**The dynamics of message exposure in online political discussion forums:**

**Effects of motivation, homophily, and endogenous network processes**

**Expectations and hypotheses**

***Motivations and homophily***

From the perspective of the cognitive consistency principle, we expect that those with higher consistency motivation would be more selective than those with lower consistency motivation with regard to what they choose to expose themselves. All things being equal, individuals are more likely to choose to view the message that conforms their expectations (McPherson, Smoth-Lovin, & Cook, 2001; Iyengar, Hahn, Krosnick, & Walker, 2008). Yet at the same time, prior findings generally suggest that partisans with high consistency motivation are no more likely to “avoid” themselves from potentially attitudinally dissonant messages (Garrett, 2009; Garrett & Stroud, 2016). This leads us to expect that those with higher consistency motivation are equally likely to seek out (potentially dissonant) information presented by others irrespective of its congeniality with their prior attitudes. At the same time, their messages are more likely to *be selected and viewed by others*, presumably since they communicate clear, strong partisan messages to potential alters in their social networks (Ahn, Huckfeldt, & Ryan, 2014) within the context of online political discussion forum. These two expectations culminate to our first set of hypotheses:

**H1a**: Consistency motivation is associated with the higher propensity of one’s messages being selected by others in the online discussion forum.

**H1b**: Consistency motivation is associated with the higher propensity of selecting others’ messages in the online discussion forum.

Moving from individual level to dyadic level, the cognitive consistency principle leads us to hypothesize positive impact of partisan preference homophily in their message selection dynamics. That is, an ego (“focal respondent”) and alters (“potential discussion partner”) are more likely to select each other’s messages if they share same political preferences, such that:

**H1c**: Same political preferences within a dyad increase the propensity of selecting each other’s messages in the online discussion forum (“same candidate preference” & “similar policy preference”).

From the perspective of the understanding principle, we expect those with higher understanding motivation to be more likely to seek out relevant information (more likely to select others’ messages) in general. Yet compared to those who have higher consistency motivation, those with understanding motivations are less likely to clearly communicate partisan messages, let alone they are presumably less expressive of their partisan viewpoints. This would lead them to be less likely to be selected by others compared to those with higher consistency motivation, resulting interesting asymmetries in their message selection patterns. Formally, we expect:

**H2a**: Understanding motivation is associated with the lower propensity of one’s messages being selected by others in the online discussion forum.

**H2b**: Understanding motivation is associated with the higher propensity of selecting others’ messages in the online discussion forum.

At dyadic level, we expect voters of similar candidate evaluation criteria (“evaluation criteria homophily”) would be more likely to select each other’s messages, irrespective of their congeniality towards their prior attitudes. This is based on the expectation that such information is of high utility to make relevant judgments regarding whom they should (or should not) support for. While prior literature generally agrees that voters actively glean relevant information from their social networks, they also appear to value political expertise more than shared preferences in selecting whom they interact with (Ahn, Huckfeldt, & Ryan, 2014). Also, Hart et al.’s (2009) research have found that disconfirmation bias (based on consistency motivation) is substantially reduced when individuals encounter messages with higher informational value. Since messages that are similar in terms of judgmental criteria on which others make candidate evaluations may actually contain highly relevant information, and therefore signal informational utilities, voters are more likely than otherwise to select such messages especially when they are motivated to make accurate evaluations towards political candidate. Formally, we expect that:

**H2c**: Similarity in candidate evaluation criteria within a dyad is positively associated with the propensity of selecting each other’s messages in the online discussion forum.

While the notion of hedonic motivations primarily has been applied to political entertainment media consumption, hedonic motivation – or an idea that people seek to gain pleasure and enjoyment – is another important motivational underpinning of why people use media in general and interact with each other. Assuming participating in online discussion forum continuously and repeatedly is partly driven by its enjoyment-driven capabilities, those who found using online discussion forum and interacting with others more pleasurable and enjoyable would be generally inclined to be active and more participatory than otherwise.

While it is expected that those who are high in hedonic motivations of using online discussion forums to be more active in general (i.e., more likely to view others’ messages and engage with others), it is not entirely clear whether and how such hedonic motivation is also related to the propensity of *being selected by others*. Therefore, we simply expect following:

**H3**: Hedonic motivation is positively associated with the propensity of selecting others’ messages in the online discussion forum.

***Endogenous influence of network structure***

*Reciprocity.* The notion of reciprocity, or the extent of which the relationships between actors in a social network are symmetric (Wasserman & Faust, 1994), represents one of the most strongest and fundamental dynamic social processes in which how individuates create and maintain their social relationship (Snijders, 2011; Wasserman & Faust, 1994). While previous studies have generally emphasized the idea of mutual understanding, trust, and cooperation as the defining characteristics of reciprocity in social relations (Colman, 1990; Lubell & Scholz, 2001; Putman, 2000), research often finds positive tendency towards reciprocity as well in many empirically observed social networks. Although the exact nature of such reciprocal relationship is not entirely clear sometimes, the positive tendency towards reciprocity often can be found within an online political discussion context as well (e.g., Hagemann, 2002; Graham & Wright, 2013).

Often in online discussion forums, users not only intentionally seek for certain information, but they also spontaneously exchange, respond, and react to others’ opinions and messages. This presumably may take a number of possible forms such as providing simple feedback cues (“likes” or “dislikes”), recommend such posts to others, and leaving a comment, etc. Yet the most simple and frequentist form of such “interaction” may manifest as continuous, interactive “discussion” – message exchange sequences – among a set of members. Going one step further, this also implies that such interaction patterns may have create a situation of which an actor *i* and actor *j* mutually choose to view each other’s messages within such message exchange sequence, provided that leaving a reply or comments to an original message necessitate a responder to actually click and read that message at first place.[[1]](#footnote-1) Based on this expectation, we hypothesize that reciprocity would be one of the significant and positive predictor of presence of ties within an online discussion network.

**H4**: There would be more than expected by chance likelihood of reciprocity in message selection pattern within a dyad (*positive reciprocity hypothesis*).

*Transitivity, cyclic closure, and local hierarchy.* Transitivity and cyclic closure in online social network represent another fundamental social process of which how individuals select which messages that they select to read, determining the message exposure patterns, and overall structure of an online discussion forum. The concept of transitivity, sometimes described as “triadic closure,” denotes situation when nodes *i* is more likely than chance to form a tie to another node *j* when they are connected to *k* other nodes (Holland & Leinhardt, 1975). In contrast, cyclic closure denotes similar situation for node *j* to form a tie to node *i* when they are connected to *k* other nodes (see Figure 1 below for the respective diagrams).

It is worth noting that transitive closure can signify several different underlying mechanisms of which one can select potential alters in social network; While the most common explanation for transitive closure is that it reflects a local spread of social relations (e.g., “friends of my friends are my friends”), such a pattern also reflects the closure of structural hole, in that node *i* circumvents brokerage role of other node *k* in reaching out another node *j*. Another, equally plausible possibility is that a positive tendency for transitivity reflects a hierarchical nature of a given network, such that node *i* would seek to create a tie towards a higher status individual *j* given the exiting relations with intermediate-status individual *k*. This expectation is especially true when the network exhibits negative tendency towards cyclic closure (e.g., *j* is less likely to form a tie to low status individual *i* despite the positive tendency of *i* to form a tie *j*). Since positive tendency of cyclic closure is interpreted as the indication of generalized exchange, the lack of such exchange, coupled with positive triadic closure, signals local status hierarchy in a given network.

It is important to nothing that, within the context of “message selection” dynamics in an online political discussion forum, one usually cannot perceive actual message selection relations that others possess. To simply put, the information of whether or not *k* has chosen to view *j*’s messages is not available to *i* when *i* choose to view *j*’s messages (unless such information is explicitly visible via some functionalities in the system). Therefore, it is somewhat less likely that transitivity would reflect local spreads of social relationship, which requires actors to be aware of others’ social relationship in choosing others to interact. Within the context of predicting micro-level configurations within a triad (i.e., predicting a *i → j* message selection given *i → k → j* selection patterns), it is therefore more plausible to assume that such transitivity patterns naturally arise from the hierarchical nature of underlying criteria in which people choose each other’s messages.

It is now well documented that people’s political expertise level is not evenly distributed among public (Converse, 1990; Delli Carpini & Keeter, 1996; Downs, 1957; Huckfeldt, 2001; Verba, Schlozman, & Brady, 1995), and people routinely rely on and seek guidance from those who are more politically attentive and knowledgeable (Huckfeldt, 2001; McClurg, 2006). Therefore, one possible source of such hierarchical organization of network structure is an individual’s need for having political experts around and choose to view messages of those local experts. Assuming the underlying tie-generative process is indeed driven by such substantive interests, it is conceivable that the uneven level of political expertise within a triad would be manifested via a hierarchically organized message selection dynamic (e.g., *i* seek recommendations from *k*, and *k* seek recommendations from *j*, therefore *i* also seek recommendations from *j*; yet *j* does not seek recommendations from *i*). Based on this expectation, we predict:

**H5a**: There would be more than expected by chance likelihood of transitive closure in message selection pattern among set of three actors (*positive transitive closure hypothesis*).

**H5b**: There would be less than expected by chance likelihood of cyclic closure in message selection pattern among set of three actors (*negative cyclic closure hypothesis*)

*Structural equivalence and profile similarity.* Another important local configuration that help us understand the nature of message selection dynamics in online forums is the concept of structural equivalence and profile similarity. In addition to the hierarchical nature of underlying criteria in which people choose each other’s messages, they choose to interact with each other because they both connected to the same way to other actors in the network. That is, similar to the notion of structural equivalence, they maintain similar pattern of connections to all other actors in the network, such that they choose to view messages from the many same alters (“activity closure”), or they are chosen by same many alters (“popularity closure”: see Figure 1 below for the respective diagram), which signals the common properties of a given dyads. This may be viewed as structural bases of homophily, whereby the formation or maintenance of ties between a given dyads are driven by similarity in choices they make with respect to other actors in the system (DiMaggio, 1986). Therefore, we expect following:

**H6a**: There would be more than expected by chance likelihood of activity closure in message selection pattern among set of three actors (*positive activity closure hypothesis*).

**H6b**: There would be more than expected by chance likelihood of popularity closure in message selection pattern among set of three actors (*positive popularity* *closure hypothesis*)

*Preferential attachment.* Several studies indicate that a structure of large, online social network tends to follow power-law distribution. While the existence of skewed degree distribution is rather common in any kind of human-induced social network (Barabási & Albert, 1999; Snijders, 2011), it appears that such tendencies are more pronounced in online context. For instance, Fisher, Smith, and Welser (2006) found highly imbalanced distribution of message posting and attraction in Usenet newsgroup discussions. Likewise, Himelboim’s (2011) analysis suggests a sharp inequality in ability to draw attention and elicit further engagement with a given message from a large number of users in online discussion groups. This is at least partly explained by the principle of “preferential attachment,” the idea that well-connected nodes or actors draw more connections by virtue of their already exiting connections, such that new nodes prefer making an association to already well-connected nodes that already have large connections in the network. Within an online discussion forum, one often employs certain heuristic cues such as the number of “views” and “likes” in selecting which messages to click, which signals utility based on popularity of a message. Therefore, a message that has large number of engagement cues (such as views) usually draw disproportionate reactions by its self-reinforcing dynamics, leading to highly imbalanced distribution of message selections among members. Therefore, we expect:

**H7**: A message is more likely to be selected by other participants (“alters”) in an online discussion forum when they are *already* selected by a large number of alters.

Temporal dynamics in message selection criteria

Therefore, it is possible that the effect of various forms of homophily (i.e., candidate preference, policy preference, and evaluative criteria) can increase over time until the election day rather than being constant over the course of campaign. Therefore, we ask:

H8: The effect of

*Figure 1*. Comparison of different triadic configurations.

**Panel A: transitive closure and cyclic closure.**



*Note*: Positive transitivity closure and negative cyclic closure means node i is more likely than chance to send a tie to j, but j are less like than chance to send a tie back to i, suggesting network has a hierarchical structure.

**Panel B: Activity closure and popularity closure.**



*Note*: Positive shared activity closure and shared popularity closure means that node i and node j are selecting and being selected by many common actors, suggesting that they are in common in terms of certain nodal characteristics. This signifies structural bases of homophily in their characteristics.

1. In many of online political discussion forums, reciprocity does not necessarily imply that a dyad involved in reciprocal relationship exchange and transmit equal amount of information. Rather, the emphasis should be placed at the fact that they simply direct and return their attentions to each other. [↑](#footnote-ref-1)