaviors of information seeking; why and when people trust what they read (Wilson, 1983). Wilson's four conceptual dimensions of cognitive authority in documents focuses on the source of authority:

- Personal authority (author)
- Institutional authority (publisher forum)
- Textual type authority (document type)
- Intrinsic plausibility authority (content of text)

However, OSM postings differ from other information sources such as print materials and even websites. Author identity including credentials is often missing

in those resources. This provides a challenge to Wilson's cognitive authority outlined above. Expanding consideration of other content elements may serve to inform identification of CA in the OSM environment. Therefore, I propose infusing the conceptual dimensions of CA offered by Wilson with a commonly available model devised by LIS professionals (United Nations, n.d.; NNLM, n.d.; U.C. Berkley, n.d.; University of Washington, n.d.; Cornell University, n.d.; Yale University, n.d.) used to judge quality of websites. Sans formal branding, I refer to it as the Quality of Information Source (QIS) model. It employs five traditional criteria:

1. Accuracy
2. Authority (borrowed from Wilson)
3. Objectivity
4. Currency
5. Coverage

The specifically informal context of OSM rules out one specific criteria offered by the QIS model. The concept of 'accuracy' involves a notion of correctness that is indeterminable in opinion posts, which are subjective in nature. The remaining four criteria purport relevance in the context of informality as demonstrated through definitions and operational statements in Table 1.

For the framework, I propose an additional criteria endemic to the Internet and OSM; glyphs. Glyphs are visual enhancements of content realized through diacritic marks such as exclamation points and question marks. Repetitive diacritic marks such as multiple exclamation points provide a visual element that conveys emotion beyond its singular meaning of emphasis. Glyphs also encompass the inclusion of textual enhancement such as bold, italics, and capitalization for the purpose of emphasis. Emoticons are also classified as glyphs that convey content or emphasis of textual content. Glyphicality of texts employs a visual subjectivity force indicating an element of emotion underlying the textual content. In sum, the frequency of glyphs conveys a level of subjectivity of content, either positive or negative in sentiment potentially impacting believability on the part of the reader.

Cognitive Authority Framework – Quality Information Source (CAF-QIS)

OSM posts are fraught with subjectivity undermining identification of quality information that impacts everyday decision-making. Concepts serve as filters for identifying trustworthiness of OSM posts.

Table 1: CAF-QIS Definitions and Operationalized Concepts

Authority	Objectivity	Currency	Coverage	Glyphicality
<p>[cognitive authority] Documented by sharing of experiences.</p> <p>[personal/institutional] Documented by sharing title/qualifications</p>	<p>Expressed through statements of fact.</p> <p>Statements of fair-mindedness that contrast with the emotion providing balance to passion.</p>	<p>Posting date is considered as reviews may grow stagnant for a business). Additional factors include codification of time frame of experiences outside of posting date.</p>	<p>Realized through qualification of opinion.</p> <p>Specific examples are provided to clarify tone of the post.</p>	<p>Expressed through diacritic and other visual enhancements of information.</p>
Examples				
<p>I have been a client of this vet for 4 years... (duration of experience)</p>	<p>This vet clinic has 24-hour service.</p> <p>Perhaps it was an incredibly busy day with emergencies, but I waited over 2 hours to see the vet. (deference for the situation)</p>	<p>(Post 10/08/2016) I had an appointment with the vet 2 months ago and received a bill for over \$1,000. (experience documented as 2 months prior to actual post)</p>	<p>Do not take your dog to this vet. They prescribed medication and did not say it would cause my dog to lose hair. (qualified why does not recommend the vet based on specific experience)</p>	<p>Do not take your dog to this vet!!!! My dog was put on medicine and her his hair fell out in patches. He had a beautiful coat and now he looks <u>awful!!!</u> (Diacritic enhancement with multiple punctuation indicates emotion... subjective approach.</p>

Combining Wilson's conceptual dimensions of CA with select criteria from the QIS model along with considerations of glyphicality provides a useful framework for filtering subjectivity and determining CA in OSM. CAF-QIS concepts are focused upon the nature of content as a clue to determination of CA. Furthermore the framework can act as a guide for crafting OSM posts backed by situation-relevant CA.

Method

Employing qualitative analysis, this research explores the application of an evaluative lens (CAF-QIS) to determine CA in OSM opinion posts. The context for evaluation is case-based examination of a specific business service; veterinary practice within the Yelp! OSM community. This grounded theory approach allows for examination of both the phenomenon at hand; CA in OSM opinion posts and evaluation of the theory in its nascent state.

Veterinary evaluations are a relevant context to explore based on pet ownership demographics and national relocation statistics. Statistics regarding pet ownership indicates that over 2/3 of the U.S. population owns a dog or cat, a number that has been steadily increasing over the past half decade (AVMA, 2007; AVMA, 2012). According to 2015 U.S. census data the population was 282,556,000. Based on AVMA ownership statistics, roughly 94,185,333 people owned a pet in 2015. Ownership and the responsibility for care place the issue of veterinary care at a high level of importance for pet owners relocating to a new geographic locale. According to Home Data (2015) statistics, fourteen percent (14%) of the U.S. population relocated their residence with 3% moving to another state or outside of the country. Relocation distance data indicates that nearly 3 million Americans moved beyond reasonable reach of their current veterinary caretaker, particularly for unplanned (emergency) care. Many websites address the issue of moving with a pet, and finding a reliable veterinarian ranks high on their list of relocation recommendations along with securing that information from a 'trusted' source (McHolm, 2014; Ross, n.d.; Moving FC, n.d.; New Market Services, n.d.). The notion of 'trust' beckons the importance of Wilson's cognitive authority when looking to OSM opinion posts for selecting a veterinarian in a new hometown.

A content analysis of ten (10) randomly selected veterinary reviews posted to Yelp! was conducted to test the CAS-QIF model as a lens for determining CA among rater postings. An alphabetical listing of states (A- W) was assigned numbers in numerical order starting with 1-50 (i.e. Alabama = 1, Alaska = 2, Arizona=3,...Wyoming = 50). A random number generator (<http://www.randomnumbergenerator.com>) was used to select State capitals for searching Yelp! veterinary services by location. The first ten unique random

numbers generated for this study and their corresponding state and capital names used for location searching in Yelp! Prior to conducting the analysis on the ten selected posts, the method was tested on a post for three states not selected for the study. Intercoder reliability was performed on the three test states' posts. There was code variance on the concept of objectivity. After discussion, the concept was further defined and operationalized. Intercoder reliability was tested again on three additional states not selected for this project with both coders reaching the same conclusion for tone and all five concepts. The randomly selected states on which the CAF-QIS framework was tested are listed in Table 2.

Table 2: Randomly selected state capitals

Random Number	State	Capital
11	Hawaii	Honolulu
3	Arizona	Phoenix
31	New Mexico	Santa Fe
44	Utah	Salt Lake City
40	South Carolina	Columbia
18	Louisiana	Baton Rouge
45	Vermont	Montpelier
43	Texas	Austin
42	Tennessee	Nashville
14	Indiana	Indianapolis

The researcher accessed Yelp! (<http://yelp.com>). The word 'veterinarians' was entered in the *find* search box on the Yelp! Website. The capital city name was entered in the *near* search box and the matching city listed in Table 2 was selected. The first opinion post listed was used for analysis, excluding any posts marked 'ad' for advertisement.

Using the CAF-QIS framework, the posts were analyzed for evidence of authority, objectivity, currency, coverage, and glyphicality. First, overall tone was assessed to determine if the review was positive or negative about the veterinary service. Each of the five concepts was applied to analyze the content with samples provided from the opinion post. Overall tone of the post and the five concepts of the CAS-QIF framework are noted + for evidence and – for lack of evidence found within the opinion post. The notion of tone is identified by + for a positive review and – for a negative review. All concepts are single value coded with either a +/- except for the concept of currency, which has a two-factor code. Posting date is automatically generated by the system. If the post is more than 1 year old, then the first currency value notation for the post is negative (-). The second code value for currency represents additional factors of time reference beyond the auto-generated

posting date represented by a positive (+) code. If no additional time factors are mentioned, then the code value is negative (-). Glyphicality has an inverse relationship with believability based on objectivity, a – indicating lack of visual supplementation of the text suggests lack of extreme subjectivity through less emotionally driven content. In order to protect identity and avoid promotion, where quoted examples make reference to the actual veterinarian or clinic name, *vet* or *vet clinic* has been substituted respectively. A summary analysis for the ten posts is provided in Table 3.

Data Analysis

Honolulu, HI

The post was positive in tone with the author stating “I have taken my four dogs to all the clinics in the Hawaii Kai area, and this one is the best.” CA was indicated through various experiences such as “The vets and the staff are caring and helpful. They take the time to explain the issues and address any concerns about your animal. They don't run unnecessary tests, or otherwise try to overcharge or take advantage of their clients in order to maximize their profit...” However, there is no indication in the post of how many times or for how long the author has patronized the veterinary business leaving quality of CA questionable. The author displayed objectivity through indication of comparison with other vets in the area. “I have taken my four dogs to all the clinics in the Hawaii Kai area,…” and “They don't run unnecessary tests, or otherwise try to overcharge or take advantage of their clients in order to maximize their profit like other vets in the area do...”. The only indication of currency, which was positive, was the posting date of 07/20/2016 indicating that content is recent in relation to the reading in October 2016. There was no other expression of currency in the post, such as when the author, as related to the posting date, visited other vets in the area. Coverage was indicated through qualifying statements to support expressed opinions. “The vets and the staff are caring and helpful. They take the time to explain the issues and address any concerns about your animal.” Their caring and helpfulness are qualified by their time to address issues and concerns. There was no glyphicality evident in the post conveying a matter-of-fact approach to the OSM opinion post about the veterinary business.

Phoenix, AZ

The overall tone was positive for this OSM post with an opening sentence of “I never write reviews but I must say I am extremely impressed by the staff here.” CA is couched in two positive experiences for the author with the vet clinic. “I took my dog in to have a cyst looked at that had been bleeding and popped. The techs and Doctor took care of it right away and said if need be they would remove the rest of it when he came in for his teeth cleaning” And, “Dr. Hoppe called me after my

dog's dental cleaning and went over everything that went on.” No other visits are mentioned in the post beyond these two instances. Objectivity is evident through references to past experiences with other vets and health care professionals. “The tech went over all the possible charges that may occur during the teeth cleaning (like if he needed any extractions or extra anesthesia) so there would be no surprises which I have dealt with in the past at other vets/my own doctor.” Beyond the posting date of 04/05/2016 (post accessed in October 2016), there is no other evidence of currency. Coverage is provided through concrete examples for positive opinion expression. “I never write reviews but I must say I am extremely impressed by the staff here. Everyone is extremely nice and they make you feel like you're a friend or a family member which is more than I can say for my own doctor.” The author is impressed because of pleasant experiences with the staff. The author employs limited glyphs in the closing comment “I would recommend *vet clinic* to anyone with pets!”

Santa Fe, NM

There is a positive tone to this OSM opinion post conveyed through the statement “The staff & vet were great.” And “*Vet clinic* is a veterinary clinic I would recommend to residents and out of towners alike.” CA is based on two back-to-back visits to the vet clinic as new clients. “Some issues arose post visit and we returned the next day but everything turned out to be okay and we were reassured of this after another exam.” Lack of objectivity is expressed through a qualifying, critically expressed statement “And we are always looking for the best care where ever we may be living. That said its a bit nerve racking when out of town and something arises.” These comments indicate high expectations and evaluation of this clinic was conducted under unusually stressful conditions of being away from their regular vet’s care. Currency evaluation point is limited to the posting date of 05/15/2016. Coverage is evident in qualifying examples to support positive review statements. “We brought our dog in 1 day after arriving in Santa Fe with some stomach issues. It was a Monday and we were able to get in that morning.” Satisfaction is qualified through availability of access to the vet on short notice. There is no application of glyphs to place emphasis on the positive experience leaving the reader with the facts and experiences of the author’s post.

Salt Lake City, UT

This OSM opinion post is very positive in tone opening with “Best clinic ever!” CA is assumed based on indications of multiple visits, having clearly frequented the clinic more than once. “I brought my dog in during an emergency once after she was attacked by some neighborhood dogs and they were concerned for my well-being as well as my dog's. She gets lots of love and affection from the staff every time she visits...” There are no markers for objectivity such as mentions of

experiences with other clinics or length of time of ownership and general experience with veterinary care. There is no mention of time frame indicating currency other than the posting date (08/19/2016). The author demonstrates coverage through qualifying positive opinion statements with examples such as staff helpfulness and excellent veterinary medical care. “Best clinic ever! The receptionists are always friendly and helpful and the personal attention my animals receive is fabulous. This team goes above and beyond to ensure client needs are met and their team of doctors is very knowledgeable and experienced.” Although the overall review is positive, there is no application of glyphs to enhance the tone.

Columbia, SC

There is a strong tone of positivity with the author stating “Hands down, the best vet I've ever taken my dogs to.” Cognitive authority is demonstrated through ownership of more than one pet along with general indication of experiences with other veterinarians. “I have a 14 year old lab and an 11 year old basset hound and I've never been to another veterinary clinic that comes close to the level of patience and care they provide.” There is a lack of objectivity due to absence of specific examples, outside of general references to patience and care related to perception of service received. Beyond posting date data, there are no references by the author to indicate currency. Coverage is lacking as no specific examples are provided to support the author's opinions. The closing comment confirms the positive tone of the opening line, with glyphical enhancement through application of an exclamation point adding to the positive tone. “I can't rate this place high enough or recommend them enough!”

Baton Rouge, LA

The tone of the review post is positive with the author noting, “The staff and veterinarians are awesome- friendly, efficient and knowledgeable.” CA is explicitly declared in the opening sentence “I have been taking my dogs to *vet clinic* for years.” The comment indicates extensive [positive] experience with the veterinary clinic. Evidence of objectivity is realized in qualification of a negative comment about price. “They are a bit pricey (compared with other vets in Baton Rouge), but I find it completely worth the price.” Outside of posting date, there is no references to time frame other than one to the past in general, indicating frequenting the clinic “...for years.” This gives no indication of specific time frame related to posting date of 07/23/2016. The author provides factual information about extensive clinic hours and the existence and relationship with an onsite emergency clinic confirming further the positive feeling about the business. “They are open 24 hours as they have an emergency hospital attached. I have never had to use the emergency room (I have only taken my dogs for routine vet visits and an occasional planned surgery) but I am glad that it is there should the need arise.” There is an evident lack of

glyphicality leaving the reader with a matter-of-fact tone conveyed by the posting author.

Montpelier, VT

Despite a grave context for the veterinary visit, the overall review was positive in tone. The author stated “Onion River Animal Hospital was very compassionate and understanding and accommodated us even though her cat wasn't a patient of theirs.” There is a lack of CA conveyed by the author based on two conditions. First, the author is not the primary client of the practice, nor the owner of the pet receiving care services. Rather the author was a companion to the pet owner during the visit. Second, this was the first and only visit to the clinic. “Today I helped a friend to put down her cat of 11 years.” And “*Vet clinic* was very compassionate and understanding and accommodated us even though her cat wasn't a patient of theirs.” With statement limited to experience accounts, this post is devoid of objectivity. Other than a posting date of 11/24/2012, there are no references to dates or timespans. The poster offered supporting evidence for the positive comments about service experience providing further coverage beyond opinion statements. “Losing a family member is devastating and they understand this.” There are no glyphical enhancements to content of the OSM post.

Austin, Tx

This OSM post conveys a positive tone commencing with the opening line: “*Vet* and his team are attentive, loving, patient, and care deeply for their patients/clients.” CA is expressed through length of time as a client of the reviewed veterinarian, having sought out services for over a year. “I have been taking my 18mo German Shepard mix to *Vet* since getting her from a rescue July 2015.” There is no indication of objective approach in this post, with content focused on explanation of a specific experience with services and care. Currency is double coded as positive (+/+) as the posting date is recent to this October 2016 reading (08/08/2016). There is a timespan reference with the author indicating use of the rated veterinarian since “...July 2015.” Coverage is exemplified in a detailed account of why the author is a “fan” of this vet and thus supporting the positive review. “The moment I became a life-long fan of *Vet*: My year old dog went into anaphylactic shock in the middle of the night, due to a bee sting, and we spent the night in a 24 hr ER with her. They faxed a review of what was happening with her to *Vet's* office in the early morning hours, and told me to go to his office first thing when they open for a follow-up. We walked in and *Vet* saw us in the waiting area, he walked right up to us, got on the ground with her (in the middle of the waiting area with others all around), was patient with her, tended to her needs, and advised me on my next steps of care for her... right then and there. He explained he read the fax, and was awaiting our arrival.” There are two occurrences of glyphs within the

closing paragraph emphasizing the positive sentiment of the review. “Amazing! I had spent the night before so worried, and he put me at ease. Thank you, *Vet*, and your team for all you do for us!”

Nashville, TN

This review is positive about the vet under review and conditionally favorable in recommending services stating “This vet was perfect for my needs for this...” and “I recommend this vet for anyone who does not need a quick, ultra affordable test or one-off look.” There are indicators of CA on veterinary care as the author does indicate having sought services at other clinics in the area by stating “I must admit, I have been one to jump from vet to vet over my time in Nashville to find a balance between affordability, knowledge, and a shared ideology on pet care.” Objectivity is realized through factual statements about the clinic devoid of opinion. “The office is clean and modern... They emailed me a price list before I committed anything so that I could make sure I was prepared and not surprised or sticker shocked. They are a bit more expensive, than say Value Vet but you get a nice facility and prices are in line with most other non-value vets.” The price comparison with another vet clinic does not convey experience with care of another clinic as the author may have asked for a faxed price list and opted to not seek services. There are no indicators of currency in the opinion post outside of the posting date of 09/24/2016. Coverage is lacking within the content as no qualifying statements are expressed providing support for the positive post. The author did not pose glyphs thus conveying a matter-of-fact tone to the review.

Indianapolis, IN

The tone of this post is established in the opening statement: “*Vet clinic* is truly amazing!” CA is immediately conveyed early in the post with the author writing “We started going there almost two years ago when we got our new family member, our little black lab mix rescue pup, who was 8 weeks old.” With two years of a veterinary-client relationship, the author is speaking from [positive] experience. The post lacks conveyance of objectivity, as there are no factual statements outside of personal experience accounts. A double positive code (+/+) for currency is indicated due to the recent posting date of 08/21/2016 (Accessed October 2016) and the note of two years of seeking veterinary health care from the vet clinic under review in this OSM opinion post. The author does qualify the positive sentiment expressed in the review by providing additional coverage through accounting of various care experiences over the two years. “They have since taken care of all of Charlie's needs, including a stomach surgery, a continuous prescription diet, and his basic vaccinations. All of the staff is extremely sweet, knowledgeable, caring, and great with Charlie. We always feel very welcomed here.” Glyphicality is evidenced through use of capitalization to provide emphasis on affordability of

care. “And on top of the excellent care you receive, their prices are VERY reasonable.”

Table 3: Summary of CAS-QIF analysis

Location	Tone (+/-)	Authority	Objectivity	Currency	Coverage	Glyphicality
Honolulu	+	+	+	+/-	+	-
Phoenix	+	+	+	+/-	+	+
Santa Fe	+	+	-	+/-	+	-
Salt Lake City	+	+	-	+/-	+	-
Columbia	+	+	-	+/-	-	+
Baton Rouge	+	+	+	+/-	+	-
Montpelier	+	-	-	-/-	+	-
Austin	+	+	-	+/+	+	+
Nashville	+	+	+	+/-	-	-
Indianapolis	+	+	-	+/+	+	+

Application of the CAF-QIS framework has provided a lens to look more deeply at OSM opinion posts about veterinary care in one online social media community, specifically Yelp!. Examination of objectivity, coverage, currency, and glyphicality were considered to further explore indications of CA in the context of unfamiliarity with author expertise and qualifications. The following section addresses findings based on analysis of the data.

Findings

Grounded theory approach, at this stage of the research analysis is inductive in nature with a focus on testing of the structure and function of the CAF-QIS framework. In a nascent state borne of separate thought pieces, the CAF-QIS model applied to collection and analysis of data reveals unique patterns for consideration of evidence of CA. Only one opinion post lacked CA identified by statement of ownership of a pet. For the purpose of this study, only posts that indicate CA through statement of pet ownership were examined. CA is based on documentation of direct experience by the author of the OSM opinion post. Nine posts demonstrated evidence of CA as realized through accounts of experience. However, documented experiences, considered in isolation, lack depth of experience when the author and reader have weak or no personal ties. Sans CA the

informal information is less trustworthy or believable. Thus other concepts of the framework are used to identify elements that lend credibility to the authors' posts.

As noted in Table 3, instances of author objectivity were equally as evident as lack thereof. Authors' use of indicators to demonstrate currency was significantly lacking. Instances of coverage were well distributed across author OSM opinion posts. Application of glyphicality occurred slightly less among authors, with four (4) of the nine employing visual markers such as exclamation points and all capital lettering for emphasis of emotion. In sum, this exercise demonstrates that the theoretical framework functions as a lens to examine CA and indicators that inform identification thereof in the OSM opinion post environment.

Discussion and Implications

While functionality of the CAF-QIS framework is plausible, application in the OSM context revealed additional considerations for further development of the framework. Considerations include both structural and functional aspects of theory development practices.

Structural considerations were noted in the data analysis section. A few posts raised questions where CA and coverage intersect. For example, the Honolulu post indicated that the clinic did not overcharge for services rendered. However, a lack of indication of frequency of use of services or duration of the veterinary-client relationship leaves room for question of CA. Refining the concept of coverage to include frequency of experience is appropriate for consideration.

Another structural element for consideration in refining the theory is the concept of glyphicality. Limited use of glyphs was demonstrated in a summary sentence in two of the OSM posts which tied directly back confirming the sentiment in the opening sentence. This evidence of affirmation begs the question of adding an element of degree of strength or weakness of concepts.

The issue of imagery through language arose in at least one of the opinion posts. For example, one of the posts included the phrase "Hands down, the best vet I've ever taken my dogs to." Figures of speech are made up of words and phrases that convey messages that differ from their literal meaning. Typically used to further explain or emphasize a message, they are often laden with emotional messages. Given the imagery aspect of this type of use of language, it might be considered under the concept of glyphicality, at least initially. Testing may reveal that language (non-literal and imagery invoking) should be an added concept to the framework.

Another interesting structural element that arose during content analysis employing the CAF-QIS framework test is one of non-traditional application of punctuation. Interpreted as a vehicle to express emotional emphasis, employment of periods between words in a sentence provided an example of emotional expression. The OSM opinion post for the Indianapolis venue offers a final sentence that provides a sound example. “Best. Vet. Office. Ever.” This too would contribute to the definition of glyphicality further developing the concept within the CAF-QIS framework.

Functional aspects involve the conditions under which testing of the framework occurred. Preliminary testing of concept identification through content analysis of OSM opinion posts was conducted on both positive and negative toned posts. Interestingly, the random selection of posts in Yelp! for this study provided only positive opinion reviews. This questions application of the framework across various natures of opinion often seen in OSM posts. Therefore, future research should include analysis of OSM posts that are both positive and negative in tone.

Grounded theory requires deductive approach to examine data to discern appropriateness or ability to explain the phenomenon in question. Does the theory provide a lens of sense-making? For example, are there patterns across the data that speak to evidence or lack thereof of markers of CA? Posing probing questions to OSM users about trustworthiness in relation to the four concepts of objectivity, currency, coverage, and glyphicality are necessary to determine the ability of the lens to shed a light of understanding of the phenomenon.

Conclusions

Recognizing that CA is elusive in OSM opinion reviews, this study proposes a new framework to identify additional elements that support identification of CA in contexts where the author credentials is unknown or vague at best. Employing grounded theory approach, this research aimed to test the functionality of the CAF-QIS framework as a lens for examining CA in OSM opinion posts. In this case, specifically posts to Yelp! focused on evaluating veterinary services and veterinarians was used as a context for theory testing.

Analysis of the data leads to the understanding that the theory is functional in identification of data that supports concepts of objectivity, currency, coverage, and glyphicality. Examining posts with evidence of authority through self-identification of pet ownership provided appropriate context for testing of evidence of other markers of CA through the CAF-QIS concepts. There is strong evidence for coverage across OSM posts examined for this research. Evidence was found in the accounting of experiences by posting authors. The concept of objectivity was

evident in less than half of the posts analyzed which suggests that CA is less evident in a context where credentials are typically elusive and experience is identifiably limited. Currency is mostly limited to the posting date, which is automatically generated in the posting process. In cases where supplemental currency is indicated, CA is supported through timing of experience relative to posting date. The lack of glyphicality found in OSM posts examined for this study suggests that authors reserve expression of strong emotion regarding their opinions. Such reserve of emotion contributes to identification of CA, as objectivity is not overshadowed. Further testing of the CAF-QIS framework invites consideration of identification of CA in the OSM environment.

Further research is needed to test the CAF-QIS framework for structural development and functional application to examine CA in the context of OSM. The framework serves as a guide for OSM users accessing second hand knowledge to inform everyday life decisions where CA is elusive based on weak personal ties. The QIS model may serve as a framework for OSM users in establishing CA in their OSM evaluative postings.

References:

American Veterinary Medical Association. (2007). Market research statistics - U.S. pet ownership 2007. Retrieved from <https://www.avma.org/KB/Resources/Statistics/Pages/Market-research-statistics-US-pet-ownership.aspx>

American Veterinary Medical Association. (2012). U.S. pet ownership statistics. Retrieved from <https://www.avma.org/KB/Resources/Statistics/Pages/Market-research-statistics-US-pet-ownership.aspx>

Barry, C.L. (1994). User-Defined Relevance Criteria: An Exploratory Study. *Journal of the American Society for Information Science*, 45, 149-159.

Blair, D.C. (1990): *Language and representation in information retrieval*. Amsterdam: Elsevier.

Chen, B., & Bryer, T. (2012). Investigating instructional strategies for using social media in formal and informal learning. *The International Review of Research in Open and Distributed Learning*, 13(1), 87-104.

Coe, J. B., Adams, C. L., & Bonnett, B. N. (2008). A focus group study of veterinarians' and pet owners' perceptions of veterinarian-client communication in companion animal practice. *Journal of the American Veterinary Medical Association*, 233(7), 1072-1080.

Cornell University. (n.d.). Evaluating web sites: Criteria and tools. Retrieved from <https://olinuris.library.cornell.edu/ref/research/webeval.html>

Dabbagh, N., & Kitsantas, A. (2012). Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and higher education*, 15(1), 3-8.

Ellimoottil, C., Leichtle, S.W., Wright, C.J., Fakhro, A., Arrington, A.K., Chirichella, T.J., and Ward, W.H. (2013). Online physician reviews: The good, the bad, and the ugly. *Bulletin of the American College of Surgeons*. Retrieved from <http://bulletin.facs.org/2013/09/online-physician-reviews/>

Gilbert, E., & Karahalios, K. (2009, April). Predicting tie strength with social media. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 211-220). ACM.

- Gobet, F. (2015). *Understanding expertise: A multi-disciplinary approach*. London, UK: Palgrave/Macmilland.
- Home Data. (2015). What Percentage of Americans Really Move Each Year. Retrieved from <http://avricksdirect.com/homedata/?p=31>
- Johnson, C. (2016). From The Dean. *Auburn Veterinarian*, Winter 2016, 5.
- Khuly, P. (2011). Why veterinarians hate online reviews and what you can do about it. Retrieved from http://www.petmd.com/blogs/fullyvetted/2011/aug/hating_online_reviews-11445
- Klobas, J. E. (1995). Beyond information quality: Fitness for purpose and electronic information resource use. *Journal of Information Science*, 21(2), 95-114.
- Kwasnik, B.H. (1991). The Importance of Factors that are not Document Attributes in the Organization of Personal Documents. Retrieved from <http://surface.syr.edu/cgi/viewcontent.cgi?article=1146&context=istpub>
- Lagu, T., Hannon, N.S., Rothberg, M.B., and Lindenauer, P.K. (2010). Patients' Evaluations of Health Care Providers in the Era of Social Networking: An Analysis of Physician-Rating Websites. *Journal of General Internal Medicine*, 25(9), 942-946.
- Mazereeuw, A. (2015). Dos and don'ts of dealing with online reviews. Retrieved from <http://www.lifelearn.com/2015/10/16/dos-and-donts-of-dealing-with-online-reviews/>
- McHolm, L. (2014). 10 things you need to know before you move with pets. Retrieved from http://www.huffingtonpost.com/laura-mholm/10-things-you-need-to-know_b_5648160.html
- Moving FC. (n.d.). Moving a dog to your new home – Checklist. Retrieved from <http://www.movingfc.com/guide/moving-with-a-dog-checklist/>
- National Network of Libraries of Medicine. (n.d.) Evaluating health websites. Retrieved from <https://nnlm.gov/outreach/consumer/evalsite.html>
- New Market Services. (n.d.). Relocating your pet tips. Retrieved from <https://newmarketservices.com/PDF/PetTips.pdf>

O'Connor, B.C., Copeland, J.H., & Kearns, J.L. (2003). *Hunting and Gathering on the Information Savanna: Conversations on Modeling Human Search Abilities*. Lanham, MD: Scarecrow Press.

Olaisen, J. (1990). Information quality factors and the cognitive authority of electronic information. In I. Wormell (Ed.), *Information quality: Definitions and dimensions* (pp. 99-120). Los Angeles: Taylor Graham.

Pierce, S. J. (1991). Subject areas, disciplines and the concept of authority. *Library and Information Science Research*, 13, 21-35.

Rieh, S. Y. (2005). Cognitive authority. In K. E. Fisher, S. Erdelez, & E. F. McKeechie (Eds.), *Theories of information behavior: A researchers' guide*. Medford, NJ: Information Today.

Rieh, S.Y. and Belkin, N.J. (2005). Understanding judgment of information quality and cognitive authority in the WWW. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.107.8991&rep=rep1&type=pdf>

Root-Bernstein, R. (1997). Art, imagination and the scientist. *American Scientist*, 85(1), 6-9.

Ross, L. (n.d.). Finding the right veterinarian for your pet. Retrieved from <http://blog.apartmentfinder.com/preparing-to-move/finding-the-right-veterinarian-for-your-pet/>

Scheidegger, J. (2014). Negative reviews, Yelp and your veterinary clinic. Retrieved from <http://veterinarynews.dvm360.com/negative-reviews-yelp-and-your-veterinary-clinic>

Shaw, J. R., Adams, C. L., & Bonnett, B. N. (2004). What can veterinarians learn from studies of physician-patient communication about veterinarian-client-patient communication?. *Journal of the American Veterinary Medical Association*, 224(5), 676-684.

Shaw, J. R., Adams, C. L., Bonnett, B. N., Larson, S., & Roter, D. L. (2004). Use of the Roter interaction analysis system to analyze veterinarian-client-patient communication in companion animal practice. *Journal of the American Veterinary Medical Association*, 225(2), 222-229.

Shaw, J. R., Bonnett, B. N., Adams, C. L., & Roter, D. L. (2006). Veterinarian-client-patient communication patterns used during clinical appointments in companion animal practice. *Journal of the American Veterinary Medical Association*, 228(5), 714-721.

United Nations. (n.d.). Criteria used in evaluating web resources. Retrieved from http://unfccc.int/essential_background/library/items/1420.php

University of California, Berkley. (n.d.). Evaluating web pages: Techniques to apply & questions to ask. Retrieved from <http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Evaluate.html>

University of Washington. (n.d.). Website assessment and evaluation. Retrieved from <http://depts.washington.edu/trio/trioquest/resources/web/assess.php>

Wilson, P. (1977). *Public Knowledge, Private Ignorance: Toward a Library and Information Policy*. Westport, CT: Greenwood Publishing Group.

Wilson, P. (1983). *Second-Hand Knowledge: An Inquiry into Cognitive Authority*. Westport, CT: Greenwood Publishing Group.

Yale University. (n.d.) The web vs. library databases – A comparison. Retrieved from https://www.library.yale.edu/researcheducation/pdfs/Searching_Evaluating_Resources.pdf