



Computer Tailored Technology for eHealth Programs: An overview of Dutch RCTs

ISRII: Chicago May 17 2013

Hein de Vries Ph.D.

Professor in Health Communication
Department of Health Promotion
Caphri Research Institute
Maastricht University
The Netherlands

Fam te Poel
Catherine Bolman
Daniela Schulz
Francine Schneider
Iman Elfeddali
Eline Smit
Ciska Hoving
Stef Kremers
Math Candell





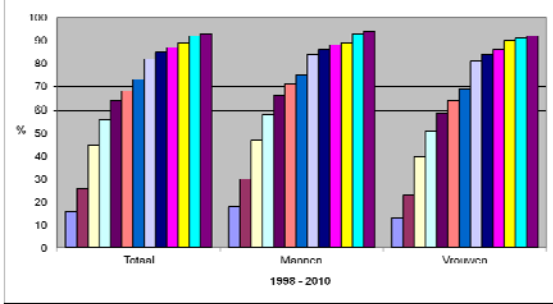

Since the 1980's



- The Internet Revolution



Dutch Internet Use 1998 – 2010







The bar chart displays the percentage of internet users in the Netherlands from 1998 to 2010, broken down by gender. The Y-axis represents the percentage from 0 to 100. The X-axis shows three categories: Total, Mannen (Men), and Vrouwen (Women). Each category has ten bars representing the years 1998 through 2007. The data shows a steady increase in internet usage over the period, with men consistently having a higher percentage of users than women.

Year	Total (%)	Mannen (%)	Vrouwen (%)
1998	15	18	12
1999	25	30	20
2000	45	55	35
2001	60	70	50
2002	70	80	60
2003	78	88	68
2004	85	95	75
2005	90	100	80
2006	92	100	82
2007	95	100	85

CTT

- **eHealth**
 - Magic buzz word
- Will a carr run without a good engine?
- eHealth effectiveness is dependent on sound health communication models





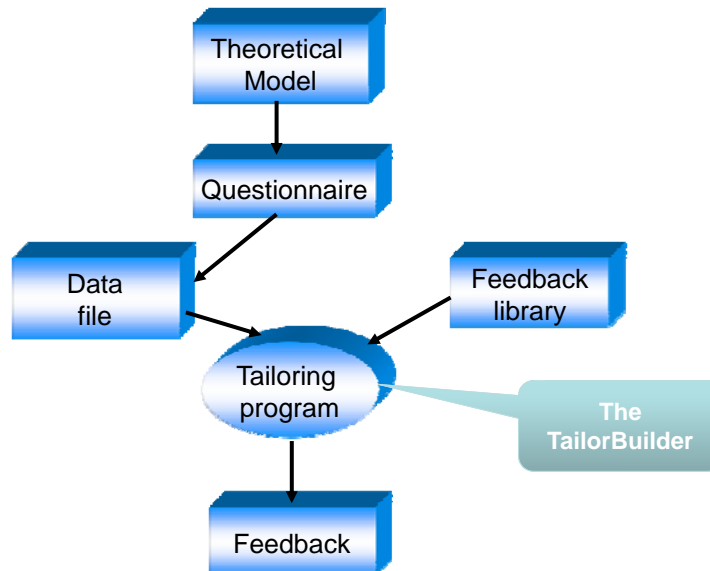
What is Computer Tailoring?



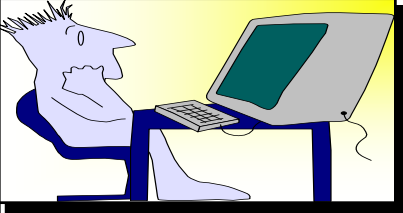
- **Computer Tailored Technology**
 - Any combination of information and change strategies intended to reach one specific person
 - Theory driven
 - Based on characteristics that are unique to that person
 - Feedback is based on an individual assessment
- **Computerized tailored information:**
 - Information adapted to the characteristics of the receiver
 - All elements are relevant for the receiver
 - Facilitates giving personally tailored advice to large populations
 - Reaching large populations may be more cost-effective than individual approaches where counselor provides the health information




The Computer Tailoring Process



Dear Heleen,



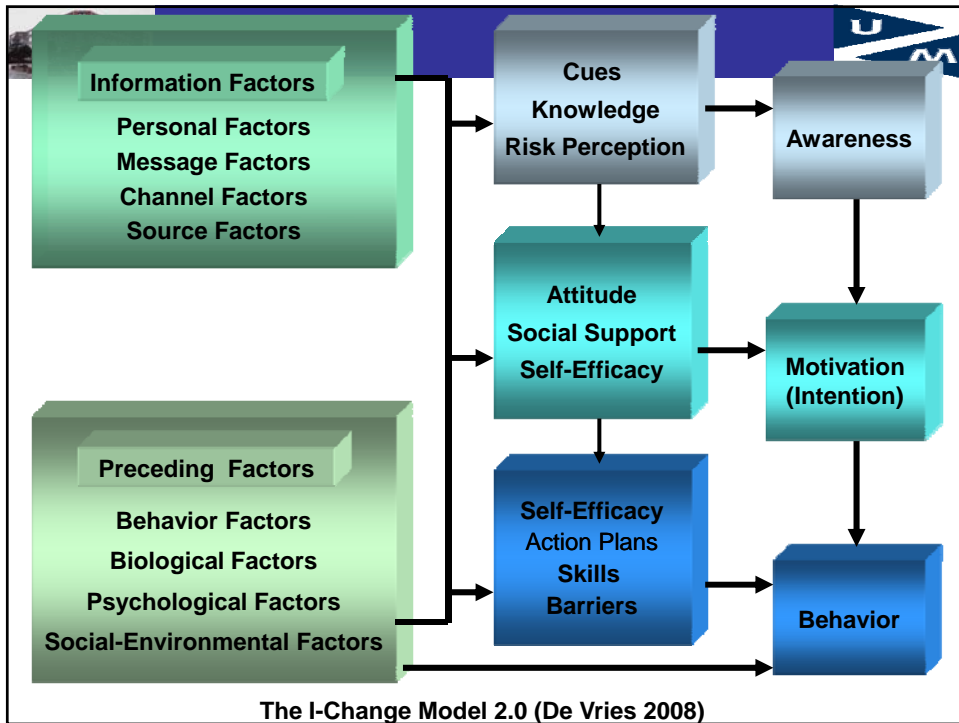
Dear Heleen Riper,





You said that it will be difficult for you not to drink more than 2 glasses of wine during dinner.


Indeed, this happens more often and There are more people like you and say that they have the same problem.

The good news is that we have some special tips for you on how you can cope with such a challenge. They are listed below.






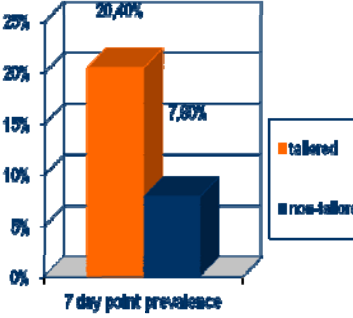
Effects of CT




Web-based CT smoking cessation




- **Researchers:**
 - Fam te Poel, MSc; Catherine Bolman, PhD, Astrid Reubsaet, PhD, Hein de Vries, PhD;
– Hth Ed Res 2009
- **Design:**
 - RCT: Tailored versus non tailored
 - Follow-up after 6 months
- **Intervention:**
 - 1 Web based computer tailored advise
 - Attitudes
 - Social influences
 - Self-efficacy
 - Action planning
 - Recruitment via local news papers
- **Results: Smoking cessation (7D)**
 - OR = 3.21, $p < .05$ (1.16-8.90); ES = .37 (medium)




Group	7 day point prevalence
tailored	20.40%
non-tailored	7.60%





SQ4U! STAY QUIT 4 U!



Researchers:

- Iman Elfeddali; Catherine Bolman;
- Math Candel; Hein de Vries
- JMIR, 2012

Goal SQ4U:

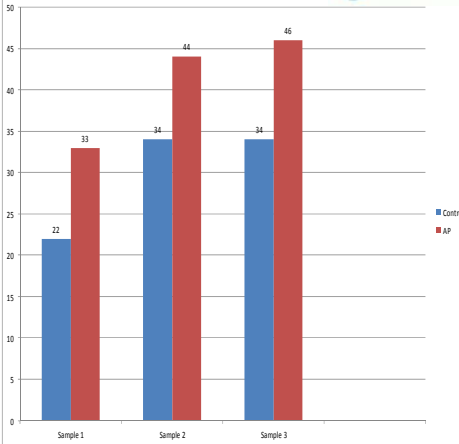
- Smoking relapse prevention program
- Internet based computer tailoring with action planning

Design:

- Action planning (AP) program
 - Tailored advice based on baseline questionnaire
 - 3 planning assignments before quit-date
 - 3 planning assignments after quit-date


Control program

- No intervention




Sample	Control	AP
Sample 1	22	33
Sample 2	34	44
Sample 3	34	46



■ Samples all; quit attempt; minimal participation
 ■ Sample 1:
 ■ AP program: (OR 1.95, P = .005)



CT & Multiple Behaviors



- **Researchers:**
 - Daniella Schulz; Stef Kremers; Math Candel, Hein de Vries
- **Goal:**
 - To compare sequential tailoring with simultaneous tailoring
 - Multiple-behaviour interventions
 - *a greater impact on public health than single-behaviour interventions.* (Prochaska et al., 2008)
- **Researchers:**
 - Daniella Schulz; Stef Kremers; Hein de Vries
- **Multiple-behaviour interventions: how?**
 - Simultaneous Tailoring
 - Feedback on the behavior that does not meet the Dutch recommendations
 - Smoking; Alcohol; Fruits; Vegetables; Physical Activity
 - Sequential Tailoring:
 - One behavior at the time

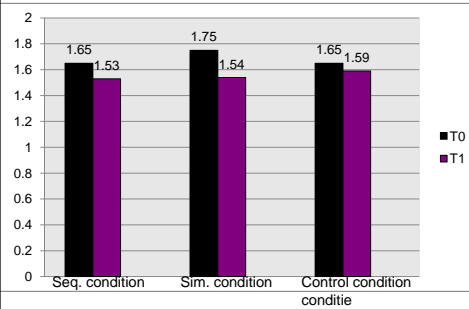





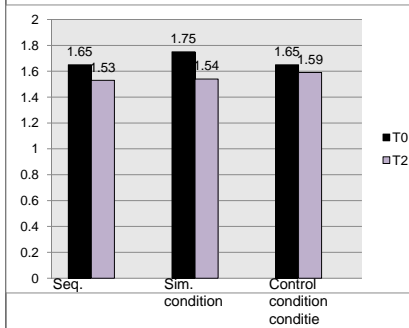
Effects after 12 and 24 months



- After 12 months:
- Mean number of risk factors (n=791): To-T1
- Seq, Sim significantly outperformed the control condition






- After 24 months
- Mean number of risk factors (n=1128);
- Only the SIM condition was significantly better than the CON condition

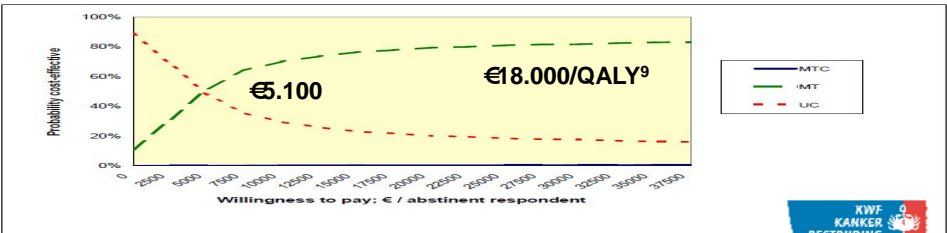


Cost-effectiveness




CE CT in the GP practice

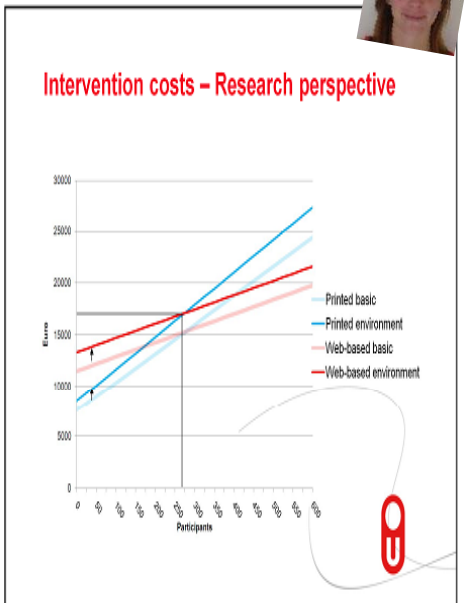
- **Smit, Hoving, Candel, De Vries**
 - JMIR, 2012
 - Under review
- **Compared:**
 - CT only on smoking cessation
 - CT + one counseling session with nurses
 - Usual care
- **Significant effects of CT**
- **CT: more cost effective**
 - Quality-Adjusted Life Year





6 mo Cost-Effectiveness AP







- **Authors:**
 - Denise Peels, Catherine Bolman; Aart Mudde; Maartje van Stalen; Hein de Vries; Lilian Lechner
- **RCT: 50+, PA**
 - **Factor 1:**
 1. CT PA;
 2. CT PA + Environmental Feedback
 3. control
 - **Factor 2:**
 1. Print; 2. Webbased Feedback
- **Results: E > C (p<.001).**
 - E1-3: +249 min/week
 - Control: 49 min/week
- **eCTT interventions**
 - Less costly
 - Adding Env Feedback had no added effects and is more costly

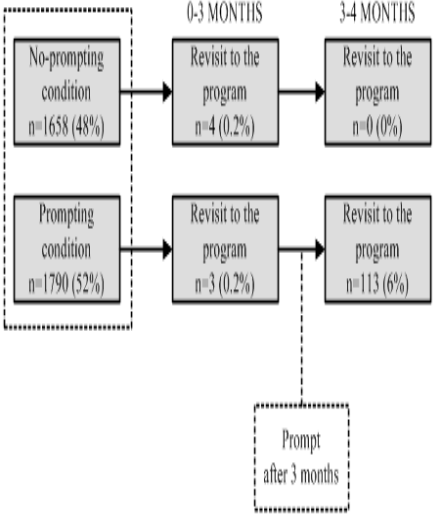






Prompts for promoting eLoyalty






- **Researchers:**
 - Francine Schneider, Liesbeth van Osch, Math Candel, Hein de Vries
- **Adult Health Monitor 2009**
 - CT program with/without
- **Prompts:**
 - **6% increase in revisits**
 - OR = 28.92; CI 10.65 – 78.52; p < 0.001
- **Conclusions:**
 - Prompts effects, but modest
 - Explanations
 - Prompt content not appealing
 - Suboptimal prompt frequency
 - Spam
 - Wrong e-mail address
 - More research needed ☹






Recruitment via Mass Media or GPs?

- **Researchers:**
 - Eline Smit, Ciska Hoving, Math Candel, Hein de Vries
 - Smit, E.S., Hoving, C., Cox, V.C.M., de Vries, H. (2011).
- **Recruitment effects after 6 months**
GPs versus Mass Media




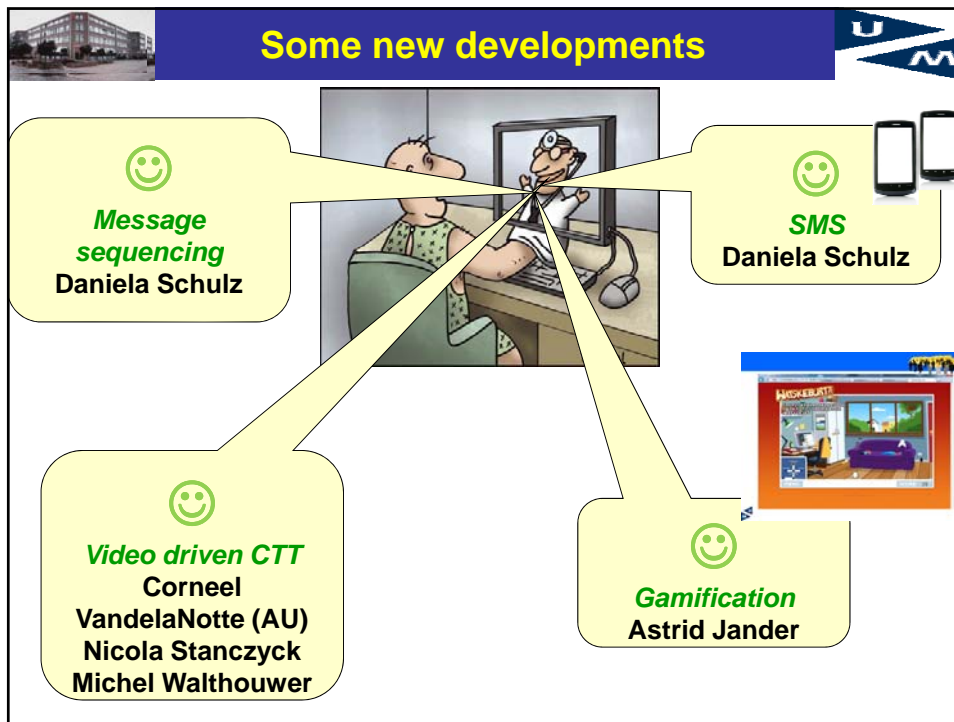
	GP	Mass Media	
Costs	€6266	€1190	
Retention	47.7% (210)	36.1% (454)	OR= 1.63*
Cessation	43% (91)	33.1 (151)	OR= 1.55*

€ spent per abstinent smoker: €68,86 GP vs. €7,88 mass media

General Practices:

- ☺ better retention and success
- ☹ more expensive and in total less smokers stopped





-
- Conclusions**
- **Computer tailoring (CT) methods have been shown to be successful**
1, cost-effective 2 and no delay3
 - 1 Civljak, M, et al., 2010; Krebs et al., 2010; Shahab, L & McEwen, A, 2009;
 - 3 Keulen et al., 2010
 - 4 Hoving EF, 2007.
 - **Multiple behavior lifestyle: a challenge**
 - **eHealth and eCTT & eLoyalty** ☹️
 - New avenues need to be explored to assess eLoyalty:
 - Attrition rates are high
 - Revisits need to be stimulated
 - Tunnelling versus free choice (Crutzen et al., JMIR, 2012)
 - New methods for reaching people should be tested
 - the addition of more may not always be better
 - **Public Health Impact**
 - eHealth certification
 - Organizations do not automatically adopt effective eHealth programs
 - Stakeholder involvement from the very beginning (Havelock, 1971)



Thank you!



Smoking

Alcohol

Nutrition

Physical Activity

Obesity prevention

Diabetis

Hepatis C

COPD & Asthma

Early detection of Cancer

Cancer risk detection

Skin cancer prevention

Cardiac rehabilitation

Donor registration

Aidspreventoin

Collaboration with other countries

- Portugal
- Cyprus
- Romania
- Germany
- France
- United States
- Canada
- Brazil

EU eCTT

hein.devries@maastrichtuniversity.nl