Switching during commercial breaks

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2 Defining “switching behaviour”

There appear to be as many ways of defining and researching switching behaviour as there are ways of watching television. There are many different definitions of the concept “zapping” or switching in use in the research literature. In this chapter, the various terms applied to switching and other forms of television advertising avoidance behaviour are discussed. This is followed by a review of various studies of switching and a differentiation of the definitions and methods of operationalising the concept of switching found in the research literature. Finally, in section 2.6, the definition selected for use in this study is discussed.

In examining various studies of switching, it soon becomes clear that the way in which switching is defined and the theories based on a definition often reflect the constraints that the research methodology imposes on the operationalisation of switching. Differences in the definition and operationalisation of switching not only reflect disagreement about the content of this concept, but are also often the consequence of differences in the methods of measurement and treatment of the data. These differences directly affect the difference in reported levels of switching. A close look at the definition and operationalisation of switching is therefore necessary to interpret differing outcomes. In this chapter, the reported levels in the studies examined will be discussed with reference to the definitions used in these studies.

Because of the impact of methodology on the definition and reported level of switching, the studies reviewed below have been classified into three types of research: recall surveys, observational research and research using “people meter” data. A separate category of research concerns “zipping” or fast-forwarding through commercials during the playback of video tapes.

The discussion of various definitions and methods of operationalising switching that follows is based on a study of the relevant research literature carried out in preparation of the research phase of this study (Intomart, 1995b), as well as a review of more recent publications carried out in preparation of this report. A listing of 94 different switching studies is presented in appendix 1, grouped according to research methodology, providing a global summary of the definitions of switching and the registered levels of switching.

5 The people meter is a device for the electronic registration of viewing behaviour (see section 2.4 and 4.1).
2.1 Terminology

In addition to the various ways in which switching is defined, various terms are used to refer to this behaviour. One of the most frequently used terms for switching is zapping. In a 1985 review of switching studies, Kaplan noted:

During the past few years, a new buzzword has been inserted in our lexicon of media jargon, and that word is - zapping. According to the learned sages of our industry (i.e. anyone over 40), the term originated in the old Buck Rogers comic strip as the written description of the sound of a “ray gun” made when the bad guys were being “vaporized” - or, to put it in another way, Buck made them disappear. (Kaplan, 1985, p. 9)

In an article intriguingly titled “Zapping is just a new zip to an old flip”, Feinberg defined a number of switching terms:

Zapping: Using a TV remote to switch to another channel when a commercial comes on.

Muting: A less aggressive form of zapping is muting: killing the sound by pressing the appropriate button on the remote.

Zipping: Using a VCR remote to fast-forward through a commercial on a videotape made of a TV programme, or through a commercial on a pre-recorded videotape.

Flipping: Using a TV remote to change from one channel to another and back again, regardless of whether there is a commercial in the air. This allows a viewer to “watch” more than one programme at a time.

Grazing: An even more frenetic use of the remote, referring to a viewer sampling or watching more than two channels by flipping. Grazing includes a viewer who watches all the channels by starting on a channel, say 2, and flipping to the next channel in ascending numerical order and so on until all channels on the set or the cable have been sampled. Then, like a pianist playing a descending scale, the viewer works his or her way down. (Feinberg, 1989, p. 17)

Audience behaviour during commercials is not limited to the use of the remote. Danaher (1995, p. 38) listed the following number of choices available to viewers once a commercial break starts:
Defining "switching behaviour"

- leave the room;
- switch to another channel;
- switch the set off;
- watch the ads;
- mute the sound;
- read a book, newspaper, etc.;
- talk with other people in the room, etc.

For many authors, all of the actions listed by Danaher constitute switching behaviour, with the exception, of course, of "watch the ads". Roper (1985, cited in Bozell, 1992) distinguished between three types of zapping: electronic zapping (switching off or switching channels), physical zapping (leave the room or stop watching the set) and mental zapping (pay no attention to the breaks). Other authors who make this distinction use the term "mechanical zapping" instead of "electronic zapping". An attractive but infrequently used term for mental zapping is "napping" (Van Zaanen, cited by Van Os, 1995a). The terms switching and zapping are frequently used interchangeably, and few seem to have objections to this practice. In this study, however, the terms switching and zapping are only used to refer to electronic and physical zapping as defined above.

Authors who group mental zapping together with electronic and physical zapping sometimes refer to this as switching behaviour but may also use the more general term “advertising avoidance behaviour”. However, this is not always an appropriate label. While much channel switching done during commercials is undoubtedly intended to avoid commercial advertising, this does not always have to be the case. Switching can occur for other, positive reasons, such as the fact that another programme is starting on another channel.

The effect of switching on the registered number of viewers of a commercial break is frequently referred to as a loss in audience ratings. In fact, as is pointed out in section 2.6, there are two distinct effects: a decrease in audience ratings and an increase in audience ratings.

2.2 Recall surveys

In recall surveys, questionnaires or interviews are used to examine switching behaviour. Respondents are questioned about the way they watch television and about their switching habits. The assumption is made that people remember and can reflect on their own behaviour, hence the name recall survey. More than half of the studies of switching found in the survey of the literature are based on interviews.

Interviews can be carried out face to face or via the telephone. Both methods have their advantages and disadvantages, but these are not an issue here. The issue is rather the advantages and limitations of recall research in the study of switching. All interview techniques have in common the fact that viewers are asked to es-
timate how much switching they do. They can also be asked about other relevant aspects of viewing behaviour, such as the level of attention with which the television is watched or about other activities carried out while watching. In most interviews, questions about viewing behaviour in general, and switching in particular, are only a relatively small part of the interview.

The great advantage of using interviews is the possibility of relatively easily combining the measurement of many different aspects of audience behaviour, for example, in a single investigation. However, as we shall see in the following sections, the simple but limited possibilities the interview offers can also create problems for a precise defining and registering of switching.

2.2.1 Differences in recall research

There are considerable differences among the various studies in the definition of switching and in the questions used in the interview. It is possible to differentiate a number of different aspects.

Commercial breaks or programmes

Questions may concern viewing behaviour during programmes or during commercial breaks. While this is an obvious distinction, it is not always precisely clear which of these forms of switching is being investigated in a given study. The survey of the literature focused on studies of switching during commercial breaks, so it is not surprising that most of the studies listed in appendix 1 are concerned with this form of switching.

Normal behaviour or specific moment

In most interviews, respondents are asked to give a general estimate of what they “normally” do while watching television. This form of questioning is more susceptible to the effects of social desirability (see section 2.2.2) than are questions concerning viewing behaviour or switching at a specific moment, such as the day or the hour before the interview. In a series of split-sample experiments, Price and Zaller (1993) demonstrated that respondents reported more biased and higher rates of media use when asked about an average or typical week than when asked specifically about last week. In discussing a similar study, Smit noted:

According to Clancey (1992) average viewing is more subject to overestimation of actual behaviour than recent or “last time viewing”. The reason is that “average” allows people to express an idealised view of themselves. In her study, a higher proportion of respondents reported that they, on average, switch channels more often than they actually did the last evening they viewed. (Smit, 1999, p. 43)
Defining "switching behaviour"

One method of obtaining a very specific registration of viewing behaviour is to ask respondents to keep a diary, as was the case in switching research carried out by Nielsen (1984, cited in Kaplan, 1985).

Response categories
In many interview studies, it is not clear how respondents interpret the available answer categories used in the interview (Saris, 1988). This is especially true for questions concerning behaviour. In some studies, for example Behaviour and Attitudes Ltd. (1987), Greene (1988) and Mittal (1994), response categories such as "frequently" or "sometimes" are used without a clear definition of precisely what is meant by these terms. Similarly, Kitchen and Yorke (1986) use the option "likely to switch" without indicating exactly what they mean by this answer. When a certain percentage of those questioned admit to "frequently" switching away during commercial breaks, it is not clear precisely to which extent switching away occurs.

Relative response categories can be useful, for example, in sorting respondents into groups for crossing with other characteristics, or in research intended to provide an initial inventory of switching. But if the aim is to establish the level of switching during advertising and determine the commercial consequences of this audience behaviour, then these relative categories are not suitable. The exact amount of the decrease in audience ratings during commercial breaks cannot be established in most of the studies based on interviews.

In a number of interview-based studies, however, the questioning concerning viewing behaviour was specific enough to allow a good assessment of switching. These include the log book research carried out by Nielsen (1984, cited in Kaplan, 1985) and a study by Rakshit (1990), in which interviews in 7,600 households in India were used to register the loss in audience ratings during 20 different programmes and commercial breaks.

Different types of viewer behaviour
In the studies surveyed, the different types of electronic, physical and mental zapping are defined in various ways and combined under the cover term switching behaviour. Nuttall (1962, cited in Abernethy, 1990) included only people who left the room. In many other interview-based studies, distinctions are made between various forms of audience behaviour such as leaving the room during breaks, stopping watching during breaks, stopping paying attention to the television during breaks, or changing channels. In a number of studies, including Ehrenberg and Twyman (1967, cited in Abernethy, 1990), Rich, Owens and Ellenboge (1978), and Roper (1985, cited in Bozell, 1992), types of viewer behaviour are separately and explicitly indicated in the interview. Wichers (1996), for example, distinguished four categories of viewer behaviour: switching, walking away, doing something else and watching all commercials.
A weakness in many definitions of switching in recall research is the failure to distinguish the moment of switching from the break. Viewers are identified as having switched away, but no indication is given of the number of commercial spots they saw before switching away. This means that it is not possible to determine precisely the decrease in the number of viewers during a commercial break.

Registered levels

Among the studies based on interviews, there are considerable differences in the levels of switching registered. Sometimes the level of switching is low, as in the study by Greene (1988), in which 8% “often” and 16% “sometimes” switched, indicating that the loss in audience ratings for a break was never more than 24%. In a British study, Ehrenberg and Twyman (1967, cited in Abernethy, 1990) reported switching levels during commercial breaks of 30% (20% leave the room and 10% stop watching). A much higher level of viewer loss was reported in a Canadian study by Van Rich, Owens and Ellenboge (1978): 22% leave the room and 48% stop watching. A high level was also registered in interviews carried out in the Netherlands by Research International (1994); here 12% of the viewers stated that they always zap away during advertising, 28% often and 28% sometimes.

There are a number of possible explanations for the disparities in the various outcomes in recall studies. Leaving aside possible internal causes, such as changes over time or cultural differences between countries, one explanation may lie in the differences in the definitions of switching used. In addition, the results may be affected by memory effects and social desirability. These effects are discussed in the following section.

2.2.2 Memory effects and social desirability

The reliability of the results of recall surveys is dependent on the reliability of respondents’ recollection. This memory effect may not be a serious problem when research deals with events that are significant and that only happen once in a while, such as buying a car, having a baby or perhaps voting behaviour at national elections. However, television viewing, and especially channel switching, is a very frequently recurring activity that can generally be considered non-salient. It is unlikely that many people are able to observe their own viewing behaviour with the accuracy and objectivity needed for reliable outcomes in switching research and can recall it during an interview a few hours or later, perhaps even the next day.

Recall surveys are also likely to be affected by social desirability, the tendency among respondents to give what they perceive to be the socially appropriate instead of the accurate response to questions. If switching away during commercial breaks can be caused by irritation, then the results of recall surveys on this be-
Defining “switching behaviour”

Behaviour may be strongly influenced by the social desirability of certain answers. According to York and Kitchen (1985), the claim to be engaged in other activities during a commercial may be intended to convey the impression that the viewer is intelligent or that they engage in useful and productive activities during commercial breaks. A respondent may feel the need to come across as an assertive, clever viewer who can always avoid unwanted commercials. Not everyone will admit during an interview that they enjoy commercials once in a while, or that they are sometimes so lazy when watching television that they cannot be bothered to switch away during advertising. When irritation with television advertising is a frequently discussed topic, as it was in the Netherlands in 1994 and 1995, respondents may be especially unwilling to admit that they do not always switch away when they find a commercial irritating (Jongeren zeggen, 1997).

2.3 Observational research

The second type of research used in the studies of switching surveyed is observational research, which is carried out in a laboratory or in a household setting. In laboratory research, television viewing is observed in a controlled environment in which the effect of certain factors on switching can be demonstrated by experimental manipulation (e.g., Olney, Holbrook & Batra, 1991). The principle advantage of this kind of research compared to recall surveys is that the possible effects of respondent memory lapses and the giving of socially desirable answers can be eliminated, although possible distortion resulting from socially desirability in other aspects of respondent behaviour remains a problem. A clear disadvantage of observational research in a laboratory setting is that the observed behaviour often differs from “normal” viewing behaviour. This can be much less of a problem during observations in a home setting (e.g., Van den Berg & Ruster, 1992; Capocasa, Denon & Lucchi, 1985; Horsley, 1986), depending on how much the act of observation itself disturbs the normal viewing pattern. To overcome this problem, cameras were used in a number of studies to observe a household (Compagnon Marktforschung, 1988, cited in Media data, 1995; Allen, 1965; Anderson et al., 1995; Bechtel et al., 1972; Bogart, 1986: all cited in Abernethy, 1990).

Various definitions of switching behaviour are used in the studies based on observational research. In a study of German households in which the television set was tuned to ARD or ZDF during commercial breaks, Compagnon Marktforschung (1988, cited in Media data, 1995) registered the percentages of all those present in the house who were not present in the room, those who left the room and those who remained in the room but engaged in other activities such as reading a newspaper, magazine or book, or conversing with each other. This unusually broad definition of switching or advertising avoidance can be summarised as “being at home with the set on and not watching”. In this definition, people who have seen a portion of an advertising break are also counted as either switchers or avoiders.
Switching during commercial breaks

Using a definition analogous to that of audience rating in a number of countries, Bogart (1986, cited in Abernethy, 1990) registered the presence of a person in the room when the television set is on, regardless of whether or not the person was actually watching the television. A more refined measurement is produced by registering the actual watching of television, as in the study by Anderson et al. (1995, cited in Abernethy, 1990) or by registering the exact amount of time spent watching commercials, as in the study by Olney, Holbrook and Batra (1991).

As with recall survey results, the reported levels of switching or stopping viewing during commercials vary in the observational studies. The lowest level of loss is found in Bogart (1986, cited in Abernethy, 1990), who reported that 15% of viewers left the room during commercials. On the other hand, Steiner (1966, cited in Abernethy, 1990) registered 53% leaving the room. In both of these studies, it is not clear whether changes in the behaviour of persons remaining in the room with the television set were registered. Allen (1965) and Bechtel et al. (1972, both cited in Abernethy, 1990) reported decreases in audience ratings during commercials of 46% and 40% respectively, and Capocasa, Denon and Lucchi of 20% (1985). Compagnon Marktforschung (1988, cited in Media data, 1995), reported figures of 68% (ARD) and 64% (ZDF) for persons who did not see the advertising on television, although, as previously noted, in this study, everyone present in a household who was not watching was counted. In a study of households with remote control devices, Horsley (1986) registered a 22% loss in audience ratings for end breaks and a 17% loss for centre breaks.

A potential drawback of observational research is the fact that sample sizes are relatively small. In addition, the quantification of results may be a problem.

2.4 People meter research

To a certain extent, people meter research can be regarded as an ideal form of observational research. Here, respondents are accustomed to the fact that their behaviour is being registered and the observer is replaced by unobtrusive electronics that register viewing behaviour exactly and flawlessly at all times. The only human action required for the registration of this behaviour is that viewers log on (when they turn on the set or join others who are already watching) and off (when they stop watching) using the people meter’s remote control. The people meter provides the ideal instrument for registering switching, provided panel members log on and off reliably. This issue and other determinants of the reliability and validity of people meter research are discussed in chapter 4.

In people meter research, switching during commercial breaks can be broadly defined in two ways. The first of these, discussed in the following section, consists of counting the actual number of switches. In most people meter-based research, however, switching is related to its effect on ratings. The definition of these relative measures is discussed from section 2.4.2 on. Examples of each type of switching analysis using people meter data will be discussed in detail.
2.4.1 Counting the number of switches: length of tune

One of the earliest analyses of switching using people meter data is the 1985 study by AGB, commissioned by BARB and extended with further analysis by Aitchison, commissioned by the IPA (AGB, 1985; Aitchison, 1985). This study focused on switching in 200 homes in the British people meter panel (of which 100 had a remote-control). The study included a special experiment in which the meter’s persistence threshold (see also section 4.5) was set to 3 seconds instead of the usual 15 seconds, providing an opportunity for a detailed registration and investigation of switches. The result of this registration was presented as the length of tune, which is defined as the average number of minutes viewed before any changes take place (switching to another channel or stopping watching). In the AGB study, switching was reported in two different ways:

- the average length of tune was 35 minutes in the homes with a remote and 16 minutes in the homes without one;
- there was 70% more switching in homes having a remote control.

In addition to these findings, a more qualitative analysis of the switching in 9 heavy zapping households was also carried out, based on a detailed examination of all logged events. The detailed qualitative analyses were not specifically concerned with switching during commercials, but with describing the overall switching during all television viewing. This kind of analysis of viewing data has become known as “navigation analysis”. It was found that switching at the start and finish of viewing sessions (a session is the period from when the television is turned on until it is turned off) was over double the rate of switching within sessions.

There is usually a burst of switching activity at the start of a viewing session and often another burst at the end, especially the last session of the day ... a desultory search towards the end of viewing for the day to see if there is anything worth watching before switching off. (Aitchison, 1985, p. 13)

Ten examples were found of a switching pattern the researchers labelled “the butterfly syndrome”, marked by switching activity lasting from 7 to 38 minutes, during which the viewer did not watch any single channel continuously for more than a few minutes.

The conclusions to be drawn from an examination of these switching patterns among “butterfly” homes is that the main reason for switching is programme based. There are periods when none of the programmes available are sufficiently interesting to hold the viewer’s attention and he flits from channel to channel in search for a programme that he considers...
worth viewing continuously. Even when he is watching a channel consistently there is a tendency to keep an eye on what is going on on another channel by flicking over from time to time. (Aitchison, 1985, p. 15)

In the 9 heavy zapping homes, 52 out of 76 breaks were watched uninterrupted. Of the 24 interruptions, 9 were the results of switches into the breaks and 3 by viewers coming back to the break.6

In a later study in the United States, Cunningham (1992) registered a length of tune of 24 minutes in prime time, with a shorter length of tune earlier in the day and, in general, the shortest for young men. He also defined a second measure, the turnover factor, which is the number of switches per viewing household. He reported a turnover factor of 1.2 in prime time, with a lower factor earlier in the day and, in general, the highest factor for young men. In a second American study, Mane (1993) investigated grazing, which was defined as part of the process of deciding what to watch, consisting of rapid channel scanning for an effective search and sampling of programme content. This was operationalised based on short duration tuning (a length of tune of 1 to 4 minutes). When a viewer remained tuned for a longer length of time to one channel continuously, resulting in a longer length of tune, this was referred to as settling in. Mane divided viewing behaviour in three types:

- settling in without prior grazing: 64%;
- settling in after grazing: 31%;
- grazing without settling in: 5%.

Other examples of people meter based research in which the number of switches is calculated included studies by Nielsen (1985, cited in Kaplan, 1985) and Zufryden, Pedrick and Sankaralingam (1993).

An advantage in this type of research is the detailed level of description of switching that is possible, as is illustrated in the AGB study discussed above. One drawback is that the results can only be used in comparison with other results, without giving information on the actual level of switching. For example, the number of switches per day or per hour does not provide an indication of the effect of viewer loss on audience ratings. The reporting of these measures is only useful when comparisons between them can be made. In a German study by GfK (MGM, 1994), a comparison of the number of switches per 60 minutes of viewing time was made between total prime time and advertising (2.3 versus 6.0). Other comparisons made include comparisons between different household types (AGB, 1985; Aitchison, 1985) and between time periods or programme types (Nielsen,

6 The definition of switching in this early study is not limited to the counting of the number of switches. In fact, the differentiation used by Aitchison is closely related to the definitions used in the current research, including the distinction between switching in and out, coming back and nipping in and out.

7 The number of tuning sessions divided by the number of households tuning.
Defining "switching behaviour"

1985, cited in Kaplan, 1985). In table 1, various measures of switching behaviour in the Netherlands in three separate years are compared, showing an increase in the amount of switching over time.

Table 1  **Number of switches in the Netherlands**  
Viewers 3+, first week of March, daily average

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of switches</td>
<td>4.0</td>
<td>7.0</td>
<td>9.0</td>
</tr>
<tr>
<td>View time (min)</td>
<td>124</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Length of tune</td>
<td>31.0</td>
<td>17.1</td>
<td>13.3</td>
</tr>
<tr>
<td>Switches per 60 min</td>
<td>1.9</td>
<td>3.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Source: Von Meurs (1998c)

### 2.4.2 Effects of switching on ratings

The majority of switching studies examine the effect of switching on the number of viewers during commercial breaks. This effect can be defined by relating the number of viewers during these commercial breaks in some way with the number of viewers at the start of the break or during the surrounding programming. The definitions of this relationship in the various switching studies surveyed can be divided into seven categories:

- difference in ratings;
- inheritance;
- loyalty index;
- break flow;
- relative loss of viewers during commercials;
- net fraction (see section 2.4.3);
- block factor (see section 2.4.4).

**Difference in ratings**

The difference in ratings can be defined as the difference between the audience ratings for the break and ratings for the programmes preceding or following it (Van den Berg & Ruster, 1992; McCann-Ericson, 1983, cited in McSherry, 1985), or as the difference in ratings between the break and the last minute of the preceding programme (Billet Consultancy Ltd, 1992). This measure provides a good indication of whether audience ratings rise or fall in relation to the surrounding programming. A drawback of this measure, however, is that the absolute level of difference is directly dependent on the total number of viewers at that moment. A difference of 2% is more dramatic by an audience rating of 4% than by one of 10%. When this measure is adjusted relative to the total number of viewers it is the equivalent of a one-sided block factor (see section 2.4.4).
Switching during commercial breaks

Inheritance
Inheritance is defined as the percentage of people who watched at least a specified portion of the broadcast in question (standard 50%) as well as a specified portion of the preceding broadcast. In the Continu KijkOnderzoek (CKO), the continuous television audience research in the Netherlands, inheritance is calculated for all programmes on a daily basis. On the basis of an analysis of inheritance between programmes, Dronkers (1993) concluded that commercial breaks can profit from a high degree of inheritance between programmes. This measure was primarily developed to describe the flow of viewers between programmes or time periods, but it is also suitable for an analysis of switching between programmes and advertising. However, no examples of such an analysis were found in the literature surveyed.

Loyalty index
The loyalty index, as used in a study by IP Belgium (1994, cited in Boelé & Van Niekerk, 1995) and by ITV Network Centre (1993), is defined as the percentage of viewers of a break who watched the entire break. With this index, all viewers who have only seen a portion of the break are grouped together, regardless of whether they had only seen or had only missed a small fraction of that break.

Break flow
Break flow is defined as the audience rating for each spot within a commercial break divided by the average audience rating for the break. It can be used to follow the change in the number of viewers during a commercial break. This measurement was used in studies carried out by GfK Fernsehforschung (AGF, 1997), Gehner (1993) and Harderwijk (1993).

The more switching occurring directly at the end or the start of a programme, the greater the differences in break flow among the spots in the adjacent break. The break flow of the first and last spots in a break provides a good measure of the number of viewers switching away and switching in during a commercial break. Break flow is especially relevant for media purchasers when deciding whether to select a spot at the beginning or end of an advertising break as the preferred position for placing advertising.

Relative loss of viewers during commercials
Frank (1984) cites two early switching studies from Nielsen and IRI-Media Services, both of which were carried out using set meters. In both studies, switching

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8 In the study of IP Belgium viewers are defined as those who watched a minimum of 15 seconds of the break.
9 This measure is related to the net fraction (see section 2.4.3), but instead of the average fraction, the percentage of viewers is calculated as a fraction of 1.
10 A meter which electronically registers viewing and switching behaviour per television set, without registering the type or number of viewers watching the set.
was defined as the number of television sets that switched in or away in relation to the total number of sets tuned in during commercials. It is notable that the loss of sets was relatively low (2.6% en 2.9%, respectively) in both studies. The relative loss of sets was so small because a very short unit of observation was used. In contrast to the majority of switching studies, the observation unit or the percentage base was not the entire commercial break, but only one minute in the Nielsen study and 30 second commercials in the IRI-Media Services study. Additionally, in the latter study, only those switches occurring after the first 5 seconds of a commercial were counted. This made these measures very suitable for those who wanted to argue that viewer loss during advertising was not as bad as expected.

### 2.4.3 Net fraction

The net fraction is defined as the average portion of a broadcast seen by viewers who watched at least a specified portion of the broadcast (programme or time period). In the CKO, the net fraction is calculated daily for all programmes. Ottler (1998) refers to the net fraction as the “stick-value”. Very closely related is the concept “hold factor” (ITV Network Centre, 1993), defined as the portion of a broadcast seen by viewers who watched the first minute of the broadcast.

Despite differences in patterns of viewing behaviour in the various countries in which the net fraction is used in research on switching, the reported averages for this measure are very similar: 85% in the United Kingdom (ITV Network Centre, 1993), 87% in the USA (Siddarth & Chattopadhyay, 1998), 82% in Germany (Ottler, 1998) and 84% for the public channels in the Netherlands (Vioen, 1995). An exception is the very high net fraction of 94% reported by Vioen for the commercial channel, RTL4. The low level of switching away indicated by this high net fraction may be an artefact of the large number of short programmes on this channel, which are a result of programme-interrupting advertising. The net fraction is strongly influenced by the length of the broadcast: the shorter the programme, the greater the chance that a viewer will see all of it. Broadcasts of a minute have a net fraction of 100% by definition. The effect of programme length is a complicating factor in the use of this measure; this is illustrated in the example below.

Comparing switching during programmes and breaks: an example

One advantage of the net fraction is that it allows a comparison of switching dur-

11. In the Netherlands, as a standard rule, viewers are required to have seen a minimum of 31 seconds of a programme before they are included in the calculation of the net fraction.
13. At the time of the study, it was the practice in the CKO (in contrast to many other countries) to count segments of programmes separated by advertising as separate broadcasts. This definition of programme was a consequence of restrictions in the programme files used in the calculations during the time of the research. These restrictions have since been removed.
Switching during commercial breaks

In March 1995, television viewers in the Netherlands watched, on average, 63% of a programme (on NL123 and RTL45) and 90%, on average, of a commercial break. It appears that less switching occurred during commercial breaks than during programmes. However, commercial breaks are almost always shorter than programmes; for a more realistic comparison of the net fraction for commercial breaks with that of programmes, a correction needs to be made for the length of broadcast. In table 2, the average net fractions for broadcasts are given according to the length of the broadcast.

Table 2. Average net fraction by length of broadcast
March 1995, NL123 and RTL45

<table>
<thead>
<tr>
<th>Length of Broadcast</th>
<th>Programme Net Fraction</th>
<th>Programme n</th>
<th>Commercial Break Net Fraction</th>
<th>Commercial Break n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5 minutes</td>
<td>86.3%</td>
<td>880</td>
<td>89.8%</td>
<td>3,314</td>
</tr>
<tr>
<td>6 - 10 minutes</td>
<td>71.6%</td>
<td>661</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11 - 20 minutes</td>
<td>66.8%</td>
<td>1,126</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>21 - 30 minutes</td>
<td>55.9%</td>
<td>1,920</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>30+ minutes</td>
<td>42.9%</td>
<td>737</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>63.4%</td>
<td>5,324</td>
<td>89.8%</td>
<td>3,314</td>
</tr>
</tbody>
</table>

Source: Intomart (1996a)

The net fraction for programmes varies considerably with the length of the broadcast; the longer the broadcast, the smaller the net fraction. A relatively smaller portion of longer programmes was seen by viewers than is the case for shorter programmes. Viewers saw, on average, 43% of a programme lasting half an hour or longer; for programmes lasting five minutes or less, the figure is 86% and for commercial breaks, which also last five minutes or less, 90%. From the data in table 2, it would appear that viewers switched away less often during commercial breaks than during short programmes. In order to be certain this is the case, it is necessary to compare the net fraction for programmes and commercial breaks in more detail in relation to the length of each broadcast. This can be accomplished using a regression model in which the net fraction is explained in terms of the length and type of broadcast (commercial break versus programme). The parameters of such a model are presented in table 3.
Defining "switching behaviour"

Table 3  **Net fraction regression model**

Breaks and programmes of five minutes long or less. March 1995, NL123 and RTL45, n = 4,194

<table>
<thead>
<tr>
<th>Length (1, 2, 3, 4 or 5 minutes)</th>
<th>B</th>
<th>B^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising breaks (1 = break, 0 = programme)</td>
<td>-5.70</td>
<td>-0.71</td>
</tr>
<tr>
<td>Constant</td>
<td>105.53</td>
<td>49.97</td>
</tr>
</tbody>
</table>

Source: Intomart (1996a)

In this example, broadcasts of five minutes long or less were chosen for analysis. In addition to all commercial breaks, this includes such programmes as short news programmes, weather reports, previews, video clips, a great many children's programmes such as cartoons and animated features, and short broadcasts for charities. From the model, it can be seen that for short broadcasts there is a strong relationship between net fraction and length. The net fraction decreases 5.7 percentage points for each minute of a broadcast. After correcting for differences in length, there was slightly more switching away during commercial breaks than during programmes. However, the net fraction for blocks is only 0.8 percentage points lower than that for programmes. This difference is so small that it can be concluded that only slightly less switching away occurred during commercial breaks than during programmes of comparable length.

2.4.4 Block factors

The block factor can be defined as the relative loss of viewers during a commercial break when compared to the surrounding programming. It can be calculated as the audience rating of the break relative to the audience rating of the programmes preceding and/or following it. A distinction can be made between one-sided and two-sided block factors.

In a one-sided block factor, the audience rating of the break is related to that of the programming preceding or following the break. In the studies by Percy and Co. (1988, cited in Danaher, 1995; Kneale, 1988; Nakra, 1991), the Network Television Association (1992, cited in Danaher, 1995) and Danaher (1995), the block factor was determined on the basis of the audience rating for the commercial break and the programme preceding it. A variant on this, a block factor based on the audience rating of the break and that of the second minute before the start of the break, was used in the studies by Breemhaar (1992) and Van der Laar and Breemhaar (1991). A drawback of the one-sided block factor is that the flow in audience rating is only measured in relation to the preceding programme. For example, it cannot account for a strong increase in audience rating during a break preceding a major sports event. Because of decreasing ratings, a one-sided block
factor will usually be lower for a late evening programme than a two-sided block factor, which takes into account the audience ratings of the programme following the break as well as the programme preceding it.

Two-sided block factors, as illustrated in figure 4, are defined by the following formula:

$$bf = \frac{2 \times r_b}{(r_p + r_f)}$$

where

- $bf$: the block factor;
- $r_b$: the rating of the commercial break;
- $r_p$: the rating of the preceding programme;
- $r_f$: the rating of the following programme.

The two-sided block factor is used in Dutch studies by Van den Berg and Ruster (1992), Oomens, Roest and Vaessen (1993), Van Meurs (1995), and in the German study by Sat.1 SatellitenFernsehen GmbH (1997). Unless otherwise stated, the block factors referred to in this study are two-sided.

The block factor is an easy to use measurement of the net loss of viewers during a commercial break. It can be used to compare channels or break types, or to follow viewer loss during commercial breaks. Changes in the block factor since 1990 for all Dutch channels are shown in table 4, with totals for all breaks, end breaks and centre breaks. The block factor for centre breaks, which interrupt programming, is clearly higher than that of breaks that are placed between two different programmes. The level of the block factor does not remain constant, but drops

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14 NL123, RTL45, Veronica, SBS6, KinderNet, The Music Factory, Cartoon Network, TV10/FOX, Net5 and Sport7. The start date of each channel is given in appendix 2.
Defining “switching behaviour”

from almost 88% in 1992 to just under 85% in 1993. The increase in viewers loss during this period was especially evident on the public channels NL123. From 1995 (when this research was carried out) on, block factors have shown a rise for all channels and type of breaks.

Table 4  Block factor Dutch channels
Persons 6+, January-March

<table>
<thead>
<tr>
<th>All Dutch channels</th>
<th>NL123</th>
<th>RTL45+Veronica</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All breaks</td>
<td>End</td>
</tr>
<tr>
<td>1990</td>
<td>87.7%</td>
<td>86.9%</td>
</tr>
<tr>
<td>1992</td>
<td>87.6%</td>
<td>86.5%</td>
</tr>
<tr>
<td>1993</td>
<td>84.8%</td>
<td>82.8%</td>
</tr>
<tr>
<td>1994</td>
<td>84.5%</td>
<td>80.6%</td>
</tr>
<tr>
<td>1995</td>
<td>85.1%</td>
<td>82.4%</td>
</tr>
<tr>
<td>1996</td>
<td>87.4%</td>
<td>84.8%</td>
</tr>
<tr>
<td>1997</td>
<td>88.8%</td>
<td>85.9%</td>
</tr>
<tr>
<td>1998</td>
<td>89.1%</td>
<td>85.9%</td>
</tr>
<tr>
<td>1999</td>
<td>89.0%</td>
<td>85.2%</td>
</tr>
</tbody>
</table>

Because of its simplicity, the block factor is a useful measure of the effect of switching during commercial breaks. An additional practical advantage is that the block factor can be calculated per target group on the basis of the audience ratings for programmes and breaks, data which is usually readily available11. The often complex calculations at the respondent level are not necessary for the calculation of the block factor. This makes the block factor a very useful measure for examining the effect of switching during commercial breaks. For example, it can be applied in automated models for forecasting the ratings of commercial breaks (e.g., Van Meurs, 1994).

Despite its advantages, the block factor was not an appropriate measurement for use in this study of switching during commercial breaks. This is because the block factor does not allow for a distinction to be made between switching in and switching away. A definition of switching suitable for this study will be discussed

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11 When ratings are low, the block factor of individual breaks can reach very high levels. Distortion of the average value of block factors by these extreme values can be prevented by weighting the breaks by their rating. This method is used in table 4. An alternative is to ignore the block factor when the ratings of the programmes before and after a break add up to less than 0.1%, and by applying a maximum of 400% for the block factor. The following recommendations can be made for the calculation of block factors:
- ignore “continuity” between programmes and commercial breaks, such as programme schedule information or other general announcements, fragments of music, clocks, etcetera;
- do not calculate the block factor if the continuity exceeds 10 minutes;
- do not calculate the block factor if no programme is broadcast within 10 minutes before or after the commercial break.
Switching during commercial breaks

in section 2.6. First, however, two special types of switching research are examined in the following section.

2.5 Other types of switching research

Two types of studies of switching behaviour differ radically from those examined in the previous sections. The first of these involves research that makes use of an unusual data set, here referred to as "external data sources". The second concerns research into a form of advertising avoidance that is closely related to switching, namely, fast forward winding during the viewing of a video tape.

2.5.1 External data sources

A very remarkable category of switching research involves research that is not based on interviews with or observations of viewers, but which relates viewer loss during commercial breaks to external data, such as the use of water or electricity. Following television broadcasts of major public events, such as the finals of the football World Cup, reports regularly emerge of marked increases in water, electricity and telephone use after each game half. The flow of viewers can be derived from such measures in much the same way as from graphs of audience ratings. A sharp fall in the number of viewers during commercial breaks following each game half is often observed, coinciding with an increase in water, electricity and telephone use. These studies are interesting because they form an objectively measurable alternative confirmation for the results of people meter research.

Comparisons of water, electricity and telephone use with people meter results seldom appear in the literature. Nakra (1991, p. 217) cites two American references of the so-called "flush-factor", respectively:

In 1952 the water commissioner in Toledo, Ohio, noticed whenever "I Love Lucy" was shown on the city's only television channel, each advertising break was marked by a huge drop in water pressure as thousands of toilets flushed at once (Kneale, 1988). ... More than 25 years later during the telecast of a blockbuster programme - a mini-series "Roots", the first showing of “The Godfather" or “Jaws" - water consumption would fluctuate dramatically to coincide with commercial breaks (Whalan, 1986).

Another example of this type of research is a study by Bunn (1982), in which he presented a model for deriving a decrease in the number of television viewers between programmes and commercial breaks based on electricity use. One advantage of this kind of research method is that it provides an alternative form of confirmation of people meter research findings concerning the start and end of television viewing and as well as a control for panel members' logging on and off by panel members. However, studies such as Bunn's analysis of electricity do not provide
information on switching between channels; in these instances switchers remain watching television and there is no increase in the use of utilities. With the increase in the number of channels, programming on any single channel will have less and less of an effect and this effect will only be discernible in special circumstances.

2.5.2 Zipping

One type of switching research frequently found in the literature is that dealing with “zipping” or fast forwarding through advertising. Of the 94 different switching studies listed in appendix 1, ten are studies of zipping. They involve research using diaries, interviews and observation.

Watching a video tape recording of a programme recorded earlier gives the viewer the freedom to stop the tape in the middle of the recording, to rewind and to fast forward through certain segments. Zipping through advertising can be considered a form of switching and research on it can provide information on the extent of which advertising is considered a disrupting element during television viewing. After all, a person viewing a video recording who objects to advertising has the ability to avoid commercials with a minimum of effort.

Most of the research on zipping was carried out in the late 80s and early 90s, when the video recorder was winning a place in the living room. The producers of advertising saw the video recorder as a threat. They expected that soon most television viewers would no longer watch television in real time, but would primarily watch programmes via the video recorder at a time more convenient for them (time shifting). It was further expected that during this delayed viewing, viewers would zip through the blocks of advertising en masse.

It has since become evident that the influence of the video recorder on viewing behaviour has remained marginal. In the CKO, audience behaviour during the viewing of video recordings is registered separately. It has been found that households with a video recorder spend, on average, 7% of their viewing time watching their video. When playing video tapes, about 70% of this time is spent watching broadcasts that were recorded on the same video recorder, and the rest is spent watching pre-recorded tapes which, in general, contain no advertising other than previews of other films.

It would appear from the various studies of zipping that the average video viewer fast forwards through approximately two-thirds of the recorded advertising, watching only a third (see appendix 1). From this, it can be concluded that,

\[16\text{ In the period January-March 1995.}\]
Switching during commercial breaks

given the choice, television viewers would prefer to skip advertising when watching television\(^{17}\).

2.6 Choosing a definition of switching

Because of the many possibilities of defining switching behaviour and the differences between the various definitions, it was necessary to make careful choices when defining and operationalising switching for this study. Various internal aspects of the definition and operationalisation are discussed in this section; they are described in greater detail in appendix 3.

Electronic and physical zapping

In this study, the distinction between electronic zapping (switching away) and physical zapping (walking away, see also section 2.1) is not relevant because both types of switching will have the same influence on the audience ratings of commercial breaks, assuming panel members correctly log on and off (the reliability of logging on and off by panel members in the CKO is discussed in detail in section 4.6.1).

Distinguishing between switching away and switching in

As discussed in section 1.1, in defining switching for the purposes of this study, a distinction is made between switching away (and/or stopping viewing) and switching in (and/or starting viewing) during commercial breaks. Switching away may be caused and influenced by completely different factors than those that affect switching in. This study seeks to provide explanations for both types of switching, and to make recommendations to discourage switching away and stimulate switching in to commercial breaks. Consequently, two distinct switching variables must be defined: the decrease in audience ratings and the increase in audience ratings.

Rates of increase and decrease

In determining the net gain or loss of viewers during a commercial break, it is important to note whether viewers zap away at the start of a break or just before the end of the break. In fact, the decrease and increase in audience ratings are products of two movements: the number of persons switching and the moment during the break when this switching occurs. These two movements can be influenced by

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\(^{17}\) Two studies, Gilmore and Secunda (1993) and Metzger (1986), argue that zipping does not reduce the effectiveness of television advertising. They argue that viewers pay increased attention to the visual aspects of commercials during zipping in order to avoid fast winding too far forward. They claim this actually increases the effectiveness of commercials. The sound portion of an ad is lost during zipping but, depending on the quality of the video recorder, the visual images are clearly recognisable. However, other studies indicate that the recall and recognition of commercials strongly declines with zipping (Abernethy, 1990).
Defining “switching behaviour”

different factors and are defined separately. In addition to the two major measures, the increase and the decrease in ratings, four other switching measures are calculated in this study. These are:

- the decrease in viewers;
- the rate of decrease;
- the increase in viewers;
- the rate of increase.

Definitions of these measures are given in appendix 3. The rates of decrease and increase can be used to determine in what part of the break the loss or gain of viewers from switching occurs.

*Nipping in and out*

The behaviour of viewers who nip in and then out during a commercial break falls outside the parameters of the two switching measures. Although the behaviour of these “hit and run” viewers might be expected to have a positive effect on the ratings of the commercial break, the effect proved to be marginal (see section 5.3).

*Basis for the decline*

A point two minutes before the start of the break was chosen as the basis for the decline. At this point in many programmes it becomes apparent that the programme is drawing to a close. This may be indicated by the leave-taking rituals in game shows, by the end titles of a film or a series, et cetera. When viewers become aware that the programme is about to end, they may start looking for another programme. Consequently, switching that takes place during the last two minutes of a programme will be considered as switching away from the commercial break following that programme.\(^{18}\)

*People meter data*

The decision was made to base this study on data from the CKO people meter research. While this research method provides a high degree of validity and offers many possibilities of analysis of the results, there are also limitations this research method that affect the operationalisation of switching behaviour. Tying this research to the results of the meter research meant that it was not possible to incorporate differences in attention levels during viewing. The registration of switching on or off of the volume (“muting”), also a form of behaviour possibly intended to avoid advertising, was not technically possible.\(^{19}\) An overview of some of the technical limitations of the audience research that are relevant to the definition of switching behaviour is presented in section 4.1.

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\(^{18}\) The switching between the end of a programme and the beginning of the following break is examined in detail in the study of ITV Network Centre (1993).

\(^{19}\) Recent research (Smit, 1999) indicates that this kind of advertisement avoidance is seldom used.
Switching during commercial breaks

2.6 Choosing a definition of switching

Because of the many possibilities of defining switching behaviors and the differences between the various definitions, it was necessary to define switching when defining and operationalizing switching for this analysis. This was done by investigating the differences between switching behavior and viewing behavior. Since switching behavior involves the use of electronic programs, it is necessary to use a definition of switching that is consistent with the use of electronic programs. In this study, the definition of switching behavior was defined as the act of changing the program or channel during a commercial break.

3.5.3 Methodology

In this study, the distinction between electronic programs and physical programs was made. Electronic programs are programs that are accessed through a computer or a television program guide. Physical programs are programs that are accessed through a television or a radio program guide. In this study, the distinction was made between electronic programs and physical programs because the results of the study were based on the use of electronic programs.

4.6.1 Results

The results of the study showed that the use of electronic programs during commercial breaks increased the likelihood of switching. Consequently, the use of electronic programs during commercial breaks must be defined as the decision to change programs during the commercial break.