Adults Use of ICT in Healthcare: The Persuasive Impact of Children

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Abstract

Healthcare as currently practiced and supported is increasingly unaffordable and incapable of dealing with emerging population dynamics in virtually every country in the world. Sustained behaviour change, within which ICT will likely play a prominent role, is required to meet the needs of the future. ICT has the ability enable new approaches and amplify efforts. Towards that end, educated adult children are in a unique position to influence their parents’ use of ICT in healthcare given their inherent ICT familiarity, learned subject matter expertise and family trust. This study uses the Elaboration Likelihood Model (ELM) as a guide to gather and analyze qualitative data from PhD students associated with an ehealth research institute to explore the persuasive impact of educated young adult children on their parents’ use of ICT in healthcare. Results are presented. Implications for theory and practice are addressed.

1. Introduction

Healthcare, in its current incarnation, is increasingly unaffordable and incapable of dealing with emerging population dynamics in virtually every country in the world. Life expectancy has increased dramatically and birthrates have become significantly lower resulting in higher demands for healthcare services accompanied by a dearth of new medical professionals. Rapid increases in chronic diseases (e.g., type-2 diabetes and hypertension) further exacerbate the impending crisis. The need for new healthcare thinking is paramount. Information and Communication Technologies (ICT) provide a degree of freedom in searching for solutions. Solution approaches
include minimizing required hospital visits by keeping patients at home as much as possible as well as having citizens take more responsibility for their healthcare, e.g., increased sensitivity to wellness.

Unfortunately, adults aged 55 and over did not grow up with a heavy presence of ICT in their lives and are, accordingly, less likely to naturally use ICT in association with healthcare. This presents a particular dilemma since it is this age group that can be expected to have the highest healthcare demands compared to those younger. However, typical children of adults age 55 and over have grown up with ICT and are, therefore, more inclined to recognize ICT usefulness in healthcare, especially if that have had exposure to the topic, e.g., in university environments. The potential exists for children to influence their parents in consideration of use of ICT in healthcare. Little is known, though, regarding the nature of this influence and its effectiveness. This research is aimed at reducing uncertainty in this regard. The research question is “What is the persuasive impact of educated young adult children on their parents’ use of ICT in healthcare?”

To answer this question, ten PhD in their twenties (associated with an ehealth research institute) were interviewed using the Elaboration Likelihood Model (ELM) as a guide. Follow-up interviews were conducted to judge the extent to which their persuasive efforts had an impact as well as to glean additional barriers to sustained behavioural change. An ELM-driven coding scheme was used to analyze interview data. The remainder of this paper is organized as follows. A brief review of relevant persuasion literature and elaboration likelihood model application is followed by results, discussion and conclusion.

2. Background

Sustained use of ICT in healthcare requires behavioural change that cannot be mandated. No single stakeholder, organization or government can unilaterally and directly change an individual’s behaviour. Behavioural change under these circumstances requires persuasion and coercion of one form or another. The general literature on persuasion is lengthy going back to the Greeks and can have multiple paths of influence. Systematic persuasion is the process through which attitudes or beliefs are leveraged by appeals to logic and reason whereby heuristic persuasion, on the other hand, is the process through which attitudes or beliefs are leveraged by appeals to habit or emotion.

Sustained behaviour change goes beyond persuasion to facilitate lasting impact required for long-term benefit and positive evolution of healthcare systems and services with societal value in mind. Motivation can be both intrinsic and extrinsic. Complications can easily occur as a result of behavioural complexity manifested by the many influences (and tensions) among healthcare stakeholders. Policies and reward systems await to be realigned to meet emerging circumstances.

Children are in a unique position to influence (and be influenced by) their parents and will also suffer the consequences of inadequate attention to healthcare. With respect to ICT, children (at least by the time they reach university level) have had sustained engagement and are in a particularly strong position to influence their parents and grandparents with respect to use of ICT in healthcare both through reasoned argument and general appeal (courtesy of their heritage and history of interaction).

3. Research Approach

This research draws on the Elaboration Likelihood Model (ELM) to examine routes to persuasion, i.e., central or peripheral, as well as the moderating influence of motivation and ability of the target individual. This is a potent combination that enables examination of the position of the persuader as well as the response to the message of the target individual(s) being influenced regarding use of ICT in healthcare. Central route induced changes are generally considered more stable (and, thus, more predictive of sustained behavioural change) since they demand more deliberate and reasoned consideration. The ELM has been previously used in related research.

A structured questionnaire was created for subject interviews based on the ELM plus additional questions regarding their parents’ health condition and use of ICT for healthcare. A total of ten subjects, PhD students from an ehealth research institute in China, were interviewed. The choice of subjects was purposeful given their ICT and healthcare knowledge and opportunistic ability to persuade. Initial interviews lasted typically 30 minutes with
additional follow-up interviews after 1 month and 6 months to gauge the impact of their persuasive efforts. A coding scheme using tenets of ELM was created to assist in analysis.

4. Results

In this section we report the results from the initial interviews and 1-month follow-up interviews. The group of subjects was relatively similar e.g., average age 27.3 (range 24-29) with six females and 4 males (reflecting the gender balance of the research institute) spanning all four cohort years of the PhD program. All were ethnic rural and urban Chinese from scattered provinces in China. The subject groups’ families were diverse, e.g., half of the subject group had a sibling (average age 29.2 with a range of 22-37) which was rather unexpected given China’s 1-child policy. The average age of the parents was 55.5 for fathers (range 52-62) and 54.9 for mothers (range 48-64). The fathers were generally still working while the mothers were predominantly retired given the typical Chinese retirement age of 55 for women and 60 for men. Almost all of the parents had some health problems ranging from minor (e.g., a bit weak or occasional sore back) to major chronic diseases (e.g., diabetes). Heavy smoking on the part of the fathers was noted in four cases. Exercise patterns varied widely from predominantly sedentary to (in one case) very active (e.g., walking over 14,000 steps per day). Education level of the parents was typically pre-university albeit with a couple of exceptions, e.g., one mother is a Chinese medicine doctor.

4.1. Current use

Few of the parents exhibited any current use of ICT for healthcare and generally lacked advanced ICT skills, even though all used a mobile phone and some also had a computer in the home. The limited use that was evident was typically a result of the PhD student having purchased a special device (and instructed the parent in its use). For example, one student bought a step counter wristband for her mother (which she can monitor through her mobile phone) who has traditionally been a walker and likes the idea of her daughter monitoring (and communicating) her use. That mother also has a friend who uses a step counter wristband with whom she could compare results. Another student noted use of health information gleaned by her parents from television public service programs. Fathers particularly were absent in terms of demonstrated use of ICT for healthcare, even though some used a computer at work in addition to having a mobile phone. There were exceptions, however, e.g., “my father gets health messages [on his smart phone] about what food to eat [as a government service]” and “my father accesses the Internet and gives reports to my mother”.

Predominantly, parents preferred more traditional approaches to healthcare in terms of face-to-face interaction with medical professionals or discussing with friends their own age with similar medical conditions. Books and newspapers were noted to provide some healthcare related information. Consideration of use the Internet as a source of information was rarely recognized given the relative “newness” of the source and lack of perceived value. Decent Internet connectivity has not been prevalent (particularly in rural areas) in China until relatively recently (e.g., the past several years). Content availability and ease of searching and finding the right information was seen as a strong hindrance in effective current use. Lack of trust and inability to sort out good from bad information was also a pervasive concern.

4.2. Prospective use

All of the PhD students, though, had something in mind in terms of how they would like to see their parents use ICT for healthcare. This typically involved use of the Internet to learn more about the nature of their healthcare deficiencies and engage more with their children accordingly. Specifics ranged from disease sensitivity and drug availability (as well as purchase) to information and products to assist in cessation of smoking and excessive drinking. Some students hoped to convince their parents of the usefulness of online health communities, particularly to help them become better informed and screen need to see a doctor. Some students envisioned buying mobile devices as gifts for parents, e.g., for measuring exercise or monitoring blood pressure. Most felt that increased use of social media was in the offing and would be useful for their parents in sharing experiences as well as learning and communicating with other stakeholders, e.g., family and those with similar healthcare concerns.

Almost all PhD students felt that they could influence their parents (especially their mothers) in the increased use
of ICT for healthcare, e.g., “no problem talking to my mother” often with the help of others, e.g., “my aunt is a doctor.” Approaches were predominantly oriented around appealing to logic or reason based on information provided along with additional support, e.g., from classes, relatives or friends. However, many (especially the women) felt that a personal appeal would be particularly effective in combination with use of logic and reason as well as demonstration, e.g., “my mother is not very active but likes to exercise with me when I am home and could learn to use WeChat sport.” Most, especially the women, were optimistic in their persuasive abilities. As one noted, “of course, I’m the baby” while another said “my mother sees me like a sister”. Male children were more reserved, e.g., “maybe they’ll listen - but then likely will do whatever they want”.

4.3. Parent motivation

In terms of their parents’ motivation, most children felt that personal relevance was a particularly strong driver which, indeed, makes sense given the pervasiveness of health problems. However, the perceived ability of the parents to process persuasive information varied considerably. In general, relevant knowledge and healthcare familiarity and literacy were quite low. With relatively few exceptions (e.g., mother is a Chinese medicine doctor), the parents had poor educational levels and lacked exposure to opportunities. Ability of their parents to process advice regarding use of ICT for healthcare was questioned, at least to some degree, by most of the children as was parental ability to judge information quality. Further, although most parents, especially the mothers, had considerable available time to spend concerning healthcare, there were also distractions and some with little time for other pursuits, e.g., “still busy working.”

In general, the children expected that they would have to spend considerable time teaching their parents how to use ICT for healthcare once they had convinced them of the need and usefulness but accepted the responsibility without reservation. Parental ICT skills were judged as poor even though smartphones were ubiquitous and some had a computer in the home with Internet access. Phone use was typically limited only to audio with some texting and occasionally a bit of social chat (e.g., WeChat, a popular mobile phone social media application). Home computer use revolved predominantly around work extension with virtually no consideration of use for healthcare, e.g., searching for useful information or online healthcare communities. In short, the parents had not made the cognitive leap to considering ICT as a viable component of healthcare and were judged by their children as seriously lacking necessary ICT skills.

On the bright side, most students felt that their parents (especially the mothers) were interested in thinking about their suggestions and were generally open to change and trusted technology, albeit with a few exceptions and caveats, e.g., “my mother will only listen to the doctor, not me” and “not so willing to change – worried about money.” Another noted that “maybe my father might listen more after he retires.” The PhD students (except for one male) were generally confident that their parents were open to being persuaded to use ICT for healthcare with some noted exceptions, especially for fathers. As one female PhD student noted “maybe my father will quit smoking when I have a baby but my mother is OK to change.” In general, though, likelihood of parental change was seen as high and the students were optimistic to act as change agents given their evident respect and prospective responsiveness from their parents.

4.4. Follow-up (1 month)

The follow-up after one month to see the extent to which the students had been successful in influencing their parents’ use of ICT in healthcare was a bit more sobering than the initial outlook and expectation but hope remains universal. As one students noted, “There is little change. Over the next 5 months, I think I will introduce some useful mHealth device to them and try to teach them how to use.” Other students were similarly inclined to look to the future, e.g., “I prepare to buy [wearable] bracelets for them cause my mother not familiar with any intelligence device.” Another noted “I introduced them to use bracelets, but they did not know how to use it. So, I will help them when I go back to hometown in the summer holiday.”

Some success, however, was evident, e.g., with respect to encouragement for recording exercise in that “my father already has learned about how to use it by himself, and I found he changed the picture of his page into a famous leader he likes.” Another (who had initially doubted his persuasive ability) noted “I bought a new smart band for my parent. My father really likes it, and uses it to count steps and heartbeats. I will buy other new digital health instrument and teach them how to use.” The initial interviews definitely had an impact in generating
awareness and the students, by in large, followed through with their promise to encourage their parents to make more use of ICT for healthcare. As one student noted, “After the interview, I called my parents to talk about the usefulness of online Q&A. They said they will have a try. In the following months, I will show my parents how to use online Q&A to get information in detail. I think it is better to teach my parents face-to-face than through the phone.” The need for help was clearly apparent from other responses, e.g., “they begin to actively learn how to make an appointment online, but they don’t know how to use it, so they ask my sister to help them.”

There was also some behavioural change not explicitly attributable to use of ICT for healthcare. For example, “I bought some nicotine patches for my father. And then he stopped smoking for most of the time. There may be no ICT factors.” Another student, who had encouraged her mother to exercise more and eat less, reported “Two days ago, I saw her new picture -- she looks good.” There were also social influences other than children, e.g., “Someone who usually chats with her tells her that arm swinging is healthy, so she spends about half an hour doing this. She think it's effective.”

4.5. Follow-up (6 months)

The results from the 6-month interviews to judge the degree of sustained behavioural change with respect to parents’ use of ICT for healthcare were even more sobering albeit with reason for some optimism as well as insight on future direction. As one student noted, “As I was really busy over the past months, I spent little time to track my mum’s records. When she noticed that, she gave up using the fitband (also it may be because someone said the fitband is used for old people).” Another reported that “My father almost gave up smoking. But when his friend gives him a cigarette, he also smokes.” Another noted, “Still resist to use wechat sports I recommend” but has enlisted the help of her young very ICT literate niece to further the cause. It’s fair to say that a lot of the earlier confidence faded when faced with reality and the influence of others, e.g., neighbours and friends, beyond the scope of the students interviewed.

On a more positive note, one student reported “There is a change! When I went home, I showed my parents the function of a bracelet. They were very interesting in it. They want to know their steps and heart rate every day, especially when they exercise.” Some of the student efforts have been focused on associates as well as parents. As one noted, “I actually did some work to influence my boyfriend. I gave a band to him to monitor his heart rate while sleeping. The app showed that the heart rate fluctuated wildly and the highest rate reached 140. He was shocked. Then I search for the symptoms on Haodaifu and another online health community, and told him that he had something wrong with his nose and throat.” Unfortunately, her persuasive ability did not carry over to her father, i.e., “By the way, I still can't persuade my father to change his behaviour.”

A common theme from the students was the usefulness of ICT in concert with their persuasive attempts. All students and parents had (and used) a mobile phone with some having more than one device with differentiated usage. Although student use was generally broader in scope (e.g., more apps and extended use of chat), the common bond of being able to conveniently communicate by mobile phone established a platform of opportunity from which to encourage increased ICT use. Of particular note was the enlistment of wearables to promote wellness. Wearable devices provided a degree of freedom and novelty that parents appreciated as gifts with a relatively low barrier for use. However, wearable devices alone were not sufficient to sustain behavioural change with continued student interaction with their parents being noted as particularly important.

5. Discussion

The coding scheme driven analysis of the interview data yielded both expected and unexpected results. It was no great surprise that almost all parents have some health problems and that current level of use of ICT for healthcare was limited at best. It was somewhat surprising to see the general lack of Internet use. However, in reality, Internet use is only beginning among the “parent generation” in China given historically spotty availability and poor connectivity, especially in rural areas. Further, businesses have lagged in use of ICT although recent giants such as Alibaba and Tencent are rapidly changing the nature of service access and general use across both business and personal landscapes. Government agencies have only relatively recently come online to provide a range of
healthcare information. Expectations for increased use of the Internet are deservedly high which bodes well for more ICT use in healthcare.

It was also not surprising to see the interest in children prescribing more use of ICT for healthcare for their parents including phone apps and other mobile devices as well as extended use of the Internet for information discovery, online health community access and general social interaction (including keeping their children informed on their health status). Children, rightfully so, felt that extended use of ICT for healthcare was especially personally relevant to their parents’ healthcare circumstances and purchase of gifts for their parents would be well received. It was a bit surprising to see the lack of faith the children had in their parents’ ability to effectively process and make use of ICT for healthcare and special concern about information quality judgment. However, given the general lack of parent education and ICT skills, these concerns are not completed unfounded. Of note also is the reticence of fathers to engage, albeit fathers also generally had less time available given their work obligations. This may have been a consideration in children noting that mothers were more open to change, willing to listen and generally interested.

It was pleasantly surprising to see the extent to which the children were willing to try to persuade their parents to make more use of ICT for healthcare and their confidence in so doing recognizing that they might have to spend considerable personal time training and supporting such use. Children expected use of both central and peripheral routes to persuasion is noteworthy and makes route isolation difficult. Similar to Bhattacharjee and Sanford, we find that both the central and peripheral routes are viable ways of influencing parents in the use of ICT for healthcare. Such also was the case in earlier research gauging the persuasive impact of presentation visuals where arguments and perceptions of the presenter were both influential and intertwined. Results are also consistent with health psychology in that likely benefit is higher from a combination of efforts to effect change. Heightened risk appraisal alone is not as effective as in combination with message boosting coping appraisals, e.g., confidence about undertaking action. Towards that end, children have a natural advantage in encouraging their parents.

It was also comforting to witness the general willingness of parents to accept and make use of ICT gifts from their children although, in the absence of continued encouragement, that use could easily wane, especially in the presence of countervailing social forces, e.g., doubting friends. Ultimately, ICT can be a catalyst for change but sustained behavioural change requires concerted effort beyond ICT alone. Towards this end, continued interaction needs to accompany ICT use. Wearables (and their associated mobile apps) provide an opportunity in this regard to not only provide feedback to the user but also selected information to interested friends and family. Savvy vendors have made note of this in providing opportunities for text-based encouragement from designated “friends” as well as promoting challenges in addition to personal achievement badges based on accumulated results. Selected friends and family members seem more persuasive in this context than more general social-media interaction.

Children confidence abounds in terms of ability to persuade their parents, albeit females were more so that the men in this study. Children become intermediaries between healthcare professionals and can provide personal assistance in the use of ICT to overcome parental reticence and reluctance for use. Appropriately educated students have the potential to be ambassadors for change extending beyond their parents and can help enable change demanded to meet future healthcare needs. However, it becomes difficult to isolate causality with respect to the influence of children, even if they are “only children” (which was the case, somewhat surprisingly in China, for only half of our subjects). Parents are not only influenced by their children but also by their extended social network. To that extent, we have limited knowledge. The reality is that sustained behaviour change is difficult and not to be underestimated in terms of effort required. It is a sobering dose of reality in a world of optimism.

There are numerous implications for theory and practice, albeit ill-formed at the point in time given the exploratory nature of this study. In terms of theory, it is clear that it is exceeding difficult to completely separate central and peripheral avenues to persuasion to the point that it may be important to recognize joint occurrence in the elaboration likelihood model. In fact, it could possibly be argued that the central and peripheral routes are synergistic when combined and result in a whole greater than the simple sum of the parts. In terms of practice, the adage of “when in doubt, do both” applies here. It would seem there is little motivation in practically trying to separate central and peripheral avenues to persuasion, as is clearly apparent from contemporary advertising. The moderators in the elaboration likelihood model, especially in terms of ability to process and distractors, remain as salient aspects of persuasion.

There clearly are limitations of this preliminary study that warrant further research (which, in fact, is on-going). In China, there is a cultural expectation that children will care for their parents, which certainly is a consideration in terms of result generalizability. Further, the sample selected cannot be generalized to the broader population. PhD
students (we would hope) are in a position to be more persuasive than, perhaps, more typical children. PhD students are typically better informed and more eloquent than their less educated peers. The extent to which the more general population feels that they can influence their parents remains to be seen (as does parental response). However there is reason to be optimistic, given the general positive feelings most parents have for their children. Also yet to be determined is the extent to which the central route leads to effects that are more stable and persistent, noted by Petty and Cacioppo\(^2\). However, it may be asking the wrong question. Rather, a more pragmatic stance would be the extent to which the combination of central and peripheral routes leads to effects that are more stable and persistent. Research is on-going in this vein. Extension of our research to organizational contexts\(^13\) in terms of service creation and implementation remains as a challenge. Research in that direction is currently underway.

6. Conclusion

This research has sought to explore the usefulness of the Elaboration Likelihood Model (ELM) in the context of the persuasive impact of children on parents with respect to use of ICT for healthcare. Towards that end, the research has been informative in addressing the research question, i.e., What is the persuasive impact of educated young adult children on their parents’ use of ICT in healthcare? The answer to that question is positive in that children can indeed influence their parents, albeit with the caveat that separating central and peripheral routes to persuasion was not possible (and, perhaps, rarely is in practice). Children certainly can influence their parents in spite of difficulties in ability to process and distractions posed in real life, especially in concert with extended education. Going beyond children and parents to suggest that young elderly can have a similar influence in interacting with and influencing incapacitated seniors is an easy step. Much research remains but initial results look promising regarding the usefulness of ELM and the impact of children (and others) on adult use of ICT in healthcare.

References