Approaching Vagueness:
Teaching Critical Thinking With Sustainability as Metaphor

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Students need to be prepared for a VUCA (volatile, uncertain, complex, ambiguous) world. This paper is situated at the intersection of heuristics and pedagogy to answer the pressing question of how to teach in light of definitional vagueness. We build on Searle's (1986) Open-ended Metaphorical Utterance Model and demonstrate through a systemic expert analysis that linguistic sense-making is derived via fuzzy logic. We discuss how metaphor can be a tool to teach critical thinking in the class room and apply the sustainability concept as metaphor. We conclude with a discussion for approaching vagueness in the classroom through teaching critical thinking with metaphor.

Keywords: sustainability, pedagogy, metaphor, critical thinking, fuzzy logic

INTRODUCTION

> *According to a Norse myth known as Loki's wager, the frost giant Loki made a bet with dwarfs. The price for losing the deal was his own head. Loki lost the bet. When the dwarfs came to collect Loki's head, he said he would gladly give it to them, but insisted that he would need to keep all of his neck. The resulting heated discussion among the parties came to the conclusion that certain parts of Loki were definitely "head" and other parts obviously "neck," but they could not agree on where one body part ended and the other began. Therefore Loki kept his head.*

How can we prepare students for a volatile, uncertain, complex and ambiguous (VUCA) world (Thurman, 1991)? Students are faced with vagueness in their learning journey every day. Although there may be philosophical discussions revolving around ontological (what is vagueness?) and epistemological (how can we evaluate vagueness?) concerns (Keefe, 1998), for students this question is above all practical (how to make decisions in the context of vagueness?). This paper brings an important viewpoint to the discussion of higher education by suggesting metaphor[1] as a means to approach the context of vagueness in pedagogy and social theory. Let's use Loki's wager as an analogy: Students (the dwarfs) have won the wager (privileged to continued higher education) to change the status quo[2] (come to collect Loki's head) but when they arrive they are caught up in debating vague definitions (how to qualify "neck" versus "head"), a process (education) that hypnotizes them into indecision and by default inaction (Loki keeps

his head). However, inaction has resulted in global and local calls for taking action. For example, in terms of climate change in 2019, millions of students inspired by Swedish teenager Greta Thunberg held worldwide protests calling for action ("Climate protests," 2019). As practitioners and academics continue to disagree about "nebulous definitions" (Davis, 1960; Osuji 2011; Sheeny, 2015), we can be like the participants in Loki's wager and become paralyzed by vagueness. Therefore, the practical implications of this research are twofold. First, it provides a tool for preparing our students to approach vagueness by teaching critical thinking with metaphor by emphasizing fuzzy reasoning. Second, for managers and policy makers the research makes a point of that epistemological language concerns can cloud very real issues for narrow political and economic reasons (Demeritt, 2001).

The heuristic value of metaphor (Cornelissen, 2005) as a knowledge container (Searle, 1979; Tsoukas, 1991) and tool for reasoning (Reid & Scott, 2013) has made metaphor use of continued and growing interest in social theory and management education (Audegrand, 2017; Hacking, 1999; Beatty, 2004; Anderson, 2007; Taber, 2007; Musson, Cohen, & Tietze, 2007). However, despite the ubiquitiousness of metaphor, most scholars (and, by association, students) are not aware of the metaphors they employ on daily basis (Hamngton, 2009). This paper is an invitation to consider approaching vagueness through metaphor via the following journey: After a brief introduction to how metaphor can stimulate critical thinking, we demonstrate how to identify metaphor. We challenge the assumption that sustainability is a "definition" and test sustainability as a metaphor through a systematic fuzzy linguistic analysis conducted by field experts to confirm the metaphorical root. Sustainability was chosen because it is one of most cited terms in the business and society field (Bakker, Groenewegen, & Hond, 2005; Calabretta, Durisin & Ogliengo, 2011), it reflects the pressing and growing need to address environmental concerns in general (Geissdoerfer, Savaget, Bocken, & Hultink, 2017), and it is underrepresented in the management curriculum in particular (Audebrand, 2010; Kopina, 2014). We conclude the paper with implications for approaching vagueness with metaphor for students, practitioners, policymakers, and linguistic theory.

METAPHORS: TOOLS FOR CRITICAL THINKING

Critical Thinking
A VUCA world reflects a dynamic global economy responding to a constantly changing socio-political-geographical-natural environment. In this context students require critical thinking skills beyond technical training in order to meet the needs of constant change and provide solutions to new and evolving problems (Durkee, 2011; Hermann, 1991; Jackson & Durkee, 2008). The Accounting Education Change Commission (AECC), for example, has for decades called for "capacities for inquiry, abstract logical thinking, and critical analysis" as objectives of accounting education (AECC, 1990, p. 308). This paper hears their call.

Schwarz (1988) elaborated that, in terms of pedagogic scholarship, critical thinking is a collection of competencies known as higher order thinking skills that hold the key to helping students meet the challenges of a brave new world order. These important transferable life skills include comparison of ideas, drawing of inferences, and solving of problems (Kaya, 2014) or "grasping the meanings of statements, judging ambiguities, assumptions or contradictions in reasoning, [and] identifying necessary conclusions" (Ennis, 1987, p. 12). Ennis (1987) defined critical thinking as reflective thought necessary for problem solving and taking action. This type of thinking identifies and challenges the assumptions of our ideas (Brookfield, 1987) and "helps us make choices" (Thayer-Bacon, 2000, p. 148), Therefore, critical thinking is a necessary precursor to taking action.

Moreover, students need to navigate through vagueness, in particular linguistic vagueness, that describes our state of affairs and more importantly attempts to normatively prescribe on what course to proceed. Alston (1964) defined a term as vague if and only if "there are cases in which there is no definite answer as to whether the term applies" (p. 84). He further asserted that vague terms hold areas of clear application and non-application as well as areas of indeterminacy. As such, most students will unanimously agree over central interpretations but there will be decreasing consensus over peripheral or borderline cases for vague terms; and like the dwarfs in Loki's wager they are left in an analysis paralysis

over boundary determination. Therefore, training in reflective thought through conscious engagement in critical thinking will enable students to develop the previously mentioned critical skill of "judging ambiguities".

Metaphors as Tools for Critical Thinking: Use of Metaphor

There is overwhelming agreement with Jung's (1959) assertion that metaphors speak a common symbolic language which provide the mind with an a priori archetype structure and are commonly used to describe and simultaneously proscribe reality (Black, 1962; Cassirer, 1946; Cornelissen, 2006; Gibbs, 1996; Lakoff & Johnson, 1980; Morgan, 1986; Tsoukas, 1991). A metaphor is "a figure of speech in which a word or phrase literally denoting one kind of object or idea is used in place of another to suggest a likeness or analogy between them" ("Metaphor," 2019). Metaphors function by similes and analogies (Bunge, 1973), either within the same domain or between conceptually different domains. "Whenever a linguistic, or for that matter visual, auditory, tactile, kinesthetic, somatic, or olfactory symbol provides a schema for transfer to a new domain, there is metaphor" (Yob, 2003, p. 132). This is accomplished via a transfer of knowledge in what Harré (1984) understood as making inferences about one thing, usually referred to as a target domain or topic, on the basis of what we know about another thing, usually called a base domain (Johnson-Laird, 1989; Lakoff & Johnson, 1980; Ortony, 1975). Black (1962) called this a cognitive conceptualization of "pouring new content into old bottles" (p. 239); the effectiveness of the metaphor depends on how well it can be employed to provide insight about the target domain. Therefore, metaphor is basic to learning. On the most superficial level, metaphors can be a teaching tool where knowledge can be transferred quickly and easily by progressing from well-known to less-known contexts (Sticht, 1979).

Moreover, it has been proposed that metaphors can be used as training tools in the classroom to encourage critical thinking, particularly for the analysis of relevant issues) through reflective thinking (Durkee, 2011). Ivie (1996) underlined the importance of reflective critical thinking in metaphoric assumption:

> Reflective thinking revolves around the habit of critically examining the basic assumptions underlying a pattern of thought. Assumptions, in turn, are frequently expressed in the language of metaphor. Metaphor offers us a reflective tool which can be used to analyze basic assumptions. Forming the habit of selectively evaluating metaphors is an important step to developing a reflective mind. (p. 59)

Furthermore, there is a need to teach students to distinguish between metaphors and definitions because many students default to the assumption that the business and society field only uses freestanding (Gibbs, 1996). With this assumption, they run into the grave danger of missing the metaphorical root (Ennis, 1987) and therefore "the importance of obtaining a reflective (critical thinking) understanding" (Morgan, 1986, p. 465) of a deeper insight of world realty. Language is the principal means of communication between human beings. It establishes a conversation between thinking and acting. Drawing on previous work, Tsoukas (1991) pointed to the twofold function of language in both describing and constituting reality. He agreed with Srivastva and Barrett (1988):

The process of giving language to experience is more than just sense-making…To change the name of an object connotes changing your relationship to the object to it because when we name something, we direct anticipations, expectations, and evaluations toward it. (pp. 34-35)

Therefore, meaning is grounded in language. De Graff (2006) emphasized that metaphors reflect the speakers' world view or paradigm (P; Kuhn, 1962; Morgan, 1980). This function of cognitive mapping and expression is found in the form of metaphors, similes, and analogies. In terms of critical thinking, nothing is more basic for students than the need to encourage higher order thinking. In the business and society field students need to distinguish between metaphor or definition to identify how our world is constructed.[3] (Berger & Luckman, 1966; Hacking, 1999).

When thinking critically about metaphor we conclude that, for metaphors representing complex phenomena, one metaphorical utterance can easily accumulate more than one meaning. This is due to a cognitive clustering of concepts forming around the original metaphorical root (Morgan, 1980). We propose that speech on a complex matter cannot avoid using metaphors and will espouse several definitional clusters around one metaphorical root because a speaker is in a puzzle solving process in the context of dynamically constructed social reality (Berger & Luckmann, 1966; Morgan, 1980). As the business and society field is studying a complex phenomenon, we believe that metaphorical utterance leads to several definitions. Metaphors hold within them the possibility of transferring new knowledge (Petrie, 1979). This new knowledge is key to building mutual understanding and problem solving, and students are better able to think reflectively if they understand the root metaphors they employ (Ivie, 2001).

However, the new knowledge can lead to ambiguities and different possible readings of the same metaphorical concept. The range of possibilities for interpretation creates an environment of vagueness for students. Lakoff (1987) explained metaphors and evolutions of meanings, continuing with the mental categories created by Wittgenstein (1953) from cognitive concepts to philosophical investigation. He asserted that only the meanings of the names remain, established by language games and connected by family resemblance to the original metaphor. Lakoff (1987) built on the concept of root metaphor taken from Pepper (1942) to claim that a metaphor is first created by an original prototype category that is defined by common properties that link concepts and, in turn, establishes a certain relationship to the original prototype category. For example, the prototype category "mother" is based on the motherhood concept and a nurturing relationship link. However, "mother" is a metaphorical concept that does not have a clear definition, only a clear relationship to the original prototype. Therefore, the prototype is placed into an abstract container for the metaphor. For Pepper (1942), root metaphors form the basis of world views and theory in particular.

Since language is a dynamically evolving and living institution, a cognitive clustering of concepts occurs soon after the original prototype arises. The "mother" metaphor diverges from the original mother to stepmother, surrogate mother, adopted mother and all other forms of mother-like concepts which are part of a cluster of mothers that are pulled together by the motherhood relationship root within the metaphor. During the evolved metaphor stage, it is difficult to assert which is the original mother. Lakoff (1987) concluded that "the concept mother is not clearly defined" (p. 37), thus it is vague in nature. This approach to understanding is grounded in interpretive heuristic traditions (Larsson, 2017) of understanding phenomena. Therefore, concepts are linked to prototype categories. This radial layering on the root metaphorical concept explains how the clustering of different converging cognitive models can espouse different meanings that are vaguely defined (Ackerman, 1989; Cornelissen, 2006).

Metaphors as Tools for Critical Thinking: Approaching Vagueness

This article continues the conversation of thousands of years of heuristic traditions (Larsson, 2017), for approaching vagueness via fuzzy linguistic analysis. The ancient Greeks pondered the phenomenon of vagueness by asking, "How many grains of sand make a heap?" Known as the Sorites paradox, this conundrum considered that we cannot be completely sure that taking one grain away or adding another grain changes our idea of what a heap is. Hence philosophically vague phenomena within the classical logic context are susceptible to the Sorites paradox because they allow for borderline cases where it is not clear if the phenomenon does or does not apply (Lemmi & Getti, 2006). Classical logic would allow for three buckets of sharp boundaries: definitely true, definitely false, and intermediate cases. However, this view may be too simplistic for vague phenomena that are characterized by a lack of clear boundaries (Keefe, 1998).

To address this problem, degree theory introduced a continuum of truth values, allowing for several simultaneous interpretations of a given phenomenon and the existence of unclear boundaries (Forbes, 1983; Goguen, 1969; King, 1979; Machina, 1976). This theory explains that we can only identify the metaphorical Gestalt of belonging to a "heap" from our own sensemaking of what Oswick, Keenoy, and Grant (2002) would call "analogical reasoning" within our "cognitive comfort zone" to a certain degree within a membership function. Thus, the borderline cases of "heap" would be true to a certain degree of

truth (Lemmi & Getti, 2006). In this line of thinking, Zadeh (1965), Goguen (1969), and Machina (1976) have operationalized this degree theory through quantifiable variables which will be further elaborated below.

Fuzzy logic (Zadeh, 1965) measures the degree of belonging by being an extension of Boolean logic, multi-valued or continuous, which allows for intermediate values between the Boolean values of true and false. Therefore, the degree to which a variable matches the linguistic concept implies the degree of membership that can be represented by a continuous membership function. The basic notion in fuzzy logic is that of a fuzzy set or, technically, a fuzzy class. A fuzzy set A is characterized by the membership function m which takes values within the interval [0.1], that is, m(A): U-> [0.1], where U is a universe of discourse in which A is defined (Zadeh, 1965). In other words, a fuzzy set is a generalization or a degree of membership within the interval which arises by blurring boundaries through the use of membership functions. For example, the expressions approximately and mostly employ fuzzy logic as opposed to a crisp set of elements that are divided into two groups of members (i.e., "1") or non-members (i.e., "0"). The degrees of membership expressed by linguistic variables are converted through defuzzification into numbers on a real line. Therefore, the specification of membership functions then becomes key because it determines the level of interest, and variances are perceived by decision makers (Tiglioglu, 2006). (See Appendix 1, Business and Society Definitions: Fuzzy Set Theory Analysis).

We previously discussed how complex phenomena inherently lead to open-ended metaphors and, therefore, that a harmonious cognitive cluster of several fuzzy interpretations can exist around the same metaphorical link. If we bear in mind that the business and society field uses metaphors to describe and highlight an aspect of the corporate role in society via a set of fuzzy definitions, then the degree of membership to one semantic concept is made clear by the metaphorical root. In other words, membership of a definitional construct to the metaphor is not only true or false, but can be true to a certain degree. Therefore, as opposed to definitions just being vague, abstract or random, they actually represent clusters of meaning employing fuzzy loigic for the membership function via a metaphorical root. As described above, when transferring information from the source domain to the target domain, each cognitive cluster will need to be named or defined by the speaker and interpreted by the hearer according to their experience, context, knowledge, and background. The speaker's process of linguistic sensemaking and the hearer's sense giving inevitably lead to fuzzy definitions. Students can make sense of vague definitions by considering that every definition belongs to a certain fuzzy degree within a membership function, where the rules of crisp logic do not apply. Therefore, in a classroom represented with a heterogeneous population a plurality of views can coexist harmoniously around any given metaphorical root. Metaphor can therefore teach critical thinking through reflective dialogue around identification of the root metaphor and the meaning assigned by both speaker and hearer to any term in question. Only the metaphorical root remains for future evolution.

Students notice that this is particularly the case in the business and society field where the practitioners, academics, and policy makers have reached a certain Babelonian-type state, ironically leaving them at odds with one another, haggling over definitions, while their dialogue in fact aims to address how business can contribute to the good of society. Until now, we have often mistakenly fallen into what Gibbs (1996) warned us with regard to not identifying metaphor: Namely, about trying to apply the rules of crisp logic to a fuzzy set of definitions clustered around a metaphorical root. Although the research examined three popular "nebulous" (Davis, 1960) business and society terms - Corporate Social Responsibility (CSR), Corporate Citizenship (CC), and Corporate Sustainability (CS) - the following sections focus on CS. CS is of particular relevance to the international community of practitioners and policy makers (Geissdoerfer et al., 2017), as well as, to academia (Audebrand, 2010; Kopina, 2014). The metaphorical lens will be a useful tool for creating a common platform for reflection where a dialogue about several or, at times, even opposing terms can take place.

Example of Critical Thinking: Metaphor as Tool for Challenging Assumptions and Reflective Thinking

In order to approach vagueness we will first consider that critical thinking includes identifying and challenging assumptions (Brookfield, 1987). Therefore we first challenge the assumption that Corporate Sustainability (CS) is a definition and we test the concept for the existence of a metaphorical root through fuzzy set linguistic analysis. The study was conducted by experts who followed strict linguistic analysis guidelines (Dimitrov, 1997). However, in a classroom the students are the "experts" on their own interpretation of linguistic terms. Therefore, the analysis is demonstrative in nature in that it proves how linguistic interpretation occurs and it provides a solid basis for our discussion around how to approach vagueness through critical thinking using metaphors as a tool.

We started with identifying metaphor because, according to Gibbs (1996), it is the first step for understanding semantic meaning. Therefore, critical thinking requires a reflective analysis of the terms we employ in order to identify and approach vagueness. Until now we have proposed that language in general, and our definitions within the business and society field in particular, can be interpreted through fuzzy logic. In this section, we will briefly outline how fuzzy logic is employed, followed by an application of fuzzy logic to the sustainability definition, to demonstrate how to trace it back to its original metaphorical root. We then conclude by discussing the implications of this analysis for approaching vagueness through critical thinking.

Methodology and Rationale for Study

We have proposed that language in general, and our definitions within the business and society field, employ fuzzy reasoning for sensemaking. In this section we briefly outline how fuzzy logic is employed, followed by an application of fuzzy logic to the sustainability definitions and corresponding metaphorical link. We then conclude by discussing the implications of using fuzzy logic in the business and society field and the sensemaking process.

Dimitrov and Kopra (1996) and Dimitrov (1997) have developed a research method for how fuzzy logic methodology helps us to quantify the degree of truth that a fuzzy statement may have in reference to a linguistic variable. They explain that, in general, we can consider that two fuzzy sets (α, β) make up a broader linguistic concept (Σ), identified by the relationship below, where α and β represent some fuzzy statement:

$$\text{IF } \alpha \text{ AND } \beta, \text{ THEN } \Sigma.$$

They then assign a degree of membership (truth) to each fuzzy set as it relates to the concept Σ, using the standard rules of fuzzy logic as employed in fuzzy set theory (see Appendix 1, Part 1, Fuzzy Set Rules for Fuzzy Logic Analysis, which provides an exact summary of three-variable analyses of linguistic variables):

– degree of truth (α)
– degree of truth (β)
– degree of truth (NOT α) = 1 - degree of truth(α), [the same for β]
– degree of truth (α AND β) = MIN [(degree of truth(α), degree of truth(β)]
– degree of truth (α OR β) = MAX [(degree of truth(α), degree of truth(β)]

We have applied these basic rules to the most cited metaphorical definitional clusters in the business and society field: Corporate Social Responsibility (CSR), Corporate Sustainability (CS) and Corporate Citizenship (CC) (Bakker et al., 2005). For the purpose of our paper, we focus on CS. Considering our previous discussion, we now proceed to prove that the business field employs metaphors and that CS is a metaphor. Therefore, after gathering definitions we question to what degree of membership (truth) each definition belongs to with respect to the proposed original metaphorical root. Our analysis of these terms

included both academic and practitioner accounts by experts (See Appendix 3, Table 5, Business and Society Definitions).

Fuzzy Logic Analysis. For the purpose of this paper, in order to maintain validity the fuzzy analysis was conducted by a panel of five experts in the business and society field in accordance with suggested implementation of fuzzy linguistic analysis (Dimitrov, 1997). (These experts work as professors in prominent AACSB accredited schools and have doctoral degrees specializing in business ethics; see Appendix 1 for methodology and results; see Appendix 2 for a sample of questionnaire.) The experts evaluated the degree of belonging of definitions to a proposed metaphorical root via thematic analysis. An increase in the degree of membership refers to a stronger tie to the meaning of the original metaphorical root.

Metaphorical Link Selection. The theoretical foundation for the expert analysis is underscored by Gibbs (1996): "They have come to the point that simply arguing against metaphoric representation without actually testing for the presence of metaphor in many concepts is longer sufficient" (pp. 317-318). In other words, there is a need to test the concepts in our language for metaphor. To this end we used an established linguistic reference source, the Oxford English Dictionary (Simpson & Weiner, 1998), to give us the original root meaning of our proposed metaphorical link (see Appendix 3, Table 5 for highlighted metaphorical root). We used fuzzy sets to test the degree of membership of the definitions to the metaphorical root in order to test for existence of fuzzy versus crisp definitions.

Definitional Selection. For our analysis to be relevant, we used established academic definitions as identified by a bibliometric analysis (Bakker et al., 2005) for each term, and we collected the first five practitioner definitions that we encountered for each metaphor as they appeared on official corporate websites of Fortune 500 (2008) companies. We tested a total of 28 definitions (see Appendix 3, Table 5). Both the academic and practitioner definitions had to explicitly state that they aligned themselves with one of the three suggested metaphors under study.

Proof of Metaphor. We considered Schmitt's (2005) assertion that all business and society definitions employed in this analysis coincided with how a metaphor can be identified in a qualitative analysis:

> a. A word or a phrase – strictly speaking, can be understood beyond the context of what is being said; and b. the literal meaning stems from an area of physical or cultural experience (source domain) c. which, however, is – in this context – transferred to a second, often abstract, area (target domain). (p. 384)

The following section demonstrates how, by using this metaphorical identification approach, we confirmed the existence of metaphorical root and definitional clusters around the root. The final section of our paper considers some of the implications our fuzzy logic analysis has for the business and society field and sensemaking.

RESULTS AND ANALYSIS

Teaching critical thinking. Challenging assumptions: Is the term "sustainability" definitional or metaphorical in nature?

"Corporate Sustainability" is rooted in an ecosystems metaphor. Applying the proof of metaphor criteria discussed above asserts that a literal meaning (source domain) can be applied to an abstracted meaning (target domain). Therefore, we begin with the idea that "sustainable" literally means being "able to be maintained at a particular level without causing damage to the environment or depletion of a resource" (Simpson & Weiner, 1998). Using a metaphorical analysis, we can deduce that corporate sustainability literally means that business organizations (target domain) need to maintain something at a certain rate or level (source domain) and we can prove the metaphorical nature of the term via a fuzzy analysis (See Appendix 1).

In addition to the proof of metaphor via the analysis as presented in Appendix 1, the metaphorical nature of this concept is further revealed when we consider that the root of the literal modern definition of "able to be maintained at certain rate" (Dictionary, 2010) can be traced back to the French verb *soutenir*, "to hold up or support" (Brown et al., 1987) and to early forest management efforts (von Carlowitz, 1713). The principles of sustainable forestry (source domain) were later translated unto husbandry in general (target domain; Mantel, 1990) and adopted to the context of ecology (target domain) in order to underscore the principle that nature can regenerate itself (Duden, 2015). By 2007 Johnston, Everard, Santillo and Karl-Henrik took stock of around 300 different "definitions" of sustainability ranging from internally self-contradicting, ambigious utterances to specific definitions focusing from ecosystem conservation (ISO 15392, 2008) to life-form perpetuation (Eherenfeld, 2010). Corporate Sustainability (CS) is a multidimensional term (Audebrand, 2010; Milne et al., 2006) and it is thus a metaphorical utterance.

Consequently, we are led to the question: What is the corporation supposed to maintain at a certain rate or level? A review of the relevant sustainability academic and practical definitions and their metaphorical roots (see Appendix 3, Table 5) clearly points to the idea that corporations should view themselves as components of an ecosystem (Daly, 1993; DesJardins, 1998; van Marrewijk & Werre, 2003) or be ecologically embedded within their environment (Whitemen & Cooper, 2000). In fact, the most commonly accepted definition of sustainability comes from the *World Commission on Environment and Development* which defines corporate sustainability as "meet[ing] the needs of the present without compromising the ability of future generations to meet their own needs" (Bruntland, 1987, p. 41). Hence, tracing the metaphorical root, we are presented with a world view of ecological systems where corporations are responsible for keeping an ecosystem at a certain rate or level for future generations.

In summary, after understanding that CS is a metaphor we can understand that different sustainability "definitions" have their own distinct normative emphasis for describing and prescribing an organization's interaction with its environment. Most students feel enlightened to learn why what they once held for a firm "definition" is in fact a metaphor, and this is where they can start to critically reflect on what the term means to them individually and collectively. The voices in the classroom are in a state of communal cognition, because at this point the class can be understood as a "collective learner" (versus a collection of learners), with a unique evolving identity and comprehension of the subject in its own right (Davis, 2005; Davis & Simmt, 2003). As Davis (2005) explained: "Teaching is not about prompting a convergence onto prexisting truths, but about divergence into new interpretive possibilities" (p. 87). Whereas a discussion around definition is finite, the reframing of our knowledge into preexisting metaphorical roots can be used as a platform for creating conditions for the emergence of desirable possibilities that are infinite and yet to be imagined. It is by challenging assumptions that we encourage the collective imagination to identify problems and seek uncharted territory for finding solutions.

Teaching Critical Thinking. Reflective Thinking: Understanding Degrees of Belonging

The reframing of terms from definition to metaphor stimulates collaborative dialogue by advocating belonging rather than exclusion. For example, in our exercise after establishing a metaphorical root CS we performed a fuzzy set theory analysis (see Appendix 1) and we arrived at the degree of belonging for all selected academic and practitioner definitions.

Students consider CS as a vague term due of the number of "definitions" claiming to define CS and, more important, because of the contradictory nature of the definitions themselves. They often wonder what CS actually means. Critical thinking demands that we solve this problem. Therefore, it is important to approach the vagueness of these definitions with the right thinking tools. Fuzzy reasoning has been proposed as a solution. We can start by asking the students to evaluate if there is one correct answer to defining CS. Then we need to follow up with asking the students to evaluate the proposed definition(s) based on the extent to which they demonstrate belonging to the metaphorical root. If a definition is interpreted unanimously then it is a crisp definition; conversely, if there is a range of different interpretations of belonging then the definition is fuzzy. When we are dealing with a fuzzy definition, dialogue around the meaning of the definition is crucial to avoid misunderstanding or equivocation.

For the purpose of this paper, we asked experts to evaluate our definitions to validate the credibility of the findings of the analysis. First of all, the experts evaluated to what degree of membership a given definition is linked to the overall metaphorical root. Appendix 1, Table 4 ("Mode" column) depicts the range of values possible regarding the definition's membership function with respect to the metaphoric link. It shows that academic definitions range from *moderate* to *high* degree of membership function; and all practitioner definitions were ranked *low* to *high*. These results strongly suggest that the definitions are fuzzy (see Appendix 1). In fact, all the definitions have a range of degree of belonging to their membership functions. For example, the overall value of the membership function for the definition of DesJardins (1998) ranges from low to moderate to high. It is important to note that, as opposed to Boolean logic, the application of fuzzy logic allows for all the definitions to be part of the membership of one metaphorical umbrella even though they may reflect different degrees of membership. No definition is rejected; rather it is evaluated based on its degree of belonging to the metaphor.

The individual degree of membership for each key linguistic marker in a metaphorical root was derived by applying fuzzy logic rules (see Appendix 1, Tables 3 and 4). For example, the Caterpillar (2008) CS overall definitional score was "low," but the evaluation breakdown between the value memberships is different, as demonstrated in Appendix 1, Table 4. In other words, fuzzy logic allows for agreement regarding the overall value membership function even though the experts may have different interpretations of each key linguistic marker. It is precisely here where the application of fuzzy logic allows us to unite different viewpoints into one membership function value.

Our analysis supports the proposal that CS has metaphorical roots. The three steps of linguistic analysis which we complete allow us to identify key linguistic markers for evaluation of metaphor, identify metaphor, and assess a "definition's" overall degree of belonging to the metaphor. As such, it demonstrates how one metaphor can include a wide range of "definitional" interpretations. Hence metaphor as a tool for discussion can serve as a linguistic platform for where a profound understanding of the importance of acknowledging, identifying, and addressing (versus ignoring or silencing) diversity of opinions takes place.

DISCUSSION

A metaphor is a bridging device (Van de Ven & Johnson, 2006) between cognition and cognation. Our systematic analysis of corporate sustainability confirms the formation of definitional clusters employing fuzzy logic around metaphorical roots (Appendix 1). Here we will address the implications of our research findings for teaching critical thinking, informing practice of practitioners and policy makers, and promoting future research.

Implications for Teaching Professionals Who Are Teaching Critical Thinking: Approaching Vagueness Through Metaphor

Metaphor is a form of rhetoric that can be a tool for approaching vagueness. It can help teach critical thinking by highlighting the need for challenging boundary assumptions and practicing counterintuitive thinking. Students look for clear intentional definitions which specify "necessary and sufficient conditions for when the term should be used" (Cook, 2009, p. 155). However, as is demonstrated in the case of "sustainability," students are presented with a vague term and they need to challenge their own assumptions about its definition. Critical thinking approaches phenomena, as this paper approaches linguistic phenomena, by identifying and challenging assumptions (Brookfield, 1987).

Corporate Sustainability (CS) can appear ambiguous and an exhaustive list of its many meanings is open to interpretation. At the beginning of our paper, Loki's wager demonstrated how intuition may be exploited to create phenomena with no sharp boundaries (Shapiro, 2006). It may lead to erroneous logical thinking. The wager highlights that, when we are presented with vagueness or a continuum of states, we often revert to the fallacy of thinking that no true ideal state exists. Metaphors such as CS invite deep reflection about what the speaker means with the use of the metaphor employed. Audebrand (2010), inspired by von Ghyczy (2003), stated that "the value of good metaphors also lies in the richness and rigor

of the debate they engender" (p. 423), and he concluded by observing that metaphorical thinking is enriched through "discussion centered on creativity and innovation rather than on truth and validity" (p. 423). A suggested lesson plan at the end of this paper (Appendix 4) proposes creativity techniques for encouraging students to innovate around metaphorical terms. The techniques solicited in the proposed lesson plan include wordcloud, individual metaphor-elicitation technique, and group consensus-soliciting discussion.

Finally, one of the main lessons students can take away is that businesses are human artifacts and therefore are socially constructed (Berger & Luckman, 1966). The class discussion demonstrates how language conditions our mental models, or "that once we have language we have a social contract" (Searle, 2008, p. 443). At the end of the lesson, students will have their own understanding of a proposed metaphor, and will be able to take actions based on how they understand it (Audebrand, 2010). In fact, metaphors applied in a business setting can be powerful catalysts for business strategy and action (Ghyczy, 2003). Broadly speaking, we side with Audeband (2017), who called for an integration of corporate accountability metaphors, in particular sustainability, into management education. He warned that current curriculum reforms will not "create deep lasting change if the root metaphors underlying strategic management education remain unchanged" (Audeband, 2017, p.413), since the epistemic nature of metaphor fundamentally influences how we think and interact with the world.

Implications for Practitioners and Policy Makers: Epistemic Dangers

The epistemic nature of metaphor brings us to the contentious confrontation of what constitutes scientific (un)certainty (or vagueness). In our research confirming "sustainability" as metaphor we unearth a complex, multifaced and epistemically socially constructed phenomenon. We construct our world views via language, however the phenomenon in question (and particularly the science of sustainability) exists outside of language (Berger & Luckmann, 1966). Language conveys the idea of what we know and what we wish to emphasize in our communication. However, it is well documented that our agenda for metaphor choice is often set via instrumentally motivated socially controlled power processes in order to promote dominant scientific paradigms (Berry et al., 2016; Demerritt, 2001; Kuhn, 1962). Facts and science, and in our case the question of sustainability, are vulnerable to three real dangers: The first of these is a dead-end debate over the (extent of the) existence of an ontologically objective natural world. The second involves epistemic concerns of what we know when faced with vagueness—for example, the analogy of Loki's wager holds true for politicians tempted to build policy based only on scientific certainty, absolving them of any responsibility to exercise discretion and leadership when presented with vagueness. The third danger is that the "truth" represented in scientific statements communicated via language contaminated by politics and instrumental pursuits (Demerritt, 2001). Very "real" and detrimental facts can be questioned, distorted, diminished or manipulated by language. Both policy makers and practitioners need to be cognizant of the of language, and in particular, the blind spots of the metaphors that construct our world. The intrinsic potential of metaphor comes into play in vagueness, as a container of workable fuzzy knowledge where judgement, discretion and a call to action are nascent.

Furthermore, choosing metaphor is choosing dialogue for the construction of meaning. Metaphor, as stated, invites innovation where we can no longer follow the crisp, binary logic rules of what is considered "right." Instead, we need to turn to fuzzy logic, which implies degrees of membership for a given linguistic marker regarding a given business and society metaphor. Cassirer (1946b) stated that the metaphor is the "only symbolic expression [which] can yield the possibility of prospect and retrospect." The use of metaphors inevitably leads to a proliferation of definitions because they are simultaneously containers for sensemaking and sensegiving. In order to remain relevant in the past and in the future, new definitional meanings are added to a metaphorical link. Viewing the interpretation of the definitions through metaphorical lenses allows for them to coexist harmoniously within their individual contexts. Applied to sustainability, metaphor has a great potential to elicit constructive dialogue between different agents in society, including practitioners and policy makers. The first step is to embrace vagueness and to place "sustainability," and all the term entails, on the political and corporate agenda.

Implications for Scientific Thought: An Opportunity to Use Fuzzy Logic Methodology in Linguistic Analysis

As the title of this subheading suggests, fuzzy logic underlies modes of reasoning which are appropriate rather than exact. Instead of the Aristotelian "true or not true" stream of thought, fuzzy logic is defined mathematically as including statements that are true to a certain degree between 0 and 1. Boolean logic, on the other hand, considers everything to be either true or false, with a truth value of 1 or 0. Fuzzy logic is a superset of conventional (Boolean) logic that has been extended to include the concept of partial-truth values between *completely true* and *completely false*. Fuzzy logic employs self-made interval statements using subjective categories to make decisions where the complexity itself makes it too costly to specify the exact relationship among critical variables. Tiglioglu (2006) stated that "even though these statements do not have quantitative contents, the theory of fuzzy logic provides appropriate descriptions for these types of uncertainties" (p. 59). Hence, fuzzy logic provides the business and society field with a method to approximate constructs whose composition and understanding are continuously changing. It supports different interpretations based on the degree of belonging to an original concept, thereby allowing for multi-stakeholder dialogue, and it opens the door to more options even when they represent polar extremes for value membership affiliation.

Finally, fuzzy analysis holds potential for linguistic theory. It helps to determine how key linguistic markers are understood (as demonstrated by our fuzzy logic results) and to pinpoint where differences lie even when there is apparent agreement within the value of the membership function. Hence, conducting a fuzzy analysis is an opportunity to identify differences in interpretations that, on the surface, appear to be similar. Fuzzy set theory as applied to the qualitative analysis of metaphors provides an answer to the fog of definitions that exist around us because it takes the position that it:

> would not pit one engagement against another in duels to be labeled the 'right' research technique or the "right" theory, but instead share how each research technique has power to partially explain phenomenon. Cumulatively more can be explained or understood. That which is left unexplained, or in a confused state, is an indicator of the need for more n-dimensions to be established. (Treadwell, 1995, p. 96)

Limitations and Further Research

There are some limitations to the methodology and its application in this paper. First of all, in the context of our demonstrative study, the sample size of the experts could be broadened to be more international or contrasted with students. It would be interesting to widen the scope of the expert panel to include scholars and practitioners in order to see if there are differences between their respective opinions. In particular, it would also be worthwhile to note the contextual, cultural, and industry differences in the fuzzy analysis. Additionally, the number of practitioner and academic and root definitions could be extended to allow for a clearer picture of the state of discord or agreement within the field. Definitions on the practitioner side could be compared between and within industries. Second, a main limit of the methodology used, in general, is that it depends on the researcher who specifies the fuzzy categories. Therefore, consensus is required on how to form different value categories. Third, the results of our study challenge the validity of business and society constructs by pointing out the lack of agreement regarding the definitional interpretation of key linguistic markers. Hence, a construct validity test would be a natural extension for further research in this field. And finally, it would be interesting to interpret why and how both practitioners and academics construct and interpret their definitions in order to find the reasons behind their differences and similarities.

Off With Loki's Head

Our classrooms are training grounds for future employees, managers, and policy makers who will need to take decisive action in a volatile, uncertain, complex and ambiguous (VUCA) world. This research contributes an important viewpoint of utilizing metaphor to approach the context of "vagueness" in pedagogy and social theory. Arguments over semantics can lead to stagnation and inaction. Epistemic

concerns can cloud real issues; while academics and practitioners debate definitions students are left wondering about a subject. Although the science of sustainability is uncertain, policy makers and practitioners are still called to action. In Loki's wager the dwarfs did not collect their prize because they were overwhelmed by vagueness. Our students will need to take Loki's head; or to paraphrase, will need to take decisive action even under uncertain terms. Metaphors can be a tool to teach critical thinking by training students to properly identify and challenge assumptions through reflective thought processes, including counterintuitive judgment, and finally come to an understanding inspired by dialogue. Our research demonstrates that metaphor has heuristic value (Cornelissen, 2005) for the following reasons: First, it permits a wide range of interpretations within each root metaphor; second, the interpretations can coexist harmoniously through the metaphoric link across time and culture. Taking the two points together, we conclude that "vagueness" can be approached through metaphor and systematically studied via fuzzy logic. Fuzzy thinking unlocks intervals for degrees of belonging. Finally, our discussion of metaphor sends a significant message of hope that approaching vagueness through metaphor will create a platform for dialogue for both descriptive prognosis and a normative diagnosis of the challenges we face. How our students will proceed to navigate the sea of vagueness will depend in part on how well we equip them to face a dynamic world.

ENDNOTES

[1.] Metaphors are a type of trope or figure of speech used in a non-literal way. Tropes, like metaphors, metonymy, and synecdoche, are based on similarity or dissimilarity such as an anomaly, paradox, or irony. (See Oswick, Keenoy, & Grant [2002] for a full list of tropes with their key characters and utilities.)

[2.] A Deloitte (2020) survey of international Millennial and Gen Z respondents documented that their highest concern was sustainability (31%) followed by unemployment (21%). Moreover, in another survey 61% of respondents were willing to take a 15% salary decrease if that would entail working in a role to improve climate change (National Union of Students, 2018). This data supports previous research dispelling the myth of an excessive instrumentally, profit-oriented business student unwilling to change the status quo (Kagawa, 2007; Koris, Örtenblad, & Ojala, 2017).

[3.] Although a detailed discussion about social construction is beyond the scope of this paper, it is important to note that there are diverse conceptualizations of social construction whose main distinction hinges on epistemic and/or metaphysical interpretation. On the one hand, metaphysical social construction can be classified as universal construction and asserts that no independent facts exist (e.g., "X" only exists if constructed). On the other hand, epistemological construction claims assume that "X" does exit independently and the main question is around the conception or social interpretation of what "X" is in context (Hacking, 1999). A detailed review of social constructionist thought by Sveinsdóttir (2015) concluded that "constructionist analysis is not unified by their content, but by their purpose" (p. 890). This paper's position is with that of Berger and Luckmann's (1966) epistemological construction, which does not claim any form of universal constructionism, in which the authors distinguish between an objectively existing object and the socially constructed idea of the object.

[4.] Zaltman's Metaphorical Elicitation Technique (ZMET), primarily utilized in consumer studies, is the inspiration for this adapted application of the technique for in-class class metaphorical elicitation. In our suggested context, students utilize a self-selected picture to deeply reflect on a concept or subject. Images act analogously to metaphor as containers for knowledge and cognitive mapping. Essentially, this method ensures that the content will come from the student and not the instructor (Zaltman, 1997; Zaltman & Coulter, 1995).

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APPENDIX 1: BUSINESS AND SOCIETY DEFINITIONS: FUZZY SET THEORY ANALYSIS

The following appendix is organized into three parts. Part 1 is a detailed account of the fuzzy set rules employed for the fuzzy logic analysis. Part 2 uses fuzzy logic analysis for three business and society metaphors and as a sample. Part 3 provides a summary of the findings and a discussion of the final results for the definitions; further discussion is found within the main body of the text. Appendix 2 lists detailed results for each of the business and society metaphor roots. The qualifying linking root results were determined a panel of five experts (to see a sample expert questionnaire please refer to Appendix 2). Initially three business and society definitions were analyzed, however we choose "sustainability" for the purpose of discussion for the reasons outlined in our paper.

Part 1: Fuzzy Set Rules for Fuzzy Logic Analysis

Sustainability is a definition is comprised of three variables (see Part 3). Therefore, below we start with the rules that apply for a fuzzy logic analysis of linguistic definitions comprising three linguistic variables. We proceed under the assumption that the each fuzzy set has a degree of membership (truth) as described in the paper in our analysis section, and that it represents a linguistic function. Therefore, we can reasonably follow the rules inspired by Lakoff (1973), tested by Dimitrov and Kopra (1996), and formalized by Dimitrov (1997) to create rules for a three-variable Fuzzy Logic Analysis using the following logic:

a. IF two of the three linguistic variables V(1), V(2), V(3) including the membership value X are fuzzy classes and they are simultaneously characterized by one and the same linguistic variable which is not equal to "moderate," THEN "X" is described by:

IF both V(1) AND V(2) = "low" OR "high," THEN X = "low" OR "high," respectively
IF both V(1) AND V(3) = "low" OR "high," THEN X = "low" OR "high," respectively.
IF both V(2) AND V(3) = "low" OR "high," THEN X = "low" OR "high," respectively.

b. IF two of the three fuzzy classes V(1), V(2), V(3) are simultaneously characterized by one and the same linguistic variable which is equal to "moderate," THEN X is described by the linguistic variable characterizing the third class.

IF both V(1) AND V(2) = "moderate" AND V(3) = "high" OR "low" OR "moderate," THEN X = "high" OR "low" OR "moderate," respectively.
IF both V(1) AND V(3) = "moderate" AND V(2) = "'low'" OR "high" OR "moderate," THEN X = "low" OR "high" OR "moderate," respectively.
IF both V(2) AND V(3) = "moderate" AND V(1) = "high" OR "low" OR "moderate," THEN X = "high" OR "low" OR "moderate," respectively.

c. IF the three fuzzy classes V(1), V(2), V(3) are characterized by different (not coinciding) linguistic variables, THEN X is equal to "moderate."

IF V(1) = "low" AND V(2) = "moderate" AND V(3) = "high," THEN X = "moderate"
IF V(1) = "high" AND V(2) = "low" AND V(3) = "moderate," THEN X = "moderate"
IF V(1) = "low" AND V(2) = "high" AND V(3) = "moderate," THEN X = "moderate"
IF V(1) = "moderate" AND V(2) = "low" AND V(3) = "high," THEN X = "moderate"
IF V(1) = "high" AND V(2) = "moderate" AND V(3) = "low," THEN X = "moderate"
IF V(1) = "moderate" AND V(2) = "high" AND V(3) = "low," THEN X = "moderate"

These rules lead us to the creation of Table 1 for the analysis of a semantic root consisting of three linguistic variables, respectively.

TABLE 1
3-VARIABLE FUZZY LOGIC ANALYSIS TABLE

Linguistic Variables			Membership Value (*AND* operator)
V(1)	V(2)	V(3)	
Low	Low	Low	Low
High	High	High	High
Moderate	Moderate	Moderate	Moderate
Low	Low	Moderate	Low
Low	Low	High	Low
Moderate	Low	Low	Low
High	Low	Low	Low
Low	High	Low	Low
Low	Moderate	Low	Low
High	High	Low	High
High	High	Moderate	High
Low	High	High	High
Moderate	High	High	High
High	Low	High	High
High	Moderate	High	High
Moderate	Moderate	Low	Low
Moderate	Moderate	High	High
Low	Moderate	Moderate	Low
Linguistic Variables			**Membership Value (*AND* operator)**
High	Moderate	Moderate	High
Moderate	Low	Moderate	Low
Moderate	High	Moderate	High
High	Moderate	Low	Moderate
High	Low	Moderate	Moderate
Low	Moderate	High	Moderate
Low	High	Moderate	Moderate
Moderate	Low	High	Moderate
Moderate	High	Low	Moderate

Note: V(1) is linguistic variable 1 , V(2) is linguistic variable 2, V(3) is linguistic variable 3, and "X" is the value of the membership function. The above Table 2 should be read as follows: "IF both V(1) AND V(2) AND V(3) = 'low,' THEN X = 'low' and so on."

Part 2: Method and Data Collection
Fuzzy Logic Analysis of Business and Society Definitions

The fuzzy logic analysis for the business and society definitions consisted of three overarching steps:

First, we identified the original root, academic, and practitioner definitions (Appendix 3, Table 5).

Second, in keeping with qualitative analysis rules (Miles & Huberman, 1994), two independent researchers coded the root definitions for key linguistic markers (see Table 2). The Intercoder Check (ICC) validity results were as follows: CSR, ICC=0.86; for CC, ICC=0.90, for CS, ICC=0.90. The researchers also identified implicit and explicit corresponding linguistic markers within the academic and practitioner definitions (see Table 2).

Third, a fuzzy logic analysis of the business and society definitions was conducted in two parts. The first was the completion of a questionnaire by a panel of five business and society academic experts at ESADE (see Appendix B: Sample Questionnaire instructions) who evaluated the degree of membership an academic or practitioner definition had in reference to the metaphorical root. The questionnaire employed the line method for the response category in order to avoid scale bias (Saris & Gallhofer, 2007). The expert panel also confirmed that the linguistic markers for all the definitions were within the low, medium, and high categories. Subsequently, the mode, representing the greatest consensus between the expert evaluation, was then taken for each variable. Using the rules of fuzzy set theory outlined previously for linguistic analysis in the social sciences (Dimitrov, 1997), we identified the degree of belonging of each of the fuzzy business and society definitions to their original metaphorical root. This analysis for each of the three metaphorical definitions is provided in Table 2 below.

TABLE 2
LANGUAGE CODING DEFINITIONS FOR "CORPORATE SOCIAL RESPONSIBILITY"
(CSR), "CORPORATE CITIZENSHIP" (CC), "CORPORATE SUSTAINABILITY" (CS)
AND ILLUSTRATIVE EXAMPLES

Definitional variants*	Definition	Key linguistic markers	Illustrative example
High	The reference is explicit to the key linguistic words and employs the same word.	CSR: moral, obligation, legal	For obligation: "has not only economic and legal obligations but also certain responsibilities to society which extend beyond these obligations."
		CC: citizen, right duties	For duties: "on voluntarism and charity, as well as on the organization's rights and duties in and for the community."
		CS: maintenance, resources, environment	For environment: "by definition demonstrating the inclusion of social and environmental concerns in business operations."
Moderate	The reference is implicit.	CSR: moral, obligation, legal	For legal: "engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages."
		CC: citizen, right duties	For citizen: "as a responsible player in its local environments."
		CS: maintenance, resources, environment	For environment: "a manager's degree of ecological embeddedness may affect his or her commitment to and practice of sustainability. We conceptualize ecological embeddedness as the degree to which a manager is rooted in the land – that is"

Low	The reference is not clear and it is neither implicit nor explicit.	CSR: moral, obligation, legal	For moral: "the fundamental idea of CSR is that business corporations have an obligation to work for social betterment."
		CC: citizen, right duties	For rights: "as a political term citizenship means active commitment. It means responsibility. It means making a difference in one's community, one's society, and one's country."
		CS: maintenance, resources, environment	For maintenance: "in connecting economics to ecology, the sustainability model is preferable…and moral considerations should be given to the system…industries ought to be modeled on ecosystems."

*Intercoder check (ICC) validity results: CSR, ICC=0.86; for CC, ICC=0.90, for CS, ICC=0.90). The expert questionnaire panel confirmed the following explicit and implicit language markers: CSR=moderate-high, CC=high, and CS=high.

Part 3: Results

Fuzzy Set Theory Analysis for Corporate Sustainability Definitions

Applying the Fuzzy Logic rules set out in Part 1 of this Appendix, we can now proceed to analyze the relationship between the Oxford English Dictionary's (Simpson, & Weiner, 1998) definition (representing the metaphorical root) and the fuzzy academic and practitioner definitions that are found in Table 5 of the text as they apply to *Corporate Sustainability*. Recalling the definition of the reference dictionary, our two-coder research team identified that "sustainable" (X) is composed of three key root linguistic variables: maintain (V(1)), resources (V(2)), and environment (V(3)). Applying the general fuzzy logic rules for the responsibility metaphorical root with these linguistic variables we get:

IF V(1) AND V(2) AND V(3), THEN X
where V(1), V(2), V(3), and X denote the following fuzzy classes:
V(1): Maintain
V(2): Resources
V(3): Environment
X: Sustainability

The results of the international panel of experts' evaluation of the degree of belonging of each variable specification (low, moderate, high) for each fuzzy set class, is provided in Table 4. For a general discussion of the analysis of our findings, please see the "Results and Analysis" section within the main body of this paper.

TABLE 3
EXPERT CS FUZZY LOGIC ANALYSIS TABLE POSSIBILITIES FOR LOW DEGREE OF MEMBERSHIP VALUE

| Expert evaluation | CS definition linguistic markers | | | Membership value |
	V(1)=maintain	V(2)=resource	V(3)=environment	
Expert 1	Moderate	Low	Low	Low
Expert 2	Moderate	Moderate	Low	Low
Expert 3	Moderate	Low	Moderate	Low

Note: This table shows how membership value could be calculated based on a fuzzy sematic analysis with a "low" degree of membership value result. In this case Table 2 3-variable fuzzy logic analysis table is employed because of 3 linguistic markers (V(1), V(2) and V(3)). For example, Expert 1 evaluates if a definition is rooted in CS definitional linguistic makers (maintain = moderate degree, resource = low degree, environment = low degree) with an overall score of "low" degree of membership to the CS metaphorical root.

TABLE 4
RESULTS FOR CS METAPHORICAL ROOT ANALYSIS OF FUZZY SET THEORY DEGREE OF BELONGING (TRUTH) FOR ACADEMIC AND PRACTITIONER DEFINITIONS

| | Expert evaluation: Value of membership function (percent) | | | |
	Low	Moderate	High	Mode
Academic definition				
Daly, 1993	20%		80%	High
DesJardins, 1998	20%	40%	40%	Moderate/High
Whitemam & Cooper, 2000	20%	60%	20%	Moderate
Van Marrewijk & Werre, 2003	60%	40%	_	Low
Practitioner definition				
Wal-Mart, 2008	20%	_	80%	High
Alcoa, 2008	20%	80%	_	Moderate
3M, 2008	40%	60%	_	Moderate
Caterpillar, 2008	60%	40%	_	Low
DuPont, 2008	20%	_	80%	High

Note: Numbers represent % of total expert evaluation out of 100%. For example, 80% of experts evaluated Daly (1993) degree of belong to the CS linguistic metaphorical roots as high.

APPENDIX 2: BUSINESS AND SOCIETY DEFINITIONS: SAMPLE DEFINITION QUESTIONNAIRE

The degree of truth for each of the business and society definitions was determined by a panel of international business and society experts. In order to qualify for expert status, each candidate had to hold a doctorate, work for an internationally recognized university, and have an academic publishing record on business and society issues. In total, five experts received an 87-item questionnaire pertaining to 28 definitions and three confirmatory statements at the end of each definitional section. In order to avoid bias, participants were unaware of the reasons behind the questionnaire. We also used the mode result for their evaluations in order to avoid averages when listing the final results for the degree of truth employed (see Table 4) to calculate the final results of the value of each respective membership function. We have included the instructions for the questionnaire below and a sample item for a business and society

definition. (For the complete questionnaire and results of the three metaphors, please contact one of the authors.) The complete list of definitions is found in Table 5.

Questionnaire Instructions
This questionnaire contains a total of 28 definitions and 3 confirmation statements. It should take about 45 minutes to complete. It consists of an expert qualitative analysis that evaluates the degree to which either a practitioner or academic definition links back to a "root definition" meaning.

> **Step 1.** For each of the survey items below, please read the root definition and take note of the corresponding linguistic markers which are highlighted in bold.
>
> **Step 2.** For each of the survey items below, please mark an "X" on the line provided to evaluate the degree to which you feel that the academic or practitioner definition corresponds to the "root definition" key linguistic marker. The line represents a progressive correspondence of meaning between the key linguistic marker in the root definition and the provided definition. The progression is from left to right and is from "low" to "moderate" to "high." The midpoint of the line has been marked and is the midpoint of the "moderate" category. Please follow the three qualitative analysis rules outlined below.
>
> **Rule A:** An explicit key linguistic marker is the use of the exact same word for both the root and the business and society definition. It should be awarded a "high" degree of correspondence. Please mark an "X" in the high category. Please note that, for your convenience, these words have already been bolded in the business and society definitions.

For example:

Survey Item	Definitions	Key Linguistic Markers	Degree of correspondence between the identified key linguistic marker in the root definition and the business and society definition
N1	"…..**moral**….."	moral	

> **Rule B:** An implicit key linguistic marker is the use of a synonym or a linguistic phrase that makes a small inductive leap in the meaning of the root linguistic marker from the business and society definition. It should be awarded a "moderate" degree of correspondence. Please mark an "X" in the moderate category; the closer your "X" is to the right of the line, the higher your evaluation of its degree of correspondence and vice versa. Please note that, for your convenience, these words or phrases have already been italicized in the business and society definitions.

For example:

Survey Item	Definitions	Key Linguistic Markers	Degree of correspondence between the identified key linguistic marker in the root definition and the business and society definition
N1	"…..*ethical*….."	moral	

Rule C: Where there is <u>neither</u> an explicit or implicit reference to the root linguistic marker in the business and society definition, it should be awarded a "<u>low</u>" degree of correspondence. Please mark an "X" in the low category.

For example:

Survey Item	Definitions	Key Linguistic Markers	Degree of correspondence between the identified key linguistic marker in the root definition and the business and society definition
N1	"….social benefits ….."	moral	X located at Low *Low*　　　　*Moderate*　　　*High*

Step 3. At the end of each section, we provide you with an opportunity to express how much you agree with the linguistic markers proposed by the authors. Therefore, for each of the academic and practitioner sections below, please place an "X" on the line provided to evaluate the degree to which you feel that the proposed key linguistic markers (in bold and italics) are correctly aligned with the "root definition."

For example:

My overall degree of agreement with how the selected and proposed markers (bold and italic) correspond to the "root definition."	X located near High *Low*　　　*Moderate*　　　*High*

Sample Questionnaire Item

Survey Item	Definitions	Key linguistic markers from root definition.

Step 1.
Root Definition
Responsibility is a **moral obligation** to behave correctly towards (another actor) or in respect of (**legal** rules). (Simpson, & Weiner, 1998)
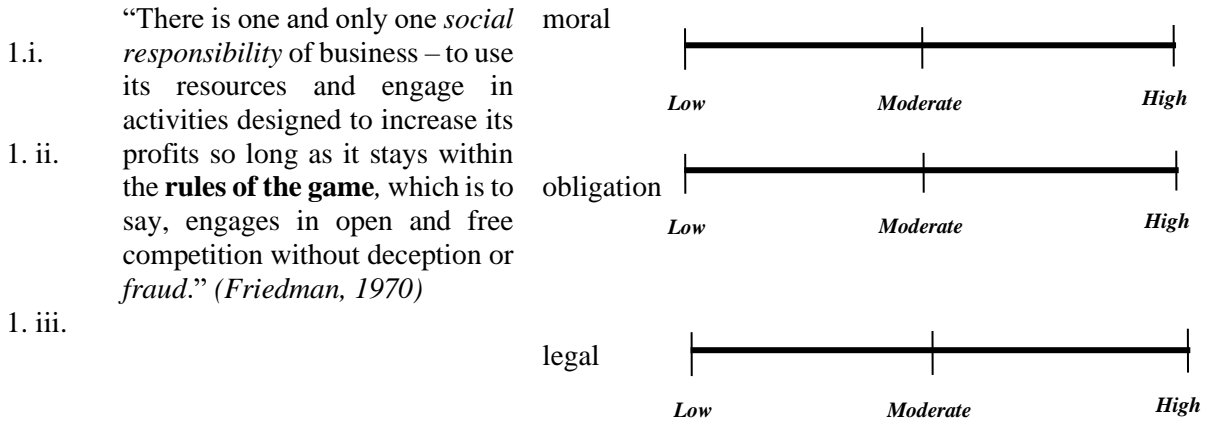
➢ moral
➢ obligation
➢ legal

Step 2.
Identify the degree of affiliation of the definition (below) to the key linguistic marker from the root definition (above).

Degree of correspondence between the identified key linguistic marker in the root definition and the business and society definition.

Academic Definitions

"There is one and only one *social responsibility* of business – to use its resources and engage in activities designed to increase its profits so long as it stays within the **rules of the game**, which is to say, engages in open and free competition without deception or *fraud*." *(Friedman, 1970)*

1.i.

1. ii.

1. iii.

moral

| Low | Moderate | High |

obligation

| Low | Moderate | High |

legal

| Low | Moderate | High |

APPENDIX 3: BUSINESS AND SOCIETY DEFINITIONS SELECTED

Bibliometric analysis of academic "definitions" reveals that three terms are most cited in the business and society field: Corporate Social Responsibility (CSR), Corporate Sustainability (CS), and Corporate Citizenship (CC; Bakker et al., 2005). After identifying the terms, we randomly selected academic and practitioner terms that aligned themselves with one of the three suggested metaphorical roots. We tested a total of 28 definitions (Table 5). Also, for the purpose of our linguistic analysis, we collected the first five practitioner definitions that we encountered for each metaphorical root as they appeared on official corporate websites of Fortune 500 (2008) companies.

TABLE 5
BUSINESS AND SOCIETY DEFINITIONS: METAPHORICAL ROOTS, ACADEMIC AND PRACTITIONER DEFINITIONS*

Corporate social responsibility	Corporate citizenship	Corporate sustainability
Metaphorical root definition (1)		
"Responsibility is a **moral obligation** to behave correctly towards (**another actor**) or in respect of (**legal rules**)."	"Being a **citizen** entails having certain **rights**, **duties**, and **privileges**, (in distinction from a foreigner)."	"Able to be **maintained** at a particular **level** without causing damage to the **environment** or depletion of the resource."
Academic definition (Bakker et al., 2005)		
"There is one and only one **social responsibility** of business – to use its resources and engage in activities designed to increase its profits so long as it stays within the **rules of the game**, which is to say, engages in open and free competition without deception or fraud." (*Friedman, 1970*)	"As a political term **citizenship** means active commitment. It means **responsibility**. It means making a difference in one's **community**, one's society, and one's country." (Drucker, 1993, quoted in Andriof & McIntosh, 2001, p. 14)	"To grow means 'to increase in size by the addition of material through assimilation or accretion.' To develop means 'to expand or realize the properties of; to bring gradually to a fuller, greater, or better state.' When something grows, it gets bigger. When something develops, it gets different. The earth's **ecosystem** develops (evolves), but it does not grow. Its subsystem, the economy, must eventually stop growing, but can continue to develop. The term '**sustainable development'** therefore makes sense for the economy, but only if it is understood as 'development without **growth**'." (Daly, H., 1993, pp. 267-268)
"**CSR** is the firm's consideration of and response to, issues beyond the narrow economic, technical and legal **requirements of the firm**…(to) accomplish social benefits along with the traditional economic gains which the firm seeks." (*Davis, 1973, p. 312*)	"CC foundation swirls around the dual concepts associated with **citizenship** of **rights and responsibilities** although promoters of the term tend to emphasize the responsibilities side. Today the term is used to connect business activity to **broader social accountability** and service for mutual benefit, and yet on the	"in connecting economics to **ecology**, the sustainability model is preferable…and moral considerations should be given to the **system**… …industries ought to be modeled on **ecosystems**." (DesJardins, 1998,.p. 832, p. 834)

"The idea of **social responsibilities** supposes that the corporation has not only economic and legal obligations but also certain **responsibilities to society** which extend beyond these obligations." *(McGuire, 1963, p. 144)*

"In my view, **CSR** involves the conduct of a business so that it is economically profitable, law abiding, ethical and socially supportive. To be socially responsible…then means that profitability and obedience to the law are foremost conditions to discussing the firm's ethics and the **extent to which it supports its society** in which it exists with contributions of money, time, and talent. Thus, CSR is composed of four parts: economic, legal, ethical and voluntary or philanthropic." (Carroll, 1983, p. 604)

Practitioner definition (2)

"The fundamental idea of **CSR** is that business corporations **have an obligation** to work for social betterment." (Frederick, 1986, p.131)

other hand it reinforces the view that a corporation is an entity with a status equivalent to a person…carries the threat of equating human rights to corporate rights." (Waddell, 2000, p. 107)

"…as **a responsible** player in its local environments . . . [with an] [e]mphasis on voluntarism and charity, as well as on the organization's **rights and duties** in and for the **community**." (Logsdon & Wood, 2002, p. 156)

"If corporations participate in governance in the respective frameworks then their **accountability** should be analogous to those other actors with whom they share in governance…certainly at a **global** level, the example of CC is quite a good example of corporations… While corporations therefore 'are' not citizens (in the sense of status) we contend that corporations could reasonably claim to act 'as if' they were metaphorically citizens in that their **engagement in society** resembles that of citizens." (Moon, Crane, & Matten, 2005, pp. 445–446 and p. 448)

…We define **corporate responsibility** as:
* Consistently applying our core **values,** set out in The Chevron Way.

"a manager's degree of ecological embeddedness may affect his or her commitment to, and practice of, **sustainability**. We conceptualize **ecological** embeddedness as the degree to which a manager is rooted in the **land** – that is, the extent to which the manager is on the land and learns from the land in an experimental way." (Whiteman & Cooper, 2000, p. 1267)

"Corporate Sustainability, and also CSR, - are voluntary by definition- demonstrating the inclusion of **social and environmental** concerns in business operations and in interactions with stakeholders. This is a broad and some would say "vague" definition of corporate sustainability…a differentiated set of CS definitions implies that there is no such thing as the features of corporate sustainability." (van Marrewijk & Werre, 2003, pp. 107-108)

"The fundamental idea of **corporate responsibility** as:

"The ExxonMobil 2006 **Corporate Citizenship** Report describes our efforts in a range of areas relating to the

"Our world is changing: **Declining natural systems, climate change and energy crises** affect us and threaten

* Maximizing the positive impact of our operations on current and future generations.
* Integrating social, environmental and economic considerations into our core practices and decision making.

* Engaging with and balancing the needs of our stakeholders. Corporate responsibility is managed through our existing management systems, processes and policies. We review our corporate responsibility elements periodically to examine our progress and to identify emerging issues. We periodically review our corporate responsibility elements to examine our progress and to identify emerging issues..." (*Chevron, 2008*)

"…ConocoPhillips is committed to setting the standard of excellence in everything we do. The company's purpose is using our pioneering spirit to **responsibly** deliver energy to the world. Our SPIRIT

economic, environmental, and social performance of owned and operated operations. We produced this report in accordance with the reporting guidelines and indicators of the International Petroleum Industry Environmental Conservation Association (IPIECA) and the American Petroleum Institute (API) Oil and Gas

Industry Guidance on Voluntary Sustainability Reporting (April 2005)…ExxonMobil applies a rigorous approach to corporate citizenship in all aspects of our business, **everywhere we operate.** Our corporate-wide management systems are designed to ensure that citizenship is directly integrated into our business practices and processes, so that expectations for citizenship performance are met in every part of our **global** operations. Operating ethically and responsibly is ingrained in our business culture and monitored, enforced, and improved upon through our globally-deployed Standards of Business Conduct and Operations Integrity Management System (OIMS)." (*Exxon Mobil, 2008*)

"General Motors is committed to sound **corporate citizenship** in all aspects of our business. Above all, we know that maintaining a strong company will help ensure our continued

future generations. As a large international company, we know we must play our part to restore the life support systems of the earth. Fortunately, along with that responsibility comes an opportunity to promote restorative business practices across our entire industry. In 2004 we launched a company-wide,

long-term initiative to unlock our potential. Leaders and executives from virtually every branch of our company formed entrepreneurial teams focusing on areas such as packaging, real estate, **energy**, raw materials, and electronics waste. These teams partnered with environmental consultants, non-profit organizations, and other groups who helped them examine our business practices through the lens of **restoration and sustainability**." (Wal-Mart, 2008)

"In May 2003, ICMM's CEO-led Council committed corporate members to implement and measure their performance against 10 Principles. The Principles are based upon the issues

identified in the Mining, Minerals and **Sustainable Development** (MMSD) project – a two-year consultation process with stakeholders to identify the issues relating to **sustainable development** in the mining and minerals sector. These issues align almost completely with those identified in the Extractive Industries Review chaired by Dr Emil Salim. In addition, ICMM undertook a "gap analysis" comparing current standards with relevant conventions and guidelines, for example, the Rio Declaration, the Global Reporting Initiative, OECD Guidelines on Multinational Enterprises, World Bank Operational Guidelines, OECD Convention on Combating Bribery, ILO Conventions 98, 169, 176, and the Voluntary Principles on Security and Human Rights." (*Alcoa, 2008*)

"3M vigorously affirms our commitment to **sustainable development through environmental protection, social responsibility and economic progress**. 3M recognizes that the company's long-term success springs from

adopting and implementing the principles of **sustainable development**: stewardship to the environment, contributions to society, and to the creation of economic value and worth. At the same time, we recognize that only by continuing to be a viable and successful enterprise can we continue to be a positive contributor to **sustainable development**." (*3M, 2008*)

commitment to the **communities** in which we live and work and to the social interests we have identified as important to our business and our stakeholders."(*General Motors, 2008*)

"…All of us at Ford consider **corporate responsibility** a key part of **who we are** as a business. Our legacy of caring will continue, because we all share the commitment of our founder. In the words of our executive chairman Bill Ford, "I want us

to be the company that makes a difference in people's lives—one that inspires its employees, delights its customers, rewards its shareholders and makes the world a better place…" (*Ford Motors, 2008*)

"At GE, we apply our spirit of innovation and dedication to integrity to address the difficult challenges that affect the **communities** and people who are touched by our business. This means we approach **citizenship** with the same

discipline, strategy and accountabilities that drive any part of our business, to produce benefits that extend far beyond our bottom line.

…GE aspires to be a leader in corporate citizenship. To do so requires identifying the key areas of impact most relevant to our business. GE has identified four strategic areas that are aligned with our

values are core principles of Safety, People, Integrity, Responsibility, Innovation and Teamwork. ConocoPhillips' purpose and **values** are essential building blocks in the continued success of the company and are an integral part of our search for greatness…" (*ConocoPhillips, 2008*)

"Since our founding nearly a century ago, the AIG Companies (Collectively "AIG") have focused on being a leader in **corporate social responsibility.** As a global financial services organization, we have committed our resources to developing products and services that address the needs of our clients as well as promote a corporate **culture** that **values** integrity, diversity, innovation and excellence." *(American International Group, 2008)*

"P&G is committed to social **responsibility.** We are always seeking ways to better integrate economic progress, **social development** and environmental concerns to ensure a better quality of life for future generations. We demonstrate our commitment to social **responsibility** by providing products and services that improve consumers' lives, in terms of health, hygiene and convenience. On a smaller scale, we contribute to the economic and social well-being of our employees, our shareholders and the local communities in which we operate. On a larger scale, we are involved in regional, national and international development. P&G contributes to social **responsibility** both in principle and in action." *(Procter & Gamble, 2008)*

company's growth strategy — areas where we believe we can lead citizenship efforts…" *(General Electric, 2008)*

"Citigroup has long been committed to making the **communities,** in which it operates better, and at the same time, setting standards for business practices and corporate **values** that exceed industry norms." *(Citigroup, 2008)*

"The Home Depot is built on the principle of creating value for our stockholders while never forgetting our values. We seek to be profitable, responsible and balance the needs of our **communities.** Throughout our company, our associates are challenged with finding ways in which we can provide the best products for our customers, provide the best possible work environment for our associates, have a positive impact on the communities in which we operate, and provide excellent returns for our stockholders." *(Home Depot, 2008)*

"**Sustainable development** poses many challenges—but also presents many possibilities—for Caterpillar, our dealers and our customers. With our commitment to **sustainable development** in the areas in which we operate—
energy, materials, mobility and development—Caterpillar is developing new solutions, profitably growing our businesses and helping to create a more **sustainable** world." *(Caterpillar, 2008)*

"The need for truly **sustainable** options for 21st century life remains one of the most critical challenges facing the global community. As a science company, DuPont has the experience and expertise to put our science to work in ways that can design in – at the early stages of product development – attributes that help protect or enhance **human health, safety and the environment.** Through our science, we will design products and processes that pass rigorous criteria for the use of **renewable resources,** energy, water and materials. We believe this is a direct route to a successful, profitable business that adds value to our customers, their customers, consumers, and the planet." *(DuPont, 2008)*

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* We have highlighted metaphorical roots in this table.

(1)   Metaphorical root selection is taken from Oxford Dictionary (Simpson & Weiner, 1998).
(2)   PR actioner definitions taken from Fortune 500 (2008).

APPENDIX 4: LESSON PLAN: POSSIBLE CLASS QUESTIONING FLOW

Course: Synchronous In-class	Business Ethics (Undergraduate)	Date & Time:	Week X Day of the Week 90 minutes
Topic:	Introduction to Sustainability	No. of students:	30-100
Homework:	• DesJardins, P. (2020). *An Introduction to Business Ethics,* 6th edition. New York: McGraw-Hill/Irwin. Chapter 10. (reading 40 minutes) • Pielke, R. (Oct 27, 2019). The world is not going to halve carbon emissions by 2030, so now what? *Forbes.* (reading 20 min) • Bring a picture that represents sustainability.		
Learning outcomes (LO):	1. Critical thinking: challenge assumptions 2. Critical thinking: counterintuitive thinking 3. Understand social construction of "business" and the implications of power. 4. Become familiar with sustainability issues and solutions. 5. Define personal stance on sustainability.		

Time: (minutes)	Activity	Associated LO	Resources
	Elicit Ideas		
5	Instructor reviews previous lesson; introduces this lessons' agenda; brings up word cloud for ice-breaker brainstorming on sustainability	5	Mentimeter: word cloud (mentimeter.com, 2021) Students' mobile phones or laptops
5	Individual metaphorical elicitation reflection [4]: Students write down their own individual definition of sustainability or they find an existing definition that they like based on the picture they have prepared to discuss with their group.	5	Laptop, word processing software
	Structuring and restructuring		
15	Group activity: Students are divided into groups of about five members. Groups are asked to write a group definition for sustainability based on consensus (not democratic vote) for definition. The need for reaching consensus naturally sparks debate within the group.	1,4,5	Laptop, word processing software
10	Group presentations: Groups upload and present their sustainability definitions.	1,4,5	Laptop, PowerPoint
15	Instructor through Socratic questioning challenges assumptions of the "definitions"; explains why there is no perfect definition because of metaphor (exposes the root of the metaphor);	1,2,3,4,5	Laptop, PowerPoint

	introduces the power of language for social construction of ideas; interactive lecture and reflection on collective sustainability metaphor.		
	Application of Theory		
40	Instructor presents interactive lecture on current sustainability concerns (see theworldcounts website for most recent statistics), soft- and hard-law political agendas and corporate solutions; launches several polls (about every 5 minutes to gage all student perceptions and for change of pace).	3,4,5	www.theworldcounts.com (2021) Mentimeter: polls (mentimeter.com, 2021) Students' mobile phones or laptops
	Closure and Reflection		
Assessment	Each student summarizes key learnings in online discussion forum.	1,2,3,4,5	Online class forum
Homework for next class	Preparation of Sustainability Case Study for next class. AES Global Values. Sharp Paine, L. (2000). Harvard Business School Case. 9-307-002. (30 minutes)		