New Measures and a New Model for Television Network Loyalty (MOTNL)

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Network loyalty is of major interest to television program schedulers and advertisers. However, until now there has been no method for measuring the loyalty of individual viewers. This paper analyses People Meter data collected by Nielsen Media Research in New Zealand during July 2003. The data provides information on minute by minute television viewing for 1067 individuals in terms of channel and program genre. From this empirical data, new short-term and long-term measures of network loyalty are calculated for each viewer. The short-term measure of network loyalty can be used to monitor the frequency of channel switching within any 15 minute time slot, providing an essential reality check for television ratings. The long-term measure of network loyalty can be used by network schedulers to monitor performance. This data is used to test a postulated Model of Television Network Loyalty (MOTNL) in which network loyalty is linked to viewer demographics, socio-economic variables and viewing behaviour. MOTNL has significant implications for network executives in their programming choices as well as benefits for advertisers.

Keywords: channel switching, television ratings, network performance

Introduction

Television consumers have a plethora of choice while switching from one television network (channel) to another. This behaviour has caused O'Keefe (2005) to ask "Is anyone watching TV ads?", suggesting that people indulge in frequent channel switching in order to avoid advertisements. The network ratings, which are used to make advertising decisions, ignore frequent channel switching behaviour. This research attempts to address this problem by measuring and modelling an individual's short-term and long-term network loyalty in relation to preferred viewing time, network and genre, providing a tool which can be used to better inform pricing and scheduling decisions for television advertising.

According to Shachar and Emerson (2000), an accurate television viewing choice model is a critical working tool for both television network executives, who face difficult programming, scheduling and marketing decisions, and advertisers, who want to get the most from their spend. Shachar and Emerson claim that such a model can help television executives maximise ratings by improving both the scheduling and the characteristics of their shows. In addition it can help advertisers predict ratings and the demographic composition of the audiences. Many researchers have developed such rating models (e.g.; Rust, Kamakura, Wagner & Alpert 1992; Tavakoli & Cave 1996; Meyer & Hyndman 2006), however, the usefulness of these models to advertisers is questionable when there is no accompanying prediction of the frequency of channel switching as an indicator of reduced advertising attention. In this study we develop a model which describes the frequency of channel switching through the use of network loyalty measures.

Network loyalty is a multi-faceted construct that includes preference for a single network, as well as loyalty during programs and during commercial advertisements (Brosius, Wober & Weimann 1992). In this study the first of these elements is referred to as long-term network loyalty while the second is referred to as short-term network loyalty. This study attempts to develop new measures of individual loyalty from these two perspectives. It then seeks to

model these two forms of network loyalty in terms of demographic and socio-economic variables, and in terms of individual viewing behaviour. In particular, it analyses the relationship between these two measures of network loyalty and average daily viewing for 1067 individuals, while predicting all three of these measures from demographic and socio-economic factors and from the percentage of viewing involving various genres, times and channels for each individual.

The data used in this study considers 24 hour AC Nielsen channel data for a whole month, recorded minute by minute on an individual basis. This means that the data records any channel switch that lasts for more than one minute, allowing the development of two sensitive measures of individual network loyalty. To the best of our knowledge, People Meter television viewing data has not previously been used for this purpose.

This paper summarises the literature on network viewing without finding any reference to individual network loyalty measures similar to those described above. It then uses relevant literature to conceptualise the model of television network loyalty (MOTNL) proposed in this study. The methodology section involves a description of the data and the two new measures for network loyalty. In the results section the relationship between network loyalty, viewing behaviour, socio-economic and demographic variables is investigated, validating the MOTNL model and the two new measures of network loyalty. The paper ends with a discussion on the implications of the new network loyalty measures and the MOTNL model for television broadcasters and advertisers.

Literature Review

There are four strands of research that relate directly to this topic. The first strand is largely qualitative in nature, based on the observation of audience behaviour during programs and commercial advertising. The thrust of this qualitative research is the exposure of the flawed nature of ratings research which "equates presence with watching" (Morley 1990). As concluded by Zwaga (1992), television viewing is combined with a host of domestic activities resulting in a tendency for advertising commercials to be ignored. Using unattended video-recording of audience behaviour, Brennan and Syn (2001) have found that the proportion of time each individual has "eyes on screen" deteriorates considerably during commercial advertisements. Other researchers such as Lloyd and Clancy (1991) have investigated the relationship between audience involvement and advertising attention, suggesting that attention to advertisements increases when there is greater program involvement. Other research, by Hoffman and Batra (1991), suggests a relationship between audience involvement and program content, with greater attention to advertisements during cognitive impact programs, like the news and documentaries, as opposed to low impact programs such as situation comedies and action series. Danaher (1995) recalibrated People Meter data to give second-by-second ratings, allowing the calculating of ratings for advertisement breaks. He found an average drop in ratings of 5% during advertising breaks, with higher rating falls for movies and lower rating falls for soaps.

The second strand of research relating to network loyalty is more quantitative in nature using statistical models to predict network choice or network switching on the basis of People Meter data, similar to that used in this study. Moshkin and Shachar (2002) have considered models for the utility of network switching, correctly predicting 86.5% of switches in terms of genre, demographics and certain program details such as start time and cast demographics. Other authors have modelled network choice in a particular time slot on the basis of network

choice in the previous time slot, genre, demographics and time of day (Rust, Kamakura, Wagner & Alpert 1992; Tavakoli & Cave 1996; Meyer & Hyndman 2006).

The third related strand of research is based on viewing perceptions rather than measured viewing behaviour. Lin, Atkin and Abelman (2002) conducted a telephone survey of 836 respondents to collect data on viewing motivations, television affinity, network affinity, network awareness and viewing time. Their analysis gives support to a model in which network loyalty is related to demographics and viewing motivation amongst other variables.

Finally, program loyalty has been investigated in terms of repeat viewing by authors such as Barwise, Ehrenberg and Goodhardt (1982), Ehrenberg and Wakshlaf (1987), Zubayr (1999) and Brosius, Wober & Weimann (1992). Brosius considered correlations between program ratings in successive weeks while Zubayr used discriminant analysis to compare the characteristics of programs with low and high repeat viewing rates. Danaher and Lawrie (1998) developed two program appreciation scores based on the percentage of viewing for total program time, finding significant differences in appreciation relating to program type and viewer demographics. In particular there was greater commitment in the case of news shows and soap operas, with women slightly more committed than men and with the 40-49 age group the most committed and the 9-19 age group the least committed (except in the case of the show called "Home Improvements"). As explained in the next section this work on program loyalty provides many of the ideas for the conceptual model described below.

The research described in this article differs from the above four strands in that it considers quantitative measures of network loyalty at the individual viewer level. The authors believe that this is the first piece of research to address this important issue from a measurement and a modelling perspective. The model used to validate these measures has grown out of the television viewing literature as described below.

Development of Conceptual Model

The demographic and socio-economic characteristics of television viewers play a pivotal role in ascertaining criteria relating to why certain shows are frequently watched (Rao 1975; Webster 1986). There has been extensive research carried out on understanding the motivations and determinants for TV viewing from a British perspective (Tavakoli, Swann, & Cave 1989; Tavakoli & Cave 1996). These researchers have also looked for ways to examine the relationship between viewers and programs. Zubayr (1999) performed demographic comparisons for repeat viewing rates, finding that repeat viewing rates are slightly higher for women and for older people. It is therefore suggested that demographic and socio-economic effects will also impact on the two new loyalty measures developed in this article.

Purchasing of advertising time, based on predictions of a definitive television audience, has been researched from an academic and industry perspective by Cooper (1993). Forkan (1986) has challenged the accuracy of predicted audiences for specific time slots, and has explained how these projections have worked adversely for TV networks. If there is a large negative discrepancy between actual and estimated audience viewing, the TV networks sometimes refund advertising expenditure (Rust & Eechambadi 1989). However, even allowing for refunds, these negative variances are against the interests of advertisers in that they deplete resources from firms' marketing strategies. In this study we probe deeper, determining the time slots with lower network loyalty. If it can be assumed that lower

network loyalty means lower program involvement, the television ratings for these time slots probably provide an exaggerated view of audience participation.

TV viewers have the ability to view many networks within their immediate community, city, state, country and across the globe via instantaneous satellite broadcasts. Such extensive choice exacerbates channel disloyalty. Webster (2005) comments that, between cable television, direct broadcast satellites and other alternative delivery systems, over 80% of homes in the United States now have more access to local broadcasters. This means that the average television household in the United States can receive over 100 channels of programming. Webster suggests that having access to such a large volume of viewing material has two serious manifestations: audience fragmentation, which Webster claims is more advanced than is generally recognized, and audience polarization, which Webster says is the tendency of channel audiences to be composed of devotees and non-viewers. In this research we consider the New Zealand market with a much more limited choice in terms of networks. In this context we find a continuum of network loyalty rather than a dichotomy of devotees and non-viewers. In this study we will test whether an increase in choice as a result of other networks, such as Pay TV, results in a decrease in network loyalty.

The existence of dedicated channels for genre specific viewing, such as sports (ESPN, Foxtel, etc.) and news (CNN, BBC, etc.), have been utilised as a basis for some segmentation of audiences by the various TV networks. However, many other networks offer a diversity of genres affording audiences the opportunity of viewing an extensive range of programs without the need for network switching. Zubayr (1999) compared repeat viewing rates for 164 German programs over a four week period involving 2022 pairs of episodes. His discriminant analysis showed that news programs were associated with high repeat viewing rates, while fictional entertainment, such as comedy, was associated with lower repeat viewing rates. In this research, we attempt to investigate the relationship between genre preferences and network loyalty, testing whether Zubayr's findings are mirrored for our measures of network loyalty.

Based upon the above literature review, a theoretical framework called the Model of Television Network Loyalty (MOTNL) is developed to find the relationship between network loyalty and demographic/socio-economic variables across television viewing choices, in particular time, channel and genre. This model allows the testing of the following hypotheses.

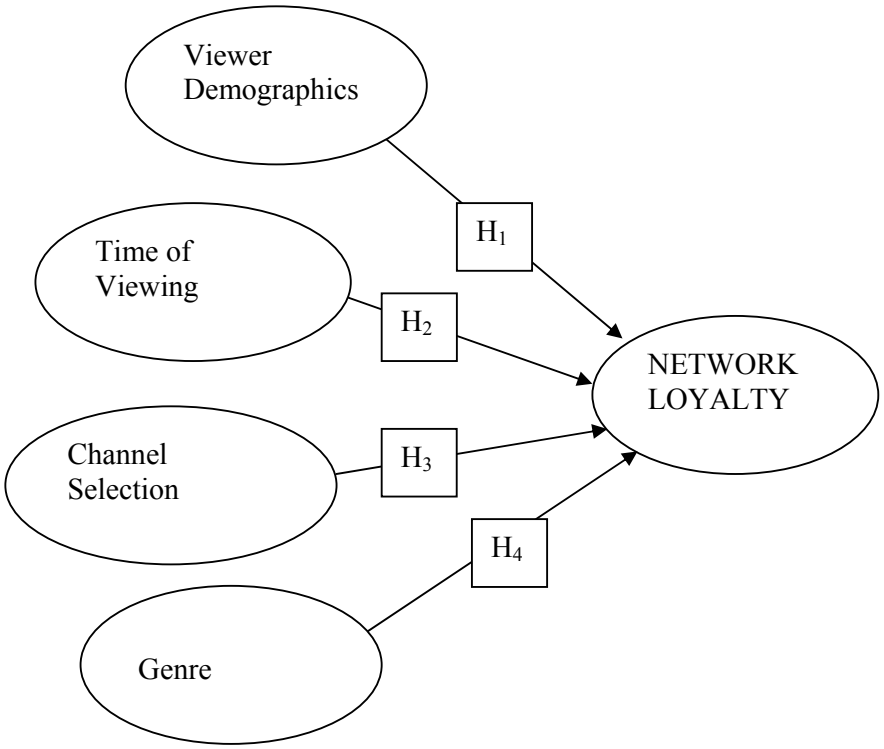
H_1 Demographic and socio-economic variables have relationships with network loyalty, with greater loyalty in the case of women and older viewers.

H_2 Time of viewing preferences have relationships with network loyalty, with less loyalty in the case of late night viewers.

H_3 Preferences for specific channel viewing have relationships with network loyalty, with less loyalty in the case of the PayTV channel viewers.

H_4 Genre preferences have relationships with network loyalty, with greater loyalty in the case of news viewers and less loyalty in the case of comedy viewers.

Figure 1. Conceptual Model of Network Television Loyalty (MOTNL)



The first hypothesis is tested by considering the impact of gender, age, number of household members, household income and levels of education on the two new measures of network loyalty. This is done using correlation analysis and analysis of variance, applying a Bonferroni correction when multiple tests are performed.

The second hypothesis suggests that there will be peak switching times. Zubayr's (1999) work suggests that repeat viewing is more likely during the day and least likely late at night so similar results are expected in terms of network loyalty. This will be tested using correlation and structural equation modelling.

Webster's (2005) work suggests that people with more network choices are less likely to exhibit repeat viewing. In this study people with access to Pay TV have more network choices so we expect less loyalty from these people. We will also test this third hypothesis using correlation and structural equation modelling.

According to Zubayr (1999), factual programs such as news, current affairs and magazine are expected to generate higher repeat viewing rates than the more light-hearted fictional entertainment genres such as comedy. We therefore expect similar results in the case of network loyalty, using correlation and structural equation modelling to test this fourth hypothesis.

Finally, program genre often dictates the specific type of advertisement that needs to be aired. McAllister and Giglio (2005) posited that advertisers try to prevent channel switching by increasing the promotional power of ad campaigns across diverse genres. Multiple Regression and Structured Equation Modelling are therefore needed to test the effect of the various genres simultaneously.

Also of interest is the correlation between loyalty and total viewing. Several authors, including Zubayr (1999), have found a strong positive relationship between repeat viewing rates and ratings. Our structural model allows us to investigate whether the two measures of network loyalty are related to average weekly viewing time, while testing for relationships between total viewing time, demographic and socio-economic characteristics and viewing behaviour.

Methodology

The data recorded by People Meters for the whole month of July 2003 was collected by Nielsen Media Research in New Zealand. In view of the impact of monthly pay packets on television viewing, a month was considered the shortest period for a study of this nature. The data provided viewing information for 470 households in 15 minute time slots for the three main "free to air" networks (TV1, TV2 and TV3) as well as smaller networks, with programs classified into one of 14 different genres (see Table 5). Viewing for households with more than one television set was aggregated.

A total of 47.6 million minutes of possible viewing time were analysed. For each individual, data was available for gender, age, level of education, annual personal income and household size. In addition data was available for individual television viewing behaviour, in particular average daily viewing time and the percentage of viewing time for each genre, for each network and for each three hour time block. Analyses were performed using SAS v9.1, SPSS v14 and AMOS v6.

Descriptive Statistics

A total of 1067 individual viewers were included in the panel. The majority of these viewers were female (52.4%). Most (66.6%) were of European descent, 11.5% were university graduates and 13.1% had an income of more than NZD50000 per annum (approximately US$25000 at that time). The favourite network was TV1 and on average only 8.2% of viewing time exacted a charge (Pay TV). Prime time viewing (5pm-8pm) accounted for only slightly more (36%) of the total viewing than late night viewing (8pm-11pm) at 35%, while day viewing (8am-5pm) accounted for 21% of total viewing.

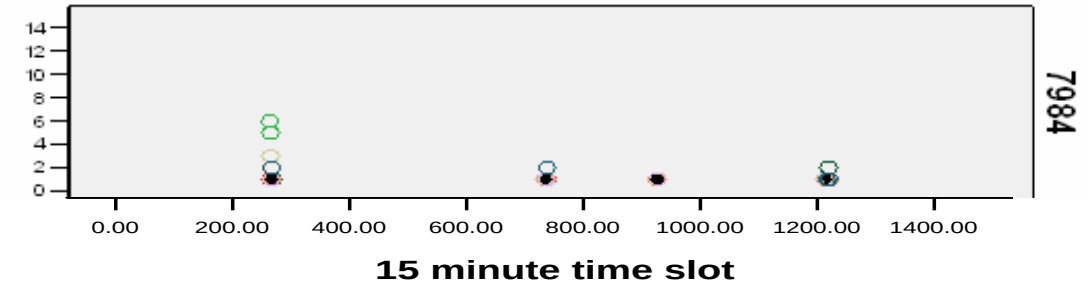
Measures of Network Loyalty

Two measures of network loyalty were considered for each individual. The first measure was obtained by dividing the total viewing time over the month by the number of network switches. No network switching was observed for 14 people. In these cases the total viewing minutes for the month was recorded for this first measure of network loyalty. Someone who always watches the same network will score very high on this measure whereas someone who likes to watch programs on a variety of networks will score much lower. This measure is referred to as long-term loyalty. The second loyalty measure was calculated as the average viewing time for each network viewed within a 15 minute time slot. Someone who frequently switches to other channels will tend to score relatively low on this measure. People who exhibit this behaviour are said to have low short-term loyalty.

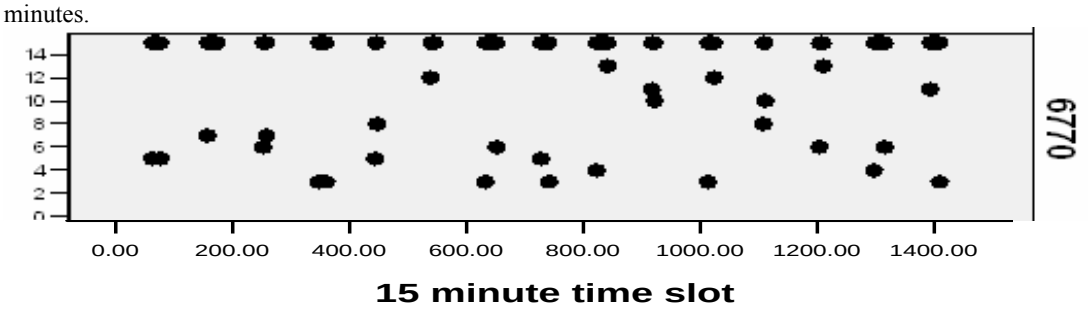
Long-Term Loyalty = (Total Viewing Time)/(Number of Network Switches)
Short-Term Loyalty = (Total Viewing Time)/(Number of Network Slots Viewed)

Figure 2. Illustrative viewing times for four people (7984, 6770, 6707 and 6696) in consecutive 15 minute time slots: 1st July – 15th July, 2003:

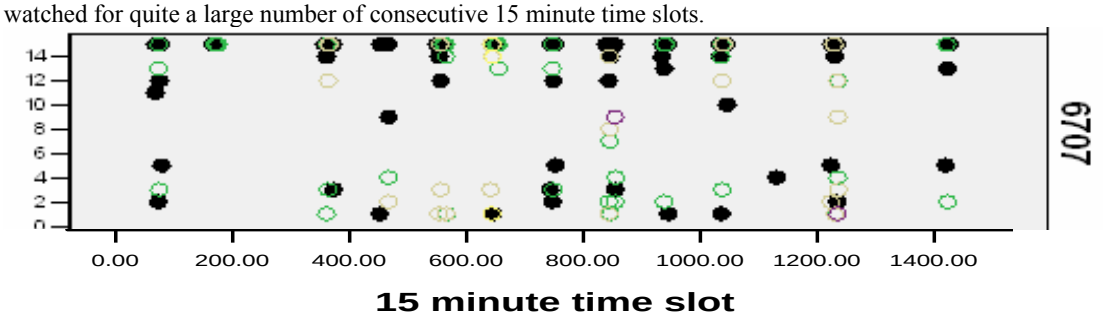
• TV1, o Various other channels



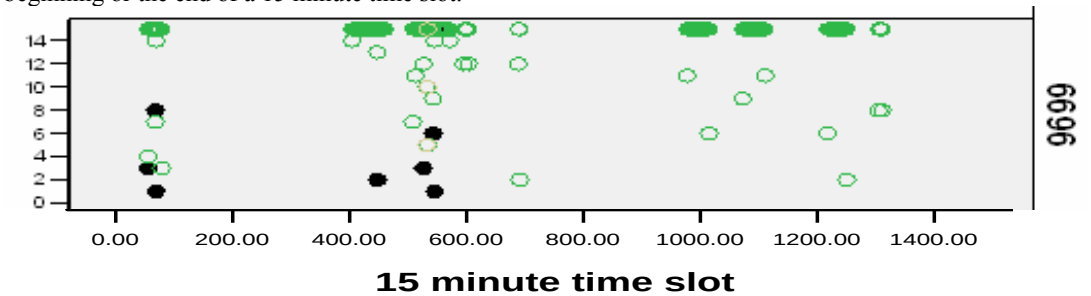
Person 7984 viewed television on only four days. Viewing was token in that in most cases there was a switch to an alternative channel within a minute. The longest period of continuous viewing for a single channel was 6 minutes.



Person 6770 watched television every day. On every day he/she watched only TV1. On almost every day he/she watched for quite a large number of consecutive 15 minute time slots.



Person 6707 watched television on 12 of the 15 days. Each day's viewing was characterised by a quite a large number of consecutive 15 minute slots but there was also some switching to other channels, usually toward the beginning or the end of a 15 minute time slot.



Person 6696 viewed television on only eight of the 15 days; however, he/she usually watched the same channel continuously for large periods of time, suggesting day viewing as well as night viewing. There was not much channel switching and very little TV1 viewing.

In order to understand the effect of viewing behaviour on these two measures we consider the four people described in Table 1 and Figure 2. Table 1 shows the network loyalty measures for these four people for July 2003 while Figure 2 illustrates the pattern of viewing behaviour for each of these people for the first 15 days of July 2003. In Figure 2 a circle with a time of 15 minutes indicates a time slot when the same network was viewed continuously for 15 minutes. A time slot with no circle indicates that no viewing occurred during this time slot. A time slot which has two circles directly above each other at (say) 1 minute and 11 minutes indicates that two different networks were viewed in this time slot for one and eleven minutes respectively. This suggests that the person switched between channels in this time slot. In Figure 2 a filled circle represents TV1 viewing while an empty circle represents some other channel. Note that there are ninety-six 15 minute time slots in every day.

Table 1. Illustrative loyalty measures for four people

Person	Average Daily Viewing (hrs)	Number of network switches	Long-term Loyalty (mins/switch)	Short-term Loyalty (mins/15 minute slot)
7984	0.3	259	1	4.0
6770	3.1	1	5731	13.9
6707	2.6	123	36	11.6
6696	3.8	31	226	14.1

Consider the long-term network loyalty measures in Table 1. Someone like 6770, who always watches the same channel (TV1) will score high on this measure, exhibiting long-term loyalty. Someone like 6707 who frequently switches networks will score much lower. This measure also takes into account average daily viewing time. Person 7984 has a particularly low measure of long-term loyalty, because he/she does not watch much television but still manages to switch channels quite frequently.

Now consider the short-term network loyalty measures in Table 1. Someone who watches for a continuous period of 15 minutes is considered to be exhibiting short-term loyalty while a person who watches more than one channel in the same 15 minute period is said to exhibit short-term disloyalty. This suggests a low measure of short-term loyalty for 7984 and, to a lesser extent, 6707, because both these people seem to switch channels frequently. However, as evidenced by their blocks of 15 minute viewing, 6770 and 6696 do much less network switching, tending to watch the same channel continuously for long periods of time. We therefore expect higher short-term loyalty measures for 6770 and 6696.

In summary this study has created two network loyalty measures for all 1067 individuals in the panel, based on their viewing behaviour in July 2003. The long-term loyalty measure favours people who tend to watch only one channel, while the second short-term loyalty measure penalises people who indulge in high frequency network switching. A graphical analysis of these measures indicates a positively skewed distribution for the long-term network loyalty measure and a negatively skewed distribution for the short-term network loyalty measure. This means that the majority of people had relatively low long-term loyalty measures, tending to watch a variety of channels, while the majority of people had relatively high short-term loyalty measures, being unlikely to indulge in high frequency switching behaviour. However, these two measures showed a very strong positive correlation (Spearman rho = 0.90) indicating that people who showed loyalty in a short-term sense were

likely to also show loyalty in the long-term sense. This is to be expected because people who are loyal to a single channel obviously will not engage in frequent channel switching.

For purposes of modelling, more symmetric loyalty distributions are required. This was achieved by applying a logarithmic transformation to the long-term network loyalty measure and a cubic power transformation to the short-term network loyalty measure, as illustrated in figures 3 and 4. Average daily viewing time also showed a positively skewed distribution which was corrected using a square root transformation. These transformations were necessary in order to ensure reliable significance levels for the following analyses and to reduce the impact of the extreme observations.

Figure 3: Long-term Network Loyalty before and after a normalizing transformation

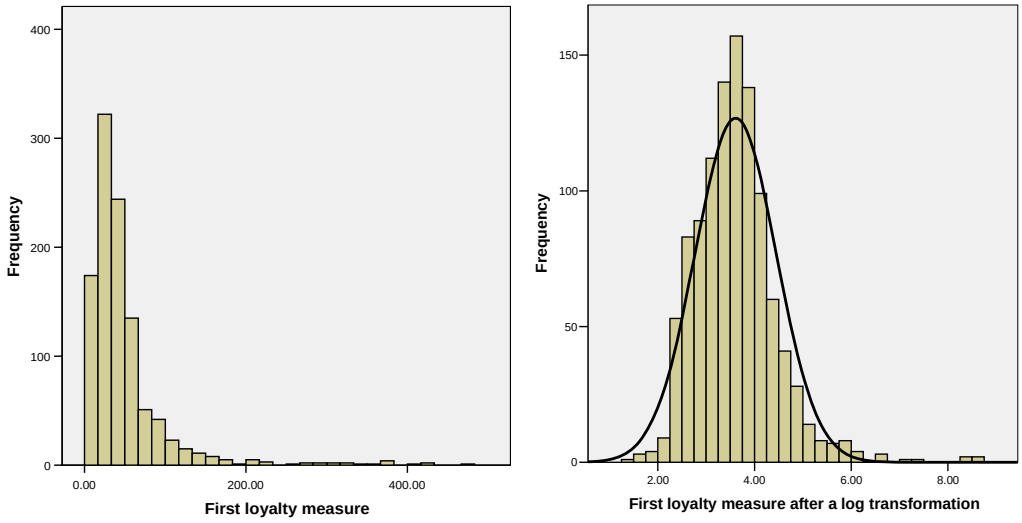
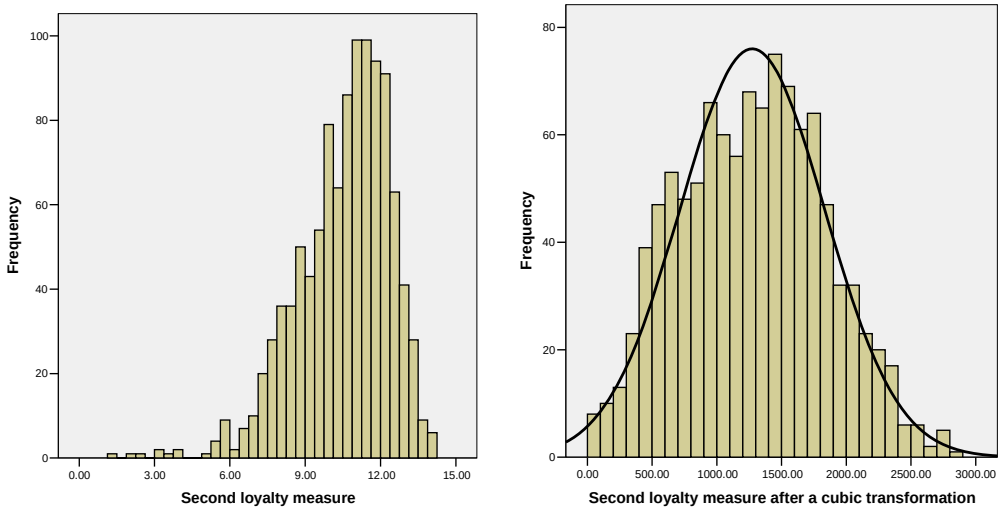


Figure 4: Short-term Network Loyalty before and after a normalizing transformation



Analysis of variance and correlation analysis were used to determine which demographic and socio-economic variables and which viewing behaviours were related to average daily viewing time and network loyalty. Hierarchical regression analysis was applied in order to assess the relative importance of these variables for predicting network loyalty, and structural equation modelling (SEM) was used to test the full MOTNL model.

Results

Relationships between the demographic/socio-economic characteristics and loyalty measures for each person were tested in Table 2 and 3, in order to establish whether there was support for the first hypothesis. There appeared to be little support for a claim of greater network loyalty in women. Also there was no significant difference in terms of average daily viewing times for males and females.

Table 2. ANOVA tests for Demographic/Socioeconomic variables

	Sample size	Long-term Loyalty (mins/switch)		Short-term Loyalty (mins/slot)		Average viewing (mins/day)	
		Mean	SD	Mean	SD	Mean	SD
Gender							
Male	506	49	57	10.41	1.88	174	135
Female	552	50	49	10.63	1.78	181	134
F(1,1065)		3.50		4.30		.22	
p-value		.061		.038		.640	
η^2		.003		.004		<.001	
Household Size							
1 person	87	72	81	11.08	1.84	236	141
2 person	265	56	65	10.82	1.57	221	132
3+person	706	44	42	10.35	1.89	154	128
F(2,1064)		17.3		15.1		38.0	
p-value		<.001		<.001		<.001	
η^2		.031		.028		.067	
Personal Income (pa)							
<$10000	439	48	47	10.55	1.88	162	128
$10000 – $39999	403	53	56	10.68	1.77	204	151
≥$40000	216	46	60	10.19	1.80	160	102
F(2,1064)		3.4		6.5		10.6	
p-value		.035		.002		<.001	
η^2		.006		.012		.019	
Age (yrs)							
≤15	223	49	51	10.46	1.91	137	104
16-29	168	47	52	10.39	1.84	131	123
30-49	347	41	40	10.22	1.91	176	128
≥50	320	59	65	10.97	1.58	233	145
F(3,1063)		14.5		12.5		36.2	
p-value		<.001		<.001		<.001	
η^2		.039		.034		.093	

However, average daily viewing was higher for people living in smaller households with one or two people (3.9 and 3.7 hrs per day respectively) than for larger households (2.6 hrs per day). For the long-term loyalty measure there was a significant but small household size effect with one person households showing on average more long-term loyalty than two person or larger households. One person households also showed more short-term loyalty than two person and larger households. It seems that larger households are more likely to practise multi-channel viewing and multi-channel searching. As can be expected, switching decisions made by a single person are less common than when there are two or more people making these decisions.

There were also significant differences in terms of income, with people earning more than $40000 pa showing less long-term and short-term loyalty, while watching less television than people earning between $10000 and $40000 pa. Loyalty and viewing were also relatively low for people (including children) earning less than $10000 pa. A comparison of age groups was particularly interesting. There were small but significant differences between the age groups and quite a large difference in terms of total viewing time. People aged over 50 watched the most television and showed the greatest short-term and long-term loyalty, while people aged 30-49 showed the least short-term and long-term loyalty.

Table 3 shows no significant education effects in terms of long-term or short-term network loyalty but there were significant differences in the case of average weekly viewing. People who had attended secondary school, without obtaining a school certificate qualification or higher, watched the most television, while university and other tertiary graduates watched the least television. The results in Table 2 and 3 provide some support for the first hypothesis, suggesting that advertisers should consider the loyalty of their target segments when making advertising decisions.

Table 3. ANOVA test for Education

Education	**Sample size**	**Long-term Loyalty (mins/switch)**		**Short-term Loyalty (mins/slot)**		**Average viewing (mins/day)**	
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Pre-Primary/Primary	217	54	55	10.66	1.82	154	135
Secondary	250	72	340	10.64	1.90	231	157
School Certificate	137	58	146	10.76	1.66	204	135
Matric/Bursary/6thform	78	41	35	10.38	1.81	149	107
Technical/Trade	121	134	655	10.59	1.74	184	114
University/Other Tertiary	255	76	288	10.28	1.91	137	100
F(5,1061)		1.51		1.99		19.22	
p-value		.185		.078		<.001	
η^2		.007		.009		.083	

Tables in the appendix show the correlations between the two loyalty measures and the percentage viewing for each network, each time slot and each genre. The significant correlations with night viewing in Table 6 suggest that short-term and long-term network loyalty decline late at night making these time slots of less value to advertisers, in that people who favour these time slots are more likely to practise channel switching, probably paying

less attention to advertising. The network correlations suggest that loyalty is highest amongst those that patronise TV1 and lowest among those who patronise "Other" networks such as "Pay TV" as expected. These results suggest support for our second and third hypotheses, confirming that the scheduling of advertisements is crucial in terms of viewer attentiveness. These results are demonstrated below in Table 4 by comparing network loyalty and viewing time for people with viewing behaviour percentage above and below the median. In all cases there are significant average viewing time differences, however, loyalty levels are similar for people with high and low preference for TV2.

Table 4. Comparison of network loyalty for people with network and time viewing patterns above and below the median

Percent Viewing		Long-term Loyalty (mean mins/switch)		Short-term Loyalty (mean mins/slot)		Average viewing (mean mins/day)	
	Median	≥median	<median	≥median	<median	≥median	<median
TV1	30.3%	53*	45*	10.65*	10.39*	195**	160**
TV2	24.2%	46	52	10.55	10.50	162**	194**
TV3	18.2%	41**	58**	10.40*	10.65*	168*	188*
Other	7.1%	32**	67**	9.89**	11.16**	198**	157**
2-5pm	6.7%	45**	54**	10.50	10.55	209**	146**
5-8pm	34.3%	55**	44**	10.65*	10.40*	160**	196**
8-11pm	34.5%	46	52	10.37**	10.68**	153**	202**
Viewing /day mean	153mins	50	49	10.83**	10.22**	274**	81**

* p<.05; ** p<.01: differences for low and high viewing behaviour percentages

Interestingly, although people who watch a lot of television tend to exhibit more short-term network loyalty it seems that they do not on average exhibit higher long-term network loyalty. This is good news for advertisers and television schedulers, because it suggests that high ratings are associated with higher short-term loyalty, even for people who watch a variety of networks. It seems that people who watch a lot of television are less likely to switch frequently between channels, suggesting more program involvement and hence, according to Lloyd and Clancy (1999), more attention paid to advertising.

Table 5 and the related table of correlations in the appendix (Table 7) provide some support for the fourth hypothesis. The factual genres such as news, magazine and current affairs have significant positive correlations with long-term and short-term network loyalty while the more relaxed genres, such as comedy and movies, tend to have negative correlations with both loyalty measures. On the whole correlations tend to be higher for long-term network loyalty than for short-term network loyalty suggesting that genre loyalty exists even for people who practice more frequent channel switching. Also of interest is the relationship between genre choices and mean daily viewing time, although the correlations are again relatively weak. It appears that comedy is popular with less loyal viewers who watch less television, while magazine is popular with more loyal viewers who watch more television. It seems that adverts screened during the news or magazine programs will receive more attention while adverts screened during movies or comedy shows will receive less attention. However, this may also have something to do with the times at which these genres are screened. A hierarchical regression analysis is needed in order to determine the relative

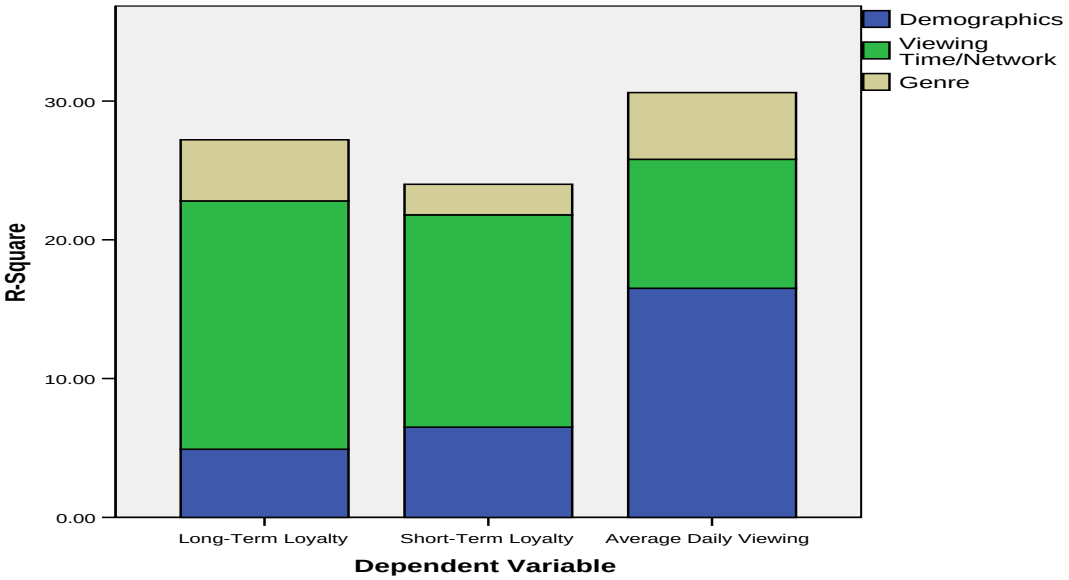
impact of scheduling and genre effects after allowing for the impact of demographic/socio-economic factors.

Table 5. Comparison of network loyalty for people with genre viewing patterns above and below the median

Percent Viewing		Long-term Loyalty (mean mins/switch)		Short-term Loyalty (mean mins/slot)		Average viewing (mean mins/day)	
	Median	≥median	<median	≥median	<median	≥median	<median
comedy	6.8%	43**	56**	10.30**	10.75**	165**	191**
current affairs	4.2%	53*	45*	10.59	10.46	180	175
documentary	5.8%	49	49	10.57	10.48	196**	159**
drama	10.8%	47	52	10.55	10.50	178	177
magazine	3.0%	54**	45**	10.84**	10.21**	204**	151**
movies	9.8%	41**	57**	10.33**	10.72**	176	179
news	12.7%	54**	44**	10.79**	10.26**	201**	154**
reality TV	4.1%	49	49	10.55	10.50	170	185
soap	6.7%	53*	46*	10.87**	10.18**	193**	163**
variety	3.0%	51	47	10.70**	10.34**	206**	149**
sport	5.4%	46*	52*	10.41*	10.64*	202**	153**

* p<.05; ** p<.01: differences for low and high genre viewing

Figure 3. Percentage of variation explained by Hierarchical Regression analyses



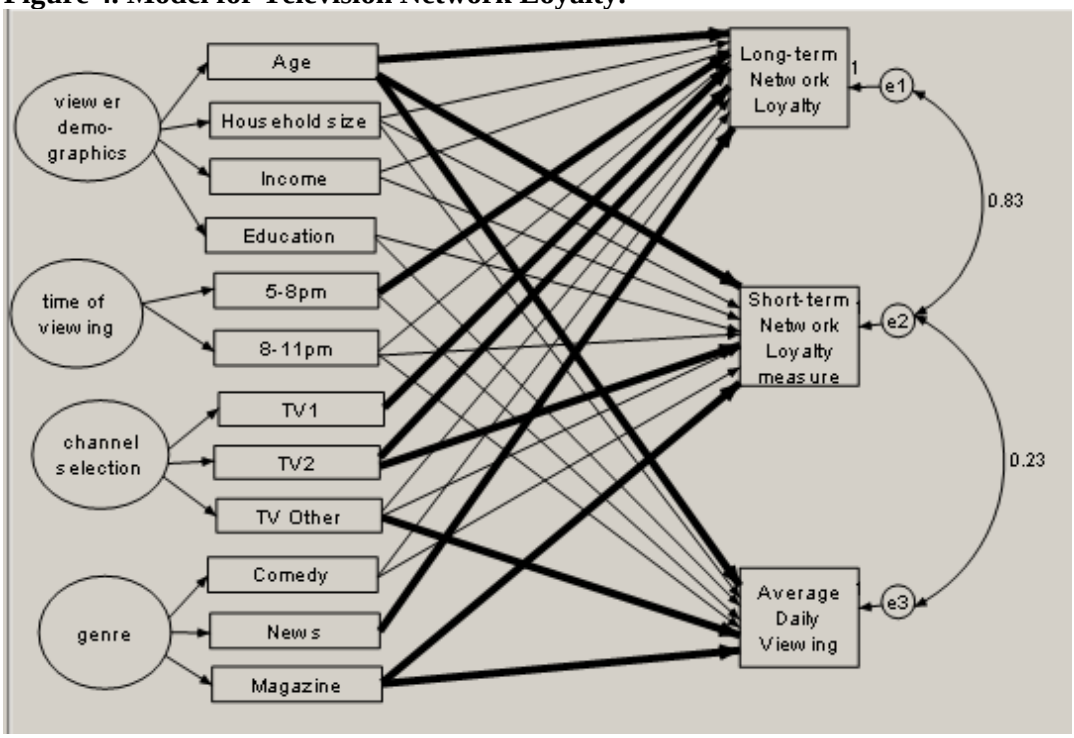
The results in Figure 3 suggest that demographic/socio-economic characteristics have more influence on average daily viewing time (R-Square = 16.5%) than on network loyalty. Whereas the demographic/socio-economic variables (gender, age, income, household size) explained only a small percentage of the two loyalty measures (4.9% and 6.5%), viewing behaviour in regard to preferred viewing time and network choice were particularly important, explaining an additional 17.9% of the variation in long-term loyalty and 15.3% of the variation in short-term loyalty. This suggests that advertisers need to take viewer loyalty

into account when scheduling advertisements. Although genre also seems to have some impact, explaining an additional 4.4% of long-term loyalty and an additional 2.2% of short-term loyalty, genre choice appears to have a weaker relationship with network loyalty than viewing time and network.

While the variation percentages explained in Figure 3 do seem low it must be recognised that our network loyalty measures are individual measures relating to personal preference rather than ratings. Researchers such as Abelman, Atkin and Rand (1997) found that the strength of viewer needs, motives and expectations determine media content selection. None of these variables are considered in this study. Lin, Atkin and Abelman (2002) have used these and other factors to predict 19% of the variation in network affinity and 28 percent of the variation in network-affiliation awareness. In particular, the frequency of network switching can probably be related to personality, which is also not considered in this analysis. With so many of the determinants of individual television behaviour ignored in this study, the R-square percentages are deemed to be acceptable for an explanatory study. However, predictions from this model should be regarded with caution.

The MOTNL model, fitted using structural equation modelling in Figure 4, serves to consolidate the previous analyses. Thicker lines indicate significant positive relationship while thinner lines represent significant negative relationships. The goodness of fit statistics confirm the appropriateness of the MOTNL model in the case of our data (Chi-Square=35.80, df = 23, p = 0.043, CFI = .998, GFI=0.995, AGFI = 0.978, Std RMR = 0.025, RMSEA=0.023 with a 90% CI of [0 ; 0.037]).

Figure 4. Model for Television Network Loyalty.



Note: Thick lines for positive relationships; thin lines for negative relationships.

This model suggests that people who exhibit long-term loyalty are very likely to also exhibit short-term loyalty ($r = 0.83$, $p<0.001$). This is expected because people who favour a single channel are unlikely to exhibit high frequency channel switching behaviour. The model also confirms that people who watch more television are more likely to exhibit short-term loyalty ($r = 0.23$, $p<0.001$), suggesting more attention for advertising amongst this group.

Conclusions, Implications and Future Research

Most of the hypotheses based on previous research have been supported by the above analyses, suggesting that our measures for network loyalty as well as our model of television network loyalty (MOTNL) have validity. This model, illustrated in Figure 4, has implications for network executives in their programming choices as well as benefits for advertisers.

If Lloyd and Clancy (1991) and Hoffman and Batra (1991) are correct in stating that attention to advertising will increase when there is more program involvement and more cognitive impact, then our short-term network loyalty measure should give a good indication of attention to advertisements. Our model for short-term network loyalty therefore allows advertisers to determine when ratings are likely to give a poor indication of advertisement attention. Programs focused on younger people, especially those with more education and more income, are likely to attract people with lower short-term loyalty, more prone to channel switching. Advertisers should be warned that ratings will over-estimate advertisement exposure for these programs. People who tend to favour the comedy genre are also likely to switch frequently. This is particularly true in the case of people who favour the "Other" television channels such as Pay TV and in the case of people who prefer late night viewing. However, people who prefer magazine programs and programs screened on TV2 appear to practise less network switching, as do programs appealing to older people, suggesting that ratings will give a more accurate estimate of advertising attention in these cases. In addition advertisers can use network loyalty information for budgeting purposes. Advertisements which have to retain the interest of the fickle but wealthy Pay-TV segment probably deserve larger budgets.

Our long-term network loyalty measure is associated with loyalty to a single channel. Interestingly the distribution of this measure seems to suggest a continuum of network loyalty, rather than the dichotomy of devotees and non-viewers described by Webster (2005). The same older demographic/socio-economic group that shows short-term loyalty also seems to exhibit long-term loyalty. This is particularly evident in the case of prime time viewers of news and magazine programs on the main free-to-air channels (TV1 and TV2). This result condones the high cost of prime time advertising. Long-term loyalty reflects the long-term appeal of a network's programs, and can therefore be used by network executives for monitoring program performance over time.

The regression results in Figure 3 show that the scheduling of programs is particularly critical in terms of network loyalty, with the ratings of late night programs being less credible than prime time ratings because the late night shows attract people with lower short-term loyalty. The key to successful marketing practices depends very much on high hit rate and conversion from advertisement viewing to the purchasing of products and services. It is therefore essential for organisations to recognise the importance of right-time advertising aimed at customers when they are most receptive to information. This result confirms the view of

previous researchers, such as O'Keefe (2005), that the reliability of television ratings does need to be challenged as a measure of advertising exposure.

However, the limitations of this research need to be recognised. Firstly it is not recommended that the MOTNL model be used to forecast network loyalty levels because the R-Square values are relatively low. Ideally the MOTNL model should be combined with the model of Lin, Atkin and Abelman (2002), using the strength of viewer needs, motives and expectations, as well as demographic/socioeconomic factors and television viewing behaviour, to predict the network loyalty of individual viewers.

Another limitation of this study concerns "channel switching" behaviour which cannot be monitored by People Meters. Brennan and Syn (2001) have found that people do not necessarily pay attention to advertisements while watching television. This passive form of 'channel switching' is not addressed in this study. In particular no attempt is made to investigate muting of sound during advertisements or to monitor activity during advertisement breaks, activities which are not often recorded by People Meters. Research is also required to determine the causes of network switching. Is it advertising avoidance or is it more a question of channel searching? Also who is responsible for channel switching? Does it represent the viewing preferences of all viewers present, or should this activity be tied only to the dominant viewer at any time.

Several uses for the two new loyalty measures have been suggested above but further research is required to operationalise the use of these measures in the television business. For example it may be appropriate to use the short-term loyalty measure to adjust the (demographic) weightings used in the calculation of network ratings, while the monitoring of monthly long-term loyalty measures for viewer segments could provide channel managers with a useful tool for monitoring the performance of programs targeted at specific segments.

Although previous research (Ferguson & Perse 1993; Neuendorf, Jefferes & Atkin 1999) suggests limited network mobility, it must be recognised that network choices are particularly limited in New Zealand. The predictability of network loyalty as a function of demographic/socio-economic variables, viewing times, networks and genres also needs to be confirmed in larger markets where there is more competition, especially in regard to the number of network channels. In particular, more research is needed to investigate People Meter data from other countries to ascertain the robustness of the MOTNL model and the reliability of the two loyalty measures. In addition the impact of personal video recorder (PVR) and high definition recording (HDR) technology (e.g. MySky launched in New Zealand in December 2005) needs to be investigated in relation to network loyalty. Just as Walker (1988) found that remote control devices produced more channel switching, it is expected that this "new" technology will also have a serious impact on network loyalty.

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Appendix

Table 6. Correlations of loyalty with viewing behaviour

Viewing Behaviour	Long-term Network Loyalty	Short-term Network Loyalty	Daily Average Viewing Time
Mean view time/day	0.03	0.24 **	1.00
Networks			
TV1	0.28 **	0.17 **	0.13 **
TV2	0.02	0.06	-0.15 **
TV3	-0.12 **	-0.01	-0.12 **
Other networks	-0.33 **	-0.35 **	0.09
Time Slots			
2am-5am	-0.03	0.02	0.20 **
5am-8am	0.03	0.01	0.08
8am-11am	0.06	0.04	0.00
11am-2pm	0.03	0.08	0.17 **
2pm-5pm	-0.02	0.02	0.13 **
5pm-8pm	0.23 **	0.09	-0.13 **
8pm-11pm	-0.17 **	-0.10 **	-0.11 **
11pm-2am	-0.17 **	-0.12 **	0.09 **

* p<.05; ** p<0.01

Table 7. Correlations of loyalty with genre viewing

Genre Viewing	Long-term Network Loyalty	Short-term Network Loyalty	Daily Average Viewing Time
Children	0.08	0.05	-0.11**
Comedy	-0.19**	-0.14**	-0.12**
Current Affairs	0.17**	0.06	-0.04
Documentary	0.02	0.05	0.12*
Drama	-0.10	-0.01	-0.07
Magazine	0.19**	0.19**	0.15*
Movies	-0.21**	-0.18**	-0.03
Music	-0.13**	0.07	-0.08
News	0.28**	0.15**	0.06
Reality TV	-0.11	-0.06	-0.07
Soap	-0.04	-0.01	0.05
Variety	0.06	0.10	0.12**
Sport	0.03	0.06	0.11*
Other	-0.11**	-0.12**	0.12*

* p<.05; ** p<0.01