Appendix chapter 9
Explanation of the model

Saskia Kunnen

This appendix is meant as an instruction for those who want to build the model. A ready-made model is available as well. The model is written in a spreadsheet (Excel). The spreadsheet consists of 14 columns (A to N) and 1000 rows (1 to 1000). Each column contains one variable. The 1000 rows are the 1000 iterations of the model. Some variables have been separated over several columns. This is mathematically not the most elegant way, but it enhances insight into the structure. Table 9.4 gives the cell addresses, names and values of the parameters used.

The equations are written in Excel notation. In all equations:

- RAND is a random number chosen from an equal distribution between 0 and 1. RAND−RAND thus results in a tent-shaped distribution of random numbers between −1 and +1.
- The $ sign means an absolute reference. Such a notation refers to a parameter given in Table 9.4. All other notations are relative references. This means that in copying the equation to another cell the same relative reference remains.
- The * is a multiplication sign.

To make the IF-THEN statements comprehensible, we have added the words THEN and ELSE to the original Excel notation.

Table 9.4 The parameters in the spreadsheet

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>rd&gt;outcome</td>
<td>0.5</td>
<td>rMM (r)</td>
<td>0.7</td>
</tr>
<tr>
<td>size CF</td>
<td>0.4</td>
<td>RAND&gt;C(O)</td>
<td>0.75</td>
</tr>
<tr>
<td>thresh.no</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUPPORT</td>
<td>−0.1</td>
<td>MM&gt;CR (g)</td>
<td>0.8</td>
</tr>
<tr>
<td>O&gt;CC</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rCR(e)</td>
<td>0.05</td>
<td>Value acc</td>
<td>15</td>
</tr>
<tr>
<td>magnet&gt;CF</td>
<td>0.1</td>
<td>Value with</td>
<td>16</td>
</tr>
<tr>
<td>thres.ass</td>
<td>0.15-0.25</td>
<td>Magnet (a)</td>
<td>3.7</td>
</tr>
<tr>
<td>thresh.K</td>
<td>0.15</td>
<td>Sup&gt;magnet (z)</td>
<td>2</td>
</tr>
</tbody>
</table>
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**Conflict**

Cel B12 (copy to B1000): =IF (E11–C11 + $D$2*(RAND–RAND) > 0.25; THEN 1; ELSE 0) * ((RAND–RAND) + 1)*$BS2*(D11 + $BS7*$DS8 + $DS9*$BS4–C11))

**Meaning making**

Cel C11=2;

Cel C12 (copy to C1000)=IF F11=$D$6; THEN C11*(1+$D$1)–$D$1*C11²/E11; ELSE C11

**Cumulated conflict**

Cel D11=0.1;

Cel D12 (copy to D1000)=(D11*(1+(2.1–F11)*$B$5)–(2.1–F11)*$BS5*D11²)+G12

**Curriculum**

Cel E11=2.5;

Cel E12 (copy to E1000)=IF(F11=$D$7;C11;E11*(1 + $B$6)–($B$6*E11²)/(3 + H11))

**Outcome**

Cel F11=1;

Cel F12 (copy to F1000)=IF(B12<=0; THEN 3; ELSE IF(B12<$BS8; THEN 2; ELSE IF(D12<$BS3; THEN 1; ELSE IF((RAND–RAND)*$BS1+$BS4+I11<-0.2; THEN $DS7; ELSE $DS6))))

**Random in equation CC**

G11 to G1000=RAND()/1000

**K Curriculum**

Cel H11 to H59 =0;
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```
cel H60 (copy to H1000)=IF(E17–C17–(RAND( )–RAND( ))/20>$BS9;H65;$DS4*(C17–2))
```

**Memory**

```
cel I11=0; I12 (copy to I1000)=K12–J12

cel J11=0.05; J12 (copy to J1000)=J11*(1 + (L12–L11))–(L12–L11)*J11^2/0.9

cel K11=0; K12 (copy to K1000)=K11*(1 + (M12–M11))–(M12–M11)*K11^2/0.9

cel L11=0; L12 (copy to L1000)=IF (F11=$D$7; THEN L11 + 1; ELSE L11)

cel M11=0; M12 (copy to M1000)=IF (F11=$D$6; THEN M11 + 1; ELSE M11)
```

Columns A and N are used for the age indication, which plays no role in the model but is used for making the graphs and for the simulated data.

```
cel N11=12;

cel N12 (copy to N1000)=N11 + 1/17.5
```

In column A the values of column N are rounded to one decimal.