Referee Report on MS 20160544 -- "The Shape of Cooperative Communication"

The paper analyzes a cheap-talk model a la Crawford and Sobel (1982, henceforth CS), with two notable differences: (1) there is no conflict of interests between the sender and the receiver – both would like the receiver to know the sender's private information; (2) the message that the receiver observes equals to the message that the sender sends plus a small (infinitesimal) amount of noise.

Denote by state of the world (known to the sender) by $q \in (0,1)$, and the message function (strategy of the sender) by $m(q)$, the results are as follows. First, and not surprisingly given there is no conflict of interests, a fully revealing equilibrium exists, that is, an equilibrium where the message function m is strictly monotone. Second, due to the noise, the message function is "steeper" in states that are more common and/or are more important to the players. This assures that, in such states, the possible error in communication due to noise has a smaller impact. (For example: suppose the receiver observes $m(q) + \epsilon$; if $m'(q) = 2$ then she infers the state is $q + \epsilon/2$, while if $m'(q) = 0.5$ she infers $q + 2\epsilon$.) The paper then shows the same logic applies also to the case where the message space is constrained and discrete, and to the case where the action space is discrete. The paper then uses the result about the shape of $m(q)$ to explain observed behavior of reviews in numerous economic settings.

I actually liked the theoretical idea behind the paper. It is not completely surprising: we all heard that "Eskimos have fifty words for snow", and that's basically the result: in things that matter, you have more vocabulary because it is important to be precise. (By the way, Google search says Eskimos don't have fifty words for snow.) But I like the fact that you can get this result elegantly in the CS framework. I also like the fact that, though any strictly monotone message function can be part of an equilibrium when there is no noise, an infinitesimal amount of noise pins down a unique strictly increasing message function. I believe that a 10 pages paper could have summarized the theory pretty well.

The authors try to show that the point they are making is extremely useful in understanding reviews in general, and financial reviews specifically. As the paper is written now, it is not clear whether a finance journal should be the right venue, given the authors write in length also on academic letters of recommendation, restaurant reviews, etc.

I did, however, carefully read Section 4.2.1 that describes the applications of the model to finance. I do not think this section contains any major contribution to the literature, because the shape of the message function, or the distribution of ratings/grades, is not very important as long as we can translate the messages back to states. Indeed, previous research has focused on the coarseness, or granularity, i.e., the number of notches in a grading system (for example, Lizzeri, 1999). The granularity of the grading system determines its informativeness and thus the actions of the receiver(s). It is determined endogenously in equilibrium (Why do rating agencies have 21 categories and Morningstar only 5?). The paper takes it as exogenous, and thus can say very little on ratings or grades.

Other comments:

1. In Section 3.1 the authors focus on the most informative equilibrium, but I did not find any mention of that. This should be stated explicitly as there are multiple equilibria in this model (for example, a babbling equilibrium where no information is transferred). Specifically, Lemma 3 is not true in general.

2. The paper is way too long. Here are some suggestions to shorten it:

    a. The literature review should be <1 page and contain only papers that are directly related to the model in the paper and the applications.

    b. Section 3.2 and 3.3 can be removed – if one understand the continuous model, it is obvious the same qualitative results will hold in more limited setups. The paper can refer to the working paper version or an online appendix with these parts.

    c. Section 4.1 is obvious and can be removed.

    d. Section 4.2 should be shortened considerably. It should contain less examples, but only examples where the theory is really relevant.

    e. I would change the term “cooperative communication” as the immediate association is cooperative game theory.