Age as a Predictor of Media multitasking Behavior

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Abstract: Media multitasking−a simultaneous consumption of two or more media is a ubiquitous behavior and is a growingly popular habit which many people carry out on a daily basis. It has been seen that there are several predictors of media multitasking and age is one among them. The relationship between age as a predictor and media multitasking is a widely studied topic with contradictory inferences. In this paper, we report one of the earliest laboratory-based studies highlighting the relationship between age and media multitasking behavior of the Indian college students aged between 18 to 24 years. We investigate the relationship between age and media multitasking habit of the participants and find that for the chosen sample, the more age is, the more the media multitasking tendency is.

IndexTerms **- Age, Indian college students, Media multitasking**

I. INTRODUCTION

Use of media and media devices is a very prominent habit of modern human being [1], [2]. The prime motivation of this behavior is to stay connected, stay updated and not to be missed out in this age of super-fast communication and information exchange. Many a times, juggling with several media, in other words media multitasking, becomes an integral part of the modern speedy life. Media multitasking is a relatively recent leaning which is defined as the simultaneous consumption of more than one media, or as a rapid task switching from one work/media to another media. One of the primary goals of this leaning is to satiate one's emotional needs [3].

Media multitasking is growing by leaps and bounds among all sections of age group. According to earlier beliefs, technological divide was more prominent between the digital natives and the digital immigrants [4]. A study by Carrier, Cheever, Rosena, Beniteza, and Changa, [5] also found that the media multitasking behavior was more prevalent among the 'net generation' people than among the 'generation X' and the 'baby boomers'. Similarly, an eye gazing study[6] reflected that the young students had more frequent and short gazes in comparison to the older college staffs. In 2013, Voorveld and Goot [7] used seven age categories and studied the media multitasking habit of the Dutch participants. Though media multitasking behavior was found to be equally common among the younger and the old age group people, yet these age groups used different media combinations and their general media use trend also varied. They argued that this difference in media combination was a result of the cohort effects that different age group people come from. In a cross-national (for six countries) study of the pattern of media multitasking behavior in 2014, Voorveld, Sejign, Ketelaar and Smit [8] observed that ~~the~~ age is a significant predictor of media multitasking globally and that young generation is doing more media multitasking with a combination of new media (in comparison to the traditional media). This study suggested that nationality of the participants is another deciding factor in the media multitasking research because countries differ from each other as far as the availability and possession of media devices is concerned. In another cross national study [9] researchers met with a similar observation. They stressed that multitasking is prevalent among all age groups, but multitasking with media is more prominent among younger generation (18-24 years old) for all the countries. Besides, a media multitasking study on the Kuwait population [10] chose the sample of students within the age group of 18-22 years as they observed that this group of people had the maximum exposure to the information and communication technology and the highest ownership of media in their country. With the arrival of smartphones it was observed that smartphones are becoming popular among most children and adolescents in the USA and in the European countries. As a result, researchers [11, 12, 13, 14] are studying media multitasking behavior of participants of less than 16 years old. They argue that young people belonging to this age group experience major developmental stages and hence are more susceptible to media multitasking behavior. Thus, on the basis of internet penetration rate and exposure of media, researchers usually choose a sample from the college/university students or from the youth [15, 16, 17, 18, 19, 20, 21].

1.1 Age as a predictor

Empirical researches regarded age as a universal predictor of media multitasking [8]. However, while investigating the relationship between media multitasking tendency and age, researchers often met with conflicting results. In one such study Carrier, Cheever, Rosena, Beniteza, and Changa, (2009) [5] found that the "net generation" reported more multitasking than the "generation X" who reported to have multitasked more than the "baby boomers". Another similar study reported a comparatively less different media multitasking habits of those different generations [22]. Voorveld and Goot, (2013) [7] found that the youngest generation (13-16 years old) in their sample media multitask the most, but the difference with the other age groups is not significant. In another study [8] it was demonstrated that age is a significant predictor in deciding the media multitasking behavior with modern day media in the countries like the USA, the UK, Germany, the Netherlands, France, and Spain. On the other hand, only in the USA, the UK and Spain, age was found to be a significant predictor of multitasking with traditional media also. Kononova and Alhabash (2012) [10] suggested that even a minor difference in the age groups can reflect an observable difference in the media multitasking behavior. Thus, it may be inferred that younger people media multitask more frequently than the older people, especially with 'new media', and also that the multitasking behavior depends on the country in which the study took place.

There can be three explanations for this age dependence of media.

1. The life-span explanation[7] posited that the developmental processes in different phases of life create needs for specific types of media in a person's life, and she barely seeks for any changes in her habit of using those media. This tendency leads to the differences in media multitasking habits among different age groups.

2. Generational theory [6] talked about the tendency of the people of certain generation getting used to the types of media which they grew up with, and developing a distinct media multitasking habit.

3. Lastly, the cognitive elements of aging determines the media multitasking tendency of an individual, too. As an example, the flexibility in the allocation of attentional resources [23] and a reliance on spatial processes for coordinating deadlines is reduced with the increase in age[24] which might resist the older people to media multitask.

There have been many studies on the age dependence of media multitasking behavior of different nationalities. The choice of sample for a media multitasking study (with new media) based in a country depends on the following factors:

1. The national survey of the internet and the new media users of different age group
2. Ownership of mobile phones and other media devices among different age groups in a country.
3. Demographic factors such as gender, region-wise internet penetration and smart phone usage among different age groups.

Taking into account the aforesaid parameters, we realized that a study of the media multitasking behavior of the Indians will be interesting because on analyzing the national surveys of the Indian population we found that:

1. The 50% population of India is less than 25 years of age.
2. India is the second largest internet users globally and out of that 71% male and 29%, female are the Internet users in India.
3. There is a striking difference between the number of internet users in urban and rural India and the use of internet is much more common in the former part of India.
4. Further, the report finds that 32% of the users are College-Going Students followed by 26% Young Men mostly who are indulged in the internet activities. Among the female Internet users, the highest growth has been observed among the Non-Working women.
5. In a report titled "Digital Media-rise of on-demand content" (Deloitte, 2015) it has been found that more than half of the app users in India are aged between 18 and 24 years and a further 29% are between 25 and 35 (45% of these users reside in the 4 most populous metros of India).

The above data indicate that the urban college students in India have greater access to mediated technologies and more freedom in their use compared to their counterparts from the high schools and from the older age group. Hence, the young urban college students are exposed to media multitasking to the maximum extent. Based on these observations and the inference drawn from that we have chosen to conduct our studies on the Indian urban college students who were hostelers and were aged between 16 to 24 years. These discussions also lead to the following hypothesis which states,

H1: Age is related with media multitasking behavior such that the younger participants will media multitask more.

We are not aware of many laboratory based studies examining the media multitasking behavior of the Indian students and hence this study may be one stepping stone in this area of research.

With this introduction, we move onto the description of our studies. In the next section we discuss the methodology which is followed by results and discussions in sections 3 and 4 respectively.

2 METHODOLOGY

2.1 Participants

152 undergraduate students studying Bachelor of Technology (B.Tech.) at a technological institute in India voluntarily participated in the study. They were all residing in the campus hostel and belonged to the same institute. The sample was so chosen to maintain a uniformity in the technology supportive ambience and the academic environment that the students are exposed to. In the sample, 113 of the participants were males and 39 were females. The high male to female ratio in the sample might show imbalance and can generate bias in our studies but, this situation may hardly be avoided as the said ratio shows almost similar trends in the technical institutes in India, especially in those of national importance [25].

A pen and paper based cross-sectional questionnaires study was conducted in a strict laboratory setting. Since the study was based on media multitasking behavior, we had avoided presenting the questionnaire online that could have been a distraction for some. Also, each participant was called in the laboratory separately, and was asked to take the questionnaire in a single sitting without any electronic gadgets. They were first briefed about the media multitasking behavior and the procedure of the entire study, and were encouraged to ask questions if they had any. After taking their consent of participation, a set of questionnaires were given to them along with the instructions. They were instructed to fill in the questionnaires taking into account their behavioral activities in past one month (starting from the date of conduction of study). This instruction was given to avoid any recall-based errors that might creep in while filling up the questionnaire.

2.2 Measures

2.2.1 Media multitasking behavior

This construct is measured by Media Use Questionnaire (MUQ) developed by Ophir, Nass, and Wagner (2009). This is a fairly popular questionnaire and addresses 12 media activities such as: a) print media b) television c) computer-based video (such as YouTube or online serial episodes) d) music e) non-music audio (such as audio lectures) f) video/computer/mobile games g) fixed telephone and mobile phone voice calls h) instant messaging using social networking sites (such as Facebook, Twitter) i) SMS (text messaging using mobile phones) j) e-mail k) web-surfing l) other computer-based applications (such as word processing).

In the questionnaire, the participants reported the total time (in hours or in minutes) spent by them on each media on an average day (during the past one month beginning from the day of the test). Also, they reported how often they use other 11 media in conjunction with a primary medium (on a four-point rating scale: a) 'most of the time' b) 'some of the time' c) 'a little of the time' and d) 'never'). Questions designed may be answered with the help of this four-point rating scale. Following are two examples of the questions asked: "While reading print media how often do you watch television at the same time?", "While watching television how often do you listen to music at the same time?" and so on and so forth. With the aid of the replies, the Media Multitasking Index (MMI) was generated for each participants and the index, thus created, gives us an idea about the media multitasking behavior of an individual during a typical media-consumption hour. From the quantitative point of view, it tells us how many media a person uses during a typical media consumption hour on an average day.

In a pilot study with 5 participants, the test-retest reliability (within a time gap of 10 days) of the MUQ of the Indian college students (from the same institute) was 0.97 ($p < 0.01$).

2.2.2 Measuring Age

Each participant in the preliminary information was asked to report their age (age was asked as an open-ended question and was included as a continuous variable in the analysis).

2.3 Procedures

The study was conducted in a laboratory setting so that the participants could be free from distractions and it ensured high response rate. The participants were selected through an open advertisement and they participated voluntarily. On their arrival in the laboratory they were explained thoroughly the phenomena of media multitasking behavior. Since the study involved self-reported questionnaires, we made sure that the participants understood what kind of behavior they were supposed to report. They were also encouraged to ask questions. Before the commencement of the study they read a consent form which guaranteed confidentiality and anonymity of their participation. The study was administered in English language (which is the medium of instruction in the institution the participants belonged to).

3 Results

Due to poor response rate and incomplete data, data of 32 participants were omitted. Thus, the final sample comprised of 120 participants (Mean (M) = 20.9 years; Standard Deviation (SD) = 1.29; within the age range 18-24 years). There were 84 male and 36 female participants.

For analyzing the data, we first calculated the Media Multitasking Index and then applied simple linear regression analysis.

3.1 Media Multitasking Index (MMI)

We calculated the MMI from the following formula given by Ophir, Nass, and Wagner (2009)

$$\text{MMI}=\sum_{i=1}^{12} \frac{m_i h_i}{h_{total}}$$

Where m_i denotes how many media are typically used in conjunction with the primary medium i, h_i is the time (in hours) spent on an average day using primary medium i, and h_{total} is the total time spent (in hours) using all primary media on an average media usage day.

Using this formula, we get individual MMI score, and on averaging, we obtained a relatively normal distribution whose Mean (M) is 4.24 and Standard Deviation (SD) is 1.27 (Skewness = -1.16 (z-score); Kurtosis = - 0.23 (z-score)) for 120 participants.

Our hypothesis stated that age is a significant predictor of media multitasking behavior and the younger participants media multitask more. Taking age as the continuous variable (age is measured in days) we applied a simple linear regression analysis to examine the relationship between age and media multitasking behavior. Results suggested that age statistically significantly predicted media multitasking behavior, $F(1, 118) = 29.55$, $p < 0.0005$, accounting for 20% variation in MMI with adjusted $R = 19.4\%$ (a medium size effect according to Cohen, 1988). However, age was seen to be positively related with media multitasking behavior, and hence older participants showed more media multitasking tendency than the younger ones. Consequently, hypothesis H1 which suggested that younger participants will media multitask more was not supported.

4 Discussions

Research suggested that age plays an important role in media multitasking behavior such that those who are in a young group media multitask more than that of the older one. However these results sometimes differ cross-culturally. In order to understand whether age influences media multitasking tendency among Indian youth we conducted a laboratory based questionnaire study. We found that age is positively related with media multitasking behavior such that multitasking behavior is more common in older students as compared to the younger ones. This result is in sharp contrast with many other researches who suggested otherwise. However, we may argue that this difference may reflect the biggest cross-cultural difference in media use among the younger people. Since our sample was drawn from India which is a very diverse country in many aspects, there is a wide digital gap among the residents of metros, big cities, and of smaller cities. So, when the students converge to a nationalized university, they might start off with different media exposure which results in inhomogeneous media multitasking behavior. Students with very less media exposure may start off as Low Media Multitaskers, but after few years they might have good exposure of media environment and out of peer pressure, over-dependence on media, and enjoyment etc. their multitasking frequency increases. However, it has to be mentioned that this study does not aim to generalize the data to the entire Indian population which is much more diverse, but comparing and contrasting the media multitasking habits on the basis of geographical diversity may be an interesting research topic to be pursued in the long run. In a nutshell, our study suggests that both age act as predictors of media multitasking behavior, but the way they are connected differs with respect to the cultural backdrop of the sample.

5 References

[1] Foehr, U. G. (2006). *Media Multitasking Among American Youth: Prevalence, Predictors And Pairings.* Retrieved from https://kaiserfamilyfoundation.files.wordpress.com/2013/01/7592.pdf

[2] Rideout, V., Foehr, U., & Roberts, D. (2010). *Generation M2: media in the lives of 8–18-year olds.* Menlo Park (CA): The Henry J Kaiser Family Foundation. Retrieved from http://www.kff.org/entmedia/upload/8010.pdf

[3] Wang, Z., & Tchernev, J. M. (2012). The "Myth" of Media Multitasking: Reciprocal Dynamics of Media Multitasking, Personal Needs, and Gratifications. *Journal of Communication, 62*(3), 493-513. doi:10.1111/j.1460-2466.2012.01641.x

[4] Prensky, M. (2001). Digital Natives, Digital Immigrants Part 1. In *On the Horizn* (Vol. 9, pp. 1-6). doi:10.1108/10748120110424816

[5] Carrier, L. M., Cheever, N. A., Rosena, L. D., Beniteza, S., & Changa, J. (2009). Multitasking across Generations: Multitasking Choices and Difficulty Ratings in Three Generations of Americans. *Computers in Human Behavior, 25*(2), 483-489. doi:10.1016/j.chb.2008.10.012

[6] Brasel, S. A., & Gips, J. (2011). Media Multitasking Behavior:Concurrent Television and Computer Usage. *CYBERPSYCHOLOGY, BEHAVIOR, AND SOCIAL NETWORKING, 14*(9). doi:10.1089/cyber.2010.0350

[7] Voorveld, H. A., & Goot, M. v. (2013). Age Differences in Media Multitasking: A Diary Study. *Journal of Broadcasting & Electronic Media, 57*(3), 392-408. doi:10.1080/08838151.2013.816709

[8] Voorveld, H., Seijn, C., Ketelaar, P., & Smit, E. (2014). Investigating the Prevalence and Predictors of Media Multitasking Across Countries. *International Journal of Communication, 8*, 2755-2777

[9] Zwarun, L., & Hall, A. (2014). What's going on? Age, distraction, and multitasking during online survey taking. *Computers in Human Behavior, 41, 236-244, doi: 10.1016/j.chb.2014.09.0*

[10] Kononova, A., & Alhabash, S. (2012). When one medium is not enough: Media use and media multitasking among college students in Kuwait. *Journal of Middle East Media, 8*(1).

[11] Pea, R., Nass, C., Meheula, L., Rance, M., Kumar, A., Bamford, H., . . . Zhou, M. (2012). Media Use, Face-to-Face Communication, Media Multitasking and Social Well-Being Among 8- to 12-Year-Old Girls. *Developmental Psychology, 48*(2), 327-336. doi:10.1037/a0027030

[12] Cotten, S. R., Shank, D. B., & Anderson, W. A. (2014). Gender, technology use and ownership, and media-based multitasking among middle school students. *Computers in Human Behavior, 35*, 99-106. doi:10.1016/j.chb.2014.02.041

[13] Baumgartner, S. E., Weeda, W. D., Heijden, L. L., & Huizinga, M. (2014). The Relationship Between Media Multitasking and Executive Function in Early Adolescents. *The Journal of Early Adolescence, 34*(8), 1120-1144. doi:10.1177/0272431614523133

[14] Baumgartner, S. E., Schuur, W. A., Lemmens, J. S., & Poel, F. t. (2018). The Relationship Between Media Multitasking and Attention Problems in Adolescents: Results of Two Longitudinal Studies. *Human Communication Research, 44*(1), 3-30. doi:10.1111/hcre.12111

[15] Ophir, E., Nass, C., & Wagner, A. D. (2009). Cognitive control in media multitaskers. *Proceedings of the National Academy of Sciences of the United States of America, 106*(37), 15583–15587. doi: http://doi.org/10.1073/pnas.0903620106

[16] Cain, M. S., & Mitroff, S. R. (2011). Distractor filtering in media multitaskers. *Perception, 40*(10), 1183-1192. doi:10.1068/p7017

[17] Lui, K. F., & Wong, A. C.-N. (2012). Does media multitasking always hurt? A positive correlation between multitasking and multisensory integration. *Psychonomic Bulletin & Review, 19*(4), 647-653. doi:10.3758/s13423-012-0245-7

[18] Alzahabi, R., & Becker, M. W. (2013). The association between media multitasking,task-switching, and dual-task performance. *Journal of Experimental Psychology:Human Perception and Performance, 39*(5), 1485-1495. doi:10.1037/a0031208

[19] Minear, M., Brasher, F., McCurdy, M., Lewis, J., & Younggren, A. (2013). Working memory, fluid intelligence, and impulsiveness in heavy media multitaskers. *sychonomic Bulletin and Review.* doi:10.3758/s13423-013-0456-6

[20] Shih, S.-I. (2013). A Null Relationship between Media Multitasking and Well-Being. *PLoS ONE, 8*(5), 1-10. Retrieved from http://dx.doi.org/10.1371/journal.pone.0064508

[21] Yap, J. Y., & Lim, S. W. (2013). Media multitasking predicts unitary versus splitting visual focal attention. *Journal of Cognitive Psychology, 25*(7), 889-902. doi:10.1080/20445911.2013.835315

[22] Carrier, L. M., Rosen, L. D., & Rokkum, J. N. (2018, January 8). *Productivity in Peril: Higher and Higher Rates of Technology Multitasking*. Retrieved from Behavioral Scientist: http://behavioralscientist.org/productivity-peril-higher-higher-rates-technology-multitasking/

[23] Prakash, R. S., Erickson, K. I., Colcombe, S. J., Kim, J. S., Voss, M. W., & Kramer, A. F. (2009). Age-related differences in the involvement of the prefrontal cortex in attentional control. *Brain and Cognition, 71*(3), 328-335. doi:10.1016/j.bandc.2009.07.005

[24] Todorov, I., Missier, F. D., & Mantyla, T. (2014). Age-Related Differences in Multiple Task Monitoring. *PLOS One, 9*(9), e107619. doi:10.1371/journal.pone.0107619

[25] Government of India, Ministry of Human Resource Development. (2018). *All India Survey on Higher Education 2017-18.* Retrieved from http://aishe.nic.in/aishe/viewDocument.action?documentId=245