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# DO YOU FIND HEALTH ADVICE ON MICROBLOGGING PLATFORMS CREDIBLE? ROLE OF SELF-EFFICACY AND HEALTH THREAT IN CREDIBILITY ASSESSMENT

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# DO YOU FIND HEALTH ADVICE ON MICROBLOGGING PLATFORMS CREDIBLE? ROLE OF SELF-EFFICACY AND HEALTH THREAT IN CREDIBILITY ASSESSMENT

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## Abstract

*Despite the increasing prevalence, microblogging users are likely to face great challenges in assessing the credibility of health information due to the user-generated nature of content and length restriction on each microblog post. In this study we aim to explore how microblog users assess the credibility of health advice in terms of microblog posts. By incorporating the Elaboration Likelihood Model and Protection Motivation Theory, we theorize that users' self-efficacy expectation of health actions recommended in a microblog post and their perception of health threat induced by the post can influence their elaboration processes of credibility assessment. As a study in progress, specific design of a controlled laboratory experiment to test the proposed hypotheses is included. Upon completion, this study can potentially provide important theoretical implications in the areas of online health information, microblogging and credibility literature.*

**Keywords:** *Credibility assessment, Self-efficacy, Health threat, Health promote.*

# 1 INTRODUCTION

The increasing popularity of the Internet is challenging the role of traditional mass media as information sources. In health care, people traditionally rely upon various forms of mass media, such as magazines, newspapers, television, radio, for health information (Brodie et al. 1999), whereas in recent years, the Internet has rapidly emerged to subsume much of this function (Cotten and Gupta 2004). Although an abundant amount of health information has now been available to general consumers online (Hesse et al. 2005), seekers for online health information could frequently be exposed to incomplete, spurious or fraudulent information (Berland et al. 2001; Crocco et al. 2002). This raises the issue of information credibility, a problem that is exacerbated by the fact that most Internet users lack the necessary medical expertise to judge the actual quality of the health information (Baker et al. 2003; PSRA 2002; UCLA 2003).

The concern of the reliability and the quality of online user generated health information has been a subject of interest for many scholars and practitioners in recent years (Metzger 2007; Seidman 2006; Suggs 2006). Despite the increased interest on research of this aspect of online health information, a great attention has to be made on the functional differences between the platforms also. Among various platforms, microblogging has recently become popular because of the easy and convenient features it provides in information exchange. It can be considered as an online blogging platform that allows users to read, post (i.e., tweet) and forward (i.e. retweet) short but important messages. Therefore, this technology is becoming a prominent and a favorite source for people to acquire and share information (Chamberlain 2009; Java et al. 2007; Siegler 2011; Zhao and Rosson 2009). Despite the increasing prevalence, microblogging users are likely to face great challenges in assessing the credibility of health information which encompasses health information quality as well as the provider's trustworthiness and expertise (Freeman and Spyridakis 2004).

First, due to the user-generated nature of most the content published in these applications (Metzger et al. 2010), users are likely to expose to content generated by unreliable providers. Different from traditional health web portals, health messages posted in microblogging platforms often lack professional gatekeepers (e.g. editors) to evaluate the reliability of the information. Second, the short length of the information posted in Twitter-like microblogging websites, imposes a great challenge on the assessment of information credibility (Jiang et al. 2012). In contrast to the other blogging platforms, restrictions on the length may encourage users to post short and incomplete statements without necessary supporting arguments such as references, evidence or analyses (Chamberlain 2009). Therefore, in such an environment, it is important to look at the factors that allows or inhibit users in correctly assessing the online health information.

With above challenges and the need for more in-depth understanding toward this specific context, in this study we aim to explore how microblog users assess the credibility of health advice in terms of microblog posts. In addition to examining the main effect of some microblogging features on users' credibility judgment of a microblog post that gives health advice, we identify two personal beliefs that may influence users' way of credibility assessment, including one's self-efficacy specific to the health actions recommended in the microblog post, as well as one's perceived health threat triggered by the microblog post.

## 2 THEORETICAL BACKGROUND

### 2.1 Elaboration Likelihood Model (ELM)

Elaboration Likelihood Model posits that there are two possible routes of social persuasion: centrally routed persuasion and peripherally routed persuasion (Petty and Cacioppo 1986). Centrally routed messages include a wealth of information, rational arguments, and evidence to support the information receiver to process the information (Dainton and Zelle 2010). Peripheral messages rely on information receiver's emotional involvement and persuade through more superficial means and do not involve elaboration of the message through extensive cognitive processing of the argument

presented. Although, these two routes of persuasion are clearly distinct from each other, the central route generally requires a greater amount of cognitive effort and results in more stable attitudinal changes that can be result in more accurately predicted long-term behaviors (Petty and Cacioppo 1981; Petty and Cacioppo 1986).

By taking individuals' motivation and cognitive ability into account, ELM theorizes that people will process and scrutinize messages they receive in more or less depth depending on their motivation and ability to do so. When people are motivated due to personal or situational factors, they are likely to pay more attention to a message, and exert more cognitive resources to process and evaluate the information and its source. On the other hand, when motivation and cognitive ability of recipients are low, information will be processed or evaluated based on more superficial and less thoughtful criteria, i.e. relying on some heuristic cues.

Prior research (Fogg et al. 2003; Rieh and Danielson 2007) demonstrated that credibility assessment of online information should not be conceptualized as a single evaluative process. Instead, depending on the purpose and intention, the processes used to evaluate the credibility of online information may vary with different users and situations (Fritch and Cromwell 2002). Therefore, Elaboration Likelihood Model, as one of well-known dual processing models involving information assessment, can be an appropriate theoretical basis for credibility assessment (Metzger 2007).

However, as Metzger (2007) pointed out in his recent study for online credibility research, "perhaps the most pressing item on the agenda for online credibility research is the need to study the role of user motivation in the credibility-assessment process" (page. 2087). Although ELM emphasizes the importance of motivation in guiding information assessment and decision making, it actually embraces a "process-oriented" approach, rather than a "variable-oriented" approach to persuasion (Dillard and Pfau. 2002). Therefore, to identify specific factors that could potentially motivate microblogging users to evaluate the credibility of health advice they encounter on the platforms, we turn to Protection Motivation Theory for more investigation.

## **2.2 Protection Motivation Theory**

Prior research based on ELM has identified the role of personal involvement as a mediator of elaboration likelihood and thus as a determining factor in the route to persuasion (Bitner and Obermiller, 1985). However, besides personal involvement, there are other factors that may affect motivation and the ability to process information (Bitner and Obermiller 1985). Thus, "there are a variety of determinants of the route to persuasion" (Petty et al. 1983 page. 22). We propose that in a health communication context, people's motivation to evaluate health advice may be influenced by their appraisal of the specific health advice, which can be accounted by Protection Motivation Theory (PMT) (Rogers 1975). This theory was originally developed within the framework of fear-arousing communication and has become the predominant theoretical frameworks in the field of fear appeal research (Ruiter et al. 2001). PMT describes an individual's motivation to protect them a self is triggered from two processes: threat appraisal process and coping appraisal process.

### *2.2.1 Health Threat Perception*

The threat appraisal process evaluates the severity of the situation and the seriousness of the threat associated. In the case of healthcare for example, evaluation of the perceived chance of contracting a disease (i.e. perceived susceptibility), and perceived seriousness of the disease if contracted (i.e. perceived severity), can be identified as two processes of threat appraisal.

Health messages highlighting threats to well-being with recommendations to take protective actions are frequently used in public health campaigns (Ruiter et al. 2001). Several studies have investigated how individuals' process threat-relevant information soon after they are exposed to the information (e.g. Baron et al. 1994; Gleicher and Petty 1992). In general, these studies share the hypothesis, 'threat perception and fear arousal will heighten the relevance of threat-relevant information and lead to systematic processing of threat-relevant persuasive information'. Specifically, people under high threat conditions are highly vulnerable to persuasion if the information presented is strongly argued

(Baron et al. 1994). However, people under less threatening conditions are less likely to persuade even if the information presented is strongly argued and logical. This finding strongly supports the hypothesis that perceived threat can promote one's systematic processing of threat relevant persuasive information.

### 2.2.2 *Action-specific Self-efficacy*

The coping appraisal is how an individual response to a situation and it evaluates relevant components of the coping responses. In the case of health advice, these components are individual's belief that following recommended actions can effectively reduce the threat (i.e. response efficacy), and the belief in one's ability to perform the recommended actions successfully (i.e. self-efficacy).

The role of response efficacy was incorporated into health communication by PMT (Rogers 1975; Rogers 1983b), however, for the majority of microblog users, the assumption that they are aware of the effectiveness of the recommended actions when they are exposed to the health message cannot be held. Average users normally lack necessary medical expertise or knowledge to assess the quality of the health information, and it is uncertain for them whether following the recommendations will lead to the desired outcome. Therefore, in this study, when investigating individual process of coping appraisal, we selectively focus on the aspect of self-efficacy, which is more appropriate in the context of credibility assessment of health advice.

According to Bandura (1977), behavior change is a function of (1) expectations about the outcomes that the behavior will lead to (i.e. outcome expectation); and (2) expectations about one's capability to follow the behavior (i.e. self-efficacy expectation). Both outcome and efficacy expectations reflect a person's beliefs about capabilities and behavior-outcome links. It should be emphasized that self-efficacy refers to beliefs about capabilities of performing specific behaviors in particular situations; it does not necessarily reflect a personality characteristic that is independent of contextual factors (Strecher et al. 1986). Therefore, it is more appropriate to characterize an individual's self-efficacy not only with reference to the particular behavior, but also with reference to the associated contextual factors. Towards this end, context includes health advices ones' receive from microblogs and associated circumstances related to healthcare. We use the term "action-specific self-efficacy" to refer to one's beliefs about how capable he/she is of performing the actions recommended in health advice that leads to averting certain health risks.

## 3 MODEL DEVELOPMENT

Figure 1 depicts the research model. The central thesis is that when confronted with persuasive health advice that recommends microblog users to take certain actions to avert health risks, recipients' coping appraisal (i.e. perceived self-efficacy) and threat appraisal (i.e. perceived threat) of the message will influence their motivation to evaluate the quality of health advice. Therefore, in our model we propose interaction effects between the processes of PMT and ELM. Specifically, we hypothesize the influence of two microblog features and two appraisal processes on the credibility assessment of the health advice users' receive. The influence of different platform features on microblog content's quality assessment has been studied in past literature (e.g. Jiang et al. 2012). However, these studies ignore the effect of individual (i.e. health consumer) differences in assessing the content. Therefore, the main focus of our current research is to theorize the aspects of health information users, grounding on protection motivation theory (PMT).

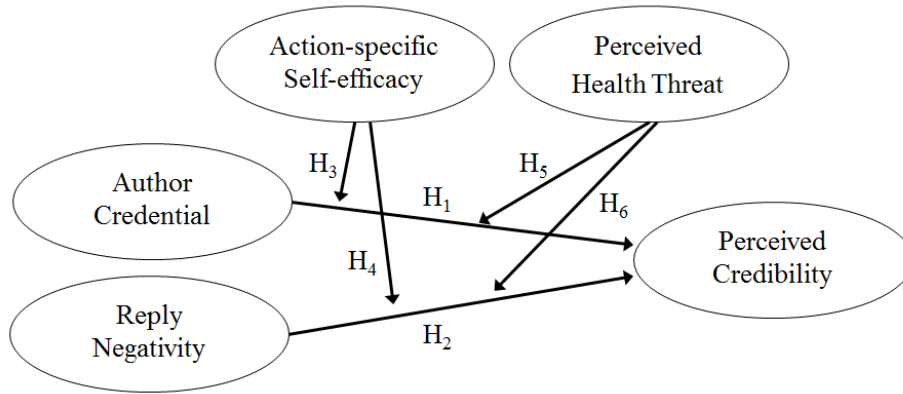


Figure 1. Research Model

### 3.1 Author Credential

Account verification service of Twitter like microblogging platforms provide mechanisms to authenticate account holders. Once an account is authenticated, a badge of verification will appear in the member profile along with the username. Moreover, this verification badge will be appeared along with every comment and post of the account holder. Therefore, any user who views a microblog post can easily recognizes the type of the account holder (verified or regular) who had generated the particular content. As a result, the availability of a verification badge would influence one's assessment of the credibility of the posting (Jiang et al. 2012). The availability of author credentials has been studied as an important antecedent the credibility assessment of online information (Walther and Burkell 2002). Therefore, author verification badges could serve as cognitive heuristics that would minimize the need to have a close inspection on the information content presented (Metzger et al. 2010). Similarly, the availability of an author bio (author description) would influence the users in the same manner. For example, in the context of our study, health advices generated by a user whose author credentials are presented, has the ability to influence a reader regardless of the reliability of the information content. Moreover, it greatly alleviates users' uncertainty about the authenticity and the authority of authors, functioning similarly to certifications from trusted third parties in traditional health websites (Jiang et al. 2012). Therefore, we hypothesize that:

**H<sub>1</sub>:** *Microblogging messages generated by an account holder with author credentials would lead to higher perceived credibility than those generated by a regular account holder.*

### 3.2 Reply Negativity

In microblogging platforms users are able to re-post messages (i.e. retweet) and provide comments as replies to postings. For example, Twitter provides the option for its users to comment on microblogging messages and the option to re-tweet messages as well. Threads of messages, replies and re-tweets can be easily accessed simply through a click. Replies and retweets to a certain microblog message could provide an informal mechanism to verify the information provided in the message. The more users participate in a microblogging platform the more value they create. This notion is consistent with the phenomenon of positive network effect (Surowiecki and Silverman 2007). Online user generated content in the form of reviews, especially in marketing research, has become favorable sources of information for consumers to make purchasing decisions (e.g. Chevalier and Mayzlin 2003; Dellarocas et al. 2004). Similarly, in microblog communities user replies and re-tweets could act as a form of review. Positive feedback to the message could add credibility to the information while negative feedback could hint unreliability of the information. Prior research has shown that the presence of negative reviews on a product or a service can negatively influence users purchase decisions. They are more likely to elicit conformity with the negative opinions (Lee et al. 2008). Therefore, we propose that more negative replies could induce more negative perceptions towards the credibility of the microblog post. Thus we hypothesize:

**H<sub>2</sub>:** *Microblogging messages with negative replies would lead to lower perceived credibility than those without replies.*

### **3.3 Action-specific Self-efficacy & Perceived Health Threat**

It is argued that majority of online health consumers lack necessary skills and knowledge needed to evaluate the online health information (Baker et al. 2003). This issue has been further exacerbated in microblogging platforms, due to the restriction on the message length. As a result users are not able to immediately judge the actual quality of the whole message, and importantly, whether the actions recommended is as effective as it asserts in averting the health risks by simply examine the content. However, in such a situation individuals go through the coping appraisal process as identified in PMT, in which one can simply expect to what extent he/she is capable of performing the actions (Rogers 1975) recommended in the health advice. According to ELM, motivation (Petty and Cacioppo, 1979) and the ability (Petty et al. 1976) can alter message recipients' elaboration likelihood and decide the route to persuasion - central vs peripheral. Self-efficacy expectations lay a basis of motivating people to perform a certain task (Bandura, 1997). Towards this end, self-efficacy would motivate an individual to put some effort to assess the credibility of the health advice received from the microblog.

We define the "action-specific self-efficacy" as one's beliefs about how capable he/she is of performing the actions recommended in health advice that leads to avert certain health risks. Motivation and action-specific self-efficacy expectations lay the basis to perform a certain action. Specifically, online health information receivers would get the initial incentive to follow the health advice, if the recommended actions are relatively easy and feasible to perform. As a consequence, they will develop a stronger need to ensure the actual quality of the advice. Therefore, they are more likely to spend more cognitive efforts to analyze the content (e.g. incorporating their own knowledge or experience, searching for more information on the issue, etc.). On the other hand, if the recommended actions are relatively heavy and complicated to execute, self-efficacy beliefs may prevent health information recipients from paying an effort to evaluate the content. As a result, they might look for other quick and available means to evaluate the health advice, such as utilizing cues like author credential through peripheral routes to justify the credibility of the information. In this sense, when the author is found to have an authenticated profile or displayed credentials as a bio (i.e. self-description), taking the peripheral route, information receivers would find the health advice more convincing and reliable. Thus we hypothesize:

**H<sub>3</sub>:** *The superiority of author credential over no author credential in terms of perceived credibility will be less prominent when the recipient's action-specific self-efficacy is high*

We further conjecture, one's self-efficacy expectation towards the recommended actions and perception of the health threat can be triggered by the type and the content of health advice itself. Considering the fact that most of microblogging users lack the necessary medical expertise to assess health information, the replies that contain opinions and comments from other microblogging users may not help much for one to better understand and further evaluate a health advice recommended in the microblogging platform. From the perspective of healthcare experts, given the length limit for the replies, they won't be able to elaborate their opinion in-depth within a single microblog. Therefore, from the perspective of average users, it is still difficult for them to judge the actual quality of the microblog postings per se by their own even if the content is generated by an expert. Instead, microblogging users might take a hint from others' replies to judge whether the information is credible or not, i.e. through peripheral routes to justify the credibility of the health advice. According to ELM, when individuals possess required motivation and self-efficacy, they are likely to put extra effort to read through the replies and evaluate them before come into conclusions. Thus we hypothesize:

**H<sub>4</sub>:** *The superiority of absence of replies over the presence of negative replies in terms of perceived credibility will be less prominent when the recipient's action-specific self-efficacy is high.*

According to PMT, in parallel with the process of coping appraisal, a threat appraisal process exists (Rogers 1983a). The severity and susceptibility information depicted as the health risks in the health advice can shape one's threat perception and prompt one's fear arousal. Specifically, when

information recipients perceive that the disease described in the health advice is severe and is vulnerable to contract the disease, they are more likely to undertake the cognitive effort to thoughtfully examine the message (Cacioppo et al. 1986; Petty and Cacioppo 1981). In addition, instead of appraising information about the effectiveness and feasibility of the recommended actions, as assumed by PMT, fearful participants are more likely to engage in searching for reassurance. As demonstrated by the study of Gleicher and Petty (1992), fearful people may have a strong need for reassurance, which may motivate them to systematically process persuasive communications. Therefore, threat perception and fear arousal will heighten the relevance of threat-relevant information (i.e. health advice) and will be more likely to result in systematic processing of health advice for credibility assessment. Moreover, recipients who engage in high elaboration will be less likely to be influenced by peripheral cues such as author credential (Petty and Cacioppo 1981; Stamm and Dube 1994). Thus we hypothesize:

**H<sub>5</sub>:** *The superiority of author credential over no author credential in terms of perceived credibility will be less prominent when the recipient's perceived health threat is high.*

If the perceived threat is higher and when fear appeals control the perceptions, individuals may tend to make safer decisions (Goonawardene et al. 2013). Therefore, high threat perceptions towards health may induce users to engage in more systematic processing of health advice and users who engage in high elaboration will be less likely to be influenced by peripheral cues. Higher perceptions of threat indicate that users (i.e. information recipients) experience a higher risk for their lives (David et al. 2006) thus resulting in seeking for more information. Therefore, perceptions of credibility towards a certain microblog post with negative replies will further alleviate when individuals' perceived health threat is higher. Thus we hypothesize:

**H<sub>6</sub>:** *The superiority of absence of replies over the presence of negative replies in terms of perceived credibility will be less prominent when the recipient's perceived health threat is high.*

## 4 PROPOSED METHODOLOGY

The proposed hypotheses will be tested through a controlled laboratory experiment using a popular microblogging platform. A between-subjects factorial design of 3 x 2 x 2 x 2, will be used in the experiment (i.e. 3 levels of author credentials x 2 levels of self-efficacy x 2 levels of health threat x 2 forms of microblog replies). Subjects will be randomly assigned to one of the treatment groups and briefed prior to the experiment. At the end of the experiment subjects will be surveyed to assess the perceptions towards microblog posts' credibility. Items will be adapted from widely accepted scales for credibility assessment (West 1994).

The author credentials will be manipulated at three levels. Three microblog accounts will be created for the purpose of the experiment. Accounts differ in the superiority of author credentials. (1) Regular account: neither with a verified badge nor profile description (2) Verified account: presence of verified badge but without profile description, (3) Superior account: presence of verified badge and medical profile. The user responsiveness will be manipulated at two levels (1) messages with no comments, (2) messages with negative replies.

Prior literature suggests the possibility of manipulating Protection Motivation Processes (coping appraisal and threat appraisal) under controlled experimental conditions (see Milne et al. 2000 for a review). Different versions of healthcare messages will be created in-order to manipulate perceptions of action-specific self-efficacy and health threat. Self-efficacy will be manipulated in two levels: high and low. (1) Messages manipulating high self-efficacy perceptions will be comprised of health advice and specific instructions of how to perform a certain task (e.g. "Get vaccinated to prevent the infection of 'abc' virus, newly developed 'xyz' vaccine is available at almost every clinic"). (2) Messages manipulating low self-efficacy perceptions give no specific instructions of how to perform the recommended task (e.g. "Get vaccinated to prevent the infection of 'abc' virus").



Similarly, two levels of health threat perceptions (high and low) will be manipulated through messages carrying different types of threat information. (1) Messages manipulating high threat perceptions, will consist of information about susceptibility and negative consequences (e.g., “from the age of 15, people are at risk for acquiring ‘abc’ virus, ‘abc’ can make its infectors feel wobbly and rough and is a deadly disease, so get vaccinated by the newly developed xyz vaccine, to prevent the infection of the virus”). (2) Messages manipulating low health threat perceptions, will consist of information related to risks but with reassuring information (e.g., “Get vaccinated by the newly developed ‘xyz’ vaccine, to prevent the infection of ‘abc’ virus; the possibility for adults to acquire ‘abc’ virus is actually quite low and it can be cured”).

## 5 POTENTIAL IMPLICATIONS

This study can potentially provide important theoretical implications in the areas of online health information, microblogging and credibility literature. By incorporating the ELM and PMT, we manage to unveil how individuals assess the credibility of health advice in terms of microblog posts, i.e. theorizing that one’s self-efficacy expectation of recommended actions and health threat perception induced by a health-advice post can influence recipients’ elaboration processes of credibility assessment. Specifically, description of specific health actions and threatening information in a microblog post may affect one’s belief in his/her ability in performing the actions recommended and also shape his/her perception of threat from certain health risks. For recommended actions that are believed to be within individuals’ personal control and capability, they may reasonably have more incentives to judge the credibility by incorporating their own experience and more information from various sources through “central route”. While for those actions that seem partially out of their personal control and capability, they might lack sufficient motives and take short-cut means, e.g. through peripheral routes, to judge the quality rather than process and evaluate the advice with deep thinking and much cognitive effort.

Our study also offers important implications for practitioners. In particular, for health professionals/institutions who want to disseminate health advice on microblogging platforms, it is important to carefully craft the content and wording of the health advice. Considering the fact that attitude changes through central route are more stable and predictive of behavior, and more resistant to counter-argumentation (see Chaiken and Trope 1999 for a review), it may be more applicable to disseminate health advice which recommends easy and feasible protective actions, or gives step-by-step instructions for the actions, as well as arouse fear by presenting a threat with more details, i.e. how vulnerable the target recipients are and what the possible negative consequence is. Besides, it is also important to utilize the available system features to enhance the credibility of the microblogs. For instance, they should obtain the verification from the microblogging platform and carefully indicate the bio information, especially when they want to disseminate health related information with seemingly less feasible actions recommended and absence of an explicit health threat.

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