



## How do users cope with trial restrictions? A field experiment on free trial software



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### ABSTRACT

Software vendors often provide free downloads of free trial versions of software but normally with some restrictions attached (e.g., time and/or functionality restrictions). The question arises as to what extent the restrictions could influence a user's propensity to procure the full version. This study seeks to answer this question through two important theoretical backbones: expectation-disconfirmation and coping. Based on these two theories, we built a research model of a user's coping reactions toward software trial restrictions. A field experiment was conducted to verify the hypotheses. Results show that negative disconfirmation on time/functionality restriction positively influenced the adoption of rational thinking strategy, which in turn positively influenced the level of action coping. As a result, the degree to which rational thinking and action coping strategy were exploited positively influenced a user's willingness to pay for the full-version software. Theoretical and practical implications of the findings are discussed.

### 1. Introduction

The concerns of intense competitions among commercial software rivals and growing threats of reduced profit due to the proliferation of non-commercial software (i.e., open source software (OSS)<sup>1</sup> or free-ware<sup>2</sup>) always haunt software firms. In order to draw the attention of potential buyers, software firms advertise their products through offering free versions of their software (Cheng & Liu, 2012; Wang, Oh, Wang, & Yuan, 2013), i.e., free trial software (or FTS in short). Since software is an experience product that requires personal evaluation for its quality to be gauged (Kempf & Smith, 1998), FTS can greatly help reduce the uncertainty and the risk related to product acquisition such as buying the software without assessing its quality and performance (Rogers, 1995). A tangible return will be increased sales of the full-version software (Cheng & Tang, 2010; Jiang, 2010; Wang & Zhang, 2009). While benefiting from such a marketing strategy, software firms have to be aware of the cannibalization effect of FTS that it may reduce a user's propensity to purchase the full-version software (Gallaughier & Wang, 2002; Tang, 2003). To encourage users who have

engaged in free trial to commit in subsequent purchase, software firms normally impose trial restrictions, including time restriction and/or functionality restriction, on the FTS (Cheng & Liu, 2012; Dey, Lahiri, & Liu, 2013).

However, the presence of trial restrictions may create stressful trial episode for users (Duhachek & Iacobucci, 2005; Fernbach et al., 2015). To our knowledge, the role of a user's responses toward FTS restrictions and the impacts on post-trial software procurement decision has not been paid much attention. In specific, we have little knowledge about how a user may cope with such a restricted trial situation especially when the expectation towards the restrictions is negatively disconfirmed. Most extant research on FTS focuses on the issues of providing free trial (e.g., Haruvy & Prasad, 1998; Jiang & Sarkar, 2003) or how to design the quality of free trial from the perspective of its economic value for vendors (e.g., Cheng & Liu, 2012; Cheng & Tang, 2010). However, they did not investigate a user's trial behavior patterns, especially the strategies for the negative disconfirmation on the FTS restrictions and their outcomes. In this light, this research seeks to answer two questions: **(1) what will a user do to cope with the**

Abbreviations: FTS, free trial software; OSS, open source software; EDT, expectation-disconfirmation theory; WTA, willingness to pay; PLS, partial least squares; IS, information systems

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<sup>1</sup> OSS, at the most fundamental level, means software for which the source code is open and available (e.g., Linux). No one can claim ownership and by sharing source codes, developers cooperate under a model of rigorous peer-review and joint force collaboration in debugging and enhancing the functionalities (<http://www.opensource.org/>).

<sup>2</sup> Freeware is software often written by enthusiasts and distributed to users at no charge (The Free On-line Dictionary of Computing, Oct 2003), such as those listed in the Freeware Home (<http://www.freewarehome.com/>).

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## situation when the FTS restrictions are worse than expected? (2) How will the coping thoughts or behaviors influence a user's purchase decision making?

To answer these questions, we apply expectation-disconfirmation theory (Oliver, 1980) and coping theory (Lazarus & Folkman, 1984) to identify the possible coping behaviors in dealing with a user's negative disconfirmation on FTS restrictions. A field experiment was conducted among a wide dispersion of demographics to test the research model. We believe this research can help to establish a theoretical foundation of the important mediating coping behaviors in influencing post-trial decision making (i.e., willingness to pay). Furthermore, by grounding on the FTS context, we also extend the understanding of the manifestations of coping and their impacts in actively promoting emotional well-being and resolving stress-inducing problems which has been the most perplexing topic in the coping literature (Somerfield & McCrae, 2000). By better understanding a FTS user's feelings and behavior when facing the restrictive interventions, the software market practitioners can anticipate greater financial achievement through utilizing the benefits of FTS and mitigating the side-effects brought about by the restrictions at the same time.

The rest of the paper is organized as follows: in the next section, we review the theory on expectation-disconfirmation and coping and relate them to the FTS context. The theoretical model of proactive coping toward adverse FTS restrictions is then introduced. The third section presents a field experiment, followed by data analysis and results. Lastly, we conclude the paper with discussion, limitation and future research, and implications from both theoretical and practical perspectives.

## 2. Coping with FTS restrictions

### 2.1. Expectation-disconfirmation on FTS restrictions

Consumers frequently encounter situations that may induce stress and negative emotions (Duhachek, 2005). If a consumer predicts the possibility of undesirable consumption outcomes, she may produce threat-related negative emotions such as worry, anxiety or anger (Duhachek, 2005; Kim, 2014; Yi & Baumgartner, 2004). One common form of stressful consumption environment is related to the violation of expectations (Zeelenberg, Van Dijk, Manstead, & van der Pligt, 2000). When product performance is found to be below one's expectation, a consumer may be disappointed and has to cope with the situation (Liao & Cheng, 2014; Yi & Baumgartner, 2004). The expectation-disconfirmation theory (EDT) (Oliver, 1980) depicts a process model whereby a consumer establishes initial pre-usage expectation (belief) about a product, experiences its usage overtime, and forms post-usage perceptions of the product (Bhattacharjee & Premkumar, 2004). The original performance-specific expectation serves as the reference point, against which the level of observed performance will be compared (Oliver, 1980). When performance does not match expectation, disconfirmation is formed, which can be either positive or negative (Lankton, McKnight, Wright, & Thatcher, 2016). Positive disconfirmation occurs when the observed performance is beyond expectation (Bhattacharjee & Premkumar, 2004). In contrast, observed performance which turns out to be below an individual's original expectation results in negative disconfirmation (Bhattacharjee & Premkumar, 2004; Lankton et al., 2016; Tan, Benbasat, & Cenfetelli, 2016).

Disconfirmation also influences consumption emotions. For example, Westbrook and Oliver (1991) showed that expectation disconfirmation was positively related to the pleasant surprise and interest dimensions of emotions and negatively related to the hostile emotions. Similarly, Oliver et al. (1997) found that positive affect was a function of how surprising the consumption experience was, how much arousal it generated, and how much it exceeded one's expectations. When the chosen option results in an outcome that is worse than expected, negative feelings such as disappointment, anger and regret may arise (Kim, 2014; Yi & Baumgartner, 2004; Zeelenberg et al., 2000).

Moreover, the stressful consumption situation and its resultant negative emotions would affect an individual's post-exposure reaction, such as the adjusted beliefs and continued product usage or non-usage (Yi & La, 2004). The negative emotions (e.g., disappointment) caused by unexpectedness may even drive individuals to withdraw themselves away from the adverse situation (Zeelenberg, Van Dijk, Manstead, & van der Pligt, 1998) and to be reluctant to engage in further interactions (Liao, Palvia, & Chen, 2009; Zeelenberg et al., 2000). From a pessimistic perspective, the negative expectation disconfirmation may be detrimental for software vendors because it can lead to goal abandonment (Frijda, 1994). For example, both positive and negative disconfirmation were found to lead to low behavioral intention to continue using a system (Brown, Venkatesh, & Goyal, 2014; Venkatesh & Goyal 2010). From an optimistic perspective, there are some proactive coping strategies which could be applied by a consumer to effectively deal with the noxious encounter (e.g., Luce et al., 2001).

Reflected in current context, when FTS restrictions on time and/or functionality are perceived to be stronger than expected, the situation is likely to be appraised as stressful (Lazarus & Folkman, 1984). This phenomenon can also be explained by the cognitive appraisal function in the coping theory (Lazarus & Folkman, 1984) which is often adopted to explain a user's adaptational acts toward disruptive events. To achieve the original goal, a user will attempt to analyze and cope with the negative situation. To this extent, the coping process and activities toward unexpected restrictions are suitable for explaining the underlying mechanism of how FTS restrictions induced negative expectation may affect a user's responses and decision-making.

### 2.2. Coping theory

Coping, defined as thoughts and behaviors that people use to manage the internal and external demands of situations that are appraised as stressful (Lazarus & Folkman, 1984), is a psychological process embedded in a network of cognitive, attitudinal and behavioral correlates (Carver & Scheier, 1994). It emphasizes a wide range of cognitive and behavioral responses that ordinary people use to manage distress and address the problem of daily life that may cause distress (Folkman & Moskowitz, 2004) (i.e., in a situation of product consumption). The coping process is likely initiated when an individual appraises that important goals have been harmed, lost or threatened (Folkman & Moskowitz, 2004). Thereby, the adaptation behaviors are acts that the individual performs in order to cope with the perceived negative consequences of the disruptive situations (Beaudry & Pinsonneault, 2005; Stein, Newell, Wagner, & Galliers, 2015).

Before initiating coping activities, an individual firstly conducts primary and secondary appraisal to evaluate the potential consequences of the encounter (Lazarus & Folkman, 1984). The primary appraisal is to assess the nature of a particular event with respect to one's personal relevance and importance. For example, one disruptive encounter may be appraised as either threat that may harm the individual or challenge that can have positive outcomes such as potential for gain or growth (Carpenter, 1992). The secondary appraisal involves the evaluation of available coping options. It mainly addresses the level of control over the situation and available resources to determine how to deal with the situation.

Based on the appraisal results, an individual devotes coping effort by performing different actions to deal with the situation at hand (Beaudry & Pinsonneault, 2005). Coping efforts can be classified as problem-focused coping which is the strategy oriented toward handling the specific aspects of the situation and emotion-focused coping which relies on changing one's perception of the situation (Beaudry & Pinsonneault, 2005; Duhachek, Agrawal, & Han, 2012). The entire coping process can occur from the period when the individual forms the expectation, followed by the period in which stressful situation happens or has taken place (Folkman, 1992).

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