Heterogeneous Reactions to Digital Opportunities: a Field Study to Test our Assumptions

Completed Research Paper

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Africa needs access to the powerful information and communication tools of the internet in order to obtain the resources and efficiency essential for its sustainable development. Unfortunately, in 2014, the data from internetlivestats.com showed only 9.8% of African populations have access to the internet. This relative low internet penetration rate signals a problem that may threaten the economic development, governmental efficiency, and ultimately the global competitiveness of African countries. Tremendous efforts have been made to provide internet access and policy makers often assumes that the advantaged and disadvantaged people will respond to the same technology in similar ways. The purpose of this paper is to understand differences between socio-economically advantaged and disadvantaged internet users. Data were collected through a survey from internet users in Ivory Coast. To address digital inequality effectively and economically, as Hsieh et al. (2008), we recommend a group alignment strategy to substitute the typical generic policy that does not distinguish ICT users and treat them as the same and offers a single invariant solution to all populations. The theoretical and practical implications are also described.

Keywords: Adoption, User behavior, Innovation diffusion, digital inequality, internet

Introduction

The internet based technology is offering tremendous advantages to organizations. They can use these technologies for configuration and pricing, promotions and packaging, building brand awareness, customer relationship development, distribution channel management, driving customer development and retention, and promotions and special offers. Internet based communication tools are a solid base for providing businesses and governments with the means to expand the potential market for their services, to improve the attractiveness of communities for business visitors and tourists, to give local entrepreneurs a chance to participate in building a professional network, and to lower barriers to enter into the market.

Unfortunately, according to internetlivestats.com which processes data elaborated through statistical analysis after being collected from the sources such as International Telecommunication Union (ITU), U.S. Central Intelligence Agency, U.N. Department of Economic and Social Affairs and the World Bank Group, only 9.8 % of African populations had access to the internet in 2014. This relatively low internet penetration rate signals a problem that may threaten the economic development, governmental efficiency, and ultimately the global competitiveness of African countries.

Tremendous efforts have been made to address the digital divide. However, studies and statistics show that access to computers and the internet is uneven and the digital divide still exists today (Dewan and Riggins 2005). Consequently, some studies have been conducted to better understand the reasons and the consequence of the digital divide (Hsieh et al. 2008). Yet, the key dimensions of the digital divide have been ignored so far. Indeed, researchers continue to focus on information technology access and have paid less attention to the usage, which is so often a critical issue of digital inequality (Hsieh et al. 2008).
Studies have indicated that digital inequality exists across a variety of demographic, ethnic, and geographic dimensions (Katz and Aspden 1997; Lenhart 2002; Venkatesh et al. 2012). Among these dimensions, income and education represent the most important factors in distinguishing ICT use or nonuse (Lenhart 2002; Jung et al. 2001; James, 2011). In this study, we focus on digital inequality that prevents the socio-economically disadvantaged from participating in and benefiting from the digital economy. Theoretical-grounded empirical research is needed both to expand our understanding of digital inequality and to inform effective policy-making and intervention. Policy makers often make the implicit assumption that the advantaged and disadvantaged people will respond to the same technology in similar ways (Hoffman et al. 2001). But this may not be a valid assumption.

The specific objective is to understand differences between these socio-economically advantaged and disadvantaged groups. From that, we will determine what prevents disadvantaged groups from benefiting from internet usage. The study will be conducted in Ivory Coast, a French speaking country located in West Africa. The internet is a relatively recent innovation in the Ivory Coast, but it is diffusing rapidly. Prior research (e.g., Venkatesh et al., 2003; Karahanna et al., 2005) suggests that context plays a great role in adoption of new technology. An under researched area such as Africa which has characteristics that may be considered to be fairly consistent, and users IT acceptance behavior models could not fit its context (Kaba et al., 2009; Mbarika et al., 2005). We truly believe that the findings of the study will benefit similar countries in Africa as well as other developing countries. The telecommunication industry in Ivory Coast is growing and has become increasingly attractive for global phone and internet services providers. While Ivorian and other similar African countries’ emerging markets holds great commercial opportunities for western information and communication technology (ICT) firms, these firms need to gain a better understanding of the differences in users’ perceptions and adoption of information technologies to be successful. While in the 90s the discourse about the digital divide focused mainly on infrastructural access, we will take into account others factors such as socio-demographic factors, accessibility, use as well as social and governmental support (DiMaggio et al. 2001; Lenhart 2002).

### Research hypothesis

Below we develop the theoretical rationale for the causal relationships of the research model presented in figure 1.

#### Behavioral intention

Behavioral Intention is a measure of the strength of one’s intention to perform a specified behavior (Ajzen, 1991). According to the theory of reasoned action (TRA), behavior or action of an individual is determined by intention (behavioral intention: BI). Previous studies have established that “intention” is a good proxy variable for future “use” (Liao et al., 2009; Venkatesh et al. 2012).

Anandarajan et al. (2002) have shown that social pressures are among the dominant factors explaining the use intention of an ICT in the African context. Subjective norm or social influence emerge as significant predictors of intention to engage in high-level internet use, suggesting that socio-economically disadvantaged people who feel more pressure from others are more likely to intend to engage in high-level internet use. The internet is an extremely social medium. It has been demonstrated in many studies that people adopt and use new technology because of social pressure. When it comes to social media, we can believe that socio-economic disadvantage people are more sensitive to social pressure than socio-economic advantaged people particularly in African context.

The internet is a relatively recent innovation in the Ivory Coast and its acceptance and use are not without constraints. There is limitation to the common beliefs and the assumption that there are no barriers preventing an individual from using an information system if people choose to do so. Nevertheless, previous studies have shown that higher perceived Behavioral control (PBC) was associated with better intention-behavior consistency (Ajzen, 1991; Hesieh et al., 2008; Taylor and Todd, 1995; Karahanna et al., 1999; Venkatesh et al. 2012). The levels of sense of control differentially impact the socio-economically advantaged and disadvantaged groups, and constrain the disadvantaged more (Hesieh, 2008). In the context of this study, we may think that the socio-economically disadvantaged groups appear to be more sensitive to the resources issues in adopting and using the internet.

Based on the above, we can identify the following hypothesis:
**H1a**: Socio-economics status will moderate the positive influence of PBC on continued use intention such that the influence is stronger for the socioeconomically disadvantaged group than for the socioeconomically advantaged group

**H1b**: Socio-economics status will moderate the positive influence of Social Norms on continued use intention such that the influence is stronger for the socioeconomically disadvantaged group than for the socioeconomically advantaged group

**Facilitating conditions**

The influence of facilitating conditions, in this paper, is similar to perceived behavioral control (PBC) of TPB. PBC upon the use of ICTs has been widely discussed in the literature through various studies (Ajzen, 1991; Karahanna et al., 1999; S. Taylor and Todd, 1995; Thompson et al., 1991; Mathieson et al., 2001). Perceived behavioral control refers to the perceptions of an individual on the presence or absence of resources, skills and opportunities required to perform a given behavior. According to Triandis (1980) a behavior is a function partly of the situational constraints and conditions. These conditions which encourage or discourage the continued behavioral intention are called facilitating conditions

According to Ajzen (1985), PBC refers to both the internal and external factors. Internal factors are under individual control and referring to skills, power, etc. while external factors are not controlled by the individual and they include opportunities, cooperation of others etc. TRA considers that the behavior is explained only by the intention and attitude while TPB opposes that an individual may well have positive attitudes toward an object and intend to use it but the unfavorable circumstances could change the behavioral intention. That uncertainty is captured by PBC.

Hsieh et al. (2008) claimed, after exhaustive literature review, that PBC could be associated with three important behavioral control factors which are Self-efficacy (SE), availability and perceived ease of use (PEOU). Following these authors in the same vein, the logic for this association is that the ease or difficulty of ICT use, the skills and the degree of accessing it affect individuals’ beliefs about the control they have on the use of the technology. Besides, Self-efficacy was inspired by the work of Bandura et al. (1977) as a key determinant for perceived behavioral control (Hsieh et al. 2008). Compeau and Higgins (1995) adapted it to the IT field by defining it as the individuals’ belief regarding their ability to use an IT. This means that an individual may boycott an IT because of lack of IT skills needed to use it properly. Availability represents a barrier for ICT use caused by lack of sufficient technological infrastructure (Taylor and Todd, 1995). Finally, Davis (1989) defines Perceived Ease of Use as the degree to which a person believes that using a new ICT will be easy. This means that using the new innovation will require less physical and mental effort (frequent use of user manual; seek for technical support, etc.).

Hsieh et al. (2008), suggested that psychological factors associated with an individual’s sense of control may affect the socio-economically disadvantaged to a greater degree than socio-economically advantaged. Many reasons could explain the rationale why the disadvantaged might decide not to make use of the information technologies available to them. Among them, there is the lack of ability to learn computing skills needed to access these technologies. Socio-economically disadvantaged are those that have fewer opportunities to develop the digital literacy necessary for an increasingly technical world (Hsieh et al. 2008). Furthermore, the development of internet skills, such as navigational skills, is directly related to the amount of time spent online (Jackson, 2008). Because the socio-economically disadvantaged group may not have the need, the means, or the disposable time to access the web, they may lack the skills needed to participate in the information society (Hsieh et al. 2008).

Studies have shown that people in low socioeconomic areas still do not have the same computer access, use, or skill level as those living in middle or upper socio-economic areas. Many Ivoirians still do not have a computer, mostly in low-income communities although computers have become increasingly affordable. Prior digital inequality studies such as Hsieh et al. (2008) have indicated that cost and availability constitute barriers that prevent people, especially the disadvantaged, from successfully using ICT. Hence we state these hypotheses:

**H2a**: Socio-economics status will moderate the positive influence of Self Efficacy on PBC such that the influence is stronger for the socioeconomically advantaged group than for the socioeconomically disadvantaged group
**H2b:** Socio-economics status will moderate the positive influence of Ease of Use on PBC such that the influence is stronger for the socioeconomically disadvantaged group than for the socioeconomically advantaged group

**H2c:** Socio-economics status will moderate the positive influence of Availability on PBC such that the influence is stronger for the socioeconomically disadvantaged group than for the socioeconomically advantaged group

**Social norms**

Rogers (2003) defines social norms or pressure as the values or behaviors which are the most accepted by the members of a society. Social norms refer to the belief of an individual that he or she should conform to the practices accepted by those who enjoy a high social status in his or her environment. Kaba et al. (2009) showed that use of communication technologies strengthens social relationship ties; consequently, people who use such technology to communicate will find it easier to convince their social network to adopt the technology if informal leaders are favorable to its adoption. The attitudes toward the use of a communication technology in the African environment are influenced by the actions of informal leaders or reference groups (Kaba et al., 2009).

In light of the theory of reasoned action, social norms may be considered as a factor affecting the perception of an individual of whether a given action should be undertaken (Ajzen and Fisbein, 1980). Rogers’ innovation diffusion theory also states that technological innovations are adopted by imitation. Anandarajan et al. (2002) have shown that social norms are among the dominant factors explaining the use of an ICT in the African context.

The social norm is determined by the influence of friends, family members, peers and superiors and the influences or pressure to adopt a behavior are exerted by those referents (Taylor and Todd, 1995, Hsieh et al. 2008). Mbarika (2002) has shown the influence of the Government in use of an ICT in Sub-Saharan Africa context. In this study, the social norm is determined by the influence of friends, family and Government. The distinction between these actors is crucial in the context of ICT adoption and use (Taylor and Todd, 1995). Thus, friends, family and Government may affect potential users; however, sometimes this influence is antagonistic. The Government may be favorable to an ICT use while at the same time, friends and family show an opposition.

Elsewhere, it has been noticed that the Government institution is important in influencing ICT diffusion and reducing digital divide (DiMaggio et al. 2001). Hsieh et al. (2008) made the assumption that government may serve as an important referent whose expectations impact individual innovation behavior. According to what is said previously, we may believe that the socio-economically disadvantaged groups appear to be more sensitive in responding to expectations from important referents included governmental institutions, family and friends.

Therefore, we stipulate the hypotheses indicated below:

**H3a:** Socio-economics status will moderate the positive influence of friends and relatives on SN such that the influence is stronger for the socioeconomically disadvantaged group than for the socioeconomically advantaged group

**H3b:** Socio-economics status will moderate the positive influence of Government on SN such that the influence is stronger for the socioeconomically disadvantaged group than for the socioeconomically advantaged group
Methodology

In this section, we define the method and instruments to reach our research objectives. More specifically, we present questionnaire development processes and data collection strategy.

Questionnaire Development

The data for this study was collected through a questionnaire survey that was divided into fifteen sections. Each section was devoted to each variable of the research model: Use continuance intention, Perceived behavioral control, Social norm, Satisfaction, Self-efficacy, Perceived ease of use, Availability, Familiarity, Government influence, Usefulness, Pleasure, Disconfirmation. A Likert scale with seven points, where 1 represents strong disagreement and 7 represents strong agreement, was used to measure all the variables of the model, except the moderator variables such as age, gender, experience, exposure, usage, activity domain, activity sector, position.

In order to gather the necessary data to address our research problem, we administered a questionnaire to a sample of French speaking people living in Ivory Coast. Therefore, the model constructs were operationalized using established scales. Most of them were borrowed from Kaba (2006)’s questionnaire which has been already translated and pretested in a Francophone environment. For the remaining constructs, we relied on back translation procedures meaning that the questionnaire was translated from English to French and translated back to English. The original version in English was compared to the back translated copy to ensure a quality outcome.

A pre-test of the final version of the questionnaire was performed in order to assure its content validity before its final distribution to the respondents. First, we designed a preliminary version of the questionnaire. This version was given to researchers in the field of IT and information systems (IS), and to experts in the industry familiar with African context. Each individual provided some comments on the formulation, the syntax, and the number of items included in the questionnaire. Taking into account the various comments, we made minor changes to the questionnaire. The various comments also permitted us to eliminate biases which could exist in the questionnaire. Next, the subsequent version of the questionnaire resulting from the changes was submitted to 10 internet users in Ivory Coast to administer the questionnaire to them in an interactive manner in order to be able to directly take their remarks. This pre-test allowed us to clarify and refine the meaning of questions which were less well understood. The pretest resulted in a final questionnaire with a greater content value in term of wording.
**Data Collection**

There are many ways of administering a questionnaire: By direct contact, by postal mailing, by telephone, and online. To the best of our knowledge there were no listings of all internet subscribers in Ivory Coast from which it would be possible to identify their mailing addresses and to contact them by mail. The investment required to compose such a list would be high and would be beyond the scope of this study. Due to the above limitations, the survey in this study was conducted using the direct contact method. We chose with great care about 8 investigators who were attentive to the demands of precision and rigor in this study. These persons were trained to perform the survey’s tasks.

As Kaba et al. (2009), to make our sample representative, we used random stratified sampling. The places where our questionnaires were sent were divided into groups called strata. A sample was then drawn from within these strata. In our case, the strata were the public or government sectors, private sectors, and informal sectors. Each of them had many constituents. We selected randomly a constituent from each and the researchers and the investigators met with the respondents, across country with focus on Abidjan where there are the majority of internet users, who completed the questionnaire.

**Results analysis**

Administration of the survey produced responses from a total of 1000 printed out questionnaires. Of the received 600 responses, 89 were dropped from the sample for various reasons, among them incomplete response and choice of more 1 indicator for the same items. Therefore a total of 511 responses were used in the statistical assessment of the hypotheses for this study. This represents a response rate of 60%.

Statistical analysis for this study employed SPSS statistical software and the partial least squares (PLS) statistical analysis method as supported by the Smart PLS software (Ringle, et. al., 2005) running on a personal computer. While the study’s hypotheses were analyzed using PLS, the assessment of the collected data’s descriptive statistics were conducted in SPSS. PLS provides for the simultaneous testing of the measurement model and the structural model that articulate the research’s hypotheses. (Chin & Todd, 1995; Ringle et al., 2005; Wixom & Watson, 2001).

**Descriptive Statistics**

The table presents the descriptive statistics for the study’s socio-demographic variables – age, gender, experience, revenue and level of education. As show in table 1, socio-demographic variables examined in this study are: gender, age, experience of using internet, revenue and education level. 63.4% of respondents are males compared to 35% of females. Respondents are relatively young as almost 63 % of them are less than 40 years old. Interestingly, respondents seem to be familiarized with internet usage as more than 52.4% of these respondents have been using internet for between three and more than 6 years. Finally, almost 73 % of internet users are well educated (above secondary school). They access the internet mainly at cybercafés and 50% among them are making less than 100 000 CFA a month.

<table>
<thead>
<tr>
<th>Table 1: Socio-demographic Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Items</strong></td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Males</td>
</tr>
<tr>
<td>Females</td>
</tr>
<tr>
<td>Missing values</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Less than - 20 years</td>
</tr>
<tr>
<td>21 - 30</td>
</tr>
<tr>
<td>31 - 40</td>
</tr>
<tr>
<td>41 - 50</td>
</tr>
<tr>
<td>51 - 60</td>
</tr>
<tr>
<td>61 - 70</td>
</tr>
<tr>
<td>Missing values</td>
</tr>
<tr>
<td>Experiences of using internet</td>
</tr>
<tr>
<td>Less than 1 year</td>
</tr>
<tr>
<td>Between 1 and 2</td>
</tr>
<tr>
<td>Between 2 and 3</td>
</tr>
<tr>
<td>Between 3 and 4</td>
</tr>
<tr>
<td>Between 4 and 5</td>
</tr>
<tr>
<td>More than 6 years</td>
</tr>
<tr>
<td>Missing values</td>
</tr>
<tr>
<td>Education levels</td>
</tr>
<tr>
<td>Not educated</td>
</tr>
<tr>
<td>Primary school</td>
</tr>
</tbody>
</table>
Testing for Validity

The validity of variables measurements was assessed through the reliability, convergent validity and discriminant validity. The reliability, the convergent and discriminant validities in this study were evaluated following the rules suggested by (Nunnally, 1967; Fornell & Larcker, 1981; Wixom & Watson, 2001; DeVellis, 1991)

Reliability of Measurements

In PLS, the psychometric properties of the scales used to measure the hypothesized model’s reliability and the validity of its constructs are measured and articulated by the measurement model. As Hsieh et al. (2008), only Family & Friends influence was modeled to be formative and the study’s remaining variables were modeled to be reflective. Its Items do not necessarily have to covary, are not interchangeable, and the direction of causality is from the items to the latent construct (Jarvis et al. 2003; Hsieh et al., 2008).

Measures of reliability include the composite reliability each construct’s indicators. The results for the composite reliability of each individual construct are presented in Table 2.

The value of composite reliability for each latent variable except Availability was above the threshold value of 0.7 recommended for empirical research (Nunnally, 1967). However, Nunnally (1967) recommended that minimal acceptable reliability for preliminary study should be in the range of .50 to .60. At another front, a low cronbach’s alpha do not immediately put the result of the analysis into question (Bernardi, 1994). Because this study is the first of its kind undertaken in Ivory Coast, it may be considered as an exploratory one. Usually Cronbach’s Alpha coefficients are expected to be low in exploratory studies (DeVellis, 1991). We can therefore decide that the internal consistency of the measurements in our study is satisfactory.

Table 2: Reliability and average variance extracted (AVE)

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Socioeconomically disadvantaged (SED)</th>
<th>Socioeconomically advantaged (SEA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AVE</td>
<td>Composite Reliability</td>
</tr>
<tr>
<td>Availability (3)</td>
<td>0.39</td>
<td>0.006</td>
</tr>
<tr>
<td>Family Friend*</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Government(2)</td>
<td>0.88</td>
<td>0.93</td>
</tr>
<tr>
<td>PBC (4)</td>
<td>0.52</td>
<td>0.81</td>
</tr>
<tr>
<td>Perceived Ease of Use (3)</td>
<td>0.69</td>
<td>0.87</td>
</tr>
<tr>
<td>SN (3)</td>
<td>0.52</td>
<td>0.74</td>
</tr>
<tr>
<td>Self-Efficacy (3)</td>
<td>0.80</td>
<td>0.92</td>
</tr>
<tr>
<td>Use Continuance Intention (3)</td>
<td>0.73</td>
<td>0.89</td>
</tr>
</tbody>
</table>
*This variable is a formative construct whose score is computed as a unit mean of three items. The number in parentheses indicates the items in the scale.

**Convergent Validity**

The tests for convergent validity are that each construct’s AVE needs to be equal or greater than 0.5 (Fornell & Larcker, 1981; Wixom & Watson, 2001) – table 2 provides these results; and, that each item’s loading onto its respective construct should be equal to or greater than 0.5 (Wixom and Watson, 2001). Except for the constructs the Availability each yielded a AVE greater than 0.5.

**Discriminant Validity**

The objective of this test is to assess the independence of the variables. The average variance extracted (AVE) for each construct was assessed in order to determine the model’s discriminant validity. A model’s discriminant validity is satisfactory if the AVE of each construct in the model is greater than the variance shared between the construct and other constructs in the model (Fornell & Bookstein, 1982). As is evident in Table 3 the AVE of each construct is greater that the constructs’ correlations. Therefore all constructs except Availability have satisfactory discriminant validity.

<table>
<thead>
<tr>
<th>Availability</th>
<th>Government</th>
<th>Intention</th>
<th>PBC</th>
<th>Perceived Ease of Use</th>
<th>Self Efficacy</th>
<th>Social Norms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>0.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>0.513</td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>0.239</td>
<td>0.234</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>0.258</td>
<td>0.204</td>
<td>0.166</td>
<td>0.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>-0.023</td>
<td>-0.022</td>
<td>0.028</td>
<td>-0.029</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>0.428</td>
<td>0.289</td>
<td>0.245</td>
<td>0.297</td>
<td>-0.022</td>
<td>0.80</td>
</tr>
<tr>
<td>Social Norms</td>
<td>0.233</td>
<td>0.334</td>
<td>-0.010</td>
<td>-0.009</td>
<td>-0.011</td>
<td>0.054</td>
</tr>
</tbody>
</table>

**Research models assessment**

The PLS procedure has been gaining interest and use among IS researchers in recent years (Compeau and Higgins 1995; Aubert et al. 1994) because of its ability to model latent constructs under conditions of non-normality (Chin et al. 2003). According to Chin et al (2003), PLS as modeling technique is similar to regression, but simultaneously models the structural paths (i.e., theoretical relationships among latent variables) and measurement paths (i.e., relationships between a latent variable and its indicators). In this sense, Scholars claim that PLS is preferable to techniques such as regression which assume error free measurement.

We have separated the socio-economically advantaged and socio-economically disadvantaged samples to validate the research model, in figure 1, in each subgroup. PLS algorithm was performed to evaluate item weight and, bootstrapping was performed to evaluate T-statistics (Ringle et al., 2005). A Two- tailed T test is considered with 1.645, 1.96, and 2.576 critical values of T at significant level (p-value) 0.1, 0.05, and 0.01 respectively (Wagner, 1992; Chin & Todd, 1995; Nunnally, 1978, Ringle et al.,2005).

<table>
<thead>
<tr>
<th>Paths</th>
<th>Path coefficients</th>
<th>Sample Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>T Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability -&gt; PBC</td>
<td>0.34</td>
<td>0.35</td>
<td>0.04</td>
<td>0.04</td>
<td>8.26***</td>
</tr>
<tr>
<td>Family Friend -&gt; SN</td>
<td>0.47</td>
<td>0.49</td>
<td>0.04</td>
<td>0.05</td>
<td>10.40***</td>
</tr>
<tr>
<td>Government -&gt; SN</td>
<td>0.21</td>
<td>0.20</td>
<td>0.04</td>
<td>0.04</td>
<td>4.83***</td>
</tr>
<tr>
<td>PBC -&gt; Use Continuance Intention</td>
<td>0.31</td>
<td>0.31</td>
<td>0.04</td>
<td>0.04</td>
<td>7.58***</td>
</tr>
</tbody>
</table>
From table 4, we have grouped both socio-economically advantaged and socio-economically disadvantaged internet users’ respondents together who participated in the survey, the collected data enabled us to evaluate the relative influence of Perceived Behavioral Control, Social Norms on Intention to continue to use the internet. As can be seen in table 4, the primary outcome continued intention was explained by both drivers. These drivers were also explained by their respective predictors.

The objective of this study is to compare socio-economically advantaged to socio-economically disadvantaged internet users on base of the variables defined on the research model. We have separated the socio-economically advantaged and socio-economically disadvantaged samples on base of education and income level to validate the research model, in figure 1, for each subgroup.

Tables 5 and 6 provide the results of the paths analysis for each sub-group. The paths comparison between both groups to validate the research hypotheses are provided in table 7.

**Multi-Group and paths analysis for differences across groups**
The bootstrapping method was applied to test our proposed model by using smart PLS, a structural equation model assessing software. Table 7 shows the detailed model test results predicting internet use continuance through the mediation of perceived behavioral control and the social norms. The four columns of results show the comparisons of results from socioeconomically advantaged and disadvantaged groups as proposed in this work. To test our hypotheses associated with differential reaction, as Hsieh et al. (2008), we compared the coefficients of individual paths between the structural models of socioeconomically advantaged and socioeconomically disadvantaged groups e.g. tables 5 and 6. According to Hsieh et al. (2008), this analysis is similar to a t-test of the moderation effect of socioeconomic status on the path strength across groups. We referred to Chin (2004) to apply a t-test to assess statistical differences in path coefficients for each pair of paths as in table 7.

In socio-economically advantaged group, the variance explained by the model for intention, perceived behavioral control and social norms are respectively 0.36, 0.38 and 0.27. For the socio-economically disadvantaged group, the model explained respectively 0.20, 0.28 and 0.59 of the variance of intention, perceived behavioral control and social norms.

We supposed the positive effect of PBC and SN on use continuance intention by admitting that influence will be stronger for socio-economically disadvantaged group. The results showed positive impacts of these predictors on users’ use continuance intention for socioeconomically advantaged group. While the difference across group with regard to PBC was significant but it was not for SN.

We theorized also a positive moderated influence of socioeconomic status on the relationship between PBC and its three drivers which are self-efficacy, perceived ease of use and availability. Such that the influence is stronger for the socioeconomically advantaged group than for the socioeconomically disadvantaged group. According to the results, while a positive influence of the three predictors on PBC were supported but the cross differential effect was not supported contrary to what was expected.

We finally stated that social norms will be positively impacted by the Government, family and friends’ influences and that effect will be stronger for socioeconomically disadvantaged people. As we expected, the results support a positive and stronger effect of family friends’ influences on SN for socioeconomically disadvantage groups as theorized. However, the Government’ influence held positive effect for both groups without yielding any difference between the two groups in our study.

In sum, from tables 5, 6 and 7, in total of 7 hypotheses stated, 2 among them were supported while 5 were partially validated. We offer more details to explain these findings in the next sections.

### Table 7: Research hypothesis test

<table>
<thead>
<tr>
<th></th>
<th>SEA Advantaged</th>
<th>SED Disadvantaged</th>
<th>Hypotheses’ validations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable: Use continuance intention</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.36</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td><strong>0.43</strong>(0.07)**</td>
<td>0.11(0.08) NS</td>
<td><strong>H1a: supported</strong></td>
</tr>
<tr>
<td>SN</td>
<td><strong>0.27</strong>(0.08)**</td>
<td><strong>0.42</strong>(0.09)**</td>
<td><strong>H1b: partially supported</strong></td>
</tr>
<tr>
<td><strong>Dependent variable: Perceived Behavioral Control (PBC)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.38</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td><strong>0.14</strong>(0.07)</td>
<td><strong>0.22</strong>(0.13)</td>
<td><strong>H2a: partially supported</strong></td>
</tr>
<tr>
<td>Perceived Easy Use</td>
<td><strong>0.19</strong>(0.07)</td>
<td><strong>0.18</strong>(0.12)</td>
<td><strong>H2b: partially supported</strong></td>
</tr>
<tr>
<td>Availability</td>
<td><strong>0.39</strong>(0.06)</td>
<td><strong>0.26</strong>(0.11)</td>
<td><strong>H2c: partially supported</strong></td>
</tr>
<tr>
<td><strong>Dependent variable: Social Norms (SN)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.27</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td><strong>0.18</strong>(0.07)</td>
<td><strong>0.22</strong>(0.08)</td>
<td><strong>H3b: partially supported</strong></td>
</tr>
</tbody>
</table>
**Family&Friends**

<table>
<thead>
<tr>
<th></th>
<th>0.41*** (0.08)</th>
<th>0.64*** (0.08)</th>
<th>H3a: fully supported</th>
</tr>
</thead>
</table>

Path coefficient is significant at: ***p < 0.01, **p < 0.05; *p < 0.1; N.S.: Path coefficient is not significant

The standard errors are the numbers in the parenthesis

T-test was performed to assess the differential effect of each pair of paths

Partially supported indicate that the positive influence of the drivers on the dependent variables hold but the differences between groups are not realized from performing the T-test.

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**Discussion**

This study seeks to provide a theoretical framework to investigate the antecedents of internet use continuance. In particular, the main objective is to identify the factors which distinguish socio-economically disadvantaged from advantaged group and prevent them to take advantage of digital opportunity. The impact of the factors identified in the research model on user’s continued use intention is explained below.

**Intention to continue to use Internet**

After consolidating and examining the results in both socio-economic groups, it seems that the relations between the predictor variables (Perceived behavioral control and Social norms) and our dependent variables (Intention to continue to use) are partially statistically significant.

Indeed, according to the results (see tables 5, 6 and 7), the influence of Perceived behavioral control (PBC) is significant only for socioeconomically advantaged group. That finding is consistent with the previous studies which established in many times the impact of perceived behavioral control on users’ intention to pursue an information communication technology use. However, the fact that PBC has no significant influence on socioeconomically disadvantaged groups’s use continuance intention was inconsistent with our expectation as well as previous findings. It may be possible that this group of users did not adequately assess or they are unaware of the facilitating conditions which are available for them about internet use.

Previous research has most often supported that Social norms is a major determinant of Users’ Intention toward a new ICT especially in African context (Kaba, 2009). The results of this study of internet use in two distinct socio-economic groups tend to confirm the traditional view of the role of the Social norms in shaping people use continuance behavioral intention. Apparently, with regard to group differential effect, both group are not statistically different with regard to the influence of SN on their use continuance intention.

Besides, some studies in western environment indicated that SN loses its strength in post adoption phase. Thus, these finding suggested that the Social norms become less important over time when users are familiar with the system. Our results contradict that fact. Indeed, according to the descriptive statistics, the majority of the respondents have been using internet more than 6 years. The users are still vulnerable to the influence of their referents’ actions to use the system. Given that apparent contradiction, we have performed a post hoc analysis by adding perceived personal network exposure to the research model.

It is important to recall that perceived personal network exposure is different from social influence in sense that it captures the proportion of the adopters in a person’s network. The addition of perceived personal network exposure to the model shapes the intention to continue to use the internet of both socio-economic groups. Thus, bigger is the size of the personal exposure; higher is the probability of the person’s willingness to continue to Use the internet.

**Influence of the antecedents of Perceived Behavioral Control**

Contrary to our assumptions, self-efficacy, perceived ease of use and availability do not significantly impact more strongly the perceived behavioral control of one socioeconomic group against another. The results showed these predictors influences the perceived behavioral control for both groups but in line with our expectation, the influence is not significantly different from one group to another. Thus, H2a, H2b and H2c were partially supported. Following our assumption, the socio-economically advantaged persons have more opportunities to be exposed to internet. Given that the personal and situational resources of those persons are adequate and their frequent interaction with the internet, they tend to develop proper skills and feel more comfortable to take full control of the internet features. The fact that self-efficacy and perceived ease of use did not induct any differential effect may be explained by the finding of the previous studies such as Karahanna et al. (1999) which have established the influence of time on information technology (IT) adoption and use behavior in pre-adoption and post-adoption
period. The results tend to confirm self-efficacy and the perceived ease of use would make difference at early stage of adoption and use. Once the IT is adopted, its use continuance would depend largely on other factors such as perceived usefulness. Another possible reason for this insignificant result may be the relative user-friendly features of the internet, which appears to have addressed the coping challenges that the socio-economically disadvantaged are likely to face when interacting with ICT that is less user-friendly.

We have supposed that availability has positive influence on perceived behavioral control and that influence was stronger for socio-economically disadvantaged persons. The empirical data showed that the influence is not significantly stronger for either group. One possible explanation may be the existence of internet at affordable price through thousand cybercafés across the country. The descriptive data reveal that those locations seem the favorite access point of internet connection and the socio-economically disadvantaged may want to take advantage of that relative facilitating condition and the accessibility seems not to be serious issues for them anymore.

**Influence of the antecedents of Social norms**

We have supposed that friends, relatives and the Government shape internet users’ social norms. These relations are stronger for socio-economically disadvantaged group. As expected the friends and relative influence to greater extent socio-economically disadvantaged group than their opponent group. That is in line with the previous study which established the dominant effect of informal leader in ICT adoption and use issues in African context. However, we have not found any differential effect with regard to the Governments’ influences on both groups. We have expected stronger Government influence on socioeconomically disadvantaged group. The possible explanation of this finding is a number of Governments in Africa context do not use a systematic approach to raise all the citizen awareness about their initiative. The information channels and strategies may not be fully accessible to socio-economically disadvantaged group.

**Practical contributions**

Digital inequality is a topic that is quite timely. As policy makers grapple with how to address this issue, there are a number of interesting experiments unfolding. According to our findings, factors that influenced individuals’ intention to continue using the internet were somewhat different between the two groups studied. Taken as a whole, 36 percent and 20 percent of the variance in a user’s continuance intention were explained by the behavioral models for socio-economically advantaged and disadvantaged groups, respectively. The discrepancy in the explained variance suggests as we have supposed that the two groups globally react differently to a digital opportunity. The results also reveal that making available information and communication technology is not enough to eliminate digital inequality between socio-economically advantaged and disadvantaged people. If government and other institutions would like to ensure ICT use in the society, they need to address the issues that are facing disadvantaged group by examining what motivate them to use ICT rather than accessing it. One major contribution of our study is to highlight that the socio-economically disadvantaged people will decide to continue to use an ICT without perceiving any facilitating conditions if their referents’ groups are favorable to it. To address digital inequality effectively and economically, as Hsieh et al. (2008), we recommend a group alignment strategy to substitute the typical generic policy that does not distinguish ICT users and treat them as the same and offers a single invariant solution to all populations.

In line with the common belief given a high weight to social norms or pressure in influencing ICT acceptance and use in Africa, policy-makers need to consider the power of family and friends’ influences, as these offer substantial leverage for the socio-economically disadvantaged group in shaping their normative beliefs for influencing internet use continuance intention. For personal network exposure, it will be interesting to find mechanisms that raise the awareness about ICT innovation in socio-economically disadvantaged social network. The study will help the key stakeholders in adoption and use of internet in Africa to understand the main factors that influence continued use intention, which is likely to play a key role in defining the long term success of internet use in addressing digital inequality. Gaining such an understanding is important because the internet can be the basis to provide business and government users, to expand the potential market for E-government services, to improve the attractiveness of the community for business visitors and tourists, and to give local entrepreneurs a chance to participate in building the network, lowering barriers to entry into the market.
Theoretical contribution

Responding to the call of Benbasat and Barki (2007) to go beyond TAM model study and to consider Theory of Planned Behavior (TPB) for better explanation of ICT acceptance and to address ICT continued use issues, we have adopted extended TPB theory as theoretical foundation of the current research. The theory of reasoned action (TRA) is a general theory, it does not specify which beliefs are most likely to cause a particular behavior. The theory of planned behavior (TPB) also has its own shortfalls (Benbasat and Barki, 2007). Although, both models have been widely applied in information systems field, a proper application of these models requires some specifications or adjustments. Indeed, while many studies recognized that perceived behavioral control and social norms affect information technology behavioral use continuance intention and acceptance, until there is a greater understanding of their determinants, it will be difficult to provide actionable and practical guidance from TRA and TPB. For instance, we came up with external factors such as availability, Government supports and referent group as family and friends that would explain the internet use continuance intention through perceived behavioral control and social norms constructs.

More specifically, we pointed out that the perceived behavioral control and referents' supports are influencing internet users at different degree with regard of their socioeconomic status. Our study challenged the common belief in digital divide literature consisting that access or availability of the technology is sufficient to occur its acceptance and use by people regardless of their status. The role of the Government to provide resource in order to reduce or eliminate digital inequality in Sub-Saharan Africa region is fundamental. However, this study showed that in the presence of normative influence from one's key referents as friends and relatives play a key role in shaping subjective norms. Thus, the government should influence people through their referents groups to increase their awareness about its actions.

The research model developed and validated in this study indicated that ICT use continuance varies according to socio-economic status and it is due to psychological and contextual issues rather than technological issues, hence individual differences must be addressed. This study represents an important step toward understanding the problem of digital inequality using a grounded approach based on Planned Behavior Theory. The theoretical model we have developed will address the often-cited need to understand the intricacies of user acceptance of ICT in the context of digital inequality (Bonfadelli 2002; Dijk and Hacker, 2003). As the importance of digital technologies range beyond the scope of organizations, some information systems researchers such as Lytras (2005) have called for investigating problems relevant to everyone. This study is among a few efforts to investigate technological innovation behavior in households and beyond typical workplace settings.

Study limitation

As is typical, this research also presents limitations. It is possible that the data collected on the internet are not easily generalizable to other ICTs, and the model developed in this study should be tested on other technologies to assess the external validity of the study. Another limitation of the study is related to the fact that it is cross-sectional, and thus does not reflect the evolution of the variables studied over time. In this sense, it would be an advice for future research to conduct a longitudinal study to study the evolution of beliefs, attitudes over the time (before, during and after the adoption of a technology). At that time, the efforts should be made to add to the model other utilitarian factors in an effort to explain more of the variance and propose solution to deal with digital inequality issues.

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