Switching during commercial breaks
van Meurs, A

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Appendix 1

Overview of switching studies

Key articles
- AGF (1997)
- AGB (1985) and Aitchison (1985)
- Asociación Española de Anunciantes (1995)
- Behaviour and Attitudes Ltd. (1987)
- Van den Berg and Ruster (1992)
- Biller Consultancy Ltd. (1992)
- Breemhaar (1992)
- Capocasa, Denon and Lucchi (1985)
- Danaher (1995)
- Dronkers (1993)
- Gehner (1993)
- Greene (1988)
- Harderwijk (1993)
- Heeter and Greenberg (1985)
- Horsley (1986)
- Hörzu Funkuhr (1992)
- ITV Network Centre (1993)
- Kitchen and Yorke (1986)
- Van der Laar and Breemhaar (1991)
- Van Meurs (1995)
- Olney, Holbrook and Batra (1991)
- Oomens, Roest and Vaessen (1993)
- Ottler (1998)
- Rakshit (1990)
- Sat.1 SatellitenFernsehen GmbH (1997)
- Siddarth and Chattopadhyay (1998)
- Vioen (1995)
- Weiman (1995)
- Yorke and Kitchen (1985)
- Zufryden, Pedrick and Sankaralingam (1993)
<table>
<thead>
<tr>
<th>Recall surveys</th>
<th>Country</th>
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<th>Definition</th>
<th>Observed level</th>
<th>Stayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asociacion Española de Anunciantes (1995)</td>
<td>Spain</td>
<td>Interview</td>
<td>n=18</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>Only correlations</td>
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<tr>
<td>Audits &amp; Service (1984), cited in Media data (1995)</td>
<td>USA</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zapping (?)</td>
<td>Cable 45%, non cable 39%</td>
<td></td>
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<tr>
<td>Barclay, Doub and McMurtry (1965), cited in Abernethy (1990)</td>
<td>USA</td>
<td>Interview</td>
<td>n=1,629</td>
<td>Breaks</td>
<td>Paying attention to TV while set is on</td>
<td>34%</td>
<td></td>
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<tr>
<td>Behaviour and Attitudes Ltd. (1987)</td>
<td>Ireland</td>
<td>Interview</td>
<td>n=1,200</td>
<td>Programmes and breaks</td>
<td>Switch away during break</td>
<td>C62%, e44%</td>
<td></td>
</tr>
<tr>
<td>Von den Berg and Ruster (1992)</td>
<td>NL</td>
<td>Interview</td>
<td>n=1,657</td>
<td>Breaks</td>
<td>Switch away or leave room during break</td>
<td>C52%, e53%</td>
<td></td>
</tr>
<tr>
<td>Ehrenberg and Twyman (1967), cited in Abernethy (1990)</td>
<td>UK</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Leaving the room or stop watching</td>
<td>Leave: 20%, stop: 10%</td>
<td></td>
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<tr>
<td>Greene (1988)</td>
<td>USA</td>
<td>Interview</td>
<td>n=4,375</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>8% always, 16% sometimes</td>
<td></td>
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<tr>
<td>Heeter and Greenberg (1985)</td>
<td>USA</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>Men 65%, women 37%</td>
<td></td>
</tr>
<tr>
<td>Hörzu Funkuhr (1992)</td>
<td>Germany</td>
<td>Interview</td>
<td>6,000 hh</td>
<td>Breaks</td>
<td>Zapping (?)</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>InterView (1993), cited in Stockmann (1993)</td>
<td>NL</td>
<td>Interview</td>
<td>3,106 24 yrs</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>34%</td>
<td>66%</td>
</tr>
<tr>
<td>InterView (1995), cited in Weekbladpers (1996)</td>
<td>NL</td>
<td>Interview</td>
<td>n=4,292</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>19% usually zaps, 60% does something else</td>
<td>21%</td>
</tr>
<tr>
<td>InterView (1997), cited in Nieuwstrubende (1997)</td>
<td>NL</td>
<td>Interview</td>
<td>± 3,000 6-24 yrs</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>56%</td>
<td>44%</td>
</tr>
<tr>
<td>InterView (1998)</td>
<td>NL</td>
<td>Interview</td>
<td>n=4,213</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>26% usually zaps, 53% does something else</td>
<td>21%</td>
</tr>
<tr>
<td>Kasten (1986), cited in Abernethy (1990)</td>
<td>USA</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>15%, 14%, 5%</td>
<td></td>
</tr>
<tr>
<td>Kitchen and Yorke (1986)</td>
<td>UK</td>
<td>Interview</td>
<td>100 hh</td>
<td>Breaks</td>
<td>Likelihood to switch during break</td>
<td>Centre: 23%, end: 54%</td>
<td>C77%, e45%</td>
</tr>
</tbody>
</table>

- Centre: 30% zaps often, 21% sometimes, end breaks: 43% often, 27% sometimes
- RAI and commercial channels: 35% & 47% (no remote), 44% and 58% (remote)
- 1,500 adults, 400 children
- hh = households
<table>
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<th>Country</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Marton (1989), cited in Media data (1995)</td>
<td>USA Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zapping (?)</td>
<td>Centre: 16% (shows), 23% (sports)</td>
<td>095%</td>
</tr>
<tr>
<td>McCann Ericson (1986), cited in Media data (1995)</td>
<td>USA Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zapping (?)</td>
<td>Centre: 5%</td>
<td>-</td>
</tr>
<tr>
<td>De Meyer, Hendriks and Fauconnier (1989)</td>
<td>Belgium Interview (Flanders)</td>
<td>262 hh</td>
<td>Breaks</td>
<td>Different reactions during break</td>
<td>Only correlations</td>
<td>-</td>
</tr>
<tr>
<td>MGM (1992), cited in Media data (1995)</td>
<td>USA Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zapping (?)</td>
<td>Centre: 14%</td>
<td>86%</td>
</tr>
<tr>
<td>Mittal (1994)</td>
<td>USA Interview</td>
<td>n=203</td>
<td>Breaks</td>
<td>Different reactions during break</td>
<td>36% often zaps, 24% sometimes</td>
<td>60%</td>
</tr>
<tr>
<td>Nuttall (1962), cited in Abernethy (1990)</td>
<td>UK Interview</td>
<td>n=3,000</td>
<td>Breaks</td>
<td>Leaving the room during breaks</td>
<td>24%</td>
<td>76%</td>
</tr>
<tr>
<td>Perse (1990)</td>
<td>USA Interview</td>
<td>n=566</td>
<td>Programmes and breaks</td>
<td>Different reactions during break</td>
<td>Only correlations</td>
<td>-</td>
</tr>
<tr>
<td>Rakshit (1990)</td>
<td>India Interview</td>
<td>7,600 hh</td>
<td>Breaks n=20</td>
<td>Average break / programme after</td>
<td>50%</td>
<td>50%</td>
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<tr>
<td>Readers Digest (1984), cited in Media data (1995)</td>
<td>USA Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zapping (?)</td>
<td>64%</td>
<td>36%</td>
</tr>
<tr>
<td>Research International (1994)</td>
<td>NL Interview</td>
<td>n=501</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>12% always zaps, 28% often, 28% sometimes</td>
<td>22%</td>
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<tr>
<td>Rich, Owens and Ellenboge (1978)</td>
<td>Canada Interview</td>
<td>n=250</td>
<td>Breaks</td>
<td>Leaving the room or stop watching</td>
<td>Leave: 22%, stop: 48%</td>
<td>30%</td>
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<tr>
<td>Roper (1985), cited in Bozell (1992)</td>
<td>USA Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Different reactions during break</td>
<td></td>
<td>58%</td>
</tr>
<tr>
<td>Sample Institut &amp; TV Movie (1992), cited in Media data (1995)</td>
<td>USA Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zapping (?)</td>
<td>33%</td>
<td>67%</td>
</tr>
<tr>
<td>Sepstrup (1986), cited in Media data (1995)</td>
<td>Italy Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zapping (?)</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Simmons Market Research (1986), cited in Media data (1995)</td>
<td>USA Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>44%</td>
<td>56%</td>
</tr>
<tr>
<td>Smit (1999)</td>
<td>NL Interview</td>
<td>n=577</td>
<td>Breaks</td>
<td>Switch away during break</td>
<td>32% off, 5% always, 44% sometimes</td>
<td>20%</td>
</tr>
<tr>
<td>SMRB (1991), cited in Bozell (1992)</td>
<td>USA Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Different reactions during break</td>
<td></td>
<td>60%</td>
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<tr>
<td>Stuts, Eure and Hunnicutt (1985), cited in Abernethy (1990) and Cobb-Walgren (1990)</td>
<td>USA Interview</td>
<td>n=310</td>
<td>Programmes</td>
<td>Switch during programmes</td>
<td>Men: 76%, women: 60%</td>
<td>-</td>
</tr>
</tbody>
</table>

** Electronic zapping: 13%, physical: 29%, mental: 25%, non-zappers: 33%
** Electronic zapping: 22%, physical: 18%, mental: 27%, non-zappers: 33%
Switching during commercial breaks

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Teleskopie (1985), cited in Media data (1995)</td>
<td>Germany</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Only correlations</td>
<td>30% to 50%</td>
</tr>
<tr>
<td>University of Göttingen (1992), cited in Media data (1995)</td>
<td>Germany</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Only correlations</td>
<td>50% to 70%</td>
</tr>
<tr>
<td>Weinman (1995)</td>
<td>Israel</td>
<td>Interview</td>
<td>180 hh</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>56%</td>
</tr>
<tr>
<td>Wichers (1996)</td>
<td>NL</td>
<td>Interview</td>
<td>n=199</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>45%</td>
</tr>
<tr>
<td>Yorke &amp; Kitchen (1985)</td>
<td>UK</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Only correlations</td>
<td>54%</td>
</tr>
<tr>
<td>Observational research</td>
<td>Allen (1965), cited in Abernethy (1990)</td>
<td>GB</td>
<td>Obs. at home + camera</td>
<td>95 hh</td>
<td>Breaks</td>
<td>Only correlations</td>
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<tr>
<td>Anderson et al. (1995), cited in Abernethy (1990)</td>
<td>GB</td>
<td>Obs. at home + camera</td>
<td>99 hh; 5 year-olds</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>67%</td>
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<tr>
<td>Bechtel et al. (1972), cited in Abernethy (1990)</td>
<td>GB</td>
<td>Obs. at home + camera</td>
<td>20 homes</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>54%</td>
</tr>
<tr>
<td>Van den Berg and Ruster (1992)</td>
<td>NL</td>
<td>Obs. at home</td>
<td>?</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>85%</td>
</tr>
<tr>
<td>Bogart (1986), cited in Abernethy (1990)</td>
<td>GB</td>
<td>Obs. at home + camera</td>
<td>100 hh</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>80%</td>
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<tr>
<td>Capocasa, Denon and Lucchi (1985)</td>
<td>IT</td>
<td>Obs. at home</td>
<td>500 hh</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>68%</td>
</tr>
<tr>
<td>Compagnon Marktforschung (1988), cited in Media data (1995)</td>
<td>Germany</td>
<td>Obs. at home</td>
<td>n=163</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>83%</td>
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<tr>
<td>Horsley (1986)</td>
<td>UK</td>
<td>Obs. at home</td>
<td>160 hh</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>47%</td>
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<tr>
<td>Olney, Holbrook and Batra (1991)</td>
<td>USA</td>
<td>Obs. in laboratory</td>
<td>n=52</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>68%</td>
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<tr>
<td>Steiner (1966), cited in Abernethy (1990)</td>
<td>GB</td>
<td>Obs. at home</td>
<td>325 hh</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>47%</td>
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<tr>
<td>People meter: counting the number of switchings</td>
<td>AGB (1985), also cited in Aitchison (1985)</td>
<td>UK</td>
<td>People meter</td>
<td>200 hh</td>
<td>Length of tune</td>
<td>68%</td>
</tr>
<tr>
<td>Cunningham (1992)</td>
<td>USA</td>
<td>People meter</td>
<td>4,000 hh</td>
<td>Programmes and breaks</td>
<td>Length of tune</td>
<td>68%</td>
</tr>
<tr>
<td>ITV Network Centre (1993)</td>
<td>UK</td>
<td>People meter</td>
<td>n=140</td>
<td>Programmes and breaks</td>
<td>Length of tune</td>
<td>68%</td>
</tr>
<tr>
<td>Von Hasebrink and Krotz (1993)</td>
<td>Germany</td>
<td>People meter</td>
<td>410 hh</td>
<td>Programmes and breaks</td>
<td>Only correlations</td>
<td>68%</td>
</tr>
</tbody>
</table>

* Switch: 39%, walk away: 16%, do something else: 31%, see all spots: 14%
* Of 76 breaks 52 were watched uninterrupted in 9 heavy zapping homes
## Overview of switching studies

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<tr>
<th>Country</th>
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<th>Definition</th>
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<th>Stayers</th>
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</thead>
<tbody>
<tr>
<td>Mane (1993)</td>
<td>USA People meter</td>
<td>4,000hh</td>
<td>Progs 1 week</td>
<td>Length of tune</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Van Meurs (1998)</td>
<td>NL People meter</td>
<td>1,000 hh</td>
<td>Progs 1 week</td>
<td>Length of tune</td>
<td>78%</td>
<td>78%</td>
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<tr>
<td>MGM (1994)</td>
<td>Germany People meter</td>
<td>3,960 hh</td>
<td>Programes and breaks</td>
<td>Length of tune</td>
<td>Programmes: 2.5 and breaks 6.0</td>
<td>-</td>
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<tr>
<td>Nielsen (1983), cited in Kaplan (1995) and Sylvester (1990)</td>
<td>USA People meter</td>
<td>?</td>
<td>Pr+br 1 week</td>
<td>Length of tune</td>
<td>Breaks: 56%, Programmes: 45%</td>
<td>-</td>
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<tr>
<td>Zufryden, Pedrick and Sankararamgam (1993)</td>
<td>USA Set meter</td>
<td>584 hh</td>
<td>Programes and breaks</td>
<td>Length of tune</td>
<td>2.8 zaps per hour, incl. 0.9 during breaks</td>
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</table>

### People meter: effects of switching on ratings

<table>
<thead>
<tr>
<th>Country</th>
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<th>Definition</th>
<th>Observed level</th>
<th>Stayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGF (1997)</td>
<td>Germany People meter</td>
<td>4,400 hh</td>
<td>Breaks n=7,895</td>
<td>Flow of ratings within break</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Van den Berg and Ruster (1992)</td>
<td>NL People meter</td>
<td>850 hh</td>
<td>Pr+br 12 weeks</td>
<td>Difference in ratings</td>
<td>-</td>
<td>-</td>
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<tr>
<td>the Bill Consultancy Ltd. (1992)</td>
<td>UK People meter</td>
<td>1,000 hh</td>
<td>Programes and breaks</td>
<td>Difference in ratings</td>
<td>-8% (end: 16% decrease)</td>
<td>E82%</td>
</tr>
<tr>
<td>Dronkers (1993)</td>
<td>NL People meter</td>
<td>850 hh</td>
<td>Progs 3 months</td>
<td>Inheritance</td>
<td>60%</td>
<td>-</td>
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<tr>
<td>Gehner (1993)</td>
<td>NL People meter</td>
<td>850 hh</td>
<td>Breaks 1 year</td>
<td>Flow of ratings within break</td>
<td>NL123: 90%, RTL4: 95%</td>
<td>90%, 95%</td>
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<tr>
<td>Harderwijk (1993)</td>
<td>NL People meter</td>
<td>850 hh</td>
<td>Breaks 1 year</td>
<td>Flow of ratings within break</td>
<td>NL123: 90%, RTL4: 95%</td>
<td>90%, 95%</td>
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<tr>
<td>IRI-Media Services (1983), cited in Frank (1984)</td>
<td>USA Set meter</td>
<td>?</td>
<td>Spots 20 weeks</td>
<td>&quot;&quot;</td>
<td>2.6% switched out, 3.0% in</td>
<td>94%</td>
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<tr>
<td>ITV Network Centre (1993)</td>
<td>UK People meter</td>
<td>?</td>
<td>Breaks 1 week</td>
<td>Loyalty index</td>
<td>75% (c85%, e64%), 75%</td>
<td>75%</td>
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<tr>
<td>McCann-Ericson (1983), cited in McSherry (1985)</td>
<td>USA Set meter</td>
<td>?</td>
<td>Pr+br 24 pro-</td>
<td>Difference in ratings</td>
<td>-2.5%</td>
<td>-</td>
</tr>
<tr>
<td>Nielsen (1983), cited in Frank (1984)</td>
<td>USA Set meter</td>
<td>?</td>
<td>Breaks 1 week</td>
<td>Dial switching ¹</td>
<td>2.9% tuning away, 2.3% tuning in</td>
<td>95%</td>
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</table>

### People meter: net fraction

<table>
<thead>
<tr>
<th>Country</th>
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<tbody>
<tr>
<td>ITV Network Centre (1993)</td>
<td>UK People meter</td>
<td>?</td>
<td>Breaks 1 week</td>
<td>Hold factor</td>
<td>85% (c91%, e78%), 85%</td>
<td>85%</td>
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<tr>
<td>Ottler (1998)</td>
<td>Germany People meter</td>
<td>4,400 hh</td>
<td>Breaks 94 breaks</td>
<td>Stick-value</td>
<td>All: 82%, centre: 84%, end: 80%</td>
<td>82%</td>
</tr>
<tr>
<td>Ottler (1998)</td>
<td>Germany People meter</td>
<td>4,400 hh</td>
<td>Breaks 94 breaks</td>
<td>Stick-value, 25% seen</td>
<td>86%</td>
<td>86%</td>
</tr>
<tr>
<td>Siddarth and Chattopadhyay (1998)</td>
<td>USA Set meter</td>
<td>350 hh</td>
<td>Commercials</td>
<td>Net fraction</td>
<td>87%</td>
<td>87%</td>
</tr>
<tr>
<td>Vicen (1995)</td>
<td>NL People meter</td>
<td>1,000 hh</td>
<td>Pr+br 1 month</td>
<td>Net fraction</td>
<td>NL123: 84%, RTL4: 94%, 94%</td>
<td>84%</td>
</tr>
</tbody>
</table>

¹ Percentage of 30-second commercials switched away from after the first five seconds
² The percentage of sets tuning in or away during commercial minute

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### Switching during commercial breaks

<table>
<thead>
<tr>
<th>People meter: block factor</th>
<th>Country</th>
<th>Method</th>
<th>Sample</th>
<th>Observations</th>
<th>Definition</th>
<th>Observed level</th>
<th>Stayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Van den Berg and Rüster (1992)</td>
<td>NL</td>
<td>People meter</td>
<td>850 hh</td>
<td>Pr+br 12 weeks</td>
<td>Block factor</td>
<td>97%</td>
<td>C97%</td>
</tr>
<tr>
<td>Breemhaar (1992)</td>
<td>NL</td>
<td>People meter</td>
<td>1,000 hh</td>
<td>Pr+br 74</td>
<td>Rating break / 1st minute before</td>
<td>77%</td>
<td>77%</td>
</tr>
<tr>
<td>Danaher (1995), also cited in Danaher &amp; Bead (1994)</td>
<td>New Zealand</td>
<td>People meter</td>
<td>440 hh</td>
<td>Pr+br 1 week</td>
<td>Rating break / programme before</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Van der Laar and Breemhaar (1991)</td>
<td>NL</td>
<td>People meter</td>
<td>1,000 hh</td>
<td>Breaks 74</td>
<td>Rating break / 2nd minute before</td>
<td>77%</td>
<td>77%</td>
</tr>
<tr>
<td>Ligthart (1998)</td>
<td>NL</td>
<td>People meter</td>
<td>1,000 hh</td>
<td>Breaks 3 months</td>
<td>Block factor</td>
<td>88%</td>
<td>78%</td>
</tr>
<tr>
<td>Van Meurs (1995)</td>
<td>NL</td>
<td>People meter</td>
<td>850 hh</td>
<td>Breaks</td>
<td>Rating break / programme before</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>Network Television Association (1992), cited in Danaher (1995)</td>
<td>USA</td>
<td>People meter</td>
<td>?</td>
<td>Breaks</td>
<td>Block factor</td>
<td>83%</td>
<td>83%</td>
</tr>
<tr>
<td>Dornens, Roest and Vaassen (1993)</td>
<td>NL</td>
<td>People meter</td>
<td>850 hh</td>
<td>Breaks 1 month</td>
<td>Block factor</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Ottler (1998)</td>
<td>Germany</td>
<td>People meter</td>
<td>4,400 hh</td>
<td>Breaks 94</td>
<td>Block factor</td>
<td>85%</td>
<td>86%</td>
</tr>
<tr>
<td>Percy and Co (1988), cited in Danaher (1995), Kneale (1988) and Nakra (1991)</td>
<td>USA</td>
<td>People meter</td>
<td>1,000 hh</td>
<td>Breaks 1 day</td>
<td>Rating break / programme before</td>
<td>95%, e8</td>
<td>95%</td>
</tr>
<tr>
<td>Sat.1 Satelliten-Fernsehen GmbH (1997)</td>
<td>Germany</td>
<td>People meter</td>
<td>4,760 hh</td>
<td>Pr+br 71</td>
<td>Block factor</td>
<td>86%</td>
<td>86%</td>
</tr>
<tr>
<td><strong>External data sources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bunn (1982)</td>
<td>UK</td>
<td>External</td>
<td>?</td>
<td>Breaks 21</td>
<td>Electricity demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zipping</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connell Communications (1989), cited in Gilmore and Secunda (1993)</td>
<td>USA</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zipping</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>Cronn and Menelly (1992)</td>
<td>USA</td>
<td>Obs. at home</td>
<td>n=83</td>
<td>Breaks</td>
<td>Zipping</td>
<td>62%</td>
<td>38%</td>
</tr>
<tr>
<td>Cronn and Menelly (1992)</td>
<td>USA</td>
<td>Obs. in laboratory</td>
<td>n=32</td>
<td>Breaks</td>
<td>Zipping</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>Horsley (1986)</td>
<td>UK</td>
<td>Obs. at home</td>
<td>160 hh</td>
<td>Breaks</td>
<td>Zipping</td>
<td>77%</td>
<td>23%</td>
</tr>
<tr>
<td>Levy (1980), cited in Potzer, Forrest, Sapolsky and Ware (1988)</td>
<td>USA</td>
<td>Interview</td>
<td>?</td>
<td>Breaks</td>
<td>Zipping</td>
<td>15%</td>
<td>85%</td>
</tr>
<tr>
<td>Metzger (1986)</td>
<td>USA</td>
<td>Interview</td>
<td>n=1,350</td>
<td>Breaks</td>
<td>Zipping</td>
<td>54%</td>
<td>46%</td>
</tr>
</tbody>
</table>

77 1,340 broadcasts of 19 Sat.l programmes
72 "I love Lucy" breaks in 1952
73 Blockbuster breaks
<table>
<thead>
<tr>
<th>Country</th>
<th>Method</th>
<th>Sample</th>
<th>Observations</th>
<th>Definition</th>
<th>Observed level</th>
<th>Stayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mittal (1994)</td>
<td>USA, Interview</td>
<td>n=203</td>
<td>Breaks</td>
<td>Zipping</td>
<td>64%</td>
<td>36%</td>
</tr>
<tr>
<td>Nielsen (1984), cited in Kaplan (1985)</td>
<td>USA, Diary</td>
<td>?</td>
<td>Breaks</td>
<td>Zipping</td>
<td>&gt; 50% &lt; 50%</td>
<td></td>
</tr>
<tr>
<td>Potter, Forrest, Sapolsky and Ware (1988)</td>
<td>USA, Interview</td>
<td>n=415</td>
<td>Breaks</td>
<td>Zipping</td>
<td>Only correlations</td>
<td></td>
</tr>
<tr>
<td>Yorke and Kitchen (1985), also cited in Kitchen (1985)</td>
<td>UK, Interview</td>
<td>100 hh</td>
<td>Breaks</td>
<td>Zipping</td>
<td>66%</td>
<td>34%</td>
</tr>
</tbody>
</table>
Switching during commercial breaks

<table>
<thead>
<tr>
<th>Time</th>
<th>Channel</th>
<th>Program</th>
<th>Viewer Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 PM</td>
<td>2</td>
<td>News</td>
<td>1.2</td>
</tr>
<tr>
<td>8 PM</td>
<td>1</td>
<td>TV Show</td>
<td>2.5</td>
</tr>
<tr>
<td>9 PM</td>
<td>3</td>
<td>Movie</td>
<td>3.0</td>
</tr>
<tr>
<td>10 PM</td>
<td>4</td>
<td>Sports</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Note: Viewer ratings are based on 1-5 scale.
## Appendix 2

### Yearly averages broadcast and viewing time

<table>
<thead>
<tr>
<th>Year</th>
<th>Viewing time</th>
<th>Broadcast time</th>
<th>Channels received</th>
<th>Viewing time commercials</th>
<th>Commercial time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>-</td>
<td>-</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1981</td>
<td>-</td>
<td>-</td>
<td>4.0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1982</td>
<td>-</td>
<td>-</td>
<td>4.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1983</td>
<td>-</td>
<td>-</td>
<td>4.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1984</td>
<td>-</td>
<td>-</td>
<td>5.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1985</td>
<td>-</td>
<td>-</td>
<td>5.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1986</td>
<td>-</td>
<td>-</td>
<td>6.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1987</td>
<td>-</td>
<td>-</td>
<td>7.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1988</td>
<td>02:04</td>
<td>23</td>
<td>11.0</td>
<td>4.4</td>
<td>01:01</td>
</tr>
<tr>
<td>1989</td>
<td>01:54</td>
<td>24</td>
<td>11.5</td>
<td>4.1</td>
<td>01:06</td>
</tr>
<tr>
<td>1990</td>
<td>02:00</td>
<td>24</td>
<td>13.9</td>
<td>2.8</td>
<td>00:54</td>
</tr>
<tr>
<td>1991</td>
<td>02:20</td>
<td>25</td>
<td>15.5</td>
<td>3.1</td>
<td>01:03</td>
</tr>
<tr>
<td>1992</td>
<td>02:26</td>
<td>32</td>
<td>16.7</td>
<td>5.3</td>
<td>01:57</td>
</tr>
<tr>
<td>1993</td>
<td>02:28</td>
<td>50</td>
<td>17.1</td>
<td>8.8</td>
<td>03:40</td>
</tr>
<tr>
<td>1994</td>
<td>02:32</td>
<td>62</td>
<td>19.4</td>
<td>9.1</td>
<td>04:20</td>
</tr>
<tr>
<td>1995</td>
<td>02:31</td>
<td>73</td>
<td>20.8</td>
<td>9.7</td>
<td>05:41</td>
</tr>
<tr>
<td>1996</td>
<td>02:37</td>
<td>134</td>
<td>23.2</td>
<td>10.2</td>
<td>09:22</td>
</tr>
<tr>
<td>1997</td>
<td>02:35</td>
<td>138</td>
<td>23.2</td>
<td>11.2</td>
<td>10:44</td>
</tr>
<tr>
<td>1998</td>
<td>02:45</td>
<td>157</td>
<td>23.5</td>
<td>12.5</td>
<td>14:06</td>
</tr>
</tbody>
</table>

*Viewing time*: persons 6+, daily average, all channels (hh:mm)

*Broadcast time*: total broadcast time Dutch channels, daily average (hours)

*Channels received*: viewers estimation about the number of channels they receive "with reasonably good reception", persons 13+ owning a television (Intomart, 1998a; NOS KLO, 1998)

*Viewing time commercials*: persons 6+, daily average, Dutch channels (minutes)

*Commercial time*: daily average, Dutch channels (hh:mm)

<table>
<thead>
<tr>
<th>Month</th>
<th>Commission</th>
<th>Starting Value</th>
<th>Commission Percentage</th>
<th>Total Commission</th>
<th>Average Monthly Commission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>8.3</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Feb</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Mar</td>
<td>7.6</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Apr</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>May</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Jun</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Jul</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Aug</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Sep</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Oct</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Nov</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Dec</td>
<td>6.0</td>
<td>0.3</td>
<td>6.0</td>
<td>5.7</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Yearly average commission and starting values.
Appendix 3

Operationalisation of switching behaviour

Decrease in ratings
The decrease in ratings is defined as the relative loss of GRPs (viewers multiplied by length of time spent viewing) during the commercial break within the group of viewers watching the channel in question two minutes before the start of that break.

\[
\text{Decline in ratings} = 1 - \frac{\sum_{i=1}^{n} t_i}{n^*t}
\]

where:
\(t_i\) = the number of minutes person \(i\) has been watching the break;
\(n\) = the number of persons watching the channel two minutes before the start of the break;
\(t\) = the length of the break in minutes.

In the example in figure 17, the decrease in ratings is: \(1 - (10/12) = 16.7\%\).

Figure 17 Switching away
Decrease in viewers
The decrease in viewers is a relative measure of the number of persons in the group of viewers watching the channel in question two minutes before the start of the break who were not watching the channel one minute after the end of the break.

\[
\text{Decrease in viewers} = \frac{m}{n}
\]

where:
- \(m\) = the number of persons in the group of viewers watching the channel in question two minutes before the start of the break who were not watching the channel one minute after the end of the break;
- \(n\) = the number of persons who were watching the channel two minutes before the start of the break.

In the example given in figure 17, the decrease in viewers is: \(1/3 = 33\%\).

Rate of decrease
The rate of decrease is calculated by dividing the decrease in audience ratings by the decrease in viewers. In the example in figure 17, the rate of decrease is: 
\[
\frac{(1/6)/(1/3)} = 0.5.
\]

Increase in ratings
The increase in ratings is defined as the relative gain in GRPs (viewers multiplied by length of time spent viewing) during the commercial break due to the group of newcomers: viewers who were watching the channel one minute after the end of the break but who had not been watching the channel one minute before the start of the break.

\[
\text{Increase in ratings} = 1 - \frac{\sum_{j=1}^{k} t_j}{k \cdot t}
\]

where:
- \(t_j\) = the number of minutes person \(j\) has been watching the break;
- \(j\) = newcomers: viewers who were watching the channel one minute after the end of the break but who had not been watching that channel one minute before the start of the break;
- \(k\) = the number of persons watching the channel one minute after the end of the break;
- \(t\) = the length of the break in minutes.

In the example in figure 18, the increase in ratings due to the newcomers is: \(3/8 = 37.5\%\).
Increase in viewers

The increase in viewers is a relative measure of the number of persons in the group of viewers watching the channel in question one minute after the end of the break, who had not been watching the channel one minute before the start of the break.

\[ \text{Increase in viewers} = \frac{j}{k} \]

where:
\( j \) = newcomers: viewers watching the channel one minute after the end of the block who had not been watching the channel one minute before the start of the break;
\( k \) = the number of people who were watching the channel one minute after the end of the break.

In the example given in figure 18, the increase in viewers is: \( \frac{1}{2} = 50\% \).

Rate of increase

The rate of increase is calculated by dividing the increase in ratings by the increase in viewers. In the example given in figure 18, the rate of increase: \( \frac{3/8}{1/2} = 0.75 \).
Switching during commercial breaks

The rate of decrease is calculated by dividing the decrease in audience ratings by the decrease in minutes. As illustrated in Figure 18, the rate of decrease is constant. The rate of decrease is calculated as follows:

\[
\frac{\Delta R}{\Delta t} = \text{constant}
\]

where \(\Delta R\) is the change in ratings and \(\Delta t\) is the change in time.

The rate of decrease is also affected by the length of the break. As the length of the break increases, the rate of decrease decreases. This is because the longer the break, the more time the audience has to switch channels.

In the example in Figure 18, the increase in ratings due to the commercial is 3.8 percent. This is calculated using the formula:

\[
\% \text{ increase} = \frac{\Delta R}{R_0} \times 100
\]

where \(\Delta R\) is the change in ratings and \(R_0\) is the original ratings.
Appendix 4

Explanatory variables

### Placement of the break

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B04</td>
<td>Time elapsed since previous break on the channel</td>
</tr>
<tr>
<td>B05</td>
<td>Part of the week</td>
</tr>
<tr>
<td>B061</td>
<td>Monday</td>
</tr>
<tr>
<td>B062</td>
<td>Tuesday</td>
</tr>
<tr>
<td>B063</td>
<td>Wednesday</td>
</tr>
<tr>
<td>B064</td>
<td>Thursday</td>
</tr>
<tr>
<td>B065</td>
<td>Friday</td>
</tr>
<tr>
<td>B066</td>
<td>Saturday</td>
</tr>
<tr>
<td>B067</td>
<td>Sunday</td>
</tr>
<tr>
<td>B081</td>
<td>Time of day: 2.00-10.00 hrs.</td>
</tr>
<tr>
<td>B082</td>
<td>Time of day: 10.00-13.00 hrs.</td>
</tr>
<tr>
<td>B083</td>
<td>Time of day: 13.00-16.00 hrs.</td>
</tr>
<tr>
<td>B084</td>
<td>Time of day: 16.00-19.00 hrs.</td>
</tr>
<tr>
<td>B085</td>
<td>Time of day: 19.00-20.00 hrs.</td>
</tr>
<tr>
<td>B086</td>
<td>Time of day: 22.00-24.00 hrs.</td>
</tr>
<tr>
<td>B087</td>
<td>Time of day: 24.00-26.00 hrs.</td>
</tr>
</tbody>
</table>

### Break between programmes and programme categories

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B01</td>
<td>Type of break (centre versus end breaks)</td>
</tr>
<tr>
<td>P06</td>
<td>Shift in programme categories</td>
</tr>
</tbody>
</table>

### Programmes preceding, following or on the other channels during the break

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01</td>
<td>Break’s market share</td>
</tr>
<tr>
<td>A02</td>
<td>Combined ratings of the other channels during the break</td>
</tr>
<tr>
<td>A03</td>
<td>Amount of commercial time on other channels per minute during the break</td>
</tr>
<tr>
<td>A04</td>
<td>Audience size (GRPs) for commercials on other channels per minute during the break</td>
</tr>
<tr>
<td>A07</td>
<td>Number of programmes ending on other channels during the break</td>
</tr>
<tr>
<td>A09</td>
<td>Audience size for programmes ending on other channels during the break</td>
</tr>
<tr>
<td>P01</td>
<td>Length of the programme preceding the break</td>
</tr>
<tr>
<td>P02</td>
<td>Length of the programme following the break</td>
</tr>
<tr>
<td>P03</td>
<td>Non-programme items before the break</td>
</tr>
<tr>
<td>P04</td>
<td>Non-programme items after the break</td>
</tr>
<tr>
<td>P05</td>
<td>Shift in broadcasting organisation</td>
</tr>
<tr>
<td>P08</td>
<td>Shift in proportion of males in the audience profile between the programmes preceding and following the break</td>
</tr>
</tbody>
</table>
Switching during commercial breaks

P09 Shift in age composition in the audience profile between the programmes preceding and following the break
P10 Shift in proportion of social class AB1 in the audience profile between the programmes preceding and following the break
P11 Break after news
P12 Break after information
P13 Break after light information
P14 Break after Dutch drama
P15 Break after foreign drama
P16 Break after amusement
P17 Break after culture
P18 Break after children’s and youth programmes
P19 Break after sports
P20 Break after other programmes
P21 Break before news
P22 Break before information
P23 Break before light information
P24 Break before Dutch drama
P25 Break before foreign drama
P26 Break before amusement
P27 Break before culture
P28 Break before children’s and youth programmes
P29 Break before sports
P30 Break before other programmes
P31 Broadcast of the preceding programme in previous week
P32 Broadcast of the following programme in previous week
P33 Appreciation of the preceding programme (NL123)
P34 Appreciation of the following programme (NL123)

Programming of the break
B02 Length of the break
C001 Complete break: programme promotion
C016 Complete break: variance in age in the product target group profiles
C017 Complete break: variance in the proportion of social class AB1 in the product target group profiles
C018 Complete break: variance in the proportion of males in the product target group profiles
C019 Complete break: variance in the three profiles of the product target groups
C020 Complete break: discrepancy in age between the product target group profiles and the viewer profile for the preceding programme
C021 Complete break: discrepancy in the proportion of social class AB1 between the product target group profiles and the viewer profile for the preceding programme
C022 Complete break: discrepancy in the proportion of males between the product target group profiles and the viewer profile for the preceding programme
C023 Complete break: discrepancy in age between the product target group profiles and the viewer profile for the following programme
Explanatory variables

C024 Complete break: discrepancy in the proportion of social class AB1 between the product target group profiles and the viewer profile for the following programme

C025 Complete break: discrepancy in the proportion of males between the product target group profiles and the viewer profile for the following programme

C101 First part of the break: programme promotion

C116 First part of the break: variance in age in the product target group profiles

C117 First part of the break: variance in the proportion of social class AB1 in the product target group profiles

C118 First part of the break: variance in the proportion of males in the product target group profiles

C119 First part of the break: variance in the three profiles of the product target groups

C120 First part of the break: discrepancy in age between the product target group profiles and the viewer profile for the preceding programme

C121 First part of the break: discrepancy in the proportion of social class AB1 between the product target group profiles and the viewer profile for the preceding programme

C122 First part of the break: discrepancy in the proportion of males between the product target group profiles and the viewer profile for the preceding programme

C123 First part of the break: discrepancy in age between the product target group profiles and the viewer profile for the following programme

C124 First part of the break: discrepancy in the proportion of social class AB1 between the product target group profiles and the viewer profile for the following programme

C125 First part of the break: discrepancy in the proportion of males between the product target group profiles and the viewer profile for the following programme

C301 Last part of the break: programme promotion

C316 Last part of the break: variance in age in the product target group profiles

C317 Last part of the break: variance in the proportion of social class AB1 in the product target group profiles

C318 Last part of the break: variance in the proportion of males in the product target group profiles

C319 Last part of the break: variance in the three profiles of the product target groups

C320 Last part of the break: discrepancy in age between the product target group profiles and the viewer profile for the preceding programme

C321 Last part of the break: discrepancy in the proportion of social class AB1 between the product target group profiles and the viewer profile for the preceding programme

C322 Last part of the break: discrepancy in the proportion of males between the product target group profiles and the viewer profile for the preceding programme
Switching during commercial breaks

C323 Last part of the break: discrepancy in age between the product target group profiles and the viewer profile for the programme after the break
C324 Last part of the break: discrepancy in the proportion of social class AB1 between the product target group profiles and the viewer profile for the programme after the break
C325 Last part of the break: discrepancy in the proportion of males between the product target group profiles and the viewer profile for the programme after the break
C013 Complete break: average age in the product target group profiles
C014 Complete break: average proportion of social class AB1 in the product target group profiles
C015 Complete break: average proportion of males in the product target group profiles
C113 First part of the break: average age in the product target group profiles
C114 First part of the break: average proportion of social class AB1 in the product target group profiles
C115 First part of the break: average proportion of males in the product target group profiles
C313 Last part of the break: average age in the product target group profiles
C314 Last part of the break: average proportion of social class AB1 in the product target group profiles
C315 Last part of the break: average proportion of males in the product target group profiles

Audience
B09 Rating of the break
K2 Shared viewing: number of viewers per set
K001 Audience composition two minutes before the break: 6-12 years
K002 Audience composition two minutes before the break: 13-19 years
K003 Audience composition two minutes before the break: 20-34 years
K004 Audience composition two minutes before the break: 35-49 years
K005 Audience composition two minutes before the break: social class AB1
K006 Audience composition two minutes before the break: men
K007 Audience composition two minutes before the break: remote control
K008 Audience composition two minutes before the break: 2nd TV set in the house
K009 Audience composition two minutes before the break: using a TV guide
K010 Audience composition two minutes before the break: heavy viewers
K011 Audience composition two minutes before the break: VCR in the house
K012 Audience composition two minutes before the break: household size 3+
K101 Audience composition one minute after the break: 6-12 years
K102 Audience composition one minute after the break: 13-19 years
K103 Audience composition one minute after the break: 20-34 years
K104 Audience composition one minute after the break: 35-49 years
K105 Audience composition one minute after the break: social class AB1
K106 Audience composition one minute after the break: men
K107 Audience composition one minute after the break: remote control
K108 Audience composition one minute after the break: 2nd TV set in the house
Explanatory variables

K109 Audience composition one minute after the break: using a TV guide
K110 Audience composition one minute after the break: heavy viewers
K111 Audience composition one minute after the break: VCR in the house
K112 Audience composition one minute after the break: household size 3+

Products
C0101 Complete break: clothing, shoes
C0102 Complete break: foodstuff
C0103 Complete break: diary products
C0104 Complete break: drinks
C0105 Complete break: candy bars and sweets
C0106 Complete break: personal care products
C0107 Complete break: feminine hygiene
C0108 Complete break: shampoo
C0109 Complete break: medicine
C0110 Complete break: washing powder and detergent
C0111 Complete break: home furnishings
C0112 Complete break: household appliances
C0113 Complete break: diapers
C0114 Complete break: consumer electronics
C0115 Complete break: transportation
C0116 Complete break: tourism and air travel
C0117 Complete break: finance
C0118 Complete break: print media, film, theatre
C0119 Complete break: office supplies
C0120 Complete break: garden and home improvement
C0121 Complete break: toys and games
C0122 Complete break: music
C0123 Complete break: radio and television
C0124 Complete break: others
C1101 First part of the break: clothing, shoes
C1102 First part of the break: foodstuff
C1103 First part of the break: diary products
C1104 First part of the break: drinks
C1105 First part of the break: candy bars and sweets
C1106 First part of the break: personal care products
C1107 First part of the break: feminine hygiene
C1108 First part of the break: shampoo
C1109 First part of the break: medicine
C1110 First part of the break: washing powder and detergent
C1111 First part of the break: home furnishings
C1112 First part of the break: household appliances
C1113 First part of the break: diapers
C1114 First part of the break: consumer electronics
C1115 First part of the break: transportation
C1116 First part of the break: tourism and air travel
C1117 First part of the break: finance
C1118 First part of the break: print media, film, theatre

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CI 119 First part of the break: office supplies
CI 120 First part of the break: garden and home improvement
CI 121 First part of the break: toys and games
CI 122 First part of the break: music
CI 123 First part of the break: radio and television
CI 124 First part of the break: others
CI 125 First part of the break: others

C3101 Last part of the break: clothing, shoes
C3102 Last part of the break: foodstuff
C3103 Last part of the break: diary products
C3104 Last part of the break: drinks
C3105 Last part of the break: candy bars and sweets
C3106 Last part of the break: personal care products
C3107 Last part of the break: feminine hygiene
C3108 Last part of the break: shampoo
C3109 Last part of the break: medicine
C3110 Last part of the break: washing powder and detergent
C3111 Last part of the break: home furnishings
C3112 Last part of the break: household appliances
C3113 Last part of the break: diapers
C3114 Last part of the break: consumer electronics
C3115 Last part of the break: transportation
C3116 Last part of the break: tourism and air travel
C3117 Last part of the break: finance
C3118 Last part of the break: print media, film, theatre
C3119 Last part of the break: office supplies
C3120 Last part of the break: garden and home improvement
C3121 Last part of the break: toys and games
C3122 Last part of the break: music
C3123 Last part of the break: radio and television
C3124 Last part of the break: others

Campaigns
C002 Complete break: average commercial length
C003 Complete break: average frequency of broadcasts during the previous eight weeks
C004 Complete break: maximum frequency of broadcasts during the previous eight weeks
C005 Complete break: minimum frequency of broadcasts during the previous eight weeks
C006 Complete break: average probability of confrontation during the previous eight weeks
C007 Complete break: maximum probability of confrontation during the previous eight weeks
C008 Complete break: minimum probability of confrontation during the previous eight weeks
C009 Complete break: average time elapsed since the previous broadcast
C011 Twin commercials
C012 Complete break: average frequency of broadcasts during the previous week
Explanatory variables

C102  First part of the break: average commercial length
C103  First part of the break: average frequency of broadcasts during the previous eight weeks
C104  First part of the break: maximum frequency of broadcasts during the previous eight weeks
C105  First part of the break: minimum frequency of broadcasts during the previous eight weeks
C106  First part of the break: average probability of confrontation during the previous eight weeks
C107  First part of the break: maximum probability of confrontation during the previous eight weeks
C108  First part of the break: minimum probability of confrontation during the previous eight weeks
C109  First part of the break: average time elapsed since the previous broadcast
C112  First part of the break: average frequency of broadcasts during the previous week
C302  Last part of the break: average commercial length
C303  Last part of the break: average frequency of broadcasts during the previous eight weeks
C304  Last part of the break: maximum frequency of broadcasts during the previous eight weeks
C305  Last part of the break: minimum frequency of broadcasts during the previous eight weeks
C306  Last part of the break: average probability of confrontation during the previous eight weeks
C307  Last part of the break: maximum probability of confrontation during the previous eight weeks
C308  Last part of the break: minimum probability of confrontation during the previous eight weeks
C309  Last part of the break: average time elapsed since the previous broadcast
C312  Last part of the break: average frequency of broadcasts during the previous week
Switching during commercial breaks

C109: Complete breaks average occurrence breaks during the previous eight weeks
C110: Complete breaks maximum frequency of broadcasts during the previous eight weeks
C111: Complete breaks minimum frequency of broadcasts during the previous eight weeks
C112: Complete breaks average probability of commercial during the previous eight weeks
C113: Complete breaks maximum probability of commercial during the previous eight weeks
C114: Complete breaks minimum probability of commercial during the previous eight weeks
C115: Complete breaks average time since previous broadcast
C116: Error decomposition
C117: Complete breaks average frequency of broadcasts during the previous week

C118: "Switching during commercial breaks"
C119: Complete breaks average occurrence breaks during the previous eight weeks
C120: Complete breaks maximum frequency of broadcasts during the previous eight weeks
C121: Complete breaks minimum frequency of broadcasts during the previous eight weeks
C122: Complete breaks average probability of commercial during the previous eight weeks
C123: Complete breaks maximum probability of commercial during the previous eight weeks
C124: Complete breaks minimum probability of commercial during the previous eight weeks
C125: Complete breaks average time since previous broadcast
C126: Error decomposition
C127: Complete breaks average frequency of broadcasts during the previous week
Operationalisation of explanatory variables

In this appendix, a number of general issues concerning the operationalisation of the explanatory variables in this study are discussed. This is followed by a technical description of the operationalisation of all 225 explanatory variables, with more detailed discussions of the operationalisation of several variables of special interest, including characteristics that, as far as could be determined, have not been discussed previously in the literature or whose effects on switching behaviour have not been investigated before. In the operationalisation, definitions currently in use in the CKO and in the programme files as reported by Intomart (Intomart, 1998b) are adhered to whenever possible.

The average and standard deviations for all variables are presented in appendix 7. Tables showing the average levels of switching for breaks with various values (i.e., high, low and average) have been published previously for each explanatory variable (Intomart, 1996a), as have the frequency distribution for all variables (Intomart, 1996b).

5.1 Databases

A number of databases are used in this research. Most of the data are drawn directly from the CKO (see also chapter 4, section 4.1). In reality, the CKO is a collection of various databases and analyses. In addition to the electronic registration of audience data, a number of questionnaire surveys provide data for the CKO (see also Intomart, 1998b). These include a base questionnaire administered to all panel members in February of each year, on which the respondents background characteristics are based. Data is also provided by Intomart's Radio Establishment Survey. This survey is carried out every year in September and October in 9,000 households and includes a comprehensive set of questions covering a variety of topics, including audio visual equipment in the household and channel reception.

In addition to the switching behaviour data and the background characteristics of panel members, the CKO also includes a number of databases covering a variety of programme and commercial breaks characteristics (Intomart, 1998b). The programme database contains the titles and broadcast times for all programmes.

74 The information from this base survey is used in the CKO from April of the year in question through March of the following year. However, because the February 1995 survey best fitted with the research period for the switching behaviour study (January through April 1995), the information from this survey was used for all four months of the research.
broadcast, as well as various programme classifications. The coding for programme classification is carried out by Intomart and the NOS. The commercial data base contains the characteristics of all commercials. Coding for commercial characteristics is carried out by Intomart and The Media Institute (HMI). The coding for product sort, brand and sub-brand (e.g., shaver, Philips, Philishave) are of special significance in the operationalisation of a number of explanatory variables in this study.

In addition to data sources directly related to the CKO, data from the Target Groups Research (“DoelGroepen Onderzoek”: SUMMO, 1995) was used to establish profiles of product users (see also section 5.7 of this appendix). In the SUMMO research, 13,245 respondents filled in a questionnaire covering, among other things, product use, purchasing behaviour, interests and activities.

5.2 Programmes and commercial breaks
All of the programmes and commercial breaks broadcast on the major channels are registered in the CKO. In this registration, commercial breaks are defined as a broadcast of one or more commercials and/or promotional films, preceded and followed by beginning and end leaders. Programmes are defined as a continuous broadcast lasting, as a rule, a minimum of five minutes. At the time this research was carried out, segments of programmes interrupted one or more times by commercial breaks were reported as separate programmes (see also footnote 13 on page 41).

Other than commercial breaks, broadcasts lasting less than five minutes are generally not registered as a separate programme. These include, for example, broadcasts between programmes and breaks of non-programme materials such as announcer's messages, programme schedule information, previews of upcoming programmes or channel calls (“continuity”, see chapter 3, section 3.2.5). At the request of the channel involved, some broadcasts lasting less than five minutes are registered as separate programmes in the CKO reports. These include individual music video clips, news bulletins and “Postbus 51” (short governmental information broadcasts). These short programmes were discussed further in chapter 2, section 2.4.3.

5.3 Calculating commercial characteristics
In order to relate switching behaviour to the programming characteristics of commercial breaks, a large number of variables were constructed dealing with the commercials and promotional clips which make up each break. A number of technical issues involved in the use of commercial characteristics in the calculation of the explanatory variables are discussed in this section.
Operationalisation of explanatory variables

Weighting
It was assumed that longer commercials were more important determinants of the character of breaks than shorter ones. For this reason, weighting for the length of each commercial took place when commercial characteristics were assigned. In determining averages for breaks, a 40-second commercial counts twice as much as a 20-second commercial.

Parts of the break
In using commercial characteristics to determine the effects of the features of a break on switching behaviour, the question arose whether commercials at the beginning of a break have a greater influence on switching behaviour than those placed in the middle or the end of a break. For this reason, a number of operationalised characteristics of commercial breaks were calculated for the beginning and end of a break as well as for the entire break. The break was divided in three equal parts for the purposes of calculating commercial characteristics per break segment. Commercials that spanned two break segments were split and were included in each break segment weighted proportionate to the number of seconds of the commercial that fell in the segment. Because of multicollinearity, characteristics assigned to break segments were only tested in beginning and end segments and not in middle segments (see also appendix 6, section 6.2.2).

The division of breaks into three parts was only done for explanatory variables concerned with the content of the break. This division was not relevant for other variables.

Commercial harmonisation
For calculations at the level of individual commercials, it was necessary to harmonise the files containing characteristics from STER and IP commercials. Commercials from the various sources were counted as the same commercial on the basis of identical spot length and HMI product code. The Intomart Commercial Harmonisation code (IHC code) was also used, although at the time of the study the IHC code was still in an experimental state. At that time, commercials of 15 seconds and longer in length were harmonised using their digitised sound pattern, but the codes assigned on this basis had not been fully corrected. Since then, the IHC codes have been fully integrated in the CKO commercial database and the data have been corrected retrospectively through 1995. Because of corrections in this database made after this study was carried out, it is possible that some small discrepancy may appear for some dependent variables in a future re-calculation. However, assuming that these differences are randomly distributed, it is not expected that they will have any significant effect on the research findings.
Missing values
Four of the 12,278 breaks did not contain commercials, consisting entirely of promotional clips. These breaks were assigned the average score for the characteristic concerned of the remaining 12,274 breaks. The absence of commercials occurred more often in break segments (15 cases in the beginning of breaks and 586 cases at the end of a break); the segments were entirely filled with promotional material. In these instances, the score of the other break segment was assigned for the characteristic concerned.

5.4 Placement of the break

Time of day
Each commercial break was assigned to a time of day on the basis of the middle minute of the break. The broadcast day was divided into seven time periods:
- 02.00-10.00 hrs.;
- 10.00-13.00 hrs.;
- 13.00-16.00 hrs.;
- 16.00-19.00 hrs.;
- 19.00-22.00 hrs.;
- 22.00-24.00 hrs.;
- 24.00-26.00 hrs.

This division in time periods was based on the following considerations:
- time periods corresponding to those used in the CKO;
- homogeneous distribution of the number of breaks (= observations) per time of day;
- as homogeneous a level of switching behaviour per time of day as possible (with special attention given to the distribution of the decrease in audience ratings).

Part of the week and weekdays
The day of broadcast for each break was entered as one of seven dichotomous variables corresponding to the days of the week. In the CKO, a day is defined as the period from 02.00 hrs. in the morning to 26.00 hrs. at night. In the division of the week into two parts, the weekend was defined as the period from Friday evening 18.00 hrs. through Sunday night 26.00 hrs.

Time elapsed since previous break on the channel
The time elapsed since the broadcast of the previous commercial break on the channel was registered to the minute. The first break of the day was assigned the number of minutes between 02.00 hrs. at night and the time of the broadcast of the break as a score.
Operationalisation of explanatory variables

Centre versus end breaks
In order to differentiate between commercial breaks between two different pro­
grammes from breaks that interrupt a programme, a break was defined as “pro­
grame interrupting” when the title of the programmes preceding and following
the break were identical.  

Shift in programme categories
Shift in programme category was defined as a change in the programme categories
of the programmes preceding and following the break. A special classification was
created for use in this study, based on the various programme classifications in use
in the CKO. It included the following ten programme categories:

1. news;
2. serious information;
3. light information;
4. Dutch drama;
5. foreign drama;
6. amusement;
7. culture;
8. children and youth;
9. sports;
10. other.

There appeared to be considerable overlap between the two explanatory vari­
ables “type of break” (centre versus end breaks) and “shift in programme catego­
ries”. In order to distinguish between the two, centre breaks were not coded as
having such a shift.

5.5 Programmes preceding, following or on the other channels during the break

Length of the programme preceding and following the break
The lengths of programmes preceding and following the break were registered in
minutes. As previously stated, the segments of programmes interrupted by com­
mercial breaks were counted as separate programmes.

Programme category preceding and following the break
The ten programme categories used in the definition of the shift in programme
categories were used to classify programmes preceding and following a break.

75 The first eight letters of the title were used instead of the entire title, because in some instances of films
or programmes interrupted by advertising, the segments of the broadcast may be numbered in the title.
Despite this difference in the titles, these breaks were considered programme interrupting.
Switching during commercial breaks

Non-programme items preceding and following the break
The programme files as reported by Intomart also formed the basis for identifying continuity broadcast preceding and following a break. When no programme was broadcast for at least one minute or more before or after a break, this “gap” was classified as continuity. In addition, a number of broadcasts were classified as continuity in the programme classification.

Programme appreciation
Appreciation scores are registered for the majority of programmes on the Dutch public channels (Bekkers, 1992). When these programmes end, panel members are asked via the people meter monitor to enter an appreciation score on a scale of 1 (very bad) to 10 (very good). This can be done simply, using the meter’s remote control. Appreciation scores are not registered for programmes on the two commercial channels, RTL4 and RTL5.

Broadcast of the programme in previous weeks
The characteristic “episodic structure” was assigned to a programme preceding or following a break if a programme with the same title was broadcast during one or more of the preceding weeks. This definition was designed to prevent the characteristic “episodic structure” being assigned to a one-time broadcast (e.g., a football game) that was repeated the next day.

Shifts in broadcasting organisation
Shifts in the broadcasting organisation of the programmes before and after the break were determined for breaks on the three public channels. No changes in broadcasting organisation takes place in the programming on RTL4 and RTL5.

Shifts in audience profile
Shifts in audience profiles for programmes preceding and following a commercial break were calculated for the background characteristics sex, social class and age. Although the base target group used in the research included persons 6 years of age and older, the characteristics sex and social class for persons 13 years of age and older were used. This was in line with the standard target groups in the CKO reports. The shift in sex in the audience profile was defined as follows:

\[
\text{shift}_{\text{man}} = 100 \times \left| \frac{(K_{y}^{\text{man}} / K_{y}^{6+}) - (K_{x}^{\text{man}} / K_{x}^{6+})}{1} \right|
\]

where
- \( \text{shift}_{\text{man}} \): the shift in audience profile men;
- \( K_{y}^{\text{man}} \): audience rating men 13+ for the programme before the break;
- \( K_{y}^{6+} \): audience rating persons 6+ for the programme before the break;
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$K_{\text{men}}$: audience rating men 13+ for the programme after the break;

$K_{s^+}$: audience rating persons 6+ for the programme after the break.

The same method of calculation was used to determine the shift in social class in the audience profile of the programme preceding and following the break for the category AB1 13+.

The shift in age in the audience profiles for the programmes preceding and following the commercial break was calculated on the basis of the audience ratings for six age categories: 6-12, 13-19, 20-34, 35-49, 50-64 and 65+. Because these groups vary in size they were weighted for the size of the universe, so that each switching viewer counted the same in the calculation of the extent of switching, regardless of his or her age. For each of the age groups, a shift factor was first calculated using the method of calculation used for men and AB1. These factors were then combined as follows:

$$\text{Shift in age in audience profile} = \frac{(1,310 \times \text{shift}_{612}) + (1,350 \times \text{shift}_{1319}) + (3,730 \times \text{shift}_{2034}) + (3,320 \times \text{shift}_{3549}) + (2,210 \times \text{shift}_{5064}) + (1,810 \times \text{shift}_{65+})}{13,730}$$

When interpreting the shift factors, it should be kept in mind that the method of calculation of the shift factor was selected so that it would make no difference whether the number of viewers in the category in question increased or decreased. Thus, a doubling of viewers, for example, yields the same value as a decrease of 50%. For example, if a programme preceding the break was a women's programme with a 20% male audience and the programme following the break was a sports event with a 60% male audience, then the shift in the audience profile for the characteristic sex is 40% (the absolute value of 20% - 60%). The resulting factor for the background characteristic sex would be the same if females rather than males were used as the reference group. In the example above, the shift factor for women is 80% - 40% = 40%.

In addition, the size of shift factors is partially determined by the proportion of the total audience formed by the category concerned. A marked decline within a group is only significant for switching in a break if the group in question forms a large part of the audience of that break. The tripling of the number of male viewers in the example above would have produced a smaller shift factor if there were very few men in the audience to begin with. This would have represented only a marginal shift in the composition of the audience.

$^{76}$ The values for the universe per age group in the formula shown were for the period from January 1 1995 through April 1 1995. In the CKO, the universes are adjusted every year in week 14, so that different universes were used for breaks broadcast in the period from April 2-30, 1995.
Market share and combined ratings of the other channels

Audience ratings for all persons six years of age and older were used to determine the market share and total audience rating for programming on other channels during a break. This included the audience figures for the five channels included in the study as well as all other channels, including video.

Programming on the other channels

A number of variables were defined that dealt with programming on other channels opposite the commercial break. They concerned the number of programmes ending on other channels during the break and the amount of advertising on other channels during the break (see chapter 3, sections 3.3.2 and 3.3.3). The audience sizes for these programmes and breaks was also determined, as this would ultimately determine the extent of the inflow and outflow of viewers. This resulted in four variables:

- amount of advertising on the other channels during the break;
- number of people watching commercial breaks on other channels during the break;
- number of programmes ending on other channels during the break;
- number of people watching programmes ending on other channels during the break.

A number of factors had to be taken into account in the operationalisation of these variables. First of all, these variables are dependent on the length of the break in question. The longer a break lasts, the more this occurs on other channels. To compensate for the mutual dependence on the length of the break, the values for these four variables were divided by the length of the break in minutes.

Secondly, because switching away at the end of programmes can take place before the programme actually ends, the number of programmes ending on other channels during a commercial break was defined as the number of programmes (excluding breaks) on the other four channels for which the second minute before the end of the programme fell during the break in question. This is analogous to the definition used for the decrease in audience ratings (see appendix 3).

In addition to the size of the audience for programmes ending on other channels, the strength of the effect of programmes ending on other channels on switching is dependent on the number of advertising minutes remaining in the break at the moment each programme ends.

Only the data from the five channels involved in the research was used in determining values for the variables dealing with programming on other channels. In reality, however, the programming on all of the channels received in the Netherlands can be expected to have an effect. Nonetheless, limiting the variables to data from five channels was an acceptable simplification; together, these five channels had a dominant market share (77.4% in the period from January through and in-
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including April 1995, 02.00-26.00 hrs., persons 6+). Moreover, many of the other channels available in the Netherlands, such as CNN and MTV, have a fairly consistent programming whose potential effect on switching during breaks can be considered constant.

The amount of advertising on other channels was defined both in terms of the number of minutes and in the number of viewers (GRPs). In this calculation, the number of minutes of advertising in commercial breaks on the other four channels during a break were multiplied by audience rating for these breaks (yielding the total GRPs on the other four channels during the break) and divided by the length of the break in question.

In the following example, the number of programmes finishing on the other channels and the size of the audience for programmes ending on other channels is calculated for an imaginary break on RTL4 from 20.15 hrs. to and including 20.17 hrs. The relevant broadcasts are:

- Programme A: NL1 19.47-20.18; audience rating = 1%; time remaining 2 minutes;
- Programme B: NL2 19.32-20.17; audience rating = 3%; time remaining 3 minutes;
- Programme C: NL3 20.17-20.19; audience rating = 4%; time remaining 1 minute.

This yields the following values:

- Number of programmes = 3, sum of the audience ratings = 8%, break length = 3
- Number of programmes ending on the other channels: 3 / 3 = 1
- Number of viewers of the programmes ending: (1 x 2 + 3 x 3 + 4 x 1) / 3 = 5

5.6 The audience

Rating of the break

The total number of viewers per break was determined using the audience rating for the target group persons 6+.

Audience composition

In order to test the possible effect of viewers' personal characteristics on switching behaviour during the break, an audience profile was generated for each break based on the audience share for a number of groups whose switching behaviour was assumed to be typical (see chapter 3, section 3.4)77:

- 6-12 years old;
- 13-19 years old;
- 20-34 years old;

77 The selection of these characteristics was limited by the fact that only background characteristics known for all respondents at the time of the observations could be used. Constraints on the planning of the research meant that it was not possible to supplement the standard CKO background characteristics either before or during the observation period with a survey of CKO panel members containing questions specifically designed for the study.
Switching during commercial breaks

- 35-49 years old (because of multicollinearity, the age group total 50+ was not included; see also appendix 6, section 6.2.2);
- social class AB1 persons 6+;
- males 6+;
- persons 6+ from households with three or more persons;
- persons 6+ from households with a remote control for the family television set;
- persons 6+ from households with two or more television sets;
- persons 6+ from households with one or more video recorders;
- persons 6+ who regularly used one of the broadcasting organisation television guides (more than the average reading probability for the combined group of the broadcasting organisation television guides during February 1995).
- heavy television viewers (persons 6+ who spent more than the average amount of time watching television, based on viewing behaviour as registered for all channels in the period from January through March 1995).

The audience profile for each break was based on the average percentage share of the total audience 6+ for each of these target groups. Because of the difference in the definitions of audience used for each of the two switching variants, the profile was calculated for both groups; viewers during the second minute preceding the break and viewers during the first minute following the end of the break.

Social viewing: number of viewers per set

The number of persons per television set was chosen as the measure of shared viewing (see chapter 3, section 3.4.20). This measure was based on the average number of viewers per set for television sets turned on during the break. In some instances, this was less than one. This occurred, for instance, when the audience for the break contained a relatively large number of viewers under the age of six, the age limit for calculating audience per television set. As a result of this limit, a television set watched only by one child under six would have an audience of zero persons.

A second, less common cause of an audience of less than one was television sets turned on for which no viewers were registered. This can occur, for example, when the television is turned on as background noise during housework, without anyone actually watching the set. This seems to have been the case for a number of breaks with low audience ratings that were broadcast during the day. In the CKO, people only have to register as “viewer” if they are actually watching a broadcast. This is in contrast to the “presence in the room” definition of viewing used in many other countries.
5.7 Programming of the break

**Length of the break**

The length of a commercial break was calculated in minutes, as reported in the programme file. Promotional clips broadcast during the break were included as part of the break.

**Programme promotion**

The presence of promotional clips in a commercial break was noted dichotomously without reference to the number of clips or the total length of promotional clips relative to the length of the break.

**Profile of the product target group**

In order to establish the target groups of the individual commercials in a break, a target group profile was determined for each of the products advertised in all of the commercials broadcast during the period of observation. The product target group profile forms the basis for the calculation of a number of explanatory variables, including "average profile of the product target group", "variance of profile of the product target group" and "discrepancy product versus viewer profile".

To determine the profile of the product target group for all of the commercials in each break and its segments (beginning and end), all 1,893 commercials broadcast in the 12,278 breaks were sorted into 159 different branches on the basis of their HMI coding. The Target Groups Research 1995 (SUMMO, 1995) was used to determine product use for the products in each branch. Depending on the relevant information available for a product, use was operationalised as interest or purchase, use or visiting frequency. The product target group was defined for each commercial based on the following three personal characteristics:

- average age of users, calculated according to the percentage of users in each of the age categories 14-19, 20-34, 35-49 and 50+ (the category 6-13 was not included in the SUMMO Study), weighted for their population size. For example, users of Dutch jenever (gin) are older, making this an "old" product, while anti-acne cream e.g. is a "young" product;
- proportion of males 14+ in the total group of users;
- proportion of social class AB1 14+ in the total group of users.

**Average profile of the product target group**

The product target group profile was calculated per break and its segment, based on the following characteristics:

- average age of the target group of the advertised products;
- average proportion of social class AB1 in the target group of the advertised products;
- average proportion of males in the target group of the advertised products.
Switching during commercial breaks

Variance of profile of the product target group

The variation in the profile indicates the extent to which the commercials in the break are aimed at a similar target group. As a measure of variation, the standard deviation for the average age, proportion of social class AB1 and the proportion of males 13+ was calculated for each break and its segment. The variation variables were standardised to allow a comparison of these three personal characteristics. A fourth variable was calculated in which the variations of the three characteristics were combined and averaged. For breaks containing only one commercial, the variance was nil.

Viewer profiles

To determine the discrepancy between the average product target group profile of the break and the audience profiles for the programmes preceding and following the break, audience profiles per programme were established based on the average age, the proportion social class AB1 13+ and the proportion of males 13+. These profiles were calculated by multiplying the audience rating for the target group concerned multiplied by their population size and divided by the total audience for the programme in question. Because these profiles were to be compared with product target group profiles calculated for consumers older than 13, viewers under 13 years of age were not included in the calculation. In calculating the average age, the audience ratings for the five age categories 13-19, 20-34, 35-49, 50-64 and 65+ were related to the population size and the average age of each age category:

\[
\text{Average age} = \frac{(1,350 \times 15.91 \times \text{rating}_{1319}) + (3,730 \times 27.20 \times \text{rating}_{3549}) + (3,320 \times 41.77 \times \text{rating}_{3549}) + (2,210 \times 56.62 \times \text{rating}_{5064}) + (1,810 \times 73.35 \times \text{rating}_{65+})}{12,420}
\]

Discrepancy product versus viewer profile

The extent of agreement between average profile of the product target groups for a commercial and the audience profile of the programmes preceding and following the break is an indication of how the average target group for the commercials in the break fits with the break's audience (see also chapter 3, section 3.5.7). A large age discrepancy between the profiles indicates that, on average, the products in the

---

78 For practical reasons a limit of 13+, a standard age limit used in the audience research was used for the profiles instead of the limit of 14+.
79 Because these variables were standardised, the size of this measure cannot be interpreted internally. However, the variables can be interpreted in relation to other variables in the analyses.
80 The values for the universe per age group used in the formula shown were for the period from January 1 1995 through April 1 1995. In the CKO, the universes are adjusted every year in week 14, so that different universes were used for breaks broadcast in the period from April 2-30, 1995.
break have much younger or older users than the audience for the break (for example, a commercial for diapers targeted young users following the programme “Zo vader, zo zoon” which has a largely older audience). Because of the way the measure of discrepancy is defined, a high value expresses a large difference, regardless of the direction of that difference. A break with viewers younger than the target group for the products advertised can have the same value as a break whose audience is older than the intended target group.

The measure of discrepancy was calculated for the break and break segments for the characteristics age, social class and sex. In order to standardise the results, the measures of discrepancy were calculated for each characteristic for each break and break segment by dividing the absolute value of the difference between audience profile and the product target group profile by the variance of the profile of the product target group (see also footnote 79 on page 178):

\[
D = \frac{|AP - PPTG|}{\sigma_{PPTG}^2}
\]

Where:

\[
D = \text{measure of discrepancy;}
\]

\[
AP = \text{audience profile;}
\]

\[
PPTG = \text{profile of the product target group.}
\]

5.8 Products

To determine the effect of product type on switching, the products advertised in commercials in the entire break and the segments were identified (see chapter 3, section 3.5.6). All of the products advertised on television during the research period were then sorted according to a classification system created for this study. The categories in this system were based on HMI product codes (also used in establishing product target group), and designed to meet the following criteria:

- internally homogenous;
- a sufficient number of commercials per category;
- as high a degree of overlap as possible with the principle categories of the two product classifications most frequently used in the Netherlands, the HMI and the BBC product classifications (despite major differences between the two);
- separate categories for products that have been related to switching behaviour or to irritation with advertising in previous research (see chapter 3, section 3.5.5).

The presence or absence of commercials for each of the following product categories was determined for each break and break segment. The percentage of blocks containing commercials in each category during the research period was:
• textiles, shoes 7%
• foodstuff 37%
• dairy products 14%
• drinks 26%
• snacks 30%
• body care 35%
• feminine hygiene 14%
• shampoo 16%
• medical remedies 17%
• washing and cleaning products 26%
• home furnishings and decoration 5%
• household appliances 5%
• diapers 12%
• consumer electronics 14%
• transport 20%
• tourism and airlines 15%
• finances and financial services 28%
• print, film and theatre 13%
• business and office items 15%
• do-it-yourself, house and garden supplies 5%
• toys and games 10%
• music 10%
• radio and TV (excluding programme promos) 5%
• others 36%

5.9 Campaigns

Commercial length
The average length of spots (excluding promotional clips) per break or break segment was calculated in seconds. Twin commercials were treated as separate commercials.

Twin commercials
At the time the research was carried out, the commercial databases of the CKO did not contain a separate coding for twin commercials. The presence of twin commercials in the break was operationalised as the presence of two or more commercials with the same HMI codes for product and brand in the same break.

Overload: period of time since the last broadcast
As a measure of overload, the period of time since the last broadcast was opera-
Operationalisation of explanatory variables

Operationally defined as the number of hours since the previous broadcast of the commercial on one of the five channels involved in the study. The period of time since the last broadcast was calculated per break and break segment on the basis of the average number of hours passed since the previous broadcast of the commercial on one of the five channels. If a commercial was broadcast for the first time or if the last broadcast occurred more than a week earlier the variable is assigned the maximum value of 168, the number of hours in one week.

Overload: frequency of broadcasting

The frequency of broadcasting was operationalised as the number of times that a commercial concerned had previously been broadcast. The frequency of broadcasts was calculated as the number of times a commercial was broadcast in the previous eight weeks on any of the five channels included in the study, including earlier broadcasts on the same day. The average, lowest and highest frequency of broadcasts for commercials during the period of eight weeks prior to the broadcast of the break were calculated per break and break segment.

A similar calculation of the average, highest and lowest frequency of broadcasts was made per break and break segment for the seven days prior to the broadcast.

Overload: probability of confrontation

A third measure of overload, the probability of confrontation, was calculated as the accumulated number of viewers (the GRPs for all persons 13 years and older) that all the commercials in the break or break segments achieved on all five channels in the eight weeks prior to the broadcast of the break, including earlier broadcasts on the same day the break was broadcast.²⁸¹

²⁸¹ In principle, the probability of confrontation can also be calculated by determining the reach and average contact frequency per viewer instead of this summation of audience ratings. Other measures of overload can also be calculated on the level of the individual. However, because the reach for a commercial increases with every broadcast, this method of calculation would require a separate reach analysis for each of the 70,702 spots. At the time of the study, the enormous calculation procedure that would have been necessary to carry this out was not feasible. For this reason, the calculation of the probability of confrontation was limited to the summation of audience ratings.
Switching during commercial breaks

The average length of commercials during a break was observed to be around 1 minute. Commercial content often includes product placements and promotional offers. The presence of commercials is crucial for sustaining revenue streams for the networks.

As the research was carried out, the commercial databases of the CKO did not contain a separate coding for TV commercials. The presence of TV commercials was noted as a factor contributing to the overall entertainment experience of viewers.
Appendix 6

Statistical methodology

No extraordinary statistical methods were used in the analysis; the regression techniques selected are standard methods used in social science research. However, a number of factors in the methodology of the research were certainly not standard and made adjustments in the statistical analysis necessary. These included:

- a large number of explanatory variables;
- a very large number of observations;
- the use of commercial breaks as units of analysis.

This appendix includes a discussion of the consequences of these features for the statistical methodology of the analysis. A number of general statistical features of the analysis are also discussed.

6.1 Model

6.1.1 Clusters
Because of the large number of explanatory variables included in this study (225), it was not possible to generate a complete model for each of the two independent variables (the decrease and the increase in audience ratings) using all of the explanatory variables in a single run. For both cases, it was necessary to construct the model in two stages.

Initially, all explanatory variables were divided into groups or clusters. The clusters are those shown in appendix 4. In total, the analyses were carried out for seven clusters. Explanatory models for the decrease and the increase in audience ratings were calculated for each of these clusters. In the second step, the significant explanatory variables in each cluster were taken together to form a variable set which was then used to calculate a model for each of the two independent variables.

6.1.2 Number of observations and power of the test
The size of the data set made testing for significance difficult. The number of observations, 12,278 commercial breaks, was so large that almost all relationships would be found to be significant, even with very small differences. The tests of the statistical methods used in social science research, as well as the restrictions on statistical parameters normally applied in these methods, are generally based on
Switching during commercial breaks

"normal" random sample research with smaller samples. With a much larger sample, the discriminatory power is too great. For a much larger number of cases, the "power of the test" is too strong and the test of significance can barely distinguish between relevant and irrelevant outcomes.

In this analysis, the power of the test was corrected by reducing the number of observations to an acceptable sample size of 1,000 by weighting all cases by a factor of $1,000/12,278^{82}$. This weighting had no effect on the size of the estimated parameters, but did affect the levels of significance reported in the testing to the desired level. In reporting the results, the $\beta$-factor is given. Explanatory variables with a $\beta$ smaller than 1.0 should be interpreted with the necessary caution.

6.1.3 Weighting

In this study, the data were analysed on the block level. In principle, it would have been possible to weight breaks for length and/or audience ratings, so that long breaks or breaks with large audiences weighed more in the analysis. There are practical as well as methodological arguments to be made for and against weighting for these characteristics. Weighting for audience ratings offers interesting possibilities in terms of the analysis. While analyses dealing primarily with characteristics of the average broadcast are best carried out without weighting, weighting for audience rating (the number of viewers per broadcast) is advisable when the aim is to make statements about the average viewer.

Practical considerations argued against such a weighting in this study. The weight factors under consideration, block length and audience rating, were already included in the set of explanatory variables. For statistical reasons, it is not possible to weight for one or more factors that are included in or are closely related to the set of explanatory variables.

Weighting does occur in the initial calculation of the CKO audience data used in this research. Viewing behaviour registered in the CKO panel is weighted for a number of household and personal characteristics in the daily calculations (Into-mart, 1998b).

6.1.4 Missing values for programme appreciation

In the CKO, programme appreciation is only registered for the programmes of the public channels NL123. All of the programmes broadcast on the two RTL channels have missing values for this factor. Because such a large number of missing

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82 Alternatively, the power of the test could have been reduced by adjusting the alpha level of the test.

83 This can be made clearer using an analogy with another kind of research. In tests of the popularity of mayors, the unweighted difference in ratings provides an indication of the popularity of the average mayor. However, when the intention is to use this data to determine the level of satisfaction with their mayor among citizens in the whole of the country, the results per mayor should be weighted for the number of residence in the city, so that the popularity of mayors of large cities counts for more than mayors of smaller towns.
values was not desirable in the model, the effect of programme appreciation on switching was tested in separate models containing only the commercial breaks broadcast on the public channels NL123. After the two definitive models were established, an extra series of regression models were calculated including programme appreciation in addition to all other explanatory variables that had a significant effect on one or both forms of switching behaviour. In total, four different models were calculated:

- increase in ratings for all commercial breaks on NL123 (n = 4,185);
- decrease in ratings for all commercial breaks on NL123 (n = 4,361);
- decrease in ratings for all commercial breaks with a minimum audience rating of 2% in the second minute before the start of the break (n = 2,698);
- increase in ratings for all commercial breaks with a minimum audience rating of 2% in the first minute after the end of the break (n = 2,273).

The last two models were generated because of the small number of observations of programme appreciation for programmes with a low audience rating. After all, only viewers give programme appreciation scores, and many programmes have only a few viewers. This selection resulted in a minimum of approximately 50 viewers.

6.1.5 Interpretation of the regression models

Regression was selected as the method of multivariate analysis for the study. In the following sections further background information is provided concerning the statistical methods used in the calculation of the regression models. The following coefficients are significant in interpreting the contents of the regression models:

- **$R^2$**: The coefficient of determination or, in other words, the goodness of fit of the model. This is also a measure of the proportion of the variation in the dependent variable explained by the model. The higher this value, the more precise the estimation of the model and the better and more complete the description of switching behaviour achieved by the model. Because of the large number of independent variables in the models, the adjusted $R^2$ is used.

- **$B$**: The regression coefficient, which indicates the extent to which the independent variable is influenced when the explanatory variable concerned changes by one unit.

- **$\beta$**: Standardised value of the $B$-coefficient, allowing for comparison of this value between the variables in the set of explanatory variables. The larger the $\beta$, the stronger the effect on the independent variable. The $\beta$ is defined as the ratio of the standard deviation of the independent variable to the standard deviation of the dependent variable.

- **Constant**: The level of the independent variable at which all explanatory variables have a value of zero.
6.2 Statistics
Various statistical procedures were used to test the significance of the outcomes. An explanation of the tests used is given in the following section.

6.2.1 Linear multiple regression
As was noted in chapter 1 section 1.3, the statistical analysis of this study was limited to the investigation of direct effects. More elaborate estimation methods, such as LISREL, which test indirect effects and generate a structural model, were not used. The multivariate analyses were carried out using linear regression. The regression analyses were carried out stepwise (SPSS/PC+). In this type of analysis all non-significant variables are discarded and only significant relationships are reported. The complete specifications and outcomes of the models per cluster and for the two models are included in the table report (Intomart, 1996b).

The regression models for each cluster and for the two models were controlled for multicollinearity and after the calculation, as discussed in the following section. A residual analysis was carried out on the models to check the linearity of the model (see section 6.2.3 of this appendix).

6.2.2 Multicollinearity
In setting up regression models, measures must be taken to prevent a strong inter-relationship exhibited between two or more explanatory variables from disturbing the estimation of the model. This problem is referred to as multicollinearity. In order to test for the extent of multicollinearity among the set of explanatory variables, a correlation matrix was calculated for each of the seven clusters and for the set of variables selected in the two models. When a correlation of 0.8 or higher was found between variables, one of the pair of variables was excluded from the analysis. These correlation matrices are included in the table report (Intomart, 1996b). The variables excluded from the regression analyses because of multicollinearity are listed in appendix 8.

It is also possible that a set of variables demonstrates multicollinearity by definition. This is the case for a series of dichotomous variables that collectively represent a single nominal variable; for example, the seven days of the week. In these instances, the variable showing the lowest correlation with the decrease in audience ratings was excluded from the analysis (see appendix 8).

As a final preventative measure, two factors were estimated for each model which trace multicollinearity in the data on a group basis (Norusis, 1990).

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\[^{84}\text{The decrease in audience ratings, and not the increase, was used because of its larger impact on the amount of commercial GRPs.}\]
**Statistical methodology**

**Tolerance:** If the tolerance for a variable is small, then this variable is almost certainly a combination of other explanatory variables. The tolerance is $1 - R^2_i$, where $R_i$ is the multiple correlation coefficient of an estimation in which the explanatory variable $i$ is predicted from the other independent variables.

**Variance inflation factor:** \(\text{VIF}_i = \frac{1}{1 - R^2_i}\). A high VIF indicates multicollinearity.

In these two measures, the tolerance between variables in the various models was never greater than 0.2, indicating that multicollinearity was no longer a problem in the analyses.

### 6.2.3 Checks on linearity and residuals

A number of controls were carried out in order to determine whether both models satisfy the initial assumptions of regression. These are discussed below. A complete report of the results of these controls is included in the tables report (Inrotsmart, 1996b).

**Studentised residuals:** In regression, a normal distribution of residuals is assumed. In the plotting of Studentised residuals, the actual distribution is compared to an ideal normal distribution. In this analysis, both models were found to have good normal distributions of residuals.

**Normal Probability Plot:** A second test for the normal distribution of residuals is the "Normal Probability (P-P) Plot". In this test, a scatter plot is used to compare the distribution of the actual residuals with the ideal normal distribution. Here again, the results were satisfactory.

**Standardised scatter plot:** Regression also assumes linearity and homogeneity, which means that no relationship may exist between the predicted value and the residuals. A standardised scatter plot showed that no such relationship was present in either model.

**Correlation of residuals with variable set:** These control measures can be used for bi-variate as well as multivariate models. In order to check whether there was still a relationship between the residual and each of the explanatory variables, supplementary correlations with the residuals were calculated. Only the programme interrupting break (B01) was found to have a weak relationship with the residual.
Switching during commercial breaks

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### Appendix 7

#### Descriptives and correlations

<table>
<thead>
<tr>
<th>Mean</th>
<th>Std. dev</th>
<th>Z1</th>
<th>Z2</th>
<th>Z3</th>
<th>Z4</th>
<th>Z5</th>
<th>Z6</th>
</tr>
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<td>-0.030</td>
<td>-0.018</td>
<td>0.447 **</td>
<td>0.087 **</td>
</tr>
</tbody>
</table>

1a. Placement of the break

| B04  | 66.05    | 174.03 | 0.120 ** | 0.114 ** | 0.008  | 0.134 ** | 0.165 ** | -0.023 |
| B05  | 0.32     | 0.47   | 0.051    | 0.038   | 0.016  | -0.005  | 0.021   | -0.031 |
| B061 | 0.16     | 0.36   | -0.010   | -0.010  | 0.008  | 0.004   | -0.009  | 0.019  |
| B062 | 0.15     | 0.36   | 0.034    | 0.037   | -0.016 | 0.036   | 0.035   | 0.003  |
| B063 | 0.15     | 0.36   | -0.014   | -0.006  | -0.011 | -0.016  | -0.013  | -0.005 |
| B064 | 0.15     | 0.36   | -0.019   | -0.021  | 0.008  | -0.010  | -0.010  | 0.011  |
| B065 | 0.16     | 0.37   | 0.007    | 0.008   | 0.006  | 0.007   | 0.004   | 0.014  |
| B066 | 0.12     | 0.32   | 0.001    | -0.005  | -0.001 | -0.014  | -0.007  | -0.031 |
| B067 | 0.11     | 0.31   | 0.002    | -0.005  | 0.007  | -0.014  | 0.000   | -0.017 |
| B081 | 0.00     | 0.01   | -0.020   | -0.016  | -0.036 | -0.012  | -0.014  | -0.019 |
| B082 | 0.18     | 0.39   | -0.219   | -0.188  | -0.144 | -0.078  | -0.135  | 0.013  |
| B083 | 0.08     | 0.27   | -0.093   | -0.076  | -0.029 | -0.024  | -0.051  | 0.002  |
| B084 | 0.26     | 0.44   | -0.021   | -0.023  | 0.035  | 0.111   | 0.128   | 0.044  |
| B085 | 0.27     | 0.45   | 0.086    | 0.056   | 0.121  | 0.099   | 0.112   | 0.053  |
| B086 | 0.15     | 0.35   | 0.266    | 0.252   | 0.033  | -0.080  | -0.038  | -0.043 |
| B087 | 0.06     | 0.24   | -0.055   | -0.042  | -0.071 | -0.117  | -0.111  | -0.140 ** |

1b. Break between programmes and programme categories

| B01  | 0.27     | 0.44   | -0.419 ** | -0.465 ** | 0.172 ** | -0.308 ** | -0.336 ** | -0.088 ** |
| B06  | 0.31     | 0.46   | -0.409 ** | -0.448 ** | 0.138 ** | -0.306 ** | -0.338 ** | -0.083 ** |
### Switching during commercial breaks

<table>
<thead>
<tr>
<th>Mean</th>
<th>Std. dev</th>
<th>Z1</th>
<th>Z2</th>
<th>Z3</th>
<th>Z4</th>
<th>Z5</th>
<th>Z6</th>
</tr>
</thead>
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<td><strong>2. Programmes preceding, following or on the other channels during the break</strong></td>
<td></td>
<td></td>
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<tr>
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<td>19.70</td>
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<td>7.73</td>
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<td>0.187 **</td>
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<td>0.24</td>
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Switching during commercial breaks

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<th>Z1</th>
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<td>C1121</td>
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<td>C1122</td>
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<td>0.029</td>
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<td>0.042</td>
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6. Campaigns

<p>| | | | | | | | | |</p>
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<td>C002</td>
<td>26.60</td>
<td>9.55</td>
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<td>71.85</td>
<td>67.76</td>
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<td>-0.049</td>
<td>-0.082</td>
<td><strong>-0.068</strong></td>
<td>-0.072</td>
<td>-0.114 **</td>
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<td>146.79</td>
<td>105.21</td>
<td>0.027</td>
<td>0.020</td>
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<td>0.048</td>
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<tr>
<td>C005</td>
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<td>68.09</td>
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<td>C006</td>
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<td>0.035</td>
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<td>C007</td>
<td>476.43</td>
<td>340.16</td>
<td>0.141</td>
<td>0.119</td>
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<td>117.72</td>
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<td>-0.076</td>
<td>-0.077</td>
<td><strong>-0.121</strong></td>
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<td>C009</td>
<td>18.86</td>
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# Descriptives and correlations

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<th>Z3</th>
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<tr>
<td>C011</td>
<td>0.26</td>
<td>0.44</td>
<td>0.109 **</td>
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<td>0.024</td>
<td>0.124 **</td>
<td>0.142 **</td>
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<td>C012</td>
<td>16.25</td>
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<td>-0.047</td>
<td>-0.042</td>
<td>-0.097 **</td>
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<td>C102</td>
<td>28.00</td>
<td>11.90</td>
<td>0.001</td>
<td>0.003</td>
<td>0.020</td>
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<td>C103</td>
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<td>-0.063 *</td>
<td>-0.047</td>
<td>-0.058</td>
<td>-0.079 *</td>
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<td>C105</td>
<td>47.93</td>
<td>75.69</td>
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<td>-0.098 **</td>
<td>-0.102 **</td>
<td>-0.120 **</td>
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<td>C106</td>
<td>219.64</td>
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<td>329.75</td>
<td>291.30</td>
<td>0.114 **</td>
<td>0.095 **</td>
<td>0.060</td>
<td>0.066 *</td>
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<td>C108</td>
<td>128.89</td>
<td>160.93</td>
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<td>-0.073 *</td>
<td>-0.043</td>
<td>-0.113 **</td>
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<td>-0.053 *</td>
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<td>28.32</td>
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<td>-0.032</td>
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<td>12.01</td>
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<td>-0.028</td>
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<td>-0.035</td>
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<tr>
<td>C302</td>
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<td>0.016</td>
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<td>0.017</td>
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<td>-0.045</td>
<td>-0.040</td>
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<tr>
<td>C304</td>
<td>103.15</td>
<td>96.09</td>
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<td>-0.032</td>
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<td>41.87</td>
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<td>-0.084 **</td>
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<td>-0.104 **</td>
<td>-0.120 **</td>
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<td>285.45</td>
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<td>C308</td>
<td>117.43</td>
<td>149.90</td>
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<td>-0.101 **</td>
<td>-0.112 **</td>
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<td>0.025</td>
<td>0.018</td>
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<td>-0.001</td>
<td>-0.030</td>
<td>-0.012</td>
<td>0.007</td>
<td>-0.059</td>
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** Pearson correlation is significant at the 0.01 level (2-tailed).  
* Pearson correlation is significant at the 0.05 level (2-tailed).
### Switching during commercial breaks

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<td><strong>C200</strong></td>
<td>0.98</td>
<td>0.24</td>
<td>0.094</td>
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<td><strong>C10</strong></td>
<td>0.19</td>
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<td><strong>C100</strong></td>
<td>0.09</td>
<td>0.30</td>
<td>0.029</td>
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<td><strong>C200</strong></td>
<td>0.04</td>
<td>0.40</td>
<td>0.024</td>
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**Note:** The values are likely related to measurements or calculations, but the context is not clear from the image.
Appendix 8

Multicollinearity

The exclusion from the analysis of variables that were too closely related to another variable was discussed in appendix 6, section 6.2.2. Variables were excluded to avoid a distortion of the regression analysis as a result of multicollinearity. The variables excluded from the analysis because of multicollinearity are listed below. The clusters are those shown in appendix 4.

Cluster 1: Placement of the break
No multicollinearity was found in the correlation matrix for this cluster.
B066 was dropped for all of the days of the week.
B084 was dropped for all time intervals.

Cluster 2: Programmes preceding, following or on the other channels during the break
A03 with A04: A03 was dropped. The number of GRPs provided more information than the number of minutes.
P11 was dropped for all programme categories before the break.
P28 was dropped for all programme categories after the break.

Cluster 3: Programming of the break
C001 with C301: C301 was dropped, the whole break provided more information than the break segment(s).
C016, C017, C018 with C019: C016, C017 and C018 were dropped, C019 is a combination of the three.
C020 with C120: C120 was dropped, the whole break provided more information than the break segment(s).
C022 with C122: C122 was dropped, the whole break provided more information than the break segment(s).
C023 with C123: C123 was dropped, the whole break provided more information than the break segment(s).
C025 with C125: C125 was dropped, the whole break provided more information than the break segment(s).
C116, C117, C118 with C119: C116, C117 and C118 were dropped, C119 is a combination of the three.
C317, C318 with C319: C317 and C318 were dropped, C319 is a combination of the two.
C320 with C323: C323 was dropped, C320 is more closely related to Z1.
Switching during commercial breaks

C313 with C315: C315 was dropped, advertising for diapers is more relevant to the discussion of irritation caused by advertising than advertising for airlines and travel agencies.

Cluster 4: Audience
K001 with K10: this multicollinearity is not relevant, these variables were not included in the same model.
K002 with K102: this multicollinearity is not relevant, these variables were not included in the same model.
K006 with K106: this multicollinearity is not relevant, these variables were not included in the same model.
K011 with K111: this multicollinearity is not relevant, these variables were not included in the same model.
K012 with K112: this multicollinearity is not relevant, these variables were not included in the same model.

Cluster 5: Products
No multicollinearity was found in the correlation matrix for this cluster.

Cluster 6: Campaigns
C003 with C005, C103, C105: C003 was dropped, the lowest broadcast frequency (C005) provided more specific information than the average.
C005 with C105: C105 was dropped, the whole break provided more information than the break segment(s).
C103 with C104, C105: C103 was dropped, the highest broadcast frequency (C104) provided more specific information than the average.
C106 with C107: C106 was dropped, the highest number of GRPs provided more specific information than the average.
C303 with C305: C303 was dropped, the lowest broadcast frequency (C305) provided more specific information than the average.

Relevance of the rejected variables
To test the potential relevance of the rejected variables, each one was tested for acceptance in the two models. None were accepted in the model for the decrease in ratings. However, two rejected variables were accepted in the model for the increase in ratings. The results are presented in table 15.

In the table, the alternative models are:
- model A, with A03 “Commercial minutes on other channels” instead of A04 “Commercial GRPs on the other channels”;
- model B, with P11 “Break after news”;
- model C, with both A03 “Commercial minutes on other channels” and P11 “Break after news”.

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**Table 15** Alternative models increase of ratings

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<td></td>
<td>B</td>
<td>β</td>
<td>B</td>
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<tr>
<td>Shift in age of audience before and after the break</td>
<td>0.10</td>
<td>0.26</td>
<td>0.10</td>
</tr>
<tr>
<td>Commercial GRPs on the other channels</td>
<td>0.19</td>
<td>0.20</td>
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<tr>
<td>Length of the break</td>
<td>1.21</td>
<td>0.20</td>
<td>1.27</td>
</tr>
<tr>
<td>Commercial minutes on other channels</td>
<td>*</td>
<td>*</td>
<td>2.50</td>
</tr>
<tr>
<td>Type of break (centre versus end breaks)</td>
<td>-2.65</td>
<td>-0.16</td>
<td>-2.76</td>
</tr>
<tr>
<td>Break before news</td>
<td>3.60</td>
<td>0.16</td>
<td>3.31</td>
</tr>
<tr>
<td>Audience size programmes ending on the other channels</td>
<td>0.06</td>
<td>0.08</td>
<td>0.23</td>
</tr>
<tr>
<td>Break after news</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Time elapsed since previous break on the channel</td>
<td>0.00</td>
<td>0.07</td>
<td>0.00</td>
</tr>
<tr>
<td>Audience after the break: 35-49 years</td>
<td>-0.04</td>
<td>-0.06</td>
<td>-0.04</td>
</tr>
<tr>
<td>Discrepancy in age between the target group and the viewer profile for the following programme</td>
<td>0.10</td>
<td>0.05</td>
<td>-</td>
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<tr>
<td>Constant</td>
<td>0.73</td>
<td>0.89</td>
<td>0.07</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>31.7</td>
<td>31.0</td>
<td>31.9</td>
</tr>
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</table>

* Not included in the input for the model
- Not significant

Replacing the variable A04 “Commercial GRPs on the other channels” with its counterpart A03 “Commercial minutes on other channels” does not improve the fit of the model. When P11 “Break after news” is introduced, it replaces the variable K104 “Audience characteristics after the break: 35-49 years”. This is only a marginal improvement; the fit of model C is only slightly better than the fit of the original model, and the β-value of the alternative explanatory variable remains less than 1.0.
Switching during commercial breaks

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Appendix 9

Testing of the hypotheses

The tables in this appendix presents all of the hypotheses and explanatory variables tested in this study. Table 16 includes all of the hypotheses with component sub-hypotheses. It also includes the significant effects from the model for variables that had no hypotheses. Table 17 lists all 225 explanatory variables linked to the various hypotheses. In both tables, the direction of the expected effect for both forms of switching is indicated by a plus or a minus sign. All effects from the two models ($\beta$) are also given, indicating the basis for accepting (✓) or rejecting (✗) each hypothesis.

Table 16 Testing of the hypotheses

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Operationalisation (only specified if relevant)</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of the break</td>
<td></td>
<td>Hyp. $\beta$ Hyp. $\beta$</td>
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<tr>
<td>1a Morning</td>
<td></td>
<td>+ ✗ + ✗</td>
<td></td>
</tr>
<tr>
<td>1b Late at night</td>
<td>22.00-24.00 hrs.</td>
<td>+ ✓ 0.17 + ✓</td>
<td></td>
</tr>
<tr>
<td>2 The weekend</td>
<td></td>
<td>+ ✗ + ✗</td>
<td></td>
</tr>
<tr>
<td>3 Centre breaks</td>
<td></td>
<td>- ✓ -0.34 - ✓ -0.16</td>
<td></td>
</tr>
<tr>
<td>Channel programming</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Shift in programme categories</td>
<td></td>
<td>+ ✗ + ✗</td>
<td></td>
</tr>
<tr>
<td>5 Time elapsed since previous break on the channel</td>
<td></td>
<td>- ✗ - ✗ 0.07</td>
<td></td>
</tr>
<tr>
<td>6a Length of the programme before the break</td>
<td></td>
<td>+ ✓ 0.15 + ✗</td>
<td></td>
</tr>
<tr>
<td>6b Length of the programme after the break</td>
<td></td>
<td>+ ✓ 0.05 + ✗</td>
<td></td>
</tr>
<tr>
<td>7a Break after news</td>
<td></td>
<td>- ✗ - ✗</td>
<td></td>
</tr>
<tr>
<td>7b Break before news</td>
<td></td>
<td>- ✗ - ✗ 0.16</td>
<td></td>
</tr>
<tr>
<td>7c Break after information programmes</td>
<td>Light information</td>
<td>- ✓ -0.07 - ✗</td>
<td></td>
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<tr>
<td>7d Break before information programmes</td>
<td></td>
<td>- ✗ - ✗</td>
<td></td>
</tr>
<tr>
<td>7e Break after drama</td>
<td></td>
<td>+ ✗ + ✗</td>
<td></td>
</tr>
<tr>
<td>7f Break before drama</td>
<td></td>
<td>+ ✗ + ✗</td>
<td></td>
</tr>
<tr>
<td>7g Break after amusement</td>
<td></td>
<td>+ ✗ + ✗</td>
<td></td>
</tr>
<tr>
<td>7h Break before amusement</td>
<td></td>
<td>+ ✗ + ✗</td>
<td></td>
</tr>
<tr>
<td>7i Break after sports programmes</td>
<td></td>
<td>+ ✗ + ✗</td>
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</tbody>
</table>
Switching during commercial breaks

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Operationalisation (only specified if relevant)</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
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</thead>
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<td>7j Break before sports programmes</td>
<td>- Break after culture</td>
<td>+ x 0.05</td>
<td>- x 0.06</td>
</tr>
<tr>
<td>8a Before an episodic programme</td>
<td>Broadcast programme before the break in previous week</td>
<td>- x 0.04</td>
<td>- x 0.05</td>
</tr>
<tr>
<td>8b After an episodic programme</td>
<td>0.07</td>
<td>- x 0.06</td>
<td>- x 0.07</td>
</tr>
<tr>
<td>9a Preceded by a programme with a high appreciation score</td>
<td>0.07</td>
<td>+ x 0.08</td>
<td>+ x 0.08</td>
</tr>
<tr>
<td>9b Followed by a programme with a high appreciation score</td>
<td>0.17</td>
<td>+ x 0.09</td>
<td>+ x 0.09</td>
</tr>
<tr>
<td>10a Preceded by non-programme material</td>
<td>0.08</td>
<td>+ x 0.09</td>
<td>+ x 0.10</td>
</tr>
<tr>
<td>10b Followed by non-programme items</td>
<td>0.17</td>
<td>+ x 0.08</td>
<td>+ x 0.09</td>
</tr>
<tr>
<td>11 Shift in broadcast organisations</td>
<td>0.26</td>
<td>+ x 0.17</td>
<td>+ x 0.18</td>
</tr>
<tr>
<td>12 Shift in audience profile Age composition</td>
<td>0.07</td>
<td>+ x 0.08</td>
<td>+ x 0.09</td>
</tr>
<tr>
<td>12 Shift in audience profile Proportion of social class AB1</td>
<td>0.20</td>
<td>+ x 0.17</td>
<td>+ x 0.18</td>
</tr>
</tbody>
</table>

Programming on the other channels

| 13 Combined ratings of the other channels during the break | 0.17 | + x 0.08 | - x 0.09 |
| 14 Break's market share | 0.05 | + x 0.06 | + x 0.07 |
| 15 Audience size for programmes ending on other channels during the break | 0.20 | + x 0.17 | + x 0.18 |
| 16 Number of viewers of programmes ending on other channels during the break | 0.20 | + x 0.17 | + x 0.18 |
| 17 Commercials on the other channels | 0.05 | + x 0.06 | + x 0.07 |
| 18 Audience size for commercials on other channels during the break Commercial GRPs on other channels per minute | 0.05 | + x 0.06 | + x 0.07 |

Audience

| 19 Male viewers | 0.05 | + x 0.06 | + x 0.07 |
| 20 Young people | 0.05 | + x 0.06 | + x 0.07 |
| 21 Viewers in large households | Viewers 35-49 years | -0.06 | |
| 22 Viewers with a high social class | 0.07 | + x 0.08 | + x 0.09 |
## Testing of the hypotheses

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Operationalisation</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyp.</td>
<td>β</td>
<td>Hyp.</td>
<td>β</td>
</tr>
<tr>
<td>23 Viewers with a remote control</td>
<td>+</td>
<td>x</td>
<td>-0.07</td>
</tr>
<tr>
<td>24 Viewers with a VCR</td>
<td>+</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>25 Heavy viewers</td>
<td>+</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>26 Viewers reading a TV guide</td>
<td>+</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>27 Viewers with more TV sets</td>
<td>+</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>28 Rating of the break</td>
<td>-</td>
<td>✓</td>
<td>-0.11</td>
</tr>
<tr>
<td>29 Shared viewing</td>
<td>Number of viewers per set</td>
<td>-</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Programming of the break

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Length of the break</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>31 Length of the commercials</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>32 Promos</td>
<td>+</td>
<td>x</td>
</tr>
</tbody>
</table>

### Products

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>33a Commercials for feminine hygiene</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>33b Commercials for washing detergents</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>33c Commercials for diapers</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>34a Commercials of products for young people</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>34b Commercials of products for men</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>34c Commercials of products for those in a higher social class</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>35 Variation in the commercials' target group profiles</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 Discrepancy between the Complete break: age profile of the product target group and the viewer profile</td>
<td>+</td>
<td>x</td>
</tr>
</tbody>
</table>

### Campaigns

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 Overload</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>38 Twin commercials</td>
<td>+</td>
<td>x</td>
</tr>
</tbody>
</table>

+: positive effect  -: negative effect  ✓: accepted  x: rejected
### Table 17: Testing of the hypotheses for all explanatory variables

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hyp.</td>
<td>ß</td>
</tr>
<tr>
<td><strong>Placement of the break</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1a B081 Time of day: 2.00-10.00 hrs.</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>1a B082 Time of day: 10.00-13.00 hrs.</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>1a B083 Time of day: 13.00-16.00 hrs.</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>1a B084 Time of day: 16.00-19.00 hrs.</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>1a B085 Time of day: 19.00-20.00 hrs.</td>
<td>-</td>
<td>-0.16</td>
</tr>
<tr>
<td>1b B086 Time of day: 22.00-24.00 hrs.</td>
<td>+</td>
<td>✓ 0.17</td>
</tr>
<tr>
<td>1b B087 Time of day: 24.00-26.00 hrs.</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>2 B05 Part of the week</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>2 B061 Monday</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>2 B062 Tuesday</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>2 B063 Wednesday</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>2 B064 Thursday</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>2 B065 Friday</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>2 B066 Saturday</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>2 B067 Sunday</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>3 B01 Centre break</td>
<td>-</td>
<td>✓ -0.34</td>
</tr>
<tr>
<td><strong>Channel programming</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 P06 Shift in programme categories</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>5 B04 Time elapsed since previous break</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>6a P01 Length of the programme before the break</td>
<td>+</td>
<td>✓ 0.15</td>
</tr>
<tr>
<td>6b P02 Length of the programme after the break</td>
<td>+</td>
<td>✓ 0.05</td>
</tr>
<tr>
<td>7a P11* Break after news</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7b P21 Break before news</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>7c P12 Break after information</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>7c P13 Break after light information</td>
<td>-</td>
<td>✓ -0.07</td>
</tr>
<tr>
<td>7d P22 Break before information</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>7d P23 Break before light information</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td>7e P14 Break after Dutch drama</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>7e P15 Break after foreign drama</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>7f P24 Break before Dutch drama</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>7f P25 Break before foreign drama</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>7g P16 Break after amusement</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>7h P26 Break before amusement</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>7i P19 Break after sports</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>7j P29 Break before sports</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>- P17 Break after culture</td>
<td>-</td>
<td>-0.06</td>
</tr>
</tbody>
</table>
### Testing of the hypotheses

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hyp.</td>
<td>β</td>
</tr>
<tr>
<td>P27 Break before culture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P18 Break after children's and youth programmes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P28 Break before children's and youth programmes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P20 Break after other programmes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P30 Break before other programmes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8a P31 Broadcast of the preceding programme in previous week</td>
<td>-</td>
<td>×</td>
</tr>
<tr>
<td>8b P32 Broadcast of the following programme in previous week</td>
<td>-</td>
<td>×</td>
</tr>
<tr>
<td>9a P33 Appreciation of the preceding programme (NL.123)</td>
<td>+</td>
<td>×</td>
</tr>
<tr>
<td>9b P34 Appreciation of the following programme (NL.123)</td>
<td>+</td>
<td>×</td>
</tr>
<tr>
<td>10a P03 Non-programme items before the break</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>10b P04 Non-programme items after the break</td>
<td></td>
<td>0.08</td>
</tr>
<tr>
<td>11 P05 Shift in broadcasting organisation</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>12 P08 Shift in proportion of males in audience before and after the break</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>12 P09 Shift in age of audience before and after the break</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>12 P10 Shift in proportion of AB1 in audience before and after the break</td>
<td>+</td>
<td>✓</td>
</tr>
</tbody>
</table>

#### Programming on the other channels

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13 A02 Ratings of the other channels</td>
<td>+</td>
<td>✓</td>
<td>0.17</td>
<td>-</td>
</tr>
<tr>
<td>14 A01 Break's market share</td>
<td>-</td>
<td>✓</td>
<td>-0.15</td>
<td>+</td>
</tr>
<tr>
<td>15 A07 Programmes ending on the other channels</td>
<td>+</td>
<td>×</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>16 A09 Audience size programmes ending on the other channels</td>
<td>+</td>
<td>×</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>17 A03* Commercial minutes on other channels</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 A04 Commercial GRPs on other channels</td>
<td>+</td>
<td>✓</td>
<td>0.05</td>
<td>+</td>
</tr>
</tbody>
</table>

#### Programming of the break

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30 B02 Length of the break</td>
<td>+</td>
<td>✓</td>
<td>0.09</td>
<td>+</td>
</tr>
<tr>
<td>32 C001 Programme promotion</td>
<td>+</td>
<td></td>
<td>-</td>
<td>×</td>
</tr>
<tr>
<td>32 C101 First part: programme promotion</td>
<td>+</td>
<td></td>
<td>-</td>
<td>×</td>
</tr>
<tr>
<td>32 C301 Last part: programme promotion</td>
<td>+</td>
<td></td>
<td>-</td>
<td>×</td>
</tr>
<tr>
<td>34a C013 Average age in the target groups</td>
<td>+</td>
<td></td>
<td>-</td>
<td>×</td>
</tr>
</tbody>
</table>
### Switching during commercial breaks

<table>
<thead>
<tr>
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<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>34a C113</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>34a C313</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>34b C015</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>34b C115</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>34b C315</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35c C014</td>
<td>Hyp. - x</td>
<td>Hyp. + x</td>
</tr>
<tr>
<td>35c C114</td>
<td>Hyp. - x</td>
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</tr>
<tr>
<td>35c C314</td>
<td>Hyp. - x</td>
<td>Hyp. + x</td>
</tr>
<tr>
<td>35 C016</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C116</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C316</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C017</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C117</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
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<tr>
<td>35 C317</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C018</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C118</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C318</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C019</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C119</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
<tr>
<td>35 C319</td>
<td>Hyp. + x</td>
<td>Hyp. - x</td>
</tr>
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</table>
### Testing of the hypotheses

<table>
<thead>
<tr>
<th>36 C020</th>
<th>Discrepancy in age between the target group and the viewers for the preceding programme</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hyp.</td>
<td>β</td>
</tr>
<tr>
<td>36 C120</td>
<td>First part: discrepancy in age between the target group and the viewers for the preceding programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C320</td>
<td>Last part: discrepancy in age between the target group and the viewer profile for the preceding programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C021</td>
<td>Discrepancy in proportion of AB1 between the target group and the viewers for the preceding programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C121</td>
<td>First part: discrepancy proportion of AB1 between the target group and the viewers for the preceding programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C321</td>
<td>Last part: discrepancy in the proportion of AB1 between the target group and the viewer profile for the preceding programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C022</td>
<td>Discrepancy proportion of males between the target group and the viewers for the preceding programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C122</td>
<td>First part: discrepancy proportion of males between the target group and the viewers for the preceding programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C322</td>
<td>Last part: discrepancy in the proportion of males between the target group and the viewer profile for the preceding programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C023</td>
<td>Discrepancy in age between the target group and the viewer profile for the following programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C123</td>
<td>First part: discrepancy age between the target group and the viewer profile for the following programme</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>36 C323</td>
<td>Last part: discrepancy in age between the target group and the viewer profile for the following programme</td>
<td>+</td>
<td>x</td>
</tr>
</tbody>
</table>

Note: The p-value for the test is 0.05.
Switching during commercial breaks

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Hyp.  ß</td>
</tr>
<tr>
<td>36 C024</td>
<td>Discrepancy proportion of AB1 between the target group and the viewer profile for the following programme</td>
<td>+  x</td>
</tr>
<tr>
<td>36 C124</td>
<td>First part: discrepancy proportion of AB1 between the target group and the viewer profile for the following programme</td>
<td>+  x</td>
</tr>
<tr>
<td>36 C324</td>
<td>Last part: discrepancy in the proportion of AB1 between the target group and the viewer profile for the following programme</td>
<td>+  x</td>
</tr>
<tr>
<td>36 C025</td>
<td>Discrepancy proportion of males between the target group and the viewer profile for the following programme</td>
<td>+  x</td>
</tr>
<tr>
<td>36 C125</td>
<td>First part: discrepancy proportion of males between the target group and the viewer profile for the following programme</td>
<td>+  x</td>
</tr>
<tr>
<td>36 C325</td>
<td>Last part: discrepancy in the proportion of males between the target group and the viewer profile for the following programme</td>
<td>+  x</td>
</tr>
</tbody>
</table>

**Audience**

| 19 K006              | Audience before the break: men | +  ✓ 0.05 |
| 19 K106              | Audience after the break: men | +  x |
| 20 K001              | Audience before the break: 6-12 years | -  x |
| 20 K101              | Audience after the break: 6-12 years | -  x |
| 20 K002              | Audience before the break: 13-19 years | +  x |
| 20 K102              | Audience after the break: 13-19 years | +  x |
| 20 K003              | Audience before the break: 20-34 years | -  x |
| 20 K103              | Audience after the break: 20-34 years | -  x |
| 20 K004              | Audience before the break: 35-49 years | -  x |
| 20 K104              | Audience after the break: 35-49 years | -  x |
| 21 K012              | Audience before the break: household size 3+ | +  x |
| 21 K112              | Audience after the break: household size 3+ | +  x |
| 22 K005              | Audience before the break: AB1 | +  x |
| 22 K105              | Audience after the break: AB1 | +  x |
| 23 K007              | Audience before the break: remote control | +  x |
| 23 K107              | Audience after the break: remote control | +  x |
| 24 K011              | Audience before the break: VCR in the house | +  x 0.07 |
| 24 K111              | Audience after the break: VCR in the house | +  x |
Testing of the hypotheses

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Decrease in ratings</th>
<th>Increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 K010 Audience before the break: heavy viewers</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>25 K110 Audience after the break: heavy viewers</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>26 K009 Audience before the break: using a TV guide</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>26 K109 Audience after the break: using a TV guide</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>27 K008 Audience before the break: 2nd TV set in the house</td>
<td>+</td>
<td>x</td>
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<tr>
<td>27 K108 Audience after the break: 2nd TV set in the house</td>
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<td>x</td>
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<tr>
<td>28 B09 Rating of the break</td>
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<td>✓ -0.11</td>
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<tr>
<td>29 K2 Number of viewers per set</td>
<td>-</td>
<td>✓ -0.09</td>
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Products
- C0101 Clothing, shoes
- C1101 First part: clothing, shoes
- C3101 Last part: clothing, shoes
- C0102 Foodstuff
- C1102 First part: foodstuff
- C3102 Last part: foodstuff
- C0103 Diary products
- C1103 First part: diary products
- C3103 Last part: diary products
- C0104 Drinks
- C1104 First part: drinks
- C3104 Last part: drinks
- C0105 Candy bars and sweets
- C1105 First part: candy bars and sweets
- C3105 Last part: candy bars and sweets
- C0106 Personal care products
- C1106 First part: personal care products
- C3106 Last part: personal care products
- C0107 Feminine hygiene
- C1107 First part: feminine hygiene
- C3107 Last part: feminine hygiene
- C0108 Shampoo
- C1108 First part: shampoo
- C3108 Last part: shampoo
- C0109 Medicine
- C1109 First part: medicine
- C3109 Last part: medicine

209
<table>
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<th>Explanatory variable</th>
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<tr>
<td>33b C1110 First part: washing powder and detergent</td>
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<td>x</td>
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<tr>
<td>33b C3110 Last part: washing powder and detergent</td>
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<td>x</td>
</tr>
<tr>
<td>33b C0111 Home furnishings</td>
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<td></td>
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<tr>
<td>- C1111 First part: home furnishings</td>
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<tr>
<td>- C3111 Last part: home furnishings</td>
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<tr>
<td>33b C0112 Household appliances</td>
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<td></td>
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<tr>
<td>- C3112 Last part: household appliances</td>
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<tr>
<td>33c C0113 Diapers</td>
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</tr>
<tr>
<td>33c C1113 First part: diapers</td>
<td>+</td>
<td>x</td>
</tr>
<tr>
<td>33c C3113 Last part: diapers</td>
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<td>x</td>
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<tr>
<td>33c C0114 Consumer electronics</td>
<td></td>
<td></td>
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<td>- C1114 First part: consumer electronics</td>
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<td>- C3114 Last part: consumer electronics</td>
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<td>33c C0115 Transportation</td>
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<td>- C1115 First part: transportation</td>
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<td>- C3115 Last part: transportation</td>
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<tr>
<td>33c C0116 Tourism and air travel</td>
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</tr>
<tr>
<td>- C1116 First part: tourism and air travel</td>
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<td>- C3116 Last part: tourism and air travel</td>
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<tr>
<td>33c C0117 Finance</td>
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<tr>
<td>- C3117 Last part: finance</td>
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<tr>
<td>33c C0118 Print media, film, theatre</td>
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<td>- C1118 First part: print media, film, theatre</td>
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<td></td>
</tr>
<tr>
<td>- C3118 Last part: print media, film, theatre</td>
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<tr>
<td>33c C0119 Office supplies</td>
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<td>- C3119 Last part: office supplies</td>
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<tr>
<td>33c C0120 Garden and home improvement</td>
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</tr>
<tr>
<td>- C1120 First part: garden and home improvement</td>
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</tr>
<tr>
<td>- C3120 Last part: garden and home improvement</td>
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<tr>
<td>33c C0121 Toys and games</td>
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<td></td>
</tr>
<tr>
<td>- C1121 First part: toys and games</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- C3121 Last part: toys and games</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33c C0122 Music</td>
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</tr>
<tr>
<td>- C1122 First part: music</td>
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### Testing of the hypotheses

<table>
<thead>
<tr>
<th>Explanatory variable</th>
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<th>Increase in ratings</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hyp. β</td>
<td>Hyp. β</td>
</tr>
</tbody>
</table>

- C3122 Last part: music
- C0123 Radio and television
- C1123 First part: radio and television
- C3123 Last part: radio and television
- C0124 Others
- C1124 First part: others
- C3124 Last part: others

#### Campaigns

| 31 | C002 | Average commercial length | + x | - x |
| 31 | C102 | First part: commercial length | + x | - x |
| 31 | C302 | Last part: commercial length | + x | - x |
| 37 | C003 | Average frequency of broadcasts during the previous eight weeks | + x | - x |
| 37 | C103 | First part: average frequency of broadcasts during the previous eight weeks | + x | - x |
| 37 | C303 | Last part: average frequency of broadcasts during the previous eight weeks | + x | - x |
| 37 | C004 | Maximum frequency of broadcasts during the previous eight weeks | + x | - x |
| 37 | C104 | First part: maximum frequency of broadcasts during the previous eight weeks | + x | - x |
| 37 | C304 | Last part: maximum frequency of broadcasts during the previous eight weeks | + x | - x |
| 37 | C005 | Minimum frequency of broadcasts during the previous eight weeks | - x | + x |
| 37 | C105 | First part: minimum frequency of broadcasts during the previous eight weeks | - x | + x |
| 37 | C305 | Last part: minimum frequency of broadcasts during the previous eight weeks | - x | + x |
| 37 | C006 | Average probability of confrontation during the previous eight weeks | + x | - x |
| 37 | C106 | First part: average probability of confrontation during the previous eight weeks | + x | - x |
| 37 | C306 | Last part: average probability of confrontation during the previous eight weeks | + x | - x |
| 37 | C007 | Maximum probability of confrontation during the previous eight weeks | + x | - x |
### Switching during commercial breaks

<table>
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<tr>
<th>Explanatory variable</th>
<th>Decrease in ratings</th>
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<tr>
<td>37 C107</td>
<td>First part: maximum probability of confrontation during the previous eight weeks</td>
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<tr>
<td>37 C307</td>
<td>Last part: maximum probability of confrontation during the previous eight weeks</td>
<td>+</td>
</tr>
<tr>
<td>37 C008</td>
<td>Minimum probability of confrontation during the previous eight weeks</td>
<td>-</td>
</tr>
<tr>
<td>37 C108</td>
<td>First part: minimum probability of confrontation during the previous eight weeks</td>
<td>-</td>
</tr>
<tr>
<td>37 C308</td>
<td>Last part: minimum probability of confrontation during the previous eight weeks</td>
<td>-</td>
</tr>
<tr>
<td>37 C009</td>
<td>Average time elapsed since the previous broadcast</td>
<td>-</td>
</tr>
<tr>
<td>37 C109</td>
<td>First part: average time elapsed since the previous broadcast</td>
<td>-</td>
</tr>
<tr>
<td>37 C309</td>
<td>Last part: average time elapsed since the previous broadcast</td>
<td>-</td>
</tr>
<tr>
<td>37 C012</td>
<td>Average frequency of broadcasts during the previous week</td>
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</tr>
<tr>
<td>37 C112</td>
<td>First part: average frequency of broadcasts during the previous week</td>
<td>+</td>
</tr>
<tr>
<td>37 C312</td>
<td>Last part: average frequency of broadcasts during the previous week</td>
<td>+</td>
</tr>
<tr>
<td>38 C011</td>
<td>Twin commercials</td>
<td>+</td>
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</table>

+: positive effect  -: negative effect  ✓: accepted  ✗: rejected
Possible indirect effects of product and campaign characteristics

One of the most remarkable findings in this study was the lack of any direct effect of product and campaign characteristics on switching during commercial breaks. As noted in section 1.3, the statistical analysis in this study was limited to the investigation of direct effects on the dependent variable and did not deal with potential indirect effects through other variables. These indirect effects can only be tested after defining a structural causal model in which the relations among the explanatory variables are defined and analysed. The defining and developing of such a model falls outside the aims of this research.

Nonetheless, as a first step to taking indirect effects into account, an inventory of the correlations of all of the product and campaign characteristics included in the original set of explanatory variables with each of the significant explaining variables of the two models is presented in this appendix. If there is an indirect effect from a product or campaign characteristic on switching behaviour during commercial breaks, there should be a correlation with one of the variables of the models. The table contains the correlations of product and campaign characteristics with all of the variables included in the two models. These are:

- A01 Break's market share
- A02 Ratings of the other channels
- A04 Commercial GRPs on the other channels
- A09 Audience size programmes ending on the other channels
- B01 Centre break
- B02 Length of the break
- B04 Time elapsed since previous break
- B086 Time of day: 22.00-24.00 hrs.
- B09 Rating of the break
- C023 Discrepancy in age between the target group and the viewer profile for the following programme
- K006 Audience before the break: men
- K011 Audience before the break: VCR in the house
- K104 Audience after the break: 35-49 years
- K2 Number of viewers per set
- P01 Length of the programme before the break
- P02 Length of the programme after the break
- P04 Non-programme items after the break
• P09 Shift in age of audience before and after the break
• P10 Shift in proportion of AB1 in audience before and after the break
• P13 Break after light information
• P17 Break after culture
• P18 Break after children’s and youth programmes
• P20 Break after other programmes
• P21 Break before news
• P27 Break before culture
• P31 Broadcast of the preceding programme in previous week

Correlations of product and campaign characteristics with a value of 0.2 or higher with explanatory variables that have a $\beta$ of 1.0 or higher in the models include the following:
• C0110 “Washing powder and detergent” and C0106 “Personal care products” had a positive relationship with A02 “Ratings of the other channels”;
• C0115 “Transportation” had a positive relationship with B086 “Time of day: 22.00-24.00 hrs.” and A02 “Ratings of the other channels”. C3115 “Last part: transportation” had a positive relationship with A02 “Ratings of the other channels”;
• C0104 “Drinks” had a negative relationship with A01 “Break’s market share”;
• C0121 “Toys and games” had a positive relationship with P18 “Break after children’s and youth programmes” and P09 “Shift in age of audience before and after the break”. C1121 “First part: toys and games” and C3121 “Last part: toys and games” had a positive relationship with P18 “Break after children’s and youth programmes”; 
• C005 “Minimum frequency of broadcasts during the previous eight weeks” had a negative relationship with A02 “Ratings of the other channels” (as well as a negative correlation with B09 “Rating of the break”), as did C105 and C305 (the first and the last part of the break);
• C007 “Maximum probability of confrontation during the previous eight weeks” had a positive relationship with A02 “Ratings of the other channels” (as well as a positive correlation with B09 “Rating of the break”), as did C107 and C307 (the first and the last part of the break).

A number of product and campaign characteristics had strong correlations with the explanatory variables A02 “Ratings of the other channels”; A01 “Break’s market share” and B09 “Rating of the break”. The placement of commercials for these products is concentrated in commercial breaks with high or low ratings in late evening, and possibly also during daytime. Given the nature of the products, it is unlikely that these relationships indicate an indirect effect on switching behaviour. As noted in chapter 6 section 6.4.5, an indirect effect on switching in relation to the category “toys and games” is less unlikely.

The minimum frequency of broadcasts correlated negatively with the ratings of
the other channels and the rating of the break, while the maximum probability of confrontation had a positive correlation with these two variables. Both also correlate with the placement of the break in late evening. Apparently, the placement of relatively new commercials is concentrated in commercial breaks when the ratings on all channels are low, such as late evening, while commercials with a higher level of overload are found in prime time, when ratings are high. Although indirect causal effects from the minimum frequency of broadcasts and the maximum probability of confrontation through the ratings of the other channels, the rating of the break or perhaps the time of day are unlikely, there is no basis for ruling them out.

<table>
<thead>
<tr>
<th></th>
<th>A01</th>
<th>A02</th>
<th>A04</th>
<th>A09</th>
<th>B01</th>
<th>B02</th>
<th>B04</th>
<th>B086</th>
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<td>0.064</td>
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<td>-0.006</td>
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<td>0.042</td>
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Switching during commercial breaks
Possible indirect effects of product and campaign characteristics

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**Note:** The values in the table represent the statistical significance of the switching during commercial breaks, with significance levels indicated by asterisks. ** indicates p < 0.01, * indicates p < 0.05.
### Possible indirect effects of product and campaign characteristics

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<td>-0.056</td>
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221
### Switching during commercial breaks

<table>
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<th>P13</th>
<th>P17</th>
<th>P18</th>
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<td>0.024</td>
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<td>-0.002</td>
<td>-0.013</td>
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<td>-0.022</td>
<td>0.021</td>
<td>-0.033</td>
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<td>0.015</td>
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<td>-0.015</td>
<td>-0.046</td>
<td>-0.001</td>
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<td>-0.015</td>
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<td>0.004</td>
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<td>0.009</td>
<td>-0.022</td>
<td>-0.004</td>
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<td>-0.025</td>
<td>-0.034</td>
<td>-0.012</td>
<td>0.011</td>
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<td>0.022</td>
<td>0.000</td>
<td>-0.034</td>
<td>0.016</td>
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<td>0.021</td>
<td>-0.091 **</td>
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<td>0.022</td>
<td>0.002</td>
<td>0.017</td>
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<td>0.035</td>
<td>0.026</td>
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<td>-0.013</td>
<td>0.025</td>
<td>0.009</td>
<td>0.012</td>
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<td>-0.009</td>
<td>-0.064 *</td>
<td>0.064 *</td>
<td>-0.012</td>
<td>-0.029</td>
<td>-0.006</td>
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<td>-0.006</td>
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</tbody>
</table>

** Pearson correlation is significant at the 0.01 level (2-tailed).
* Pearson correlation is significant at the 0.05 level (2-tailed).
Appendix 11

Average level of the effects on switching

Table 18 lists the average level of the effect on switching during commercial breaks for each factor in the two explanatory models. The average level of these effects is calculated by multiplying the mean of the explanatory variable by the B-coefficient. This is illustrated in the example below.

The effect of the length of a break on the decrease in ratings is a 1.3 percentage point decrease for each minute of break length (the B-coefficient is 1.31). The average length of all commercial breaks in the sample is 2.65 minutes, thus the average effect of the length of the break on the decrease in ratings is 3.5 percentage points. The average decrease in ratings for the 12,278 commercial breaks registered during the research period is 28.6%, of which 3.5 percentage points can be attributed to the length of these breaks.

Table 18  Average level of the effects on switching

<table>
<thead>
<tr>
<th>Mean</th>
<th>Effect on decrease in ratings</th>
<th>Effect on increase in ratings</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>B level*</td>
<td>B level*</td>
</tr>
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<td>1. Placement of the break</td>
<td></td>
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<tr>
<td>Centre break</td>
<td>0.27</td>
<td>-14.27</td>
</tr>
<tr>
<td>Time of day: 22.00-24.00 hrs.</td>
<td>0.15</td>
<td>8.71</td>
</tr>
<tr>
<td>2. Channel programming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broadcast of the preceding programme in previous week</td>
<td>0.85</td>
<td>2.30</td>
</tr>
<tr>
<td>Length of the programme after the break</td>
<td>22.24</td>
<td>0.06</td>
</tr>
<tr>
<td>Length of the programme before the break</td>
<td>20.81</td>
<td>0.19</td>
</tr>
<tr>
<td>Non-programme items after the break</td>
<td>0.25</td>
<td>2.71</td>
</tr>
<tr>
<td>Break before culture</td>
<td>0.03</td>
<td>6.28</td>
</tr>
<tr>
<td>Break before news</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>Break after children's and youth programmes</td>
<td>0.10</td>
<td>-10.49</td>
</tr>
<tr>
<td>Break after culture</td>
<td>0.02</td>
<td>-7.33</td>
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<td>Break after light information</td>
<td>0.20</td>
<td>-3.34</td>
</tr>
<tr>
<td>Break after other programmes</td>
<td>0.01</td>
<td>-14.34</td>
</tr>
</tbody>
</table>
Switching during commercial breaks

<table>
<thead>
<tr>
<th>Effect on decrease in ratings</th>
<th>Effect on increase in ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>B level</td>
</tr>
</tbody>
</table>

| Shift in age of audience before and after the break | 29.01 | 0.15 | 4.5% | 0.17 | 0.10 | 2.8% | 0.26 |
| Shift in proportion of AB1 in audience before and after the break | 17.88 | 0.07 | 1.3% | 0.07 |
| Time elapsed since previous break | 66.05 | 0.00 | 0.2% | 0.07 |

3. Programming on the other channels

| Commercial GRPs on the other channels | 2.97 | 0.13 | 0.4% | 0.05 | 0.19 | 0.6% | 0.20 |
| Ratings of the other channels | 17.17 | 0.26 | 4.5% | 0.17 |
| Break's market share | 19.70 | -0.21 | -4.2% | -0.15 |
| Audience size programmes ending on the other channels | 1.20 | 0.06 | 0.1% | 0.08 |

4. Programming of the break

| Length of the break | 2.65 | 1.31 | 3.5% | 0.09 | 1.21 | 3.2% | 0.20 |
| Discrepancy in age between the target group and the viewer profile for the following programme | 6.29 | 0.10 | 0.6% | 0.05 |

5. Audience

| Rating of the break | 3.18 | -0.69 | -2.2% | -0.11 |
| Number of viewers per set | 1.71 | -4.91 | -8.4% | -0.09 |
| Audience before the break: VCR in the house | 69.53 | -0.11 | -7.8% | -0.07 |
| Audience after the break: 35-49 years | 24.81 | -0.04 | -1.0% | -0.06 |
| Audience before the break: men | 42.45 | 0.07 | 3.1% | 0.05 |

Average level of effect: mean of the explaining variable x B-coefficient.