Predictive validity of the Motivation To Stop Scale (MTSS): a single-item measure of motivation to stop smoking

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Background

• Motivation to stop as measure for
  – effect of (population) interventions
  – tracking trends over time
  – comparing populations or subgroups

• Various (ad hoc) measures exist, many used in clinical samples

• No current standard with proven validity exists for population samples
MTSS

• Motivation To Stop Scale (MTSS)
  – Prof. Robert West and
  – English Department of Health
  – Central Office of Information

• Single-item measure of key elements of motivation (West, Theory of addiction 2005)
  – intention
  – desire
  – belief
Aims of this study

• Data from "Smoking Toolkit Study"

• Predictive validity
  – baseline > quit attempts during 6 months

• Diagnostic accuracy
  – sensitivity, specificity, ROC_{AUC}

• Divergent validity (no gold standard)
  – comparison measures of dependence
Smoking Toolkit Study

- All current smokers surveys November 2008 – January 2011
- 2,483 respondents to 6-month follow-up questionnaire (21% response)

www.SmokingInEngland.info
MTSS categories

"Which of the following describes you?"

1. "I don't want to stop smoking"
2. "I think I should stop smoking but don't really want to"
3. "I want to stop smoking but haven't thought about when"
4. "I really want to stop smoking but I don't know when I will"
5. "I want to stop smoking and hope to soon"
6. "I really want to stop smoking and intend to in the next 3 months"
7. "I really want to stop smoking and intend to in the next month".

(1=lowest, 7=highest level of motivation to stop)
MTSS categories

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(belief, desire, intention)
Outcome and covariates

• Any serious quit attempt between baseline and 6-month follow-up
• Sensitivity: 3-month follow-up
• Covariates
  – age, sex, social grade
  – Heaviness of Smoking Index (Kozlowski, Drug Alcohol Depend 1994)
  – Strength of urges to smoke (Fidler, Addiction 2011)
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Distribution scores baseline

- **1**: Not want to stop
- **2**: Should stop but don't really want to
- **3**: Want to stop but not thought about when
- **4**: REALLY want to stop but don't know when
- **5**: Want to stop and hope to soon
- **6**: REALLY want to stop and intend to in <3 months
- **7**: REALLY want to stop and intend to in <1 month
692 (28%) made attempt

Motivation to quit measured at baseline

- **13%** Not want to stop
- **20%** Should stop but don't really want to
- **10%** Want to stop but not thought about when
- **20%** REALLY want to stop but don't know when
- **30%** Want to stop and hope to soon
- **50%** REALLY want to stop and intend to in <3 months
- **50%** REALLY want to stop and intend to in <1 month
<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
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<th>95% CI</th>
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<td>1.0</td>
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<tr>
<td>7</td>
<td>6.83</td>
<td>(4.70-9.92)</td>
<td>7.16</td>
<td>(4.87-10.53)</td>
</tr>
</tbody>
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(1=lowest, 7=highest level of motivation to stop)
**ROC for MTSS**

**MTSS**

\[ \text{ROC}_{\text{AUC}} = 0.67 \]

(95% CI = 0.65 - 0.70)

**HSI**

\[ \text{ROC}_{\text{AUC}} = 0.47 \]

(0.45 - 0.50)

**Urges**

\[ \text{ROC}_{\text{AUC}} = 0.53 \]

(0.50 - 0.55)
Sensitivity analysis

- MTSS baseline, quit attempt 3 months
- Association slightly stronger
  - OR level 7 = 9.2 (vs. 6.8)
- Accuracy similar
  - $\text{ROC}_{\text{AUC}} = 0.69$ (vs. 0.67)
Strengths & limitations

- Low response (21%) to follow-up (association underestimated?)
- Retrospective self-report attempts over 6 months (small bias according to 3m data)
- No other measure for comparison (divergent validity)
+ Large sample, long follow-up
Conclusions

• MTSS single-item measure combining belief, desire and intention to quit
• Strong ordinal association with quit attempts
• Acceptable level of accuracy for this field of research
• Valuable, cost-efficient tool for studies on motivation to stop
• Future research: external validation
Disclosures

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Conflict of interest
Robert West undertakes research and consultancy for, and has received travel expenses and hospitality from, companies that develop and market smoking cessation medications. He has a share on a patent for a novel nicotine delivery device. Daniel Kotz and Jamie Brown have no conflict of interest to declare.

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