Computer tailored persuasion: effectiveness and side-effects

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Aim and content

• **Questions to be answered**
  
  • Are tailored interventions a fundamental step forward in persuasion or is it a temporary phenomenon motivated by technological possibilities?
  • Besides desired effects, do tailored interventions have undesired effects (side effects)?

• **Presentation content**
  
  • Meta-analysis of Noar et al. (2007) on effectiveness: compared to what, in whom and the type of tailoring.
  • Our own experimental studies on (side) effects of personalization.
The first tailored interventions

- Schneider, Benya & Singer, 1984
- Owen, Ewins & Lee, 1989

Quit kit versus Standard course (four posted lessons, four subsequent weeks), Tailored course (as standard course but tailored, using a “microcomputer”).
The first tailored intervention

Owen, Ewins & Lee, 1989
CTP becomes state-of-the-art

- 1. at least one print-only condition
- 2. non/less-tailored or no-treatment
- 3. experimental design
- 4. feedback on theo, behav. demo. Variables
- 5. behavioral dependent variable
- 6. English language

57 studies including 58,454 participants
Effectiveness

- Overall magnitude of effect (compared to all other conditions): sample size-weighted effect size in stimulating health behavior $r=0.074$ (=slightly less than “small”).
- Effect size of comparison with generic or targeted messages $r=0.058 = d=0.12 = OR=1.21 \approx 21\%$ more effective.
Impact; example

- 100 people exposed to a generic or targeted message: 10% changes
- 100 people exposed to a tailored message: 12% changes
- Net gain: 2 more people successfully changed
- 10,000 exposed: 200 more
- 100,000 exposed: 2000 more
- 1,000,000 exposed: 20,000 more
- 10,000,000 exposed: 200,000 more
Effectiveness

• Tailoring effects do not differ according to:
  - gender
  - age
  - level of education
  - Caucasian or not
  - screening versus preventive behaviors
  - proactive versus reactive recruitment
Effectiveness

• Tailoring is more effective:
  - in studies outside the USA
  - in smoking cessation and healthy diet
  - in prevention and screening compared to vaccination/immunization
  - than non-tailored/generic materials
  - than no-treatment
  - for pamphlets/leaflets compared to letters, manuals/booklets, newsletters/magazines
Effectiveness

• Tailoring is more effective:
  - more contacts compared to one contact
  - on the shorter term
  - proactive and reactive in general population compared to clinic-based
Effectiveness

- Tailoring is more effective:
  - when tailored to a combination of demographic, behavioral and theoretical variables compared to less variables
  - when tailored to theoretical only or plus other variables compared to behavior only
  - when tailored to theoretical plus behavior or theoretical plus behavior plus demographics compared to theoretical only
  - when tailored to theoretical concepts compared to not tailoring to theoretical concepts
  - when tailored to 4 to 5 theoretical concepts compared to 0 to 3 concepts (and not different from 6 to 9)
  - But! tailoring on perceived susceptibility was less effective compared to not tailoring to susceptibility
Conclusions

- Effects are small but existing (large scale application)
- Tailoring to psychological (theoretical) constructs is essential
- Most findings are not understood yet
- Meta-analysis is a rough method
Dear John,
From your answers it seems you are not convinced about the benefits of change. But do you know that your behavior currently has negative effects on the people around you? In addition, on the long run it will cost you lots of money.

Dear Mary,
From your answers it seems you are convinced about the benefits of change. You are right, your behavior has negative effects for your body. In addition, on the long run it will cost you lots of money.
Dear John,
From your answers it seems you are not convinced about the benefits of change. But do you know that your behavior currently has negative effects on the people around you? In addition, on the long run it will cost you lots of money.

Dear Mary,
From your answers it seems you are convinced about the benefits of change. You are right, your behavior has negative effects for your body. In addition, on the long run it will cost you lots of money.
Tailoring ingredients

• **Personalization**
  recognizable features such as gender, age, name, number of cigarettes, brand

• **Adaptation**
  avoiding redundant info, putting in relevant info (needs, preferences), communication matching

• **Feedback**
  new information about oneself (objective), the meaning of it (comparative, evaluative), the conclusion on adjustment (action oriented)
Dismantling design

In the lab

Pretest

Posttest 1

Posttest 2

4 months

In the field

Standard

Personalized

Adapted

Feedback

4 months
Standard condition

- Programmed in Author ware
- Four screens of information of about 200 words each:
  - Page 1: on the long-term consequences of smoking;
  - Page 2: on the short-term health consequences;
  - Page 3: on the social consequences
  - Page 4: on the self-evaluative consequences
Personalization condition

Standard, PLUS:

• Page 1: number of cigarettes and type of cigarettes
• Page 2: person’s first name and number of years
• Page 3: person’s first name once
• Page 4: person’s first name twice
Adaptation condition

Written “as if” it was for a general audience

- Page 1: written for males or females
- Page 2: written for sporters or non-sporters
- Page 3: written for smokers with or without non-smokers in their environment who inhale their smoke
- Page 4: written for smokers with high versus low negative self-evaluation
Feedback condition

Standard, PLUS one/two sentences true feedback:

• Page 1: on awareness of the physical dangers of smoking
  “It appears from your responses to the questionnaire that you underestimate the dangers of smoking”

• Page 2: on smoking related symptoms depending on number of cigarettes smoked. “You hardly notice from the reactions of your body that you are smoking. This might be because you are not a heavy smoker. However,….”

• Page 3: on awareness of increasingly negative meaning of smoking in society “From your answers, it seems that you barely perceive that smoking is viewed increasingly negative”

• Page 4: on having or not having a biased view and negative self-evaluation “From the questionnaire, it seems that you are so dissatisfied with yourself because you smoke that you try not to think about it”
Did the information take into account who you are?

Self-report of self-referent encoding

$p < .05$
Quitting activity

$p<.05$
Conclusion

- Evolution provided people with a self-reference scan
- Text that is recognized as being directed at the reader (personalization, feedback) increases **self-referent encoding** of the text
- Information that is **encoded as self-referent** has stronger effects
Side-effects and dangers

- Defensive reactions through forced (involuntary) central processing (The threat of the information is too strong).
- Learning with regard to tailoring and behavior change in the case of failure (“Even a modern tailored intervention can not help me”).
- Development of negative attitudes towards computer-tailoring (e.g., privacy, manipulation).
Percentages of quitting activity after eight months

(Dijkstra, in press)
The experience of negative emotions towards the tailored information

(Dijksta, in press)
Our window on reality

Psychological representation of your mother

Psychological representation of the United States

Psychological representation of your self

Psychological representation the universe

Motivation: keep it positive
The self as a self-regulation mechanism

Psychological representation of your self

What do I do now?

What do I value?

What do I think of what I do?

How do I evaluate myself?
The hurt self

- Self-referent encoding of information on negative outcomes threatens the self as being adaptive, adequate and consistent.
- Perceived personal relevance brings the information close to the self.
- A self-threat hurts: feeling stupid, ashamed and dissatisfied with oneself.
- People engage in all kinds of actions to avoid the self-threat.
Study 1

Sixty-two smoking students of the University of Groningen and the Hanze University Groningen

Perceived personal relevance: "How important is health to you?"; “not at all important” (1) to “very important” (7).

Pretest intention to quit smoking: “How strong is your intention to quit smoking during the coming six months?” (“not strong at all”(1) to “very strong”(7)) and “How probable is it that you will quit smoking during the coming six months? (“not probable at all”(1) to “very probable”(7)).

Posttest intention to quit was assessed in a similar way (not the same, to avoid strategic responses)
Feedback condition

Standard, PLUS one/two sentences true feedback:

- Page 1: on awareness of the physical dangers of smoking
  “It appears from your responses to the questionnaire that you underestimate the dangers of smoking”

- Page 2: on smoking related symptoms depending on number of cigarettes smoked.
  “You hardly notice from the reactions of your body that you are smoking. This might be because you are not a heavy smoker. However…..”

- Page 3: on awareness of increasingly negative meaning of smoking in society
  “From your answers, it seems that you barely perceive that smoking is viewed increasingly negative”

- Page 4: on having or not having a biased view and negative self-evaluation
  “From the questionnaire, it seems that you are so dissatisfied with yourself because you smoke that you try not to think about it”
Low perceived personal relevance

Intention to quit

High perceived personal relevance

Intention to quit
Effects of feedback valence

Is providing **honest feedback** always good?

Negative feedback on attitudes may trigger **defenses**: personalization brings the information close to the self.

**Self-affirmation** may soften or circumvent these reactions by boosting the self before exposure to the message.
Applying self-affirmation

• A self-affirmation procedure is diagnostic for defensive reactions caused by a self-threat

• Self-affirmation leads to open-mindedness, lowers defenses but leaves or even increases the self-threat
Self-affirmation procedure (Allport)

Choose “your most important value” and “your least important value” from six value domains (technology, religion, social relations, science, art, economy)

Self-affirmation: answer ten dichotomous questions with each time one option concerning the individual’s most important domain

No self-affirmation: answer ten dichotomous questions with each time one option concerning the individual’s least important domain
Within the feedback condition

- Intention to quit
  - Positive feedback
  - Negative feedback

- No self-affirmation
- Self-affirmation
Conclusion study 1

The effects of personalization depend on perceived personal relevance; when information on outcomes gets too close, defenses are activated.

Honest feedback may have detrimental effects.
When is the effect brought about?

Tailored intervention

1 day 1 week 1 month 1 year
Name and dose in personalization

Study 1 used feedback to refer to the self, someone’s **first name** is a more standardized way of personalizing.

What is the optimal **dose** of personalization?
Study 2

Two-hundred and eighteen smoking students of the University of Groningen and the Hanze University Groningen

Perceived personal relevance: "How important is health to you?"; “not at all important” (1) to “very important” (7).

Pre- and post test intention to quit smoking assessed as in study 1
Intention to quit

Low perceived personal relevance

High perceived personal relevance
Study 1 was replicated: The effects of personalization depend on perceived personal relevance.

The dose of personalization is relevant: In low perceived personal relevance there is a threshold; In high perceived personal relevance more is better.
<table>
<thead>
<tr>
<th>Valence of outcome</th>
<th>Gain related</th>
<th>Loss related</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive</strong></td>
<td>Gain</td>
<td>Nonloss</td>
</tr>
<tr>
<td>(=reinforcing)</td>
<td>If I do eat a lot of fruit &amp; vegetables, my health will increase</td>
<td>If I do eat a lot of fruit &amp; vegetables, my health will not decrease</td>
</tr>
<tr>
<td><strong>Negative</strong></td>
<td>Nongain</td>
<td>Loss</td>
</tr>
<tr>
<td>(=punishing)</td>
<td>If I do not eat a lot of fruit &amp; vegetables, my health will not increase</td>
<td>If I do not eat a lot of fruit &amp; vegetables, my health will decrease</td>
</tr>
</tbody>
</table>
Study 3

Two-hundred students of the University of Groningen and the Hanze University Groningen

2(Standard/Personalization) x 2(Gain frame/Loss frame)

Topic: fruit and vegetable consumption

Pre- and post test intention to increase fruit and vegetable consumption
Personalization in framing

![Graph showing personalization in gain and loss frames.](image-url)
Conclusions study 3

Personalization may lead to self-referent/deeper processing of outcome information.

Different outcome frames may have different effects when they are processed more closely to the self.
Similarity to the directed person

In tailored messages, a person is described

The similarity to this person may determine the effects of the tailoring

Distinctive similarity: “the person drawn is similar to me, it must be me” (no escape)

Non-distinctive similarity: “the person drawn is similar to me, but it is not necessarily me, others also fit this profile” (escape is possible)
Study 4

One-hundred and fifty students of the University of Groningen and the Hanze University Groningen

2 conditions: distinctive versus non-distinctive similarity

Pre- and post test intention to buy the product (fruit & vegetable drink)
<table>
<thead>
<tr>
<th>Distinctive similarity</th>
<th>Non-distinctive similarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• First and last name</td>
<td>• Student gender, type of study, living in</td>
</tr>
<tr>
<td>• Persuasive text</td>
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Name liking
Similarity in tailoring

- Low name-liking
- High name-liking

- Distinctive
- Non-distinctive
- Standard
Personalization induces a self-threat; the effects of the threat depend on the possibilities to mentally escape from being directed.

The escape can be made by imagining the directed group and distancing oneself.

This is an active and effortful process.
General conclusion

Tailored materials can be more effective than non-tailored materials.

These desired effects should be contrasted with undesired effects; the side effects.

Access to mass-media using strong methods like tailoring brings a huge responsibility.

In the development of tailored interventions, predictions of desired effects and side-effects must be made on the basis of proved theories of tailoring.
Follow-up tailoring

- Without new assessments
  - First tailored communication
  - Second tailored communication
  - Third tailored communication

- With new assessments
  - First tailored communication
  - Second tailored communication
  - Third tailored communication

Assessment = progress feedback
Chronic benzodiazepine use

Three tailored letters

1. Lowering pros of use
   Increasing pros of quitting
   5-minute telephone call

2. Increasing self-efficacy/skills
   Progress feedback
   5-minute telephone call

3. Integration of earlier information
   Progress feedback

Single tailored letter

Lowering pros of use
Increasing pros of quitting
Increasing self-efficacy/skills

2-3 pages each

4-6 pages
Three tailored letter

Pretest

tailored information

test

tailored information

1 month

Single tailored letter

Pretest

tailored information

test

tailored information

GP letter

Pretest

Standard information

3 months

POSTTEST 1

POSTTEST 2

12 months
Quitting benzodiazepines after 12 months

(Ten Wolde, Dijkstra, Empelen, Knuistingh-Neven & Zitman, 2008)
Quitting benzodiazepines after 12 months in two readiness groups
Quitting benzodiazepines after 12 months in two age groups
Conclusion follow-up feedback

- Time intervals and sequence of information mostly arbitrary and on (weak) theoretical grounds
- Much personal information will not keep
- Intensity may have detrimental effects
- The quality and quantity of the follow-up tailoring should also be tailored
General conclusion

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