Social Comparison Theory as Applied to MOOC Student Writing: Constructs for Opinion and Ability

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Abstract: There has been limited research effort toward understanding how diversity attributes might influence peer feedback in Massive Open Online Courses (MOOCs). Using social comparison theory, we investigated the influence of socioeconomic status (SES) and agreement on peer feedback text in a data science MOOC. This study contributes to understanding how social comparison theory can be operationalized in online writing environments.

Introduction and literature review

Researchers have tried to maximize the benefits of peer feedback activity for MOOCs by focusing on features such as the large size of classes and diversity of students. Social comparison theory gives suggestions on how learner diversity might influence peer feedback in online classrooms. Social comparison theory proposes that people conduct comparisons through two mechanisms: opinions and abilities (Festinger 1954). Not only are attributes such as intensity of practice used, but socioeconomic status (SES) has been perceived as an ability-related attribute (Régner and Monteil 2007). Typical classrooms, even under low competitive and individualized atmospheres, give rich context for social comparison (Dijkstra et al. 2008). Considering MOOCS have students with larger diversity including SES and opinion, we believe they offer interesting context for social comparison. Thus, the question we explore is: *How does social comparison occur during peer feedback activities in MOOCs?*

We used psychological distance to explain reasons behind learner behaviors and how they influence the learning experience of feedback recipients. Emotional intensity and formality of textual response are measurable behavioral proxies during the feedback activity context in the MOOC. Tu and McIsaac (2002) found that farther psychological distance between a sender and a recipient causes more formal and less affective textual response which can discourage learning experience (Van Boven et al. 2010; Tu and McIsaac 2002).

We contextualize our inquiry in student writing and peer feedback activities, operationalizing social comparison theory through text analytic methods. In particular, we study how learners from countries which are generally considered as high SES countries (whose proportion is prevalent in most MOOCs) interact with peers showing similarity or difference in opinions and in performance during online feedback activity. Through experimentation we were able to measure how country and opinion diversity separately and together affect the way a learner responds to peers.

Methods

In all studies, learners read question prompts asking whether they agree with the non-technical issues related to data science and completed a short writing position. A controlled peer activity is where learners were randomly presented with one of two peer positions which were written by the instructor. Participants were recruited through an optional activity in the 'Introduction to Data Science in Python' MOOC taught by Christopher Brooks on Coursera. IRB oversight was sought under University of Michigan study id HUM00120884. The number of participants in preliminary study was 246 and participants in Study 1 was 138. Learners were classified as coming from high, medium, or low SES countries, based on whether they were in the first, second or third, or fourth quartiles of the UNDP Human Development Report 2016 respectively. In this work we focus on the actions of only those learners who were identified as coming from high SES countries. Then learners were randomly presented with one of two peer positions written by the instructor. The position text differed as to whether it was for or against a given argument outlined in the question prompt learners were shown. The country indicator was set either to a high SES country, or a low SES country. Thus, the study was a 2X2 factor design where each learner was to respond to a one of four types of an instructor response: (a) a high-SES peer with dissenting opinion, (b) a high-SES peer with agreeing opinion, (c) a low-SES peer with dissenting opinion, and (d) a low-SES peer with an agreeing opinion.

Findings

Preliminary study and study 1: Hypotheses tested on the different dataset

A two-way ANOVA was run on 246 learners. There was a significant difference between agreement and disagreement on affect (agreeing M (SD)=.21(1.15), disagreeing M(SD)=-.43(.26), F-value=21.90, p<.001) and formality (agreeing M (SD)=-.22(1.02), disagreeing M(SD)=.45(.78), F-value=24.31, p<.001). There was no significant difference between high peer SES and low peer SES either on affect (high M (SD)=.08(1.14), low M(SD)=-.10,.79, F-value=1.25) or formality (high M(SD)=-.03(.92), low M(SD)=-.04(1.10), F-value=.03). Yet, we observe a trend which gives evidence to build hypothesis on SES. There was no significant interaction between the two main independent variables. From results of the preliminary study and social comparison theory, we posed two hypotheses. First, learners from high SES countries will construct feedback that is more formal, with fewer emotional language when responding to cases of disagreement with peers, regardless of the country disclosure of the peer. Secondly, learners from high SES countries will write a less emotional and more formal feedback when responding to lower SES peers. We re-tested these hypotheses in Study 1 which used a different question prompt to see whether the agreement and SES factors are effective in a different context of a peer feedback activity.

Study 1 did not demonstrate supporting evidence to support H1; there was no significant difference between agreement and disagreement on affect (agreeing M (SD)=.04(1.01), disagreeing M(SD)=-.16(0.97), F-value=2.59) and formality (agreeing M (SD)=-.05(1.10), disagreeing M(SD)=.23(.66), F-value=.02, p<.00). For H2, evidence was found with respect to formality of responses towards learners in low SES countries (high M(SD)=-.19(1.06), low M(SD)=.23(0.97), F-value=5.04, p<.05), however there was no significant difference in affect between low peer and high peer groups (high M(SD)=-.08(1.02), low M(SD)=.09(0.99), F-value=3.33). There was no significant interaction between the two main effect variables, agreement and SES.

Conclusion and future work

Before concluding SES was not effective ability-related factor, through an analysis of learner responses, we realized that there was a gap in formality between the controlled instructor responses and the actual learner responses. In particular, learner responses ranged from a formality score of -.572 to 3.484 (M = .691, sd = .549), while the two instructor created positions which had formalities of .370 and .677 (M = .523). We were concerned that peer responses were impacted by the different level of formality which can influence persuasiveness of textual response (Graesser et al. 2014). Based on current understanding of formality, a hypothesis on peer formality should be posed in the future work.

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