# Media Multiplexing in the United States

*By Max Kilger*

This paper investigates the phenomenon of media multiplexing whereby people consume small amounts of media content and then switch to another media channel. A profile of the differences in media multiplexing among a number of demographic groups is followed by an examination of the relationship between media multiplexing and media involvement. A look at the role of the Internet and how it relates to media multiplexing is also provided as well as a brief look at how advertising receptivity and media multiplexing intersect.

## Introduction

Media multiplexing involves the process by which people serially consume small, most likely incomplete "chunks" of media within a small period of time, then switch to the consumption of programming/content on another media channel. While a definitional cousin to simultaneous media consumption, this phenomena has been little explored. There may be non-trivial marketing and programming consequences that are associated with this phenomenon. Does media multiplexing mean that content programmers should aim for producing content in smaller chunks so that these media multiplexor are able to consume a complete segment of program content and perhaps stay on for the next segment? Or does programming short, segments of content facilitate media multiplexing and therefore encourage viewers/listeners/readers to abandon the media channel for another? These are complex questions and while this paper cannot answer them directly, it can provide some foundational beginnings upon which others may choose to explore further. An exploratory look at this phenomenon begins following the description of the data set below.

## Data and Method

The data source for this study comes from the one-day activity diary present in Simmons' wave 33 National Consumer Survey (NCS). The diary consists of a one-page activity matrix with 24 one-hour rows covering a single 24-hour day and 34 columns divided into three major categories: 1) Where were you? 2) With whom? and 3) What were you doing?

The NCS wave 33 study contains 9,882 respondents constituting a nationally representative sample. Inevitably not all respondents completely fill out the daily diary instrument and it is likely that some respondents do not even begin filling out the diary. This issue is a common one and is one of the major challenges of utilizing diary instruments. This makes it difficult to determine just what comprises a "completed" diary. The sheer number of definition permutations that one could designate as a completed diary further complicate the situation. Additionally, care must be exercised in the creation of a definition of a completed diary such that it does not selectively include/exclude diaries where it might inject some element of selection bias into the situation.

The three category structure of the NCS daily activity diary does not, in and of itself, provide certain guidance in identifying a completed diary. However, one logical definition might be to assume that there would be one check mark for each hour for each of the three major response categories, thus resulting in a minimum of 72 check boxes. One caution that should be observed with this potential definition is that this pattern depicts a respondent who is thorough and perfectly completes the diary. It was decided that the best solution was to create a more generalized derivative of this solution and so a completed diary was defined by having at least 72 check marks within the matrix, regardless of where in the matrix the check marks were present. This solution retained the idea that 72 check marks represented a level that could be seen as a completed diary while removing potential selection bias by requiring specific responses in specific sections of the matrix. This completed diary definition resulted in 4,924 respondents being classified as having completed the daily activity diary and they are selected for inclusion in the study.

## The Idea and Measurement of Media Multiplexing

The ever increasing presence and utilization of multiple media sources in the home has led researchers to study the rising phenomena of simultaneous media consumption (BIGresearch, 2003; Knowledge Networks, 2004). Related to simultaneous media consumption is the concept of media multiplexing. Media multiplexing is the serial consumption of different media channels within a short period of time. One example of media multiplexing is represented by an individual who watches 10 minutes of a television program followed by reading a newspaper for 15 minutes and then followed by reading a magazine for 20 minutes. Media multiplexing represents the fractionalization of media content, the consumption of media in segments rather than in whole pieces. Media multiplexing has potential consequences for media content creators who must now face the challenge of designing media content that can be consumed in discrete components.

The daily activity diary allows the operationalization of the concept of media multiplexing on an hourly basis for NCS respondents. Each row of the diary matrix allows the respondent to check consumption of traditional media: "watching television"; "watching a video"; "listening to the radio"; "reading a magazine"; "reading a newspaper"; "reading a book". Each of these activities is considered a media channel. Traditional Internet activities are also represented and in this case bundled into one media channel labeled traditional Internet: "on Internet - gathering information"; "purchasing something on the Internet"; and "viewing Internet websites". Finally, new Internet media channels are counted separately: "Internet radio"; Internet video webcasts"; and "Internet newspapers".

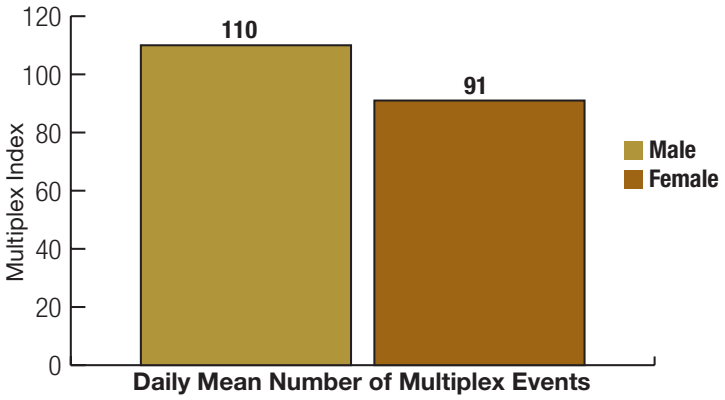
Respondents are allowed (in fact encouraged through an example) to check more than one activity within a 1 hour period. An intra-hour media multiplex is defined as occurring when two media channels are checked off by a respondent within a 1 hour row of the diary matrix. If the respondent checks three different media channels within a 1 hour row of the matrix then this would be defined as two media multiplex events occurring within that hour. The maximum number of media multiplex events that could occur within a 1 hour period is nine events. The total number of media multiplex events that a respondent experiences within the one-day diary is the media multiplex daily cume. Estimates of central tendency for these daily cumes can then be calculated for different demographic and behavioral groups for comparison purposes.

An examination of these daily cumes revealed that they were extremely sensitive to the cutoff point that defined a completed diary. Increasing the cutoff point from 72 to 85 check marks nearly tripled the mean number of multiplexing events. Given the sensitivity of the mean daily cume to the definition of a completed diary it was decided that comparisons across demographic and behavioral groups would be expressed in indices to the grand mean daily cume for all respondents with non-missing responses to the variable defining the demographic or behavioral group.

## Fundamental Demographic Profile

The first question of interest is, how do basic demographic groups compare in terms of mean daily media multiplexing levels? Figure 1 shows that men have a slighter higher than average number of media multiplexing events while women conversely index somewhat below average.

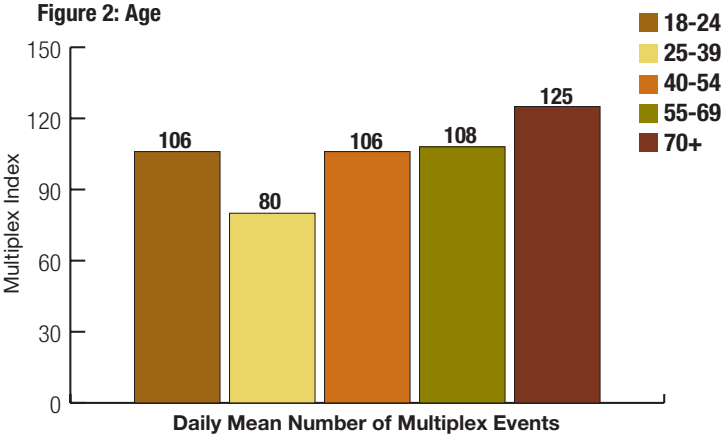
**Figure 1: Gender**




This somewhat contradicts some of the research on simultaneous media consumption where females are usually either on par with or simultaneously consume slightly more media (BIGresearch, 2003). However, this study counts different modes of Internet access (e.g. streaming video, radio or online newspapers) as multiple channels as compared to BIGresearch (2003) where the Internet is a single media channel and that may account for some of the differences.

Age is another area where media multiplexing appears to differ from simultaneous media consumption. As Figure 2 indicates, after an initial local maxima at age 18-24, the mean number of media multiplexing events begins a slow but steady rise as individuals age.

**Figure 2: Age**

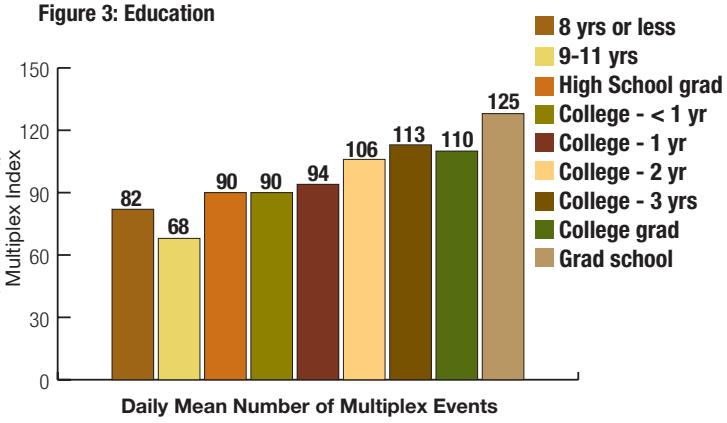



This may have some interconnection with simultaneous media consumption. As BIGresearch points out, as individuals get older, fewer of them practice simultaneous media consumption. It could be the case that these individuals as they get older find it more difficult to pull off simultaneous media consumption and instead convert this to serial consumption of media - that is, media multiplexing by switching from one media channel to another

within a short period of time rather than try to consume multiple channels simultaneously.

Education shows a clear trend in relationship to media multiplexing. As can be seen in Figure 3, starting with high school grads there is a general upward trend for media multiplexing as the level of education increases.

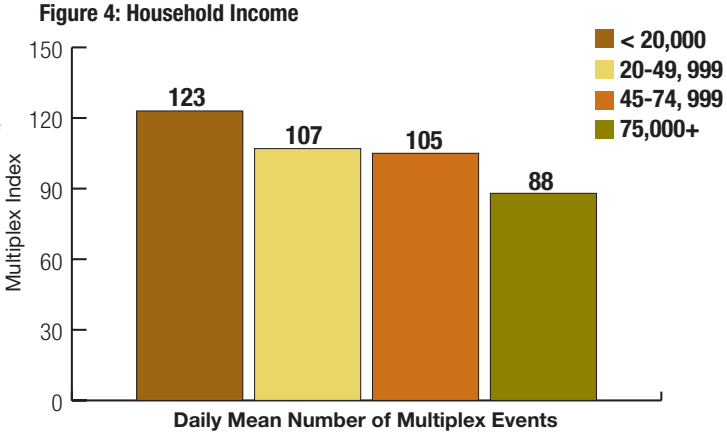
**Figure 3: Education**




The exact mechanism for this relationship is not clear. It might be due to the education process itself where college where students slice their time up into classes, studying and recreation and are able to manage a large amount of their free time, perhaps a ripe environment for media multiplexing. Alternatively, perhaps there is something about how education changes the individual and thus perhaps the way in which they view media. More theoretical research is need but it is clear that education has a cumulative effect on media multiplexing behavior.

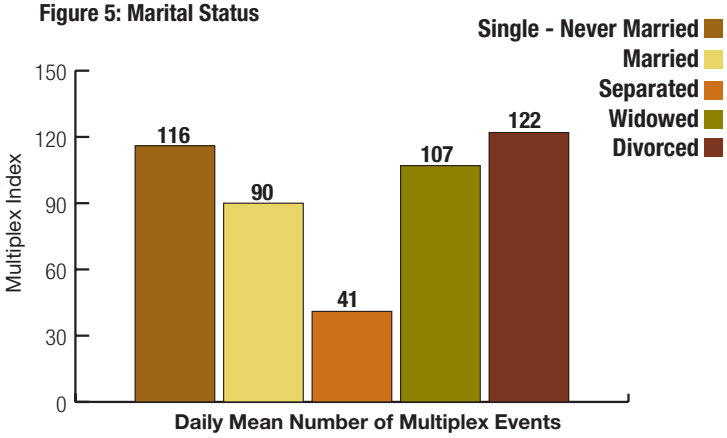
Interestingly and unexpectedly, household income has the opposite effect on media multiplexing than does education, as can be seen in Figure 4. This suggests that the nature of the relationship between household income and media multiplexing as well as education and multiplexing is **not** some sort of common socio-economic effect.

**Figure 4: Household Income**




Rather, it supports the ideas expressed earlier that the acquisition of knowledge or even the educational process itself may be responsible for some of the differences seen in media multiplexing. The inverse relationship of household income to media multiplexing also suggests that more parsimonious explanations such as having more income allows one to purchase a wider variety of and more numerous media channels are incorrect. One alternative hypothesis might be that individuals in households with higher incomes are spending more time earning this income as well as spending their larger levels of disposable income/available time on non-media consumer goods/services such as travel in lieu of consuming media. This would make sense in light of the fact that most media channels are relatively inexpensive (newspaper, magazine, cable service, Internet service) and most everyone can afford to access to at least some of these media channels. Further theoretical and empirical investigation of this phenomenon may reveal a more precise explanation.

**Figure 5: Marital Status**



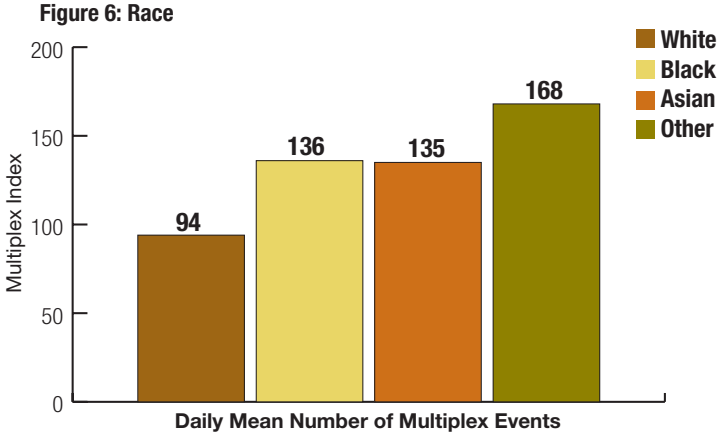

Martial status may also have an effect on media multiplexing. Having a close relationship with another individual such as the case if one is married is hypothesized to have an attenuating effect on media multiplexing because it likely reduces the time available for media consumption (and thus exposure to the risk of switching media) but also a spouse

may provide some of the entertainment and informative functions that different media might otherwise provide. Figure 5 mostly supports this idea.

Married respondents are somewhat less likely to engage in media multiplexing than singles, separated or widowed individuals. The exception is separated respondents who are much less likely to media multiplex than anyone else. Perhaps because separated individuals are preoccupied by details of their in-distress relationship they lack the time necessary to devote to significant media consumption. A cursory look at marital relationship and Simmons' measures of newspaper, radio and television involvement within this sample suggest that separated individuals are less likely to be involved with media, although the sample counts for separated individuals are small enough to add a note of caution to this suggestion.

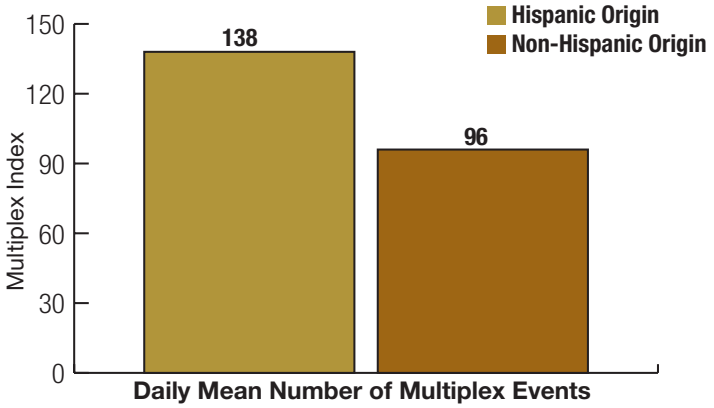
Race and ethnicity are also important demographic factors that may be related to media multiplexing. Figure 6 reveals that non-white racial groups have significantly higher levels of media multiplexing than do whites. Both Blacks and Asians exhibit more than a 50% higher incidence rate for media multiplexing than whites.

**Figure 6: Race**



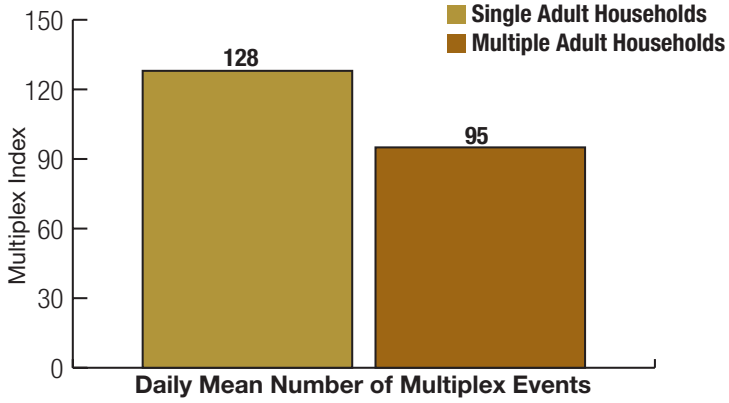

One reason that this might be the case is that these individuals have, in addition to general media channels, other media channels (radio, television programs and cable channels, magazines, etc.) that are specifically targeted at their particular cultural group and thus more opportunity to consume and switch between media channels. Further evidence that this is a cultural or ethnic rather than a purely racial phenomenon is raised by Figure 7 that shows that Hispanics also have much higher incidence of media multiplexing than do non-Hispanics.

**Figure 7: Hispanic Ethnicity**




Finally, we examine the relationship between number of adults in the household and media multiplexing. If the theory about entertainment and information opportunities from the marital status holds then we should see that multiple adult households, with other adults available to provide engagement, should have lower incidence rates of media multiplexing than single adult households. In fact, looking at Figure 8, that does appear to be the case. Households with more than one adult in them have an index of 128 when compared to the grand mean number of media multiplex events in the data set while single adult households under-index at 95.

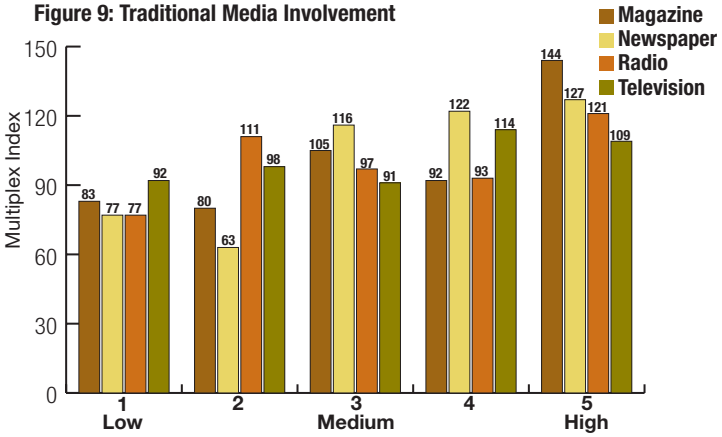
**Figure 8: Single versus Multiple Adult HH**



## Involvement in Media

There are several contrasting arguments that could be argued in terms of the relationship between media involvement and media multiplexing. On the one hand, it could be argued that individuals who are not very involved with a specific media may spend only a limited amount of time before moving on to another media that either is more attractive to the individual or perhaps another media where their involvement is also low. This would suggest that media multiplexer might be individuals who show low media involvement amongst one or more media channels. On the other hand, people who are highly involved in more than one media channel may hop from media source to media source satisfying their high level of need to consume media. Figure 9 below illustrates the indices of respondents in the data set for magazine, newspaper, radio and television involvement.

**Figure 9: Traditional Media Involvement**

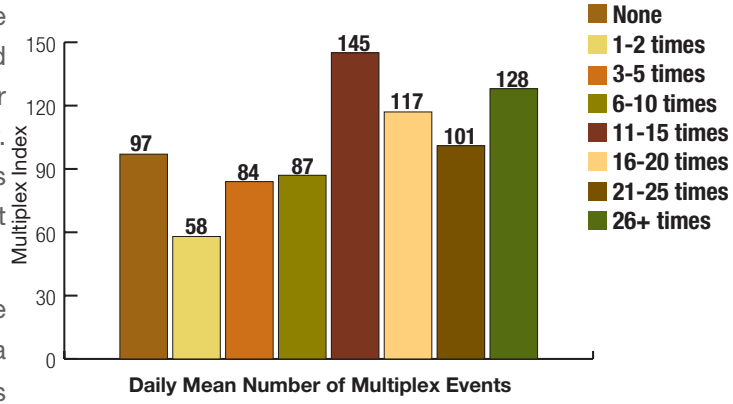



These involvement measures are proprietary media involvement scales that measure among other things a respondent's reliance on that medium as their main source of entertainment (excepting newspapers), their reliance on that medium to keep them informed and other medium-relevant indicators. As Figure 9 shows, there is a definite pattern to the relationship - that is, there appears to be a positive relationship between media involvement among traditional media and media multiplexing - suggesting that the "hopping" hypothesis where individuals are attempting to fulfill high media needs makes more sense in this situation.

## Involvement with the Internet

The Internet has brought about a number of new ways in which people consume media. Therefore it would be logical to assume that there is some sort of relationship between involvement with the Internet and media multiplexing. The relationship is likely not to be as straightforward as it was for traditional media because the Internet brings with it not only a new primary media channel but also variations of this media channel such as Internet radio, online newspapers and magazines and streaming or live video feeds. These variations are counted as new media channels in our schema and so the Internet provides more opportunities for media multiplexing given our analysis strategy. Figure 10 maps the media multiplexing indices against the number of times the respondent accessed the Internet in the last seven days.

**Figure 10: Number Times Access Internet Last 7 Days**

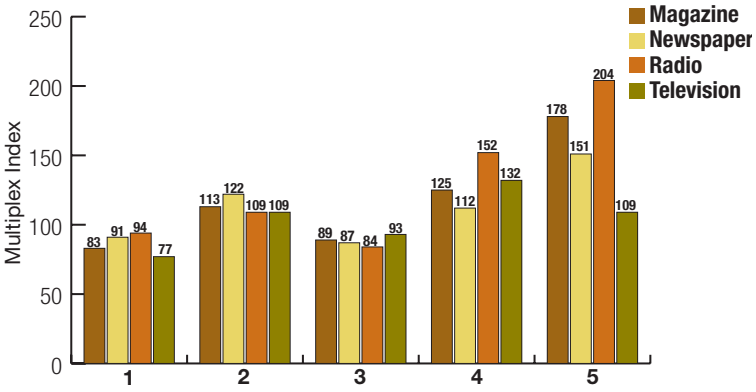



Notice that if you draw an imaginary trend line through the bars there is a general increase in media multiplexing as the number of access times increases, ignoring the None category for the moment. This generally corresponds to the concept that higher media involvement is positively correlated to media multiplexing. It is interesting to note that the "None" category for access the Internet in the last seven days has an index near the norm (97). This may be due to the fact that a number of the respondents in the None category may not have access to the Internet and so are actually missing

data points rather than actual zero use that week. Further and removal of these data points may reveal the answer to this question.

The Internet is unique in that it can deliver analogs of traditional media such as television, radio, newspapers and magazines. If that is the case, then one question that might be useful to investigate is how the Internet may be taking away consumers of traditional media and does this relate to media multiplexing. One possible answer lies in Figure 11.

**Figure 11: Spend Less Time with Traditional Media Because of the Internet**

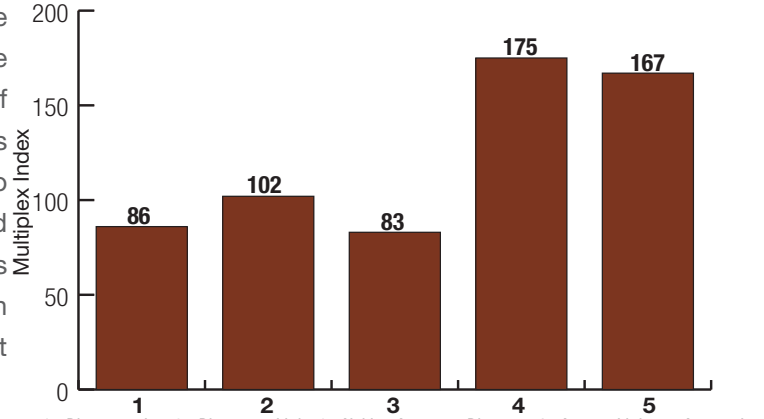



1= Disagree a Lot; 2= Disagree a Little; 3= Neither Agree nor Disagree; 4= Agree a Little; 5= Agree a Lot

Notice the increase in media multiplexing for those respondents that agree a little or agree a lot. The agree a lot category shows the most dramatic change with the exception of television. Those who agree a lot that the Internet has decreased their consumption of non-Internet radio have a media multiplexing index of 204, the highest in the traditional media groups, followed by magazines at an index of 178, newspapers indexing at 151 and television with an index of 109. One general conclusion that might be drawn from this is that the Internet is drawing away a particular kind of traditional media consumer - the higher media multiplexing consumer.

Why does television lie at the bottom of the four traditional media indices for the agree a lot category? One potential answer is that while video streams are becoming more and more popular on the Internet, there is still a dearth of program content beyond short video clips. As Internet bandwidth increases and video programming becomes more accessible and complete, one may expect to see this change as well and high media multiplexing television viewers may begin to desert traditional broadcast and cable television media channels.

**Figure 12: Internet has Become Primary Entertainment Source**




1= Disagree a Lot; 2= Disagree a Little; 3= Neither Agree nor Disagree; 4= Agree a Little; 5= Agree a Lot

This line of reasoning also suggests that people who are likely to consider the Internet as their primary source of entertainment are also going to be high media multiplexor. Figure 12 supports this idea, with high media multiplexing indices for those respondents who agree a little or agree a lot that the Internet has become their primary source of entertainment.

Finally, both the Internet and traditional media are environments rich in advertising streams. One important issue to resolve is how do media multiplexor perceive advertising and is it effective? While advertising effectiveness is a complex issue we can at least take a preliminary look at the relationship between advertising and media multiplexing. Simmons's NCS contains a proprietary advertising receptivity scale that incorporates such measures as finding advertising as interesting, a high level of "ad curiosity", and enjoyment in reading advertising.

Figure 13 reveals that there is a negative relationship between advertising receptivity and media multiplexing. That

is, people with low advertising receptivity are likely to be high media multiplexor. This suggests that advertisers on new media like the Internet may have a tougher time finding ad receptive individuals. This also suggests that it is possible that advertising might be one trigger for media switching that results in media multiplexing.

Does this mean that, for example, people who utilize advertising in their shopping decisions might have lower than average media multiplexing? Perhaps not, as Figure 14 indicates that people who agree a little or agree a lot have higher than normal indices for media multiplexing. Perhaps one explanation is that media multiplexor are accustomed to consuming media streams in smaller chunks, which may predispose them towards retaining content from the typical short advertisement on television or radio. More research here may help provide a clearer picture of just how advertising and media multiplexing fit together.

**Figure 13: Advertising Receptivity**

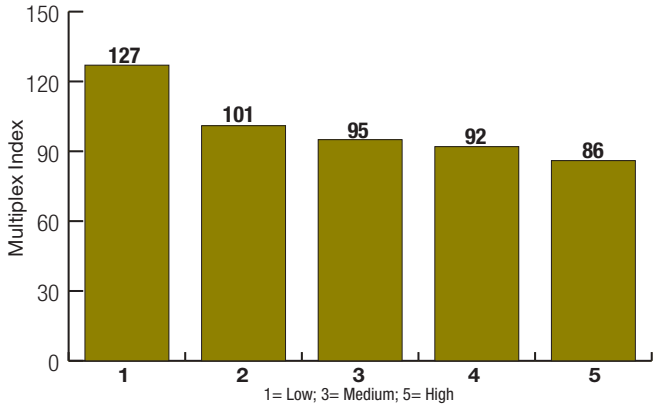
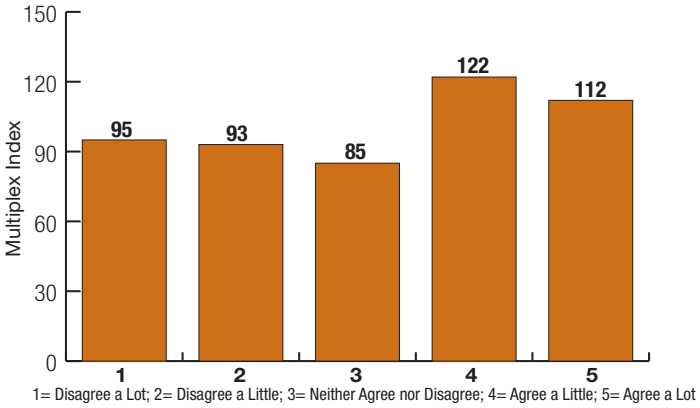



**Figure 14: Remember Advertising When Shopping**




## Summary

This paper has taken a basic look at the interesting phenomenon of media multiplexing - the behavior that represents individuals switching media channels within a small period of time such as an hour. We have examined how media multiplexing is differentially distributed among demographically different populations. Further we have examined the relationship between media involvement and media multiplexing. An extension of this investigation explored the relationship between the Internet and media multiplexing. Finally, a preliminary look was taken at the relationship between advertising receptivity, effectiveness and media multiplexing. It is hoped that this paper will generate further interest into this phenomenon.

## References


- BIGresearch, Simultaneous Media Usage Survey, October, 2003.
- Knowledge Networks, Multimedia Mentor, May, 2002.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