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International Society for Research on Internet Interventions
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Using Log-data to Make Web-based interventions more Persuasive

Session 1B 2-Lisette van Gemert-Pijnen; Saskia kelders
Thursday, 16 May 2013, 3:15 pm - 3:55 pm
Chicago, USA

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eHealth – Web-based interventions

Center for eHealth Research and Disease Management   UNIVERSITY OF TWENTE.

- Improving Health via Technology
- Different areas
  - independent and assisted living
  - better use of health data
  - empowerment for self-management of health
- Can be effective, but not always
- Critical factors for adherence

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Tsunami of Happy Feeling & Well-being Tech
low adherence, low impact

Text Driven, limited cues to persuade

Not tailored to usage and users

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Low-adherence is a problem

- Not all participants complete an intervention

- Not all participants use all features they can use

- There is a dose-response relationship

- But there is limited insight in how people use interventions

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What has been done?

- General information
  - Logins, page-views, time on site, average usage of features
- But not (or much less):
  - Individual data (No. actions per participant)
  - Real-time data (Use patterns of individual users)
- Can we use this data to make eHealth more persuasive?
  - Prompts for adherence

Case: Living to the full

- People with depressive symptoms
- Intervention based on ACT and Mindfulness (9 lessons)

- Content & System:
  - psycho-education (text and videos)
  - exercises (audio and on-screen)
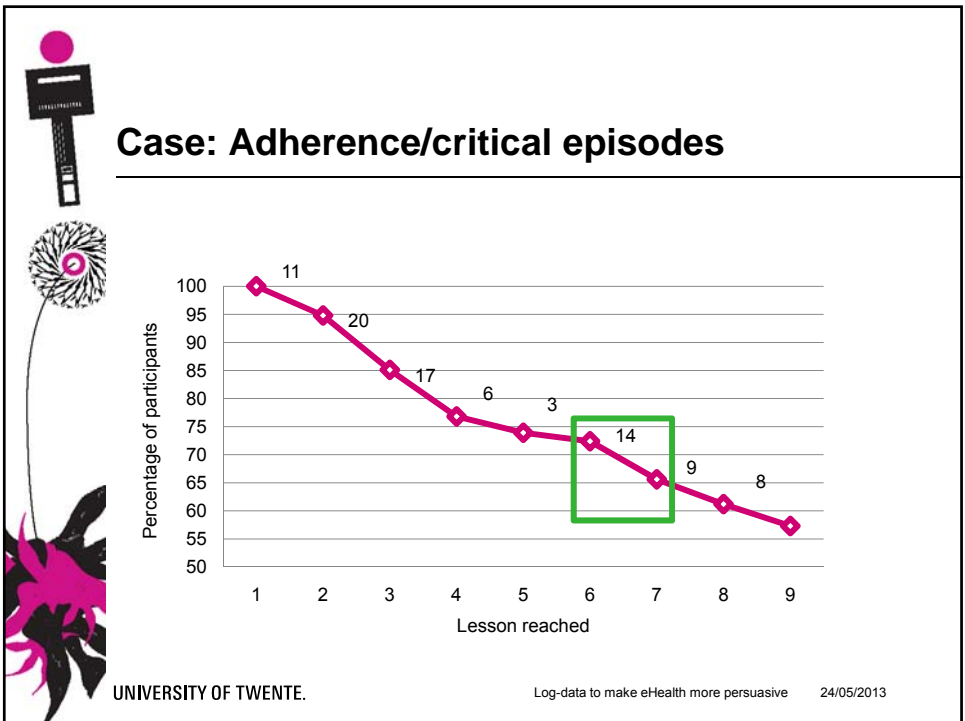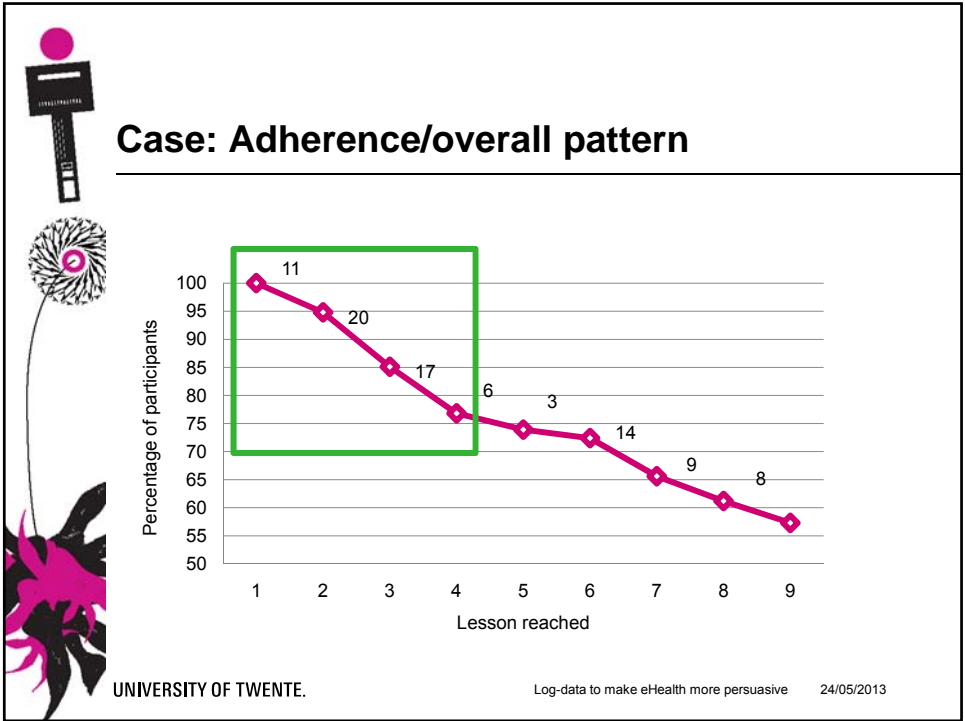 - progress monitoring (diary; feedback; success stories)

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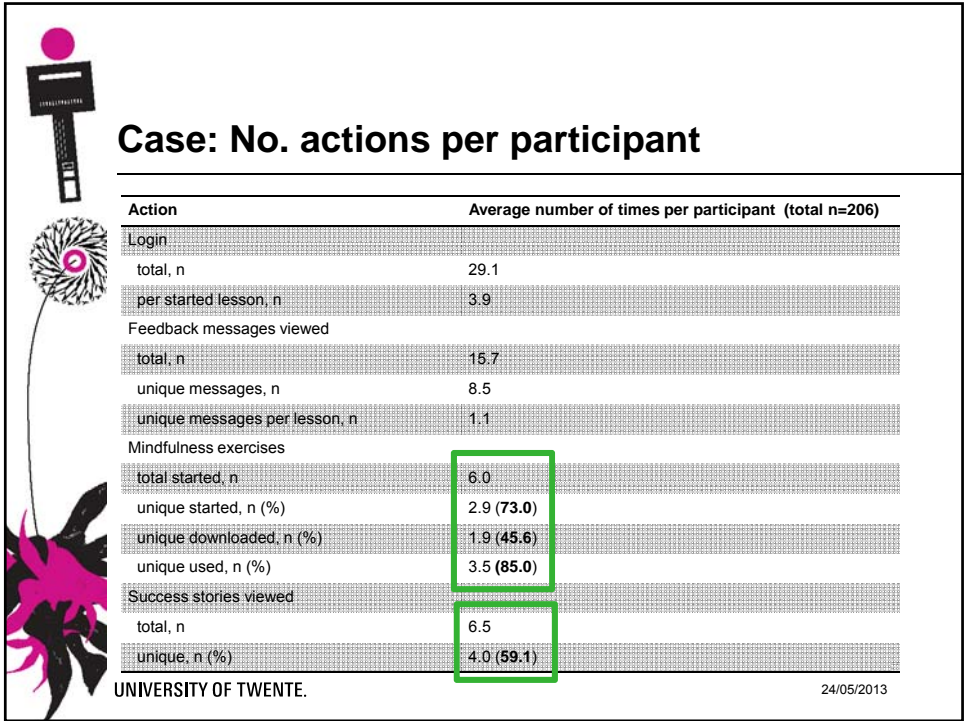
12 weeks, 9 lessons to complete   24/05/2013

Case: Log-data to open black box
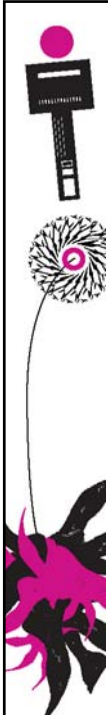
user-id	action type	specification	time and day
1096	logged in	1-11	30-3-2011 11:35
1096	viewed text-message	2	30-3-2011 11:35
1096	logged out	1-11	30-3-2011 11:35
1081	logged in	0-0	30-3-2011 11:39
1064	logged in	2-1	30-3-2011 11:49
1064	viewed text-message	3	30-3-2011 11:49
1064	logged out	2-1	30-3-2011 11:50
986	logged in	2-1	30-3-2011 11:59
986	logged in	2-1	30-3-2011 12:21
1093	logged in	2-1	30-3-2011 12:25
798	logged in	1-12	30-3-2011 12:27
798	viewed text-message	1	30-3-2011 12:27
798	logged in	1-12	30-3-2011 12:28
1072	logged in	1-1	30-3-2011 12:28
798	logged out	1-12	30-3-2011 12:31
898	logged in	2-1	30-3-2011 12:58
812	logged in	1-1	30-3-2011 12:59
898	logged in	2-1	30-3-2011 13:01
1079	logged in	0-0	30-3-2011 13:09
812	logged out	1-1	30-3-2011 13:10
895	logged in	2-1	30-3-2011 13:12
814	viewed success story	15	24-4-2011 21:49
818	logged in	2-1	30-3-2011 13:13

location (page, section of lessons etc)

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Case: Adherence/overall pattern

Case: Adherence/critical episodes

Case: No. actions per participant

Action	Average number of times per participant (total n=206)
Login	
total, n	29.1
per started lesson, n	3.9
Feedback messages viewed	
total, n	15.7
unique messages, n	8.5
unique messages per lesson, n	1.1
Mindfulness exercises	
total started, n	6.0
unique started, n (%)	2.9 (**73.0**)
unique downloaded, n (%)	1.9 (**45.6**)
unique used, n (%)	3.5 (**85.0**)
Success stories viewed	
total, n	6.5
unique, n (%)	4.0 (**59.1**)

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Case: Use patterns of individual users

Session	User 1	User 2
1	login start lesson	login start lesson
2	login continue lesson multimedia mf player 2 download mf 2 feedback 1877	login (3x) success story 2 login
3		login continue lesson
4		login feedback 2106

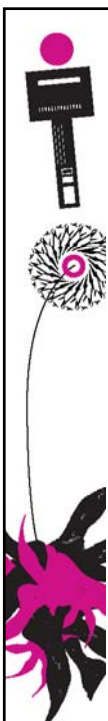Log-data to make eHealth more persuasive   24/05/2013

Case: Use patterns of individual users

- Notable use patterns
  - Session: login; logout; < 1 minute (check, able to start next lesson)
  - Feedback not viewed when available
  - Adherers are more engaged
    - ↑ logins, ↑ sessions to complete lessons; ↑ use of available features; in later lessons: less sessions to complete lesson)
  - female, ↑ need for cognition,

Case: Log-data & Persuasion

- Lesson 6: critical episode (adoption of new behaviors)
  - Persuasive triggers: praise, suggestion, social support?
- Actions
  - success stories: embedded in the lessons? (less cognitive load; task support)
  - hot trigger to access other non-visited features
  - feedback not read: notification on login? not supportive? format of dialogue support?

Omgaan met emoties eMental Health

Een ontdekkingsreis naar de balans tussen leed en geluk

Prompts for persuasive features

Cockpit

Les

Welkom Test1, je hebt de lesstof van de hele cursus afgerond!

▼ Mijn motto — Meer...

▲ Mijn waarden

• Zelfstandigheid (dingen zelf en alleen kunnen)
• Plezier
• Logica (rationeel doordenken)

▼ Mijn top 5

▼ Lessen

▼ Gemaakte oefeningen — Meer...

▼ Feedback (9) — Meer...

▼ Sms Coach

▼ Sms berichten (27)

▼ Dagboek

▼ Ervaringen van anderen — Meer...

Dialogue Support
Personalization
Reminders
Self-monitoring
Social learning
Social facilitation
Tunneling

Fractional factorial design; effect individual factors, what works best for whom…

Experiment: Dialogue support (living to the full)

automated support vs human support

Outcomes
CES-D
HADS-A

Baseline/post/follow up

Discussion

- With log-data:
  - Insight in adherence, no. actions, use patterns; adherers
  - Prompts for persuasion in treatment program: willingness, awareness, adoption of new behaviors/skills
- Next steps:
  - Smart ways to handle log-data are needed
  - Real-time => personalised adaptive interfaces
  - Intervene for people 'at risk'
  - Persuasive Triggers => profiles, timing, dose, duration,

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Log-data to make eHealth more persuasive   24/05/2013

No diversity

High educated , conscientious women
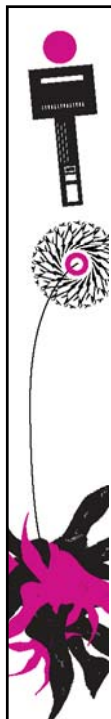
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Thank you for your attention

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s.m.kelders@utwente.nl

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Why do we need insight in usage?

- Assumptions about usage are made

- Features are added on the presumption that they will be used

- Tailoring and personalisation: what works best for whom?

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Methods

- Adherence / attrition

- No. actions per participant

- Use patterns of individual users

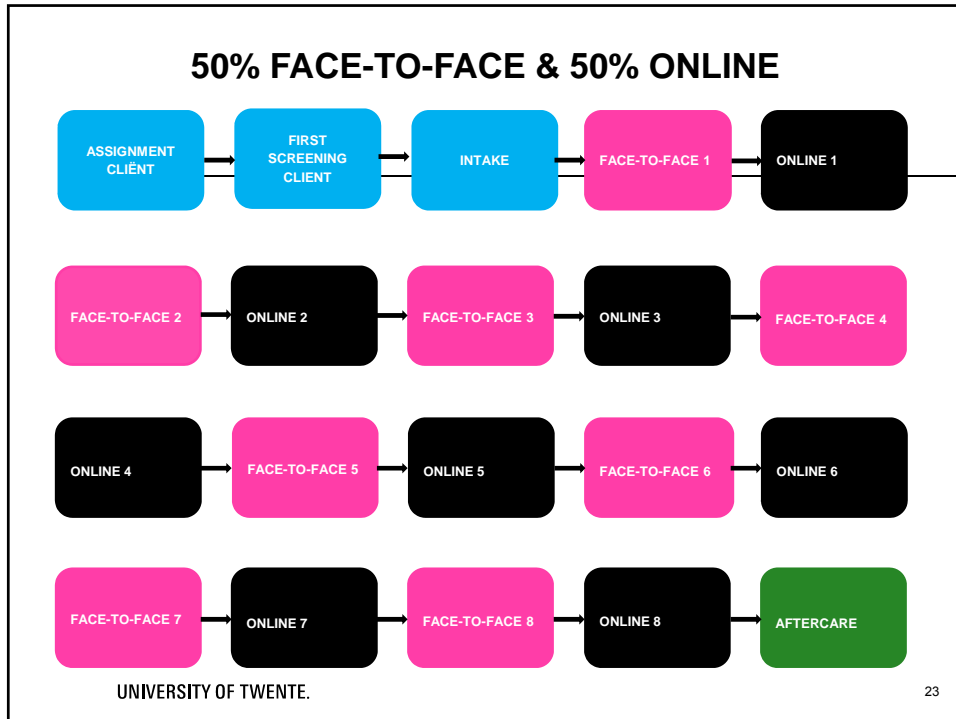# Critical episodes for persuasive features

- Within 4 weeks traceable
- Triggers based on user profiles

- Magic moment (drop out)
- Awareness and adoption of new behaviors
- Commitment with new behaviors
- Relapse

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50% FACE-TO-FACE & 50% ONLINE

| ASSIGNMENT CLIËNT | → | FIRST SCREENING CLIENT | → | INTAKE | → | FACE-TO-FACE 1 | → | ONLINE 1 |

| FACE-TO-FACE 2 | → | ONLINE 2 | → | FACE-TO-FACE 3 | → | ONLINE 3 | → | FACE-TO-FACE 4 |

| ONLINE 4 | → | FACE-TO-FACE 5 | → | ONLINE 5 | → | FACE-TO-FACE 6 | → | ONLINE 6 |

| FACE-TO-FACE 7 | → | ONLINE 7 | → | FACE-TO-FACE 8 | → | ONLINE 8 | → | AFTERCARE |

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Persuasive Therapy : Fit between content and PSD

- **What are the critical episodes for PSD?**
- Before intake
- Intake
- Treatment &Interaction (*mode, modality, triggers*)
    - Acceptation
    - Cognitive defusing
    - Conceptualized self
    - Mindfulness
    - Values
    - Commitment
- Post treatment
    - Avoiding relapse

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Persuasive technology and personalities (Halko&Kientz, 2010)

- More or less persuadable (Big Five Personalities)
- Conscientiousness successful for tech-persuasion (realising goals)
- Extraversions hard to persuade via tech
- Openness more likely to favour competitive or authoritative tech
- Agreeableness not very successful to persuade via tech
- Neuroticism no cooperation, enjoyment of negative reinforcement

Welk persuasief design past bij welke persoonlijkheid?

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Automated feedback matters…

- Reduction in depression and anxiety CES-D;HADS-A (post/follow up)
  - Resp. whith human support improved more during intervention; improvement stagnated between post-followup-time
  - Resp. whith automated support showed less improvement during intervention, improvement carried on between post-followup time
  - Automated vs Human support no difference in adherence, effect (follow up)

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Case: prompts for persuasion

- Log-data show prompts for persuasion in treatment program:

  willingness, awareness, adoption of new behaviors/skills

- Log-data show prompts for support during usage
  - hot triggers to use other non-visited features
  - personalized persuasive features to support progress