Commentary and Debate Special Section Introduction: Defining media diversity

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Against the background of the current European competitive media landscape, the media are more and more compelled to legitimize their activities in their own national context as well as at a European level. Meanwhile, the nature of the media diversity in The Netherlands has changed tremendously; from a society divided along political and religious lines, it has evolved towards a multi-ethnic society. Hence, both the conceptualizing and operationalizing of media diversity from an academic as well as a media practical perspective prove to be hot topics.

An expert meeting was held at the Department of Communication at Radboud University Nijmegen in December 2004 in which the contours of media diversity in general and in The Netherlands in particular were explored. Institutional performance as well as program-related aspects linked to the notion of media diversity were discussed. Media diversity was explored from the angle of media economics (How many media actors are there? What about the competition? Is competition deadly or just healthy or somewhere in between?) as well as from the perspective of the program/ format level (Is it more of the same? A lot of imports? What about criteria for quality, innovation? Does the public broadcaster make any difference?). In addition, the audience reception perspective (Are these media production and distribution trends followed by media use patterns?) as well as methodologically problematic aspects one encounters when measuring media diversity were assessed. What follows here is a selection of several most pertinent views on this complex topic. We welcome each critical insight from other geographical contexts which might stimulate the debate on measures of open and reflective diversity in the media.

Media markets and media diversity

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Media markets have been increasingly subjected to market forces, in the expectation that markets force media organizations to respond effec-

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Measuring diversity and level of aggregation

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Over a period of three decades, a number of studies have focused on diversity in the media. Diversity is viewed as an important indicator for the performance of broadcasting systems and channels in a democratic society. A number of diversity studies are concerned with the theoretical and methodological side of media diversity. McQuail (1992; see also Napoli, 1999) distinguishes between different forms of diversity ordered along the sequence of production to consumption, namely source diversity, channel diversity, diversity of content-as-sent, diversity of content-as-received, and audience diversity. Furthermore, diversity can be measured in terms of different dimensions, such as program type, social/cultural diversity, diversity of opinion, etc. (cf. McQuail, 1992; Van der Wurff, 2004a, 2004b). A number of studies are dedicated to the empirical problems associated with the assessment of the degree of diversity. Van der Wurff and van Cuilenburg (2001), Hellman (2001), and McDonald and Dimmick (2003) review a series of diversity measures in terms of their appropriateness. This has led to a number of formulas, each measuring different aspects of diversity for specific objectives.

Diversity is an aggregate measure. To determine the degree of diversity one needs to aggregate data to a specific level of objects of analysis. Depending on the type of diversity one has to decide whether to aggregate within separate channels, the broadcast organizations, public versus commercial broadcasters, or the broadcasting system as a whole. This approach has resulted in measures such open diversity and channel diversity (Van der Wurff and van Cuilenburg, 2001). However, another dimension of aggregation that has been largely ignored is within what time slot should be aggregated. Empirical research normally determines diversity within 3-month periods (Van der Wurff, 2004a) or a year at a time (Hellman, 2001). However, the range of possible time slots is much wider, ranging from years, 6-months periods, 3-months periods, seasons, and months down to days, hours, and even minutes. The question is, what time slots are best for measuring diversity?

There are a few arguments why diversity may vary within these different categories of aggregation. For example, in summer months, people spend more time outdoors, which results in a smaller audience. This can lead to a shift in program strategies and a different program supply from the winter months. Some broadcasters reserve specific weekdays for specific theme nights (e. g., women's night, science fiction evening, sports evening). Specific months may be characterized by a high percentage of sports broadcasting because of special events such as the Olympics or international soccer tournaments. The broadcasting time also influences the types of programs that are aired. For example, programs at the beginning of the evening (18:00 − 19:00 hours) are often targeted at children. The outcomes of program strategies such as these could have consequences for the program supply that is actually broadcast and therefore for the degree of diversity.

In this context, the distinction between vertical diversity and horizontal diversity is relevant (Litman, 1979). Vertical diversity measures the number of program types offered by a (set of) channel(s) across the entire schedule. Horizontal diversity focuses on the amount of program choice the viewer enjoys at a given moment. It implies that a viewer tends to choose a program when watching television based on the programs available there and then, and not based on programs offered in the future, that might be of interest to the viewer too. Ignoring the diversity at that point in time does not do justice to one of the objectives of diversity issues, namely supplying the viewer with a rich program choice at a particular point in time. While vertical diversity is assessed extensively, horizontal diversity is underrepresented in research.

The following research questions focus on the degree of diversity:

1. To what extent is the Dutch program supply diverse?
2. To what extent is there variation in the diversity of Dutch program supply?

In order to assess whether it is justifiable to measure diversity at a higher aggregation level, we first must determine to what degree the proportional broadcasting time of different program types differ within levels such as months, weekdays, and time of broadcasting. The third research question is:

3. To what extent does the proportional broadcasting time of program types differ on a monthly, weekly, and daily level, as well as across the time of broadcasting?

If there are no differences between months in terms of program supply, one can ignore the individual months and measure program supply and diversity at a higher aggregate level (e. g., years).

4. To what extent does diversity differ within levels of months, week-days, and time of broadcasting?

Data and measurements

The data were made available by the *Stichting KijkOnderzoek*, a Dutch foundation responsible for gathering data on program output and audi-ence research. The data refer to 2003; more specifically, they only contain data referring to the time period between 6:00 pm and midnight. More-over, the data concerns the nine general channels predominantly aimed at the Dutch population: three public service channels supplied by *De Publieke Omroep* and six commercially-funded channels supplied by RTL Nederland and SBS Broadcasting BV.

Dependent variables

Diversity is measured in terms of program type. Napoli (1999) and Van der Wurff (2004a) argue that program type is an adequate category for assessing diversity, since policy-makers refer to this dimension as an im-portant policy indicator for the performance of the broadcasting system. Also, broadcasters use program types as an important choice when de-veloping program strategies. The program types in this study are the following: entertainment, fiction, news and education, children's pro-grams, music, sports, and other programs. Open diversity is calculated as follows (Van der Wurff, 2004a):

$$\text{Open Diversity (OD)} = 1 - \Sigma\,(b_i - 1/n)/2$$
$$\text{where } b_i = \text{proportion broadcasting time devoted to pro-gram type } i$$
$$\text{and } n = \text{number of program types}$$

To answer research questions 1 and 2, open diversity is determined on different (combinations of) aggregation levels, namely month, weekday, and/or hour. In order to answer research question 3 and 4, proportions of program types and open diversity were determined for each hour on a particular weekday in a specific month, resulting in 504 measurements (i. e., 12 months * 7 weekdays * 6 hours) of proportions of program types and open diversity.

Independent variables

The measurements of proportions of program types and open diversity (n = 504) were classified based on whether they refer to a particular hour on a particular weekday in a particular month, resulting in three variables: month, weekday, and time of broadcasting. By using these variables one not only assesses vertical diversity (months and weekdays), but also horizontal diversity (time of broadcasting). The one-hour time slots are perceived to be small enough to represent the context in which viewers make meaningful choices for specific television programs.

Analysis

To test for differences between months, weekdays, and time of broadcasting in terms of proportions of program types and the degree in diversity, multiple regression analysis with dummy variables was applied (Hardy, 1993). This approach allowed for the performance of regression analysis with nominal variables, similar to analysis of variance.

Results

Research question 1 asks to what extent the Dutch program supply is diverse. In Table 1, open diversity is measured at different levels of aggregation. It demonstrates that, irrespective of (combination of) level(s) of aggregation, the average degree of open diversity is nearly identical (OD ≈ .60). Classifying open diversity as low or high is in this case difficult, because there is no point of reference. However, Table 1 shows that an increase in the level of aggregation is coupled to a decrease in the varia-

Table 1. *Descriptive measures of open diversity at different aggregation levels.*

| | Level of aggregation | | | | | | |
| | Low | | | | | | High |
	weekday hour month	weekday month	hour month	weekday hour	month	weekday	hour
Mean	.59	.60	.60	.60	.60	.60	.60
Standard deviation	.06	.04	.03	.04	.02	.03	.02
Minimum	.45	.52	.53	.52	.56	.57	.58
Maximum	.76	.70	.67	.70	.63	.67	.63
N	504	84	72	42	12	7	5

tion in open diversity (research question 2). This is illustrated by the standard deviation, the minimums and maximums. Open diversity at the lowest level (month by hour by weekday) ranges from .45 to .76, while at the highest level (hour) it only ranges from .58 to .63. Although the standard deviation of diversity at the lowest level is not very high, it is larger than at the higher levels of aggregation. Apparently, when measuring open diversity in a more detailed manner, the variation in open diversity will be larger.

I will now discuss research question 3. Earlier it was argued that, in general, aggregating to a higher level is only allowed when differences at a lower level are absent. Therefore I determined whether there are differences between proportions of program types per months, weekdays, and hours. Table 2 shows the results of multiple regression analyses. The first seven models predict the proportion of supply of program types in specific months, weekdays, and hours. For each model, the intercept indicates the average proportion per hour spent on a program type in the reference categories (December, Sunday and 8:00 pm−9:00 pm). The prediction variables (i. e., dummy variables) indicate deviations from the reference category. For example, on average, 15 % per hour is spent on entertainment, while in July this is 5 % less than in December, on Mondays on average 4 % less than on Sundays, and from 11:00 pm to midnight 4 % less than between 8:00 pm and 9:00 pm.

As can be seen, there are statistically significant differences between months, weekdays, and time of broadcasting for all program types. For example, entertainment is mainly broadcast between 7:00 pm en 9:00 pm; fiction is broadcast more in the summer months and in January and February, as well as between 9:00 pm and 10:00 pm; news and education is mainly aired on weekdays and between 7:00 pm and 9:00 pm; children's programs are broadcast between 6:00 pm and 7:00 pm; music is aired on Sundays and Mondays; sports programs are broadcast mainly in the weekend and on Mondays. Overlooking these results, the answer to research question 3 is that there are significant differences at all levels. This means that proportion of program types should be measured on an hourly basis. Ignoring these differences within levels could lead to false conclusions or at least to crude generalizations about the program supply on Dutch television.

Considering the results for program type, open diversity is to be analyzed at the same level, namely on an hourly basis. The last model, concerning research question 4, presents the results of the regression analysis for open diversity. Although many coefficients are statistically significant, September and December clearly stand out, having the highest degrees of open diversity compared to other months. In September and December, entertainment and fiction are supplied more proportionally.

Table 2. *Multiple regression analyses of point in time of broadcasting on proportions of program types and open diversity (unstandardized coefficients).*

	(1) entertainment	(2) fiction	(3) news and education	(4) children's programs	(5) music	(6) other	(7) sports	(8) open diversity[1]
Intercept	**.15**	**.33**	**.25**	**.02**	**.04**	**.16**	**.06**	**.66**
Month								
January	**−.03**	**.04**	.00	**−.01**	**−.01**	**−.02**	.03	**−.02**
February	**−.03**	**.04**	.00	**.00**	**−.01**	−.01	.01	**−.03**
March	**−.02**	.02	.02	.00	**−.02**	−.01	.00	**−.04**
April	**−.02**	.03	.01	−.01	**−.02**	.00	.01	**−.05**
May	**−.03**	.02	.00	**−.01**	**−.01**	.01	**.02**	**−.03**
June	**−.05**	**.05**	−.01	**−.01**	**−.01**	.02	.00	**−.06**
July	**−.05**	**.04**	**−.02**	.00	**−.02**	.01	**.02**	**−.04**
August	**−.04**	**.05**	**−.02**	**.00**	**−.01**	.02	.01	**−.04**
September	−.02	−.01	.00	.00	**−.02**	.02	**.03**	−.02
October	−.01	−.01	.02	**.00**	**−.02**	.01	.01	−.02
November	−.01	−.01	.02	**−.01**	**−.01**	.01	.01	−.02
December	ref	ref	ref	ref	ref	ref	ref	ref
Weekday								
Monday	**−.04**	**−.09**	**.11**	**−.01**	.00	**.02**	.00	**−.02**
Tuesday	**−.04**	**−.05**	**.12**	**−.01**	**−.02**	**.02**	**−.03**	**−.07**
Wednesday	−.01	**−.05**	**.09**	**−.01**	**−.02**	**.03**	**−.03**	**−.05**
Thursday	**−.05**	.00	**.07**	**−.01**	**−.02**	**.02**	**−.02**	**−.06**
Friday	**−.03**	−.02	**.10**	**−.01**	**−.02**	**.02**	**−.04**	**−.07**
Saturday	**−.02**	.01	**.03**	**−.01**	**−.01**	**.01**	−.01	**−.03**
Sunday	ref	ref	ref	ref	ref	ref	ref	ref
Time of broadcasting								
6:00 pm−7:00 pm	**−.05**	**.03**	**−.08**	**.10**	.00	**.02**	−.01	**.04**
7:00 pm−8:00 pm	.02	**−.04**	−.02	**.01**	.00	**.05**	−.01	**.02**
8:00 pm−9:00 pm	ref	ref	ref	ref	ref	ref	ref	ref
9:00 pm−10:00 pm	**.02**	**.12**	**−.10**	.00	.00	**−.03**	.00	−.01
10:00 pm−11:00 pm	**−.02**	**−.06**	.02	.00	.00	**.06**	.01	−.01
11:00 pm−midnight	**−.04**	−.02	.02	**.00**	.00	**.01**	**.03**	−.01
% explained variance	29	40	41	95	17	51	33	36

Coefficients printed bold are statistically significant at 5%, two-sided, n = 504

Possible explanations are the start of the new television season in September and the holidays in December. Sunday has the highest degree of diversity of all weekdays, mainly due to the relative absence of news and education compared to the other days. Between 6:00 pm and 8:00 pm the program supply shows a higher degree of diversity than during the other hours of broadcasting, mainly due to the relatively large proportion of children's programs.

Conclusion and discussion

This study set out to determine the degree of open diversity on Dutch television in 2003. Furthermore, it posed the question at what level of aggregation diversity is to be analyzed. Although the level of aggregation does not affect the average degree of open diversity, it reveals that open diversity varies between months, weekdays and time of broadcasting simultaneously. Horizontal diversity was the largest in September and December and on Sundays, while horizontal diversity was largest between 6:00 pm and 8:00 pm.

Although the reported differences in open diversity are statistically significant, only a few are substantial. There are some explanations why this is the case. First, the chosen time slot was 6:00 pm−midnight as an approximation of prime time programming. This time slot is relatively homogeneous. When daytime television was included, more substantial differences were expected. Similarly, I analyzed a single year where no major television market changes occurred. Also, there were no large media events such as the summer or winter Olympics or international soccer tournaments.

A methodological advance of the presented approach lies in the simultaneous analysis of vertical diversity and horizontal diversity. Moreover, vertical diversity is analyzed at several levels (months and weekdays). Furthermore, the presented approach can be applied to other measures of diversity as well, such as reflective diversity and channel distinction.

Thus far, diversity is mainly used in descriptive studies (Napoli, 1999), which is adequate for assessing the performance of broadcasting systems and monitoring changes over time. However, an explanatory approach such as the one undertaken by Van der Wurff (2004a) should provide more insight in the process of how the degree of diversity changes. A few studies have adopted this approach and searched for external factors such as degree of competition between channels and companies or new market entries (Hellman, 2001; Van der Wurff, 2004a, 2004b). This approach shows that differences in program supply resulting from program strategies explain additional variation in the degree of diversity. It im-

proves insight in the process of program strategies and the effect it has on the degree of diversity.

Extending the analysis to include more years, applying the analytical approach presented here or with time series analysis, one could uncover short term, midterm, and long term processes and effects. Especially when new companies enter the television market or new channels are introduced, changes in program strategies may have short term effects on program supply and diversity, something which would not be visible on a higher level of aggregation.

Note

1. It is important to keep in mind that differences between levels and categories in proportions of program types are not always reflected in differences in open diversity. Diversity on a higher level (e. g., year) is by definition equal to diversity on a lower level (e. g., months) only when proportions of specific program types on both levels are equal. However, when proportions of program types differ on both levels the degree of diversity may differ. Measures of diversity merely take into account the spread of categories: A 70 %−30 % distribution results in the same degree of open diversity as a 30 %−70 % distribution.

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