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REFLECTING ATTITUDE IN IT ADOPTION RESEARCH – THEORETICAL CONSIDERATIONS AND SCIENTOMETRIC EVALUATIONS

Research in Progress Paper

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Abstract

Users' attitudes depict one of the main determinants, why individuals use information systems. However, in the basic theoretical understanding of social psychology research attitude could be shaped in two different ways; attitude formation and attitude change. Within this paper, both attitude research streams are theoretically reflected as well as observed in IT adoption literature using data of a scientometric analysis of the following 14 top journals of the IS field according to several journal rankings. The results represent a domination of attitude formation and show that 90% of the articles applied this form. Additionally, it could be revealed that the Theories of Reasoned Action and Planned Behavior are the most applied underlyings for attitude formation. Furthermore, two interesting aspects could be outlined. Concerning attitude change, besides being by definition a construct to describe dynamic structures with a process-based measurement, 44% of the articles found used underlying theories for static structures with a moment-based measurement.

Keywords: Attitude formation, Attitude change, Scientometrics

INTRODUCTION

Observations on the use and acceptance of information technology (IT) represent one of the major streams in information systems (IS) research. Since Davis et al. (1989) introduced the Technology Acceptance Model (TAM), several information technology acceptance models have been proposed, tested, refined and unified throughout IS literature (Venkatesh et al., 2003). The use and acceptance of IT are social behaviors where user attitudes towards IT, based on the Theory of Reasoned Action (Fishbein and Ajzen, 1975), and the Theory of Planned Behavior (Ajzen, 1991) from social psychology research, represent an important antecedent for the endogenous variables. Concerning the importance of attitudes, Allport stated back in 1935 that *"the concept of attitude is probably the most distinctive and indispensable concept in contemporary American social psychology" (Allport 1935, p. 198).*

Although attitudes have been identified as a core concept and major focus of theory and research in social psychology (Eagly and Chaiken, 1993), in IS research however, the relationship between user attitudes and behavioral intentions, was found to be insignificant and therefore excluded from later versions of the TAM (Venkatesh and Davis, 2000, Venkatesh, 2000) and further important IT adoption models and theories (Venkatesh et al., 2003). These inconsistent results in the study and measurement of attitudes indicate that there are conceptual and operational misconceptions of attitudes in IS literature. This actual situation should be a starting point for further investigation (Zhang et al., 2008).

As a first step, this research approach aims at providing an overview on the status quo of research on attitude in IS literature since Davis et al. introduced the TAM in 1989. We reviewed fourteen top journals of the IS field according to major journal rankings using a scientometric approach (Lowry et al., 2004) in order to study the appearance and measurement as well as the baseline theories of the attitude construct. Furthermore, we provide a framework of the attitude research streams in social psychology to answer the question of how the existing attitude research in the chosen journals could be classified and clustered.

The paper is structured as follows: At first we take a closer look at the origin of attitude research, the structure and definition of attitude, its classification and research streams in social psychology. In particular, we go into detail concerning the distinction of attitude formation and attitude change research and their subordinated theories. The following sections four and five deal with the applied methodology and the analysis of the scientometric data. We then summarize the findings addressing raised issues, and give an outlook on related and forthcoming research.

ATTITUDE FORMATION AND ATTITUDE CHANGE

Within social psychology, research on attitudes follows two distinct streams, broadly classified as "Attitudes" or "Attitude Formation" and "Attitude Change". This distinction is manifested throughout attitude and social psychology literature (e.g. Eagly and Chaiken, 1993; Ajzen, 2001; Crano and Prislin, 2006; Bohner and Dickel, 2011) and has been classified by journals like the Annual Review of Psychology (Ajzen, 2001). The two research streams were not distinguished from the beginning of attitude research. They rather represented different peaks or focal points in attitude research. While in the 1920s and 1930s the fundamental concern of research was on attitudes' nature and structure, research in the 1950s and 1960s dealt with issues that affected attitude change (Prislin and Crano, 2006). Later research peaks went in the directions content and functions of attitude and the central issue of persuasion. Fundamental discussions among researchers led to a generally accepted division in two separate research streams within attitude research (Bohner and Dickel, 2011).

The differences between the streams can be summarized as follows: While attitude formation research considers the temporary state of attitude, attitude change focuses on the transformation of attitudes over time and under certain conditions (persuasive influences) (Albarracin et al., 2005). It is thus not a distinction of totally different subjects, but other perspectives on the same subject. Theoretical and conceptual intersections within the research streams are therefore inevitable and also beneficial to each other (see Figure 2).

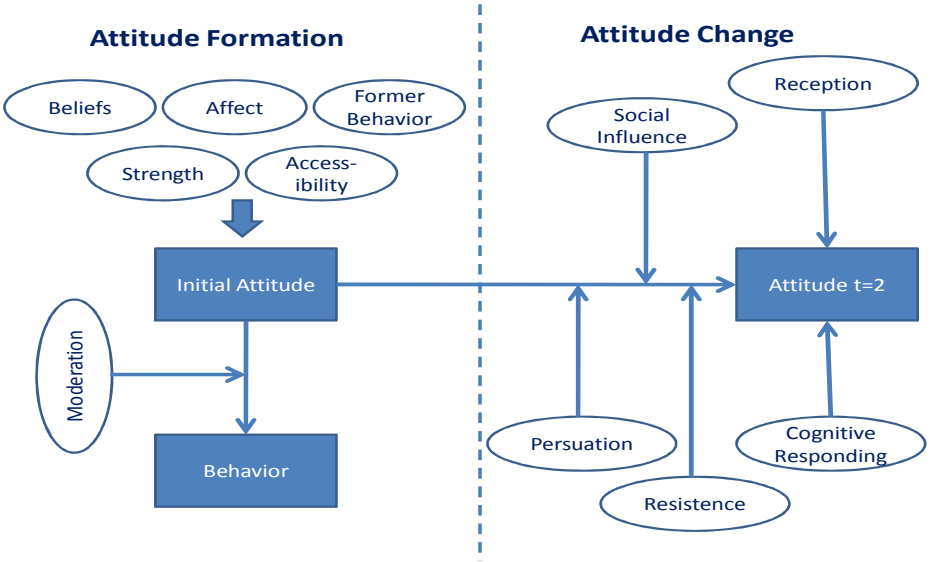

Figure 1 Attitude Formation and Attitude Change

As we stated in this section, the focus of attitude formation is formation, while the focus of attitude change is transformation. Furthermore the measurement techniques within attitude formation research are moment based, using mostly Likert, Thurstone or semantic differential measurement techniques (Eagly and Chaiken, 1993), while attitude change measurement is process-based. More differences are within structure, regarded influences and relations.

Attitude research streams in IT adoption literature

In IT adoption research since the appearance of TAM (Davis et al., 1989) over two decades ago, the attitude formation research stream and its subordinated theories were predominantly applied to IT use and acceptance contexts. The goal was to understand usage behavior as an independent variable (Venkatesh et al., 2003). The Theories of Reasoned Action (Fishbein and Ajzen, 1975) and Planned Behavior (Ajzen and Fishbein, 1980) were widely and continuously used by IS researchers as underlying for their research models (e.g. Davis et al., 1989; Taylor and Todd, 1995; Venkatesh et al., 2003; Wixom and Todd, 2005). With reference to attitude, the major interest was to examine the relationship between a user's attitude towards a system and his behavioral intention to use the system as to impact, moderation and origin. Both theories as well as the Theory of Interpersonal Behavior (Triandis, 1977) served and serve this purpose well, since they imply a discretionarily detailed measurement of salient beliefs and their user-specific weights and are relatively easy to apply to any IT adoption context. Fazio's MODE Model (Fazio, 1986; Fazio, 1990) theoretically expands the view on the attitude-behavior relationship by adding factors like attitude strength and attitude accessibility as moderators (Ajzen and Cote, 2008). Although, the transfer of the MODE model to IT adoption research might provide promising results and very detailed information about the underlying attitudinal factors that influence behavior and consequently information about lacking usage of IT, according to the results of our scientometric analysis it has not been applied so far. One reason might be that it is less standardized and accustomed for IT adoption purposes compared to TRA or TPB (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980).

In the early 2000s a shift of interest regarding attitude-related theories within IS research from attitude formation theories towards attitude change theories can be observed, whereby the Elaboration Likelihood model (ELM) played a major role (e.g. Angst and Agarwal, 2009). The ELM (Petty and

Cacioppo, 1986) is one of two dual process models of attitude change, which argues that persuasion can operate via a central or peripheral route and that personal attributes determine the relative effectiveness of these processes (Angst and Agarwal, 2009). Thus, when a message is presented to individuals in different contexts (informative or persuasive), the recipients will vary in how much cognitive energy they devote to the message (Petty and Cacioppo, 1986). Furthermore, the ELM posits that subjects can be classified according to their ability to respond to persuasive messages, which can be specifically beneficial to IT adoption research.

To come back to the question why IT adoption researchers could benefit from better knowledge about different attitude research streams and theories, we state that since the introduction of the TAM in 1989, some attitudinal models, predominantly based on TRA and TPB (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980), and aspects like different moderating conditions have been widely applied, while others were mostly disregarded as for instance issues about user's attitude accessibility and strength. Several IT adoption research approaches lack in specificity regarding the models applied to their respective research context. In simple terms, in IT adoption research some aspects and models are dominant and used across all variations of contexts, regardless of the possibility that other attitudinal theories might be better accustomed to the specific research subject or context.

METHODOLOGY

Within this section we describe our scientometric approach, the underlying data pool and the inclusion criteria.

We chose a scientometric approach for our literature review on attitude as it reveals interesting insights on the fashion IT adoption researchers publish their content. Scientometrics are defined by Leyesdorff as "*the quantitative study of scientific communication*" (Leydesdorff, 2001, p.1), while Lowry et al. (2004) regard it as "*the scientific study of the process of science*" (Lowry et al., 2004, p. 30). Lewis et al. (2007) lauded scientometric studies to facilitate the ongoing evaluation and improvement of an academic discipline (Lewis et al., 2007).

We determined a timeframe of 20 years for our approach starting with the early beginnings of IT adoption research and the introduction of TAM in 1989 (Davis et al., 1989) and searched through every single issue of the journals selected between 1989 and 2010. In total, we accessed more than 19760 articles via Business Source® Complete by EBSCOhost.

For the purpose of identifying all relevant articles, the following we inclusion criteria had to be fulfilled: The study had to include some form of attitude or related terms already found in literature (Fishbein, 1963; Fishbein and Ajzen, 1975; Ajzen, 1991; Eagly and Chaiken, 1993; Ajzen, 2001). The study had to be empirical, based on survey data. Conceptual models or research approaches using other research methods, (e.g.; Dennis and Garfield, 2003) were excluded beforehand. The study had to include an endogenous variable measuring system usage or the intention to use a particular information system as in basic technology acceptance models (e.g. Davis et al. 1989; Venkatesh and Davis, 2000; Venkatesh et al., 2003). The study had to be published in MIS Quarterly (MISQ), Information Systems Research (ISR), Management Science (MS), Journal of Information Technology (JIT), Information Systems Journal (ISJ), Decision Support Systems (DSS), Communications of the ACM (CACM), Communication of the AIS (CAIS), Decision Sciences (DS), European Journal of Information Systems (EJIS), Journal of AIS (JAIS), Information & Management (I&M), Journal of MIS (JMIS) and Journal of Strategic Information Systems (JSIS). The study had to be published between the introduction of Technology Acceptance Model in August 1989 (Davis et al., 1989), respectively September 1989 (Davis, 1989) and December of 2010.

Our scientometric search was limited to these inclusion criteria and incidences of the chosen search term attitude appearing in the body, abstract or title of the respective article. This search style resulted in the extraction of 472 articles providing topics and content related to an individual's attitude in

technology adoption research. All articles were then manually crosschecked on their relevance for the overall study. Within the next step, findings were categorized due to their title, author, year of publication, outlet, research subject, context, place and point of time of data collection, technology observed, number of survey participants, etc. Most important, the individual role of the construct attitude was observed, concerning its theoretical underlying, its classification as attitude formation or attitude change (see. Section 2), item measurement, beta value, significance (t-value), and impact on exogenous and endogenous variables. Afterwards, all results were stored and coded within a database. To ensure validity of the results and to avoid biased findings each identified article was crosschecked and coded by at least two researchers of our three-person research team. After the coding process, 147 articles containing empirical evaluated research models were included.

RESULTS

As stated above, we extracted 147 relevant articles among which 28 were published in MISQ, 9 in ISR, 3 in MS, 2 in JIT, 5 in ISJ, 8 in DSS, 6 in CACM, 4 in DS, 18 in EJIS, 9 in JAIS, 32 in I&M, 5 in JSIS and 3 in CAIS. Due to page count restrictions, the following data presentation is limited to three major issues: The presence of the two literature streams in total and in the journals, and the underlying theories of both streams. Figure 3 (left) illustrates the total presence of both literature streams. As we stated in section 2, the attitude formation stream is dominant in all journals. Among the extracted articles solely 10% addressed attitude change. This is noticeable, since ten of the fourteen articles extracted were published past 2000, the time by which IT adoption research on attitude change started to become known. To have a closer look, Figure 3 (right) illustrates the distribution to the individual journals:

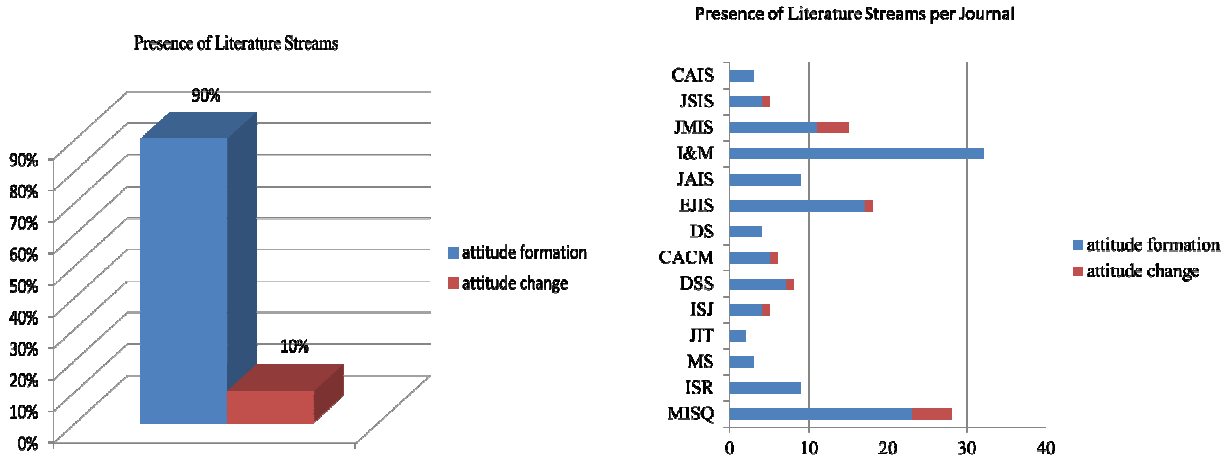

Figure 2 Presence of Literature Streams (total percentages, left) (per Journal, right)

As to the underlying theories, the most often applied attitude-related theories in IT adoption research remain the TRA (Fishbein and Ajzen, 1975), TPB (Ajzen, 1991), TAM (Davis et al., 1989) and UTAUT (Venkatesh et al., 2003). Regarding a total of 147 articles, classified to attitude formation and attitude change, we found the results depicted in Figure 4:

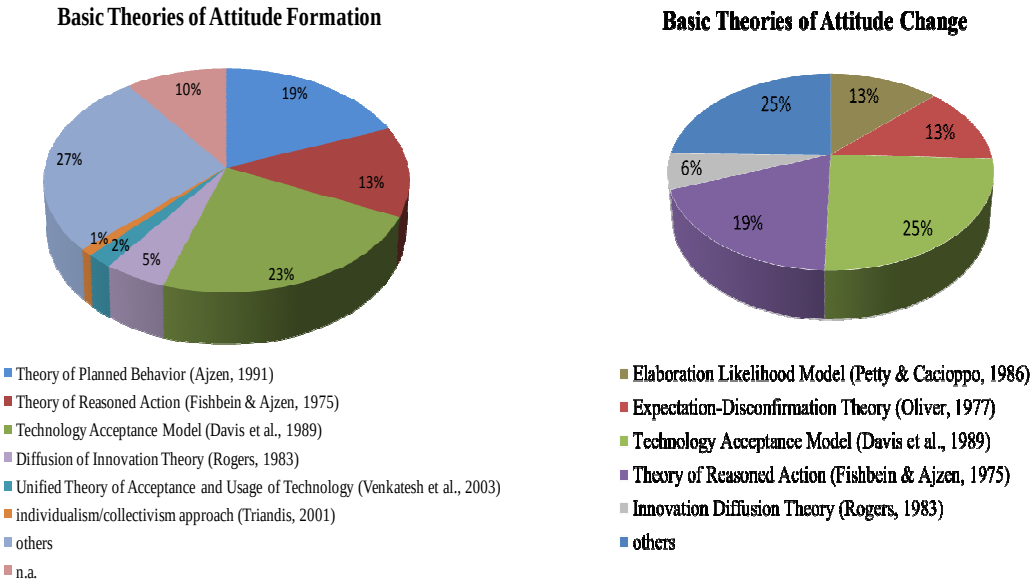

Figure 3 Basic Theories of Attitude Formation and Change

CONCLUSION

Our research reveals according to the scientometric results that a domination of attitude formation over attitude change (90% of the articles) is apparent. Furthermore, it was shown that TRA and TPB are the most applied underlyings for the attitude formation research stream. Additionally, two interesting aspects could be outlined. First, concerning attitude change, besides being by definition a construct to describe dynamic structures with a process-based measurement, 44% of the articles found used underlying theories for static structures with a moment-based measurement. Second, concerning the application of TRA and TPB, just 6.6% of the articles used the EVM, as originally intended by Ajzen, to measure attitude formation.

To give explanation for these results, we put several assumptions up to discussion. As to the dominance of the attitude formation stream, we presume that as in social psychology research where attitude change models came up appeared about one decade later than attitude formation models, the issues of attitude change will become more important in IS research. Especially regarding issues as the change from an incumbent system to a new system, questions of attitude change are of high relevance. Referring to the usage of moment-based instead of process-based measurement for dynamic research topics, the approach of rerunning a model at different points in time seems comparably natural.

Concerning further research, the scope of our scientometrics should be enhanced to confirm the present results and to provide a broader view of research on attitude in IT adoption literature. Furthermore, the results could be validated by comparing beta parameters and R^2s of different theoretical approaches.

Furthermore empirical investigations as to the benefits of the application of attitude change models in IS research can provide valuable insights with regard to change management processes and IS adoption research.

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