Based on Shannon's measure of information content, rare messages (lies) are more rapidly spread than non-rare messages (the truth)

Yoshiyasu Takefuji

Soroush Vosoughi et al. reported that lies spread faster than the truth (1). Shannon (2) derived a measure of information content called **"surprisal"** of a message *m*:

$$\text{Information}(m) = -\log_2 P(m) = \log_2 \frac{1}{P(m)}$$

Shannon derivation states that rare messages are more informative than non-rare messages. In other words, we tend to retweet more rare messages than non-rare messages. If false news are more rare, then we will retweet them. If true news are more rare, then we will retweet them. It is obvious in twitter messages that we tend to retweet "surprisal" of a message. Based on Shannon's measure of information content, rare messages (lies) are more rapidly spread than non-rare messages (the truth). Shannon has already predicted their conclusion.

References:
1. Soroush Vosoughi et al.," The spread of true and false news online," Science 09 Mar 2018: Vol. 359, Issue 6380, pp. 1146-1151
2. https://en.wikipedia.org/wiki/Quantities_of_information