Replacing Syllabi with Pledges:

Creating a Peace Frame for Learning

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Abstract— **Language is embodied. Words and metaphors that we use in our classrooms are literally neurologically sourced in shared cognitive frames or schemas. Because the field of engineering in the U.S. grew out of the military, the culturally-habitual cognitive frames derive from a "war" frame. Frames activate associated neurological states that can work against students' ability to learn. As an example, faculty will often describe assignments as a *gauntlet*, which has an original meaning of "undergoing the military punishment of receiving blows while running between two rows of men with sticks." This word can elicit a neurological state of fear which causes the release of biochemicals that undermine making synaptic connections—the stuff of learning. In this paper we propose a practice of creating a frame of peace through the use of a syllabus-replacement that we call a Pledge. Unlike a traditional syllabus, this pledge—which means a solemn promise—activates schema involving mutual respect, generosity and freedom. In this paper, we will briefly review the research of cognitive frames and how language can affect the learning environment. Through a small sample of syllabi published online from three universities, we express the state of this typical document used in higher education. We then contrast the frames of traditional syllabi with those of our pledge concept. We suggest design guidelines for people to create Peaceful pledges for their own courses.**

Keywords—embodied cognition; semantic frames; strict father; nurturant parent; linguistics

I. INTRODUCTION

To state the obvious, peace is not war. Prior to the 1970's, cognitive scientists represented 'peace' and 'war' to be mere words that symbolize an abstract concept. However, the research on embodied cognition has since revealed that words are grounded in our neurology [1]; that is, words are coupled to neurological states that affect our behavior in ways that are non-conscious. From a linguistic lens, our behavioral alterations based on our use of metaphors, such as *debate as war*, are considered entailments that are (non-consciously) evoked by the use of the metaphor.

We assert therefore, that the dynamics of embodied cognition affect us and are reinforced through our engineering cultural lexicon. Our radical proposition is that the historical military origin of the profession of engineering in the U.S. has non-consciously produced an embodied disposition within the engineering profession of war and warring reinforced through our commonly-used metaphors. Specifically, the positive intent surrounding the birth of engineering was to accurately transfer expert knowledge for the sake of protection of the greater public in a putatively hostile world. The metaphorical model that this learning context represents is that of a strict father [2]. The underlying assumption of the strict father model (SFM) is that the father is an authority on how to teach the children to survive. The child undergoes disciplined training in order to preserve the father's expert knowledge. Punishment and reward are considered sufficient to condition the behavior of the learner. Self-discipline through hard work, productivity, and self-denial produce the virtue of self-reliance. The father defines what is right and wrong and metes out justice when needed. He demands obedience. He believes that safety comes from strength and therefore restrains from showing emotion and affection, since they are viewed as undermining strength. The assumption is that the world is an inherently dangerous place. A strict father model of teaching is organized around the replication of the expert-stipulated knowledge and skills, with the underlying assumption that this replication is the desired outcome. Notice that a strict father model of teaching does not account for diversity within learners nor within teachers, yet such a model is commonly-held within engineering culture as evidenced in its engineering course artifacts like the syllabus.

The syllabus, often students' first encounter with engineering culture, can unintentionally reify the dynamics of war, specifically fostering domination, threat, scarcity, and fear. Embodied cognition implies that "concepts" like fear are neurological states with an associated set of biological impacts; these states can work against learning. For example, a state of fear releases biochemicals that undermine our ability to make the needed synaptic connections required for learning [3]. In this paper, we show how some publicly available engineering course syllabi contain war-associated language.

We posit that a peace-oriented profession requires a shift to a lexicon that embodies the cognition of peace. In the small scope of this paper, we advocate for a peace-based pledge as an alternative to a typical syllabus. We first briefly review the concept of semantic frames related to metaphors. We then explain our methods and results of a preliminary study of publicly-available engineering syllabi and how they reify the fear-based SFM. We then discuss an alternative and the three elements that support such a peace-oriented nurturant parent

model: embracing mutuality, supporting autonomy, and honoring diversity.

II. METAPHORS AND FRAMES

The ideas of this paper draw from Neuro Theory of Thought and Language (NTTL). This field recognizes that "…[h]uman language and thought are crucially shaped by the properties of our bodies and the structure of our physical and social environment. Language and thought…[are] adaptations that enable creatures like us to thrive in a wide range of situations." [4]. NTTL purports that complex concepts are learned and accessed through metaphors [5]. These metaphors use one idea to represent another, such as in the statement, *I hit the design targets*. In this short phrase, one is implying that they achieved a particular design goal by metaphorical reference to the physical act of hitting a target--a *semantic frame* [6]. The *semantic frame* (or *frame*) is a lexical domain which has elements and relationships. For example, the hit-target frame has an "agent [that] causes ballistic motion of a projectile and its subsequent impact on a target." [6]. The *hit-target* frame is connected to a *weapons* frame. The *weapons* frame includes an artifact designed to cause harm or damage. It can also include a wielder of the weapon and other elements and relationships. All of this is to say that frames contain a cohesive structure of elements that have particular relationships to one another. They act to impart meaning, highlighting particular features and deemphasizing others. Further, these frames have a sensorimotor quality [7]. That is to say that frames are coupled to embodied neurological states, such that evoking them also evokes the embodied states associated with the frame, affecting the way we reason and act [1]. One can experience this, perhaps by contrasting the phrase, *I hit the design targets*, to the phrase, *We met the design specifications*. The verb "met" comes from a *Meet specifications* frame which includes a sentient agent--in this case, "I"-- and a standard--in this case, "design specifications."

III. ANALYSIS OF PUBLISHED ENGINEERING COURSE SYLLABI

In order to investigate the frames of engineering syllabi, we performed a google search with the keywords "engineering syllabus" that yielded 67 syllabi from four different universities (Stony Brook University, University of Arizona, San Jose State University, and University of California - Berkeley). This was not an exhaustive search as we consider this a pilot for a more thorough analysis of published syllabi. Our analysis included reading the syllabi for common themes and patterns as well as tracking some quantitative differences in the syllabi forms.

There seems to be institutional differences in the length and content of the syllabi. This in itself indicates that this artifact carries some cultural communications. For instance, 22 of the 25 syllabi from Stony Brook included a warning about disruptive student behavior, while no syllabi from UC Berkeley or San Jose State (31 total) referenced this. The average length of these 67 syllabi was 3.6 pages, but there was some variation as Stony Brook had an average of 4.3 and Berkeley had an average of 3.1 pages.

The Strict Father Model (SFM) of teaching is reinforced in these groups of syllabi through assumptions/assertions of authority and emphasis on threats/punishment. Assumed authority is seen in the presence and emphasis on rules, which are formalized statements to control. From *FrameNet*'s database, a *rule* is a lexical unit within a frame of *Leadership*, which refers to control of a person over a group; the *control* frame has a *Controlling entity* and a *Dependent entity* [6]. There are also instances that assert values consistent with the SFM, such as self-discipline through hard work, productivity, and self-denial, but these are not universal across the syllabi.

Many of the syllabi indicated rules with negative consequences to a student's grade if violated. The authority of these documents was implicitly asserted and unquestioned. Approximately half of the syllabi used visual emphasis to reinforce the importance of these rules: **bold text**, CAPITAL LETTERS, red text, or OTHER COMBINATIONS. Figure 1 contains examples from a syllabus.

Exams:	All exams are closed book and closed notes. You may bring one 8.5 × 11 inch sheet with handwritten notes. IMPROTANT: NO make-up exams unless in extreme scenarios with Doctor's notes, police reports.
Homework:	1. Homework will be assigned weekly and will be due in one week at the start of class 2. Late homework will not be accepted 3. All homework assignments are individual, unless otherwise specified 4. Homework problems should be neat, professional and well organized 5. Homework will be accepted only during class or via blackboard. Please put our handwritten homework on the professor's desk before the lecture starts or submit a scanned copy via blackboard. IMPORTANT: NO ASSIGNMENT SUBMITTED AFTER THE SUBMISSION DEADLINE WILL BE GRADED

Fig. 1. Excerpt from a syllabus to illustrate emphasis on rules.

Below are other examples of these frames. Each example is taken from a syllabus with the corresponding unique identifier in parenthesis. Those enculturated into a SFM frame are likely to experience these statements as "natural, good and right," rather than artifacts of the socially-constructed, tacitly accepted SFM frame.

Regarding attendance:

"THIS POLICY WILL BE STRICTLY ENFORCED."(A2)

The item listed on the syllabus:

"Lectures are required – there will be no make-ups for announced or unannounced in-class assignments. When scheduled, lab sessions are absolutely mandatory. Students who are late for or miss a lab session will received (*sic*) a grade of zero for that lab report." (S24)

Each syllabus we analyzed implied an authorized expert author who unilaterally dictated the terms of the course. Examples of implied authority, explicit appeals to authority or policing are included below:

"….receive a grade of zero for all lab work, at the sole discretion of the instructor." (S24)

"Failure to comply with the policy on homework may result in a downgrading and/or refusal to accept the work." (A1)

"No credit is given for correct answers obtained by incorrect reasoning and/or compensating errors. Partial credit will be given for work that pertains to the correct solutions." (A1)

"…information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor." (A6)

"The Instructor reserves all rights and privileges to dismiss the student from the classroom at any time for any reason. Grounds for dismissal include, but are not limited to, failure to follow the Instructor's directions, disrespect for the lab equipment, and unruly behavior." (S25)

"…the instructors, at their discretion, may decide to consider late arrivals or early departures as full absences." (A11)

"…anyone found in violation will be ejected from the course with a failing grade." (S24)

"…in accordance with departmental guidelines, the mean GPA for this course will be ~ 2.9" (B68)

"…student observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students." (A6)

"Please note that the report will be checked for plagiarism with the entire report database until date and failing to pass that criteria will be reported directly to Head of Department and suitable action will be taken accordingly." (A10)

"…in the classroom, faculty allows students to use computer only for class-related activities…. Students are urged to report to their instructors computer use that they regard as inappropriate." (SJ2)

There was some specific wording that indicated self-discipline through hard work, productivity, and self-denial produce the virtue of self-reliance.

"The pace of this class is relatively fast, especially if you have little prior experience in electronics, so don't slack off" (SJ4)

"Homework is to be done in a neat, orderly fashion on Engineering Problem paper using only one side of a sheet." (A1)

"students in this course are expected to maintain high ethical standards in all matters" (Fundamentals of Mechatronics, San Jose State University – SJ4)

Student requirement: "Stony Brook University expects students to respect the rights, privilege, and property of other people" (S29)

"This course will require a considerable amount of work outside of regularly schedule class time so be prepared to invest a lot of time." (SJ6).

IV. A PLEDGE AS SYLLABUS ALTERNATIVE

In contrast to the frames used in these published syllabi, our pledge embodies a Nuturant Parent Model (NPM) [8] of teaching and learning. The NPM assumes a world that is equally peaceful and hostile; learning in the NPM comes through creating the conditions for the learner to draw on their innate interests and ability to learn. It recognizes that the teacher, while knowledgeable, is also a learner ("co-learner") and that the learner may hold valid knowledge outside of the teacher's lived experiences. The pledge as a syllabus substitute contains commitments and statements by the faculty member that entail mutual respect, support student autonomy and honor diversity amongst individual learners.

From *FrameNet*'s database, *pledge* is a lexical unit that sits within a *Commitment* frame [6]. The Commitment frame contains a speaker who communicates a solemn promise to the addressee; both speaker and addressee are sentient semantic elements [6]. By contrast, the Control frame of the SFM contains an agent, a sentient semantic type, and a controlled entity, person or situation, neither of which is categorized as a sentient semantic type. In other words, the NPM embodies a humanistic orientation while the SFM has a dehumanizing orientation with respect to its controlled entity. We claim that a pledge that embraces mutuality, autonomy and diversity evokes more relaxed neurological states within both learner and co-learner (i.e., instructor) to support learning.

Example of these three elements from a pledge are as follows:

A. Mutuality

Mutuality recognizes that students and faculty members alike share in the human condition and all that it entails. The faculty member has beliefs that govern their choices about the course design and these beliefs are not necessarily grounded in observable facts. Students are alike. Using statements that include mutuality serve to dissolve an assumed power dynamic of faculty as having unilateral power over students by virtue of their institutional roles or assumed status as content experts.

This purpose of this document is to communicate to you my beliefs, my aims, commitments and pledges. In return, if you choose to take the course, I request that you let me know what I can count on you for (i.e., your "pledges").

You can count on me to:
Attempt to understand your point of view;
Attempt to be fair, including a fair consideration of ideas;
Prepare before coming to class so that I don't waste your time;
Learn with you;
Incorporate your ideas and interests into the class design;

B. Autonomy

Statements that support autonomy honor individuals' inherent status as free people with rights and abilities of choice.

You can count on me to honor your decisions about whether to participate in class meetings and homework (meaning: I will not judge you or guilt you if you choose not to come to class or not do the homework, but trust that you are making conscious choices that serve you best).

Incidentally, in order to honor autonomy, the request for students to offer pledges must also come with a statement that allows them to honor or decline the request without negative consequences.

C. Diversity

Statements that support diversity honor the naturally occurring variation in people, whether that variation be in the form of learning style, lived history, social identity or other.

You can count on me to:

- Attempt to see you for who you are, rather than through stereotypes;
- Welcome different ways of understanding, knowing and being;

These commitments from the faculty member can precede any needed logistic information about the course, such as the weekly content or reading suggestions. As anecdotal evidence, both authors have been using the pledge design as a syllabus substitute since 2015. Each author had been teaching engineering courses since early the early 1990s, using inherited models of syllabi that were more closely aligned with the SFM. Our experience is that establishing a learning environment that embraces mutuality in learning, supports autonomy and honors diversity in all its forms shifts the learning experience toward these values; the people we call "students" have a helping-disposition toward their classmates and take responsibility for their learning, rather than rely on the "faculty" to dispense knowledge. We believe the NPM embodied in such a pledge therefore represents a way to support a peaceful engineering practice.

REFERENCES

[1] G. Lakoff, "Explaining embodied cognition results," Topics in Cognitive Science, vol. 4, no. 4, pp. 773–785, 2012.

[2] G. Lakoff. Moral politics: How liberals and conservatives think. Chicago, IL: The University of Chicago Press, 1996.

[3] I M. T. Owens and K.D. Tanner, "Teaching as Brain Changing: Exploring Connections between Neuroscience and Innovative Teaching." Cell Biology Education, vol. 16, no. 2, pp. fe2–9.

[4] J. Feldman, From molecule to metaphor: A neural theory of language. Cambridge, MA: MIT Press, 2006, p. 7.

[5] G. Lakoff, "Some empirical results about the nature of concepts," *Mind & Language*, vol. 4, no. 1-2, pp. 103–129, 1989.

[6] International Computer Science Institute, "FrameNet," [Online]. Available: https://framenet.icsi.berkeley.edu/. [Accessed: Sept. 14, 2018].

[7] V. Gallese and G. Lakoff, "The brain's concepts: The role of the sensory-motor system in reason and language," *Cognitive Neuropsychology*, vol. 22, pp. 455–479, 2005.

[8] G. Lakoff, "Metaphor, Morality, and Politics, Or, Why Conservatives Have Left Liberals In the Dust." Social Research,vol. 62, no. 2, pp. 177-213, 1995.