Evaluative conditioning in the context of smoking reduction: Preliminary data from a randomized clinical trial

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A known paradox in smoking...

The chemical addiction is only partially responsible for this effect.
Research background

• Strack & Deutsch (2004) – Reflexive-Impulsive Model
  – Impulsive system (automatic, fast, implicit)
  – Reflexive system (deliberate, slow, explicit)
Most interventions designed to reduce smoking focus either on pharmacotherapy, or on behavioral interventions which address changes in the explicit, reflexive system.

None of these interventions address the implicit, automatic affective reactions to smoking.

Even though...

Implicit attitudes predict cigarettes consumption and other smoking related variables, over and above the explicit ones (Chassin et al. 2011; Sherman et al., 2003; Ryan et al., 2007)
EC - refers to a change in the valence of a stimulus (the effect) that is due to the repeated pairing of that stimulus with another positive or negative stimulus (the procedure)

--(De Houwer, 2007)
EC effect on number of cigarettes smoked, mediated by implicit and explicit attitudes

Standardized regression coefficients
* p<.05; + p=.06
N= 55; positive conditioning (n=26), negative conditioning (n=29)
Objective

• Evaluative conditioning can decrease nicotine consumption in smokers who try to quit

• Randomized clinical trial, 3 interventions:
  – Pharmacotherapy based on varenicline (Champix)
  – Behavioral group intervention (Stritzke, Chong & Ferguson, 2009)
  – Combined intervention (evaluative conditioning + behavioral group intervention)
Pharmacotherapy

• Meta-analytical studies show the efficacy of varenicline for the treatment of nicotine addiction (Cahill et al., 2009)

• Disadvantages: side effects

• Participants received treatment for 5 weeks, following the recommendations of the product

• No medical prescription required

• Weekly meetings for assessment, side effects check & supplying the varenicline for the following week
Behavioral group intervention

• Following specifications of Stritzke, Chong & Ferguson (2009)

• 8 group meetings (twice/week, during four weeks)

• Content of the meetings: starting the changing process, increasing motivation, prevention and management of lapses and relapses, stress management, thoughts and how they affect smoking behavior, changing the lifestyle

• Weekly assessments
Combined intervention

Behavioral group intervention + Evaluative conditioning procedure developed in previous studies (Măgurean, 2014)

The EC combines two paradigms (Color-Word & Go/No-go), in order to enhance the negativity associated to smoking during the task

Task duration: 10 minutes X once a week, before the assessment
Measurements & Participants

**Main outcome:** Self-reported number of cigarettes smoked per day (pre-test, post-test, 3 months follow-up)

**Implicit attitudes:** Affect Misattribution Procedure for smoking (Payne et al., 2007) (pre-test, post-test)

**Explicit attitudes:** Assessment of smoking on 3 criteria (10-point scale): pleasant – unpleasant, helpful – not helpful, charming – disgusting (pre-test, post-test)
Effect of the intervention on number of cigarettes smoked – standard analysis

Wilcoxon test – number of cigarettes from pre-assessment to post-assessment, for each of the three groups

<table>
<thead>
<tr>
<th></th>
<th>Pharmacotherapy</th>
<th>Group Intervention</th>
<th>Combined interv.</th>
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<tbody>
<tr>
<td>N negative ranks(^a)</td>
<td>13</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>N positive ranks(^b)</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>N equal ranks(^c)</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Sig.</td>
<td>(Z=-3.18^{d}, p=.001)</td>
<td>(Z=-2.38^{d}, p=.017)</td>
<td>(Z=-2.36^{d}, p=.018)</td>
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Note. \(a\). posttest< pretest; \(b\). posttest> pretest; \(c\). posttest = pretest; \(d\). based on positive ranks

Post-test comparison between the three groups

Non-parametric comparisons based on Kruskal-Wallis:
\(X^2(2, N=27) = 1.518, p=.468\)
Effect of the intervention on number of cigarettes smoked – intent to treat

Effect of intervention: $F(2,59) = .16, p = .85$
Effect of time of assessment: $F(1,59) = 48.75, p < .001$
Interaction effect: $F(2,59) = 2.68, p = .03$

Pretest differences between the 3 interventions: $F(2,59) = .08, p = .91$
Posttest differences between the 3 interventions: $F(2,58) = 3.56, p = .03$
Follow-up differences between the 3 interventions: $F(2,59) = .38, p = .68$

At the end of the intervention, pharmacotherapy based on varenicline seemed to be the most efficient in reducing cigarettes consumption, but its advantage is lost three months after the end of the treatment.
Effect of the intervention on implicit attitudes – intent to treat

Effect of intervention: $F(2,59) = 1.07, p = .34$

Effect of time of assessment: $F(1,59) = 2.79, p = .10$

Interaction effect: $F(2,59) = 1.59, p = .21$

Posttest comparison of AMP between group intervention and combined intervention (controlling for pretest AMP)

$F(1,36) = 4.84, p = .03$

Implicit attitudes became more negative for participants in the combined intervention (following the EC procedure).
Discussion

• A first step to bring the EC procedures from the lab into the psychological practice in the field of smoking reduction
• Confirm that changes in implicit cognitions have to be acknowledged explicitly in order to determine changes in behavior

? What is the dynamic of implicit and explicit cognitions in the process of quitting smoking?
? In what way the discrepancy between implicit and explicit attitudes has an effect on cigarettes consumption or the process of quitting?
? What are the variables which enhance the EC effect for smoking reduction?