

THE USE OF COMMUNICATION TECHNOLOGIES BY OLDER ADULTS: EXPLORING THE BENEFITS FROM THE USER'S PERSPECTIVE

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The use of advanced communication media may enhance the social networks of older adults. Although many older adults are open to new technology, there are still barriers that keep them from learning and using media such as e-mail and the Internet. Besides lacking skills, the lack of perceived advantages, or *benefits*, may also explain their reluctance. The goal of the present study was to investigate perceived context-related benefits of communication methods by older adults. Forty-eight independently living older adults in the age range of 65-80 years, 24 e-mail users and 24 non-users, participated in a focus group discussion of different communication scenarios. A systematic analysis of their comments and statements showed the relevance of perceived context-related benefit as a motivational factor for using or not using a medium. An implication of these results may be that training the skills to handle a new technology should also involve providing information about its specific benefits, from the user's perspective.

INTRODUCTION

The use of advanced communication media by older adults may enhance their social networks. In addition to traditional means, such as telephone and hand-written letters, communication by voice mail, cellular phone, fax machine, and recently via e-mail and the Internet has also been adopted by part of the older population. Indeed, studies on older adults' attitudes towards computers, and the use of automatic teller machines (ATM) (e.g., Czaja & Sharit, 1998; Rogers, Cabrera, Walker, Gilbert, & Fisk, 1996) show that older adults are open to new technologies. On the other hand, unfamiliarity, fear, the lack of skills, and missing background knowledge, and inaccessible devices keep many older adults from learning and using them (Rogers, Meyer, Walker, & Fisk, 1998). Apparently, these are barriers to overcome. Leveling them may be realized by increasing the accessibility of devices: make them easier, more transparent, and cheaper. However, this is not the whole story.

Several studies show age-related cognitive, mental, and physical change and decline (for a review see Craik & Salthouse, 2000). These changes do affect older adults' abilities, but also their preferences and priorities. As a consequence, older adults tend to be parsimonious; they spend their energy selectively, aiming at an optimal result. This principle of Selective Optimization has been observed in older adults' daily living and leisure activities (Baltes & Baltes, 1990).

Selectivity also applies to the domain of social relationships, and is called Socio-emotional Selectivity (Carstensen, 1991). Older adults tend to selectively limit their social interactions, and focus on relatives and close friends, that is, established relationships from which they can expect

immediate confirmation and support with low investment of energy and attention.

Another factor influencing older adults' preferences is their future time perspective. Even if they are relatively healthy, older adults realize their place in the life cycle, and experience their lifetime as limited, and, consequently, as precious. They tend to be present-oriented and are reluctant to spend their time in an unpleasant way. The promise of a future advantage resulting from spent effort, and possibly frustration, is not a sufficient incentive, especially since the guarantee of enjoying it in the long term is perceived as decreasing with age. This can be explained with the principle of Temporal Discounting: A postponement, or a delay-time, reduces the perceived value of objects, outcomes and rewards (e.g., Ainslie, 1992; Loewenstein & Prelec, 1991). This general psychological mechanism affects older adults' preferences to an even greater extent than those of younger adults (Melenhorst, 1999).

Presumably, a present-oriented attitude also affects older adults' preparedness to learn something new, such as how to deal with computers. The expected gain may be perceived as not worth the trouble. Furthermore, the expected time between the investment and the benefit may be perceived as too long, and devaluates the benefit.

The mechanisms and phenomena described above suggest that older adults' choices are based on a *cost-benefit analysis*; before deciding to make an investment (e.g., spend money, energy, and possibly encounter frustrations), they also seriously weigh the expected benefits. Besides the feasibility of using a new technology, the perception of the 'benefits' also affects its adoption, and may determine older adults' choices even more than the 'costs'. Increasing the *perceived benefits* of

new communication methods may encourage their use by older adults.

Increasing the perceived benefits implies that we need to make them visible and tangible for the user. For this we need insight into what exactly a 'benefit' means to the older individual.

Obviously, the benefit of a communication method depends on the purpose and the context of the communication. What is perceived as an advantage in one situation, can be a disadvantage in another. In other words, the perception of a benefit is assumed to be context-related. The relevance of particular communication contexts may differ across age groups. For example, as also stated above, older adults especially value the contact with relatives and close friends, whereas business contacts and making new friend play a minor role (Carstensen, 1992).

So far, no specific and systematic research has been done on the concept of *context-related perceived benefits* of means of communication, neither from a human factors, nor from a gerontological perspective. Therefore, an exploratory approach seemed most appropriate. The Focus Group method (Krueger, 1994) provides a structured, semi-open procedure to explore the concept, and is very suitable to serve our purpose. The present focus group study was scenario-based with the discussion centered on communications in different contexts. Both e-mail-users and non-users were included in this research, because the perception of benefits of communication methods may be related to familiarity with e-mail or the Internet.

METHOD

Participants

The focus group participants were 48 independently living older adults in the age range of 65-80 years, 19 men and 29 women. Twenty-five percent were African American, 10 % Hispanic, and 65 % Caucasian. Half used e-mail and half did not. Participants were selected from research volunteer pools in Miami, Florida, and in Atlanta, Georgia.

There were 13 focus groups of three to five participants. Eight groups were conducted in Atlanta, five in Miami. Six groups consisted of exclusively e-mail users, five groups of exclusively non-users, and two groups of all but one non-e-mail users. The participants received compensation of \$25.

Procedure

Participants filled out a home questionnaire for demographics and background information. At the beginning of the session they received scenario booklets containing nine everyday communication scenarios. The scenarios were constructed systematically, based on earlier studies and several pilot sessions, and can be considered as representative of the most relevant everyday life communication contexts for older adults. Contact frequency, emotional closeness of the

relationship, and the specific goal of the communication were systematically included. The variable 'geographical distance' was introduced per scenario by the moderator during the discussion.

In each 2½-hour session the participants discussed the nine communication scenarios in the booklet. The moderator asked for equivalent personal experiences, kept the participants focused on their preferences for particular communication methods in a particular situation, and asked for their motivation. Each session was recorded on audio tape.

Data analysis

The sessions were verbatim transcribed by a professional transcriber. The transcripts were analyzed independently by two coders, according to a coding scheme. This scheme consisted of different dimensions and categories, based on both the data and the research question. Comments on methods of communication were selected and coded along three dimensions: (A) the medium or method (e.g., telephone), (B) the communication context according to the scenarios in the booklet, supplemented with a category 'non-specific scenario' for general comments on a medium, and (C) motivation or consideration for using this method in this situation. Dimension C included 'benefit', 'cost', 'less or no cost', and 'lack of benefit'. *Benefit* was defined as an advantage, or positive statement about using a method, for example 'it is personal', 'you get an immediate response', or 'it has a certain anonymity, I like that'. *Cost* was defined as a disadvantage, or negative statement, for example 'it is pretty cold', 'you're uncertain if they received the message', or 'it is slow'. *Less or no cost* was a negatively stated comment about a disadvantage, for example 'it is not so expensive', or 'it doesn't interrupt me'. 'Cost' and 'less or no cost' do not necessarily involve financial aspects. *Lack of benefit* was a negatively stated comment about a benefit, for example 'for me it's not useful', or 'e-mail is not so warm'. Other categories in C were 'availability' (whether the method was available for one's communication), 'habit' (being accustomed to using this method) and 'skill' (being able to handle the device).

RESULTS

General description of the data

The 13 focus group sessions yielded 1,882 comments: 857 of e-mail users, and 1,025 of non-users. They were coded along the three main dimensions A, B, and C, with inter-rater reliabilities of 98%, 89%, and 82%, respectively. Table 1 shows the percentages of mentioned considerations (dimension C) for using different communication methods (dimension A). The categories 'benefit', 'cost', 'less or no cost', and 'lack of benefit' took account for 65% of the comments. The categories C5-8 – 'availability' (6% of all considerations), 'habit' (3%), 'skill' (3%), and 'other' (23%) – accounted for the remaining 35%. Approximately two-third of the comments in

the category 'other' expressed personal or social norms, such as 'You'd better not drop in unannounced', or 'It is inappropriate to make a phone call in a church'.

Thirty-two percent (603 in number) of all comments concerned the telephone, and 31% (556) the e-mail. The categories 'visit' (9%) and 'cell phone' (6%) were considerably smaller. The handwritten message, the answering machine, the fax, and 'other methods' are not included in Table 1.

Considerations per method, per participant group

The pattern of considerations for the telephone and visiting were similar for participants who did and did not use email. However, the patterns differed for the use of e-mail and cell phones. 'Benefit' formed the largest category of considerations for using any communication method, except for e-mail for the non email users, wherein 'lack of benefit' (25%) was more frequently mentioned than 'benefit' (18%). The non-e-mail users also mentioned fewer benefits of the cell phone, and were more likely to mention the lack of benefits.

'Cost' was the second category for all methods, again with the exception of e-mail and cell phone in the non-e-mail group, wherein 'lack of benefit' was larger. E-mail users

mentioned slightly more costs involved in e-mail than non-users.

Both e-mail users and non-users mentioned relatively fewer benefits of e-mail, compared to visit and telephone. Visit and telephone yielded mainly benefits and costs, and rarely any lack of them.

Context-related considerations

An additional issue of interest were the context-related considerations, that is, considerations to use a particular communication method in a specific situation. A selection of these data is described next.

Benefits of the telephone. Twenty-one percent of all mentioned benefits of the telephone were related to keeping in touch with someone emotionally close living at more than half an hour (traveling). Not many benefits of the telephone (5%) were mentioned for keeping in touch with someone living within a half an hour circle. Also the scenarios about arranging a long weekend with relatives, setting a time for a leisure activity with a friend, and immediately sharing exciting good news yielded relatively many benefits (13% of the mentioned benefits of the telephone each).

Table 1: Percentages of mentioned considerations for using communication methods by e-mail users, non-users, and total sample

Participant group	Consideration	Communication method				All means
		Telephone	E-mail	Visit	Cell phone	
Participants using e-mail	Benefit	41	27	38	38	33
	Cost	14	18	23	10	18
	Less or no cost	5	4	0	5	4
	Lack of benefit	6	15	3	10	9
	Categories C5-C8	34	36	36	37	36
Number of comments		305	288	64	42	857
Participants not using e-mail	Benefit	38	18	43	28	30
	Cost	16	16	24	11	18
	Less or no cost	10	2	2	5	6
	Lack of benefit	9	25	1	20	13
	Categories C5-C8	27	39	30	36	33
Number of comments		298	268	96	65	1025
Total sample	Benefit	39	23	41	32	31
	Cost	15	17	24	10	18
	Less or no cost	7	3	1	5	5
	Lack of benefit	7	19	2	16	11
	Categories C5-C8	32	38	32	37	35
Number of comments		603	556	160	107	1882

A closer look at the considerations within the scenarios revealed that the participants related different benefits to different circumstances; they were 'context-related'. For example, the most important benefit of the telephone for keeping in touch was 'intimacy' (i.e., the personal touch and the tone of the voice), whereas in the scenarios about appointments and arrangements 'interactivity' (i.e., discussing back and forth) was more relevant, and for impulsive communications, like sharing good news, 'intimacy' combined with 'immediacy' (i.e., directness or speed).

Benefits, costs, and lacking benefits of the e-mail. The considerations of e-mail users and non-users for using e-mail showed different patterns. The non-users addressed most of their comments to e-mail in general, and did not assign them to a concrete communication context. E-mail users were more specific. Exceptions were the comments of non-users specifically on 'keeping in touch over small distances', accounting for 16% of all perceived lack of benefit of e-mail. Furthermore, 30% of all benefits of e-mail were related to 'keeping in touch over long distances', mentioned by both users and non-users.

The relatively small categories 'availability' and 'skill' were concentrated on e-mail. Fifty-four percent of all comments on 'availability', and 70% of all comments on 'skill' were related to this method, most of them in a negative sense. They were made by non-users and addressed 'the method in general'.

A concrete, context-related benefit of e-mail was the enhanced communication frequency with relatives and close friends far away. Both users and non-users recognized this benefit. The above-mentioned 'lack of benefit' for keeping in touch over small distances was formulated as 'no need', because bridging the geographical distance was not an issue in this situation. The general costs perceived by non-users involved the required effort and energy to use or to learn e-mail. 'Lack of benefit' concretely pointed at no intimacy and lack of interactivity. Also 'no necessity' expressed a generally perceived lack of benefit of e-mail by non-users.

Benefits and costs of the personal visit. The comments on personal visit were mainly about 'benefit' and 'cost'. Both e-mail users and non-users highly valued the personal visit, especially to keep in touch with friends and relatives living nearby. Hardly any costs were mentioned. Visiting was also preferred for bringing bad news and to emotionally support someone having a hard time. However, also the costs were concentrated in these two scenarios: too much intimacy, resulting in embarrassment, was considered as undesirable. A generally mentioned cost was the time and effort to make a visit. A generally mentioned benefit was the intimacy of the physical presence, which made the personal visit irreplaceable for most of the participants.

DISCUSSION

The results of the present study showed that the older adults in the sample tended to associate using a method of

communication in a specific situation primarily with its advantages, or *benefits*. Moreover, these benefits were context-related.

'Benefit' was the largest subcategory for almost all communication methods. This was not surprising, because the group discussions were focused on 'which communication methods do you use', triggering positive considerations. It could also explain the smaller 'cost' category. Nevertheless, there was also room for negative comments and considerations. The participants were not forced to give these considerations in one or another form; they were free to mention disadvantages ('cost') as well as missing advantages ('lack of benefit').

The size of the 'cost' category through the whole data set suggested that it was more relevant than 'lack of benefit'. However, this larger 'cost' category applied to all media, except e-mail, where in the non-users group 'lack of benefit' was larger than 'cost'. Furthermore, the sample was generally homogeneous with respect to its comments on traditional methods of communication, in which 'cost', 'benefit' and social norms played major roles, but not with respect to e-mail. In the non-e-mail group, e-mail yielded negative comments, stated in terms of lacking benefits, whereas the comments of the e-mail users showed the reverse; they were positive, and also positively stated (that is, not as 'less or no cost', but as 'benefit'). Moreover, e-mail users and non-users mentioned equally as many costs, the users of e-mail even slightly more. A 'cost-driven' approach would have predicted more costs perceived by non-email users, and fewer costs perceived by users. The observations in the present study, especially the contrasts between e-mail and traditional methods, gave support to the relevance of the 'benefit' concept to understand the adoption of a new technology.

The e-mail users were more enthusiastic about e-mail than non-users, but also the users mentioned relatively fewer benefits of e-mail than of other methods; the benefits of established methods were more easily recognized. Although the cell phone is also relatively new, it seemed to be already fully embraced by the same group. This could be explained with its close resemblance to the telephone, a traditional method. However, the numbers of observations for cell phone were relatively small, which requires careful conclusions about this medium.

The results of the present study showed that the 'balance' of a cost/benefit analysis seemed determined more by benefits and the lack thereof than by merely costs. Knowledge of the benefits of media may be an important determinant for using them. Provided the benefits are valued sufficiently high, they may overcome the inhibitory effects of low usability and interface complexity. Outside the field of communication this is exemplified by the popularity of the VCR.

In the present study, the e-mail example suggested that the e-mail users felt the benefits outweighing the costs –and also the lack of benefits in some circumstances– whereas for the non-users the benefits were not visible, or were not weighty enough to overcome the costs. In contrast, the

established, traditional methods were primarily perceived as beneficial. This may partly explain why they are adopted and frequently used: not because they do not involve costs (they do), but because the benefits are large enough to overcome the costs.

Overall, the assignments of benefits, costs, and the other judgments coded on Dimension C were context-related; whether a benefit or cost was mentioned, depended on the particular scenario in which the communication method was discussed. This showed the context-relatedness of the concepts at an abstract level. Again, the e-mail deviated. The non-users rather assigned their considerations to the non-specific scenario, indicating that they did not see the *specific* use of the method. The judgments of e-mail users were more specific, comparable to the e-mail users' and non-users' judgments on traditional methods.

The assessment of the concrete contents of (lacking) benefits and costs showed that not all benefits and costs were the same, not even for one method. In order to convey the specific benefits of a communication method, the *concrete* context-related benefits, such as mentioned in the Results section, should be shown to the potential user. Also the assessment of 'gaps' in this perception –or perceived benefits lacking– should be concretely tied to the context of the communication.

The relatively strong negative representation of 'availability' and 'skill' in the non-e-mail group's judgments on e-mail suggested that also other factors, besides lacking benefits and costs, kept the older adults from using e-mail. However, also the e-mail users mentioned 'availability' and 'skill' in a negative sense, but in this group these barriers seemed to be overcome, possibly by the perception of concrete, context-specific benefits, that were not perceived by the non-users.

From this perspective, the enhancement of using the method should be more focused on showing its benefits, rather than on merely stimulating the availability or just skill acquisition.

To enhance the use of new technologies, training the skills may still be necessary. However, older adults are only motivated to make this effort when they see the benefits. A reason why older adults do not start or continue learning a new device may be *lack of perceived benefit*. Therefore, training programs should also provide information about the potential benefits of the technology. Such benefits should not be

considered in isolation and just focused on the device, but should explicitly include the merits for communicating with one's own social network, in diverse daily life contexts.

The present data are also relevant to the design of future communication technologies. For example, an understanding of the benefits that people perceive as most relevant to adoption of a communication medium might provide insight into how future systems should be defined. Moreover, if perceived costs are incorrect perceptions, designers could make efforts to make the systems more transparent such that costs would not be misconstrued by older users.

REFERENCES

- Ainslie, G. (1992). *Picoeconomics: The strategic interaction of successive motivational states within the person*. Cambridge, UK: Cambridge University Press.
- Baltes, P.B., & Baltes, M.M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P.B. Baltes & M.M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences* (pp. 1-34). Cambridge, UK: Cambridge University Press.
- Carstensen, L.L. (1991). Selectivity theory: Social activity in life-span context. In K.W. Schaie (Ed.), *Annual Review of Gerontology and Geriatrics, 11*, 195-217.
- Carstensen, L.L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging, 7*, 331-338.
- Craik, F.I.M., & Salthouse, T.A. (Eds.). (2000). *The handbook of aging and cognition*. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Czaja, S. J. and Sharit, J. (1998). Age differences in attitudes towards computers: The influence of task characteristics. *The Journals of Gerontology: Psychological Sciences and Social Sciences 53B*, 329-340.
- Krueger, R.A. (1994). *Focus Groups: A practical guide for applied research*. Thousand Oaks, CA: Sage.
- Loewenstein, G., & Prelec, D. (1991) Negative time preference. *American Economic Review, 81*, 347-352.
- Melenhorst, A.S. (1999). *Older people planning future holidays: The role of time*. Paper presented at the 3d Gerontechnology Conference, Munich, October 1999.
- Rogers, W. A., Cabrera, E. F., Walker, N., Gilbert, D. K., and Fisk, A. D. (1996). A survey of automatic teller machine usage across the adult lifespan. *Human Factors, 38*, 156-166.
- Rogers, W. A., Meyer, B., Walker, N., and Fisk, A. D. (1998). Functional limitations to daily living tasks in the aged: A focus group analysis. *Human Factors, 40*, 111-125.