A Meta-Analysis of Implicit Association Tests adapted to Measure Sexual Interest in Children

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Background
- Sexual interest in children
  - Distinguishes child molesters from non-molesters
  - Predicts sexual recidivism
- Common methods
  - Penile plethysmography (PPG)
  - Self-report measures
- Indirect measures
  - A useful complement to currently used measures of sexual interest?

What is the Implicit Association Test?
- First used in the field of social psychology
- Categorization task
  - Strength of automatic associations in memory between a concept category (e.g., adult and child) and an attribute category (e.g., sexy and not sexy)
  - Inferred from the relative speed with which one sorts stimulus words or pictures into categories

Sexual Attraction to Children IAT
A quick example

Summary of scoring
- Automatic associations between child and sexy vs. adult and sexy
- Strength inferred from sorting speed
  - Slower in trials that are inconsistent (e.g., sorting stimuli into the category child or sexy)
  - More positive scores represent faster speeds when the child and sexy categories share a response key vs. when the adult and sexy categories share a response key

Purpose
- A meta-analysis of IAT measures adapted to measure sexual interest in children
  - Can they distinguish child molesters from non-molesters?
- Construct validity
  - What is “it” measuring?
Inclusion criteria
1) Sample of sexual offenders
2) A comparison group (e.g., nonsex offender, students)
3) Data on an IAT measure adapted to measure sexual interest in children
4) Sufficient information to calculate \( d \)

Searching for studies
1) Search of PsychINFO, Criminal Justice Abstracts, & Digital Dissertations
2) Search reference list of obtained studies & review articles
3) Reviewed previous ATSA conference brochures
4) Emailed those active in the field

Studies adapting IAT measures to assess sexual interest in children

- \( k = 11 \)
  - Published (\( k = 6 \))
  - Unpublished (\( k = 5 \))

- Diverse samples
  - Canada (\( k = 2 \))
  - Germany (\( k = 2 \))
  - UK (\( k = 3 \))
  - Single samples:
    - Australia (\( k = 1 \))
    - Belgium (\( k = 1 \))
    - Ireland (\( k = 1 \))
    - United States (\( k = 1 \))

IAT adapted differently

- Stimuli choice
  - Some used only words (\( k = 5 \))
  - Some used a combination of words and pictures (\( k = 5 \))
    - Usually words represent the attribute category and pictures represents the concept category (child/adult)
    - Thornton et al. (2009) used average of two IATs (one words, one combination of words and pictures)

IAT adapted differently

- Different attribute categories
  - Sexy/ Not Sexy (erotic/ not erotic)
  - Sex/ Not Sex (or nonsex)
  - Sex/ Furniture

- Some separated gender (concept category)
  - Women/children (Steffens et al., 2008)
  - Banse, Schmidt, et al. team created two IATs (male and female)

Summary

<table>
<thead>
<tr>
<th>Study</th>
<th>Concept</th>
<th>Attribute</th>
<th>Words only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Babchishin et al. (2010)</td>
<td>Child/Adult</td>
<td>Sexy/ Not Sexy</td>
<td></td>
</tr>
<tr>
<td>Banse et al. (2010)</td>
<td>Girls/Women Boys/Men</td>
<td>Sexually exciting/ unexciting</td>
<td></td>
</tr>
<tr>
<td>Brown et al. (2009)</td>
<td>Child/Adult</td>
<td>Sex/ Not-Sex</td>
<td></td>
</tr>
<tr>
<td>Gray et al. (2005)</td>
<td>Child/Adult</td>
<td>Sex/ Not-Sex</td>
<td>YES</td>
</tr>
<tr>
<td>Mitalidies et al. (2004)</td>
<td>Children/Not Children</td>
<td>Sexual/ Not Sexual</td>
<td>YES</td>
</tr>
<tr>
<td>Nunes et al. (2007)</td>
<td>Child/Adult</td>
<td>Sexy/ Not Sexy</td>
<td>YES</td>
</tr>
<tr>
<td>O’Caindra (2010)</td>
<td>Child/Adult</td>
<td>Sex/Furniture</td>
<td></td>
</tr>
<tr>
<td>Schmidt &amp; Banse (2010)</td>
<td>Girls/Women Boys/Men</td>
<td>Sexually exciting/ unexciting</td>
<td></td>
</tr>
<tr>
<td>Steffens et al. (2008)</td>
<td>Child/Woman</td>
<td>Erotic/Not Erotic</td>
<td>YES</td>
</tr>
<tr>
<td>Thornton et al. (2009)</td>
<td>*presents average of two IATs (Nunes/ Gray &amp; Snowden)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanhoock et al. (2010)</td>
<td>Girls/Women Boys/Men</td>
<td>Sexually exciting/ unexciting</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Sample size</td>
<td>Cohen's d (95% CI)</td>
<td>Comparison group</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------</td>
<td>----------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Babchishin et al. (2010)</td>
<td>35</td>
<td>0.43 (0.12 to 0.98)</td>
<td>N CM</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>0.10 (0.57 to 0.71)</td>
<td>N Non-CM</td>
</tr>
<tr>
<td>Banse et al. (2010)</td>
<td>38</td>
<td>0.48* (0.02 to 0.94)</td>
<td>N Non.sex Rapisants</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>0.43 (-0.05 to 0.88)</td>
<td>N Non.sex Community &amp; prison workers</td>
</tr>
<tr>
<td>Brown et al. (2009)</td>
<td>54</td>
<td>0.92* (0.51 to 1.33)</td>
<td>N Nonsex</td>
</tr>
<tr>
<td>Gray et al. (2005)</td>
<td>18</td>
<td>0.84* (0.30 to 1.38)</td>
<td>N Nonsex &amp; rapists</td>
</tr>
<tr>
<td>Mihailides et al. (2004)</td>
<td>25</td>
<td>0.63* (0.06 to 1.20)</td>
<td>N Nonsex University males</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>0.97* (0.38 to 1.56)</td>
<td>N Nonsex University females</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>0.92* (0.34 to 1.50)</td>
<td>N Nonsex University Rapists</td>
</tr>
<tr>
<td>Nunes et al. (2007)</td>
<td>27</td>
<td>0.66* (0.10 to 1.21)</td>
<td>N Nonsex</td>
</tr>
<tr>
<td>O Ciardha (2010)</td>
<td>24</td>
<td>0.60* (0.02 to 1.18)</td>
<td>N University-males</td>
</tr>
<tr>
<td>Schmidt &amp; Banse (2010)</td>
<td>41</td>
<td>0.22 [-0.28 to 0.71]</td>
<td>N Nonsex</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>0.94 (0.21 to 1.68)</td>
<td>N Rapists</td>
</tr>
<tr>
<td>Steffens et al. (2008)</td>
<td>17</td>
<td>0.53 [0.08 to 1.15]</td>
<td>N Primary rapists</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>0.08 [0.57 to 0.71]</td>
<td>N Non-exclusively pedophiles</td>
</tr>
<tr>
<td>Thornton et al. (2009)</td>
<td>20</td>
<td>0.72* [0.08 to 1.36]</td>
<td>N Rapists</td>
</tr>
<tr>
<td>Venkeke et al. (2010)</td>
<td>31</td>
<td>0.43 (0.44 to 1.38)</td>
<td>N Rapists</td>
</tr>
</tbody>
</table>

**Statistical Analyses**

- Fixed-effect and random-effect meta-analysis
  - Only fixed presented
- Q = variability in effect sizes across studies
- Moderators (fixed-effect, global attitudes item):
  \[ Q_{between-levels} = Q_{overall} - Q_{within-levels} \]
  - Distributed as chi-square (df = n levels - 1)
- Comprehensive Meta-analysis program

**Comparison groups**

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Weighted d</th>
<th>Q</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM vs. Nonoffenders (males)</td>
<td>0.623</td>
<td>2.05</td>
<td>174</td>
</tr>
<tr>
<td>CM vs. Nonsex offenders</td>
<td>0.578</td>
<td>5.46</td>
<td>406</td>
</tr>
<tr>
<td>CM vs. Rapists</td>
<td>0.381</td>
<td>2.99</td>
<td>219</td>
</tr>
</tbody>
</table>

**Meta-analysis**

- Overall, IAT measures adapted to assess sexual interest in children do distinguish between child molesters and non-molesters
  \[ d = 0.606 (0.442 to 0.769), k = 11, N = 651 \]

- There were no outliers, or significant variability between studies (i.e., findings were consistent)
  \[ Q = 6.42, df = 10, p = .78 \]

**Pictures and words produce similar results**

- Words (k = 5):
  \[ d = 0.659 (0.404 to 0.914), n = 270 \]
  \[ Q = 0.64, df = 4, p = .96 \]

- Pictures (k = 6):
  \[ d = 0.568 (0.355 to 0.782), n = 383 \]
  \[ Q = 5.49, df = 5, p = .36 \]

- \[ Q_{between} = 0.29, df = 1, p = .59 \]
No publication bias

- Published
  \[ d = 0.698 \ (0.490 \text{ to } 0.906), \ k = 6, \ n = 397 \]
  \[ Q = 2.64, \ df = 5, \ p = .76 \]
- Unpublished
  \[ d = 0.454 \ (0.188 \text{ to } 0.720), \ k = 5, \ n = 253 \]
  \[ Q = 1.77, \ df = 4, \ p = .78 \]
  \[ Q_{between} = 2.01, \ df = 1, \ p = .16 \]

Girl-Women IATs seem to do better

- Banse, Schmidt et al. studies (\( k = 3; \ n = 184 \))

<table>
<thead>
<tr>
<th>IAT Type</th>
<th>Weighted d</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls-Women</td>
<td>0.723 (0.541 to 0.906)</td>
<td>5.47**</td>
</tr>
<tr>
<td>Boys-Men</td>
<td>0.372 (0.179 to 0.565)</td>
<td>0.60</td>
</tr>
<tr>
<td>Average</td>
<td>0.617 (0.429 to 0.804)</td>
<td>3.25</td>
</tr>
</tbody>
</table>

- Significant variability in Girls-Women IAT studies
- Insufficient studies

Summary findings

- Overall, IAT measures distinguish child molesters from non-molesters
  - Community males
  - Nonsex offenders
  - Rapists
- Pictures vs. word only IATs
- Splitting gender
  - Girls-Women IAT appear to do better than Boys-Men IAT
    - Replication needed

Convergent validity of IAT measures

So it distinguishes child molesters from other groups, but what exactly is it measuring?

Penile Plethysmography (PPG)

- A physiological measure of sexual arousal
  - Thornton et al. (2009)
    - \( r = -.179, \ p > .05 \)
  - Babchishin et al. (2010)
    - \( r = .19, \ p > .05 \)
  - More data required, inconclusive
    - Possible that IAT and PPG measure different constructs (sexual arousal vs. schemas)

The Screening Scale for Pedophilic Interest (SSPI)

- A file-based measure of sexual interest in children
  - Banse et al. (2010)
    - Girls-Women IAT, \( r = .17, \ p > .05 \)
    - Boys-Men IAT, \( r = .12, \ p > .05 \)
  - Babchishin et al. (2010)
    - Child-Adults IAT, \( r = -.05, \ p > .05 \)
  - Vanhoeck et al. (2010)
    - Girls-Women IAT, \( r = .50, \ p < .05 \)
    - Boys-Men IAT, \( r = .58, \ p < .05 \)
Self-report measures of sexual interest
- Banse et al. (2010): Explicit Sexual Interest Questionnaire (ESIQ)
  - Girls-Women IAT, $r = .32, p < .05$
  - Boys-Men IAT, $r = -.04, p < .05$
- Babchishin et al. (2010): Sexual Interest Profiling System (SIPS)
  - Child-Adults IAT, $r = .35, p < .01$
  - Other
    - STABLE sexual deviancy items (interview and file based)
      - $r = .40, p < .05$

Viewing time measures
- Indirect measure of sexual interest
- Longer viewing time indicate greater interest in the age/gender group
  - Banse et al. (2010)
    - Girls-Women IAT, $r = .27, p < .05$
    - Boys-Men IAT, $r = -.15, p > .05$
  - Babchishin et al. (2010)
    - Child-Adult IAT, $r = .33, p < .01$

Relationship with other measures of interest
- Social desirability
- Risk assessment

Balanced Inventory of Desirable Responding (BIDR)
- Impression management and presentation bias
  - Babchishin et al. (2010)
    - Overall, $r = -.12, p > .05$
    - IM, $r = -.01, p > .05$
    - Self-deception, $r = -.24, p > .05$
  - Banse et al. (2010)
    - Girls-Women IAT, $r = .07, p > .05$
    - Boys-Men IAT, $r = .09, p > .05$
  - Nunes et al. (2007)
    - IM, $r = -.22, p > .05$

Risk assessments
- Static-99 and RRASOR, both actuarial risk assessment scales designed to predict sexual recidivism
  - Babchishin et al. (2007)
    - RRASOR: $r = -.13, p > .05$
    - Static-99: $r = -.10, p > .05$
  - Nunes et al. (2007)
    - RRASOR: $r = .27, p > .05$
    - Static-99: $r = .43, p < .05$
  - Vanhoeck et al. (2010)
    - Girls-Women IAT, Static-99: $r = .29, p < .05$
    - Boys-Men IAT, Static-99: $r = .28, p < .05$

Summary
- PPG = Inconclusive
- SSPI = Recent studies found large correlations
- Self-report measures = yes!
  - But if separating gender, may only be found in women-girls IATs
- Viewing time measures = yes!
  - But if separating gender, may only be found in women-girls IATs
- Social desirability = no!
- Risk assessment scales = 2/3 studies found moderate correlation coefficients
Overall summary

• Distinguishes between groups
  – Consistent results despite different methodology
• Construct validity
  – What exactly is it measuring?
  • Seems more to do with schemas/cognitions vs. sexual arousal
  • Caoilte?
• Is it predictive of recidivism?
  – Relationship with risk scales (e.g., Vanhoeck et al., 2010; Nunes et al., 2007)

References


Vanhoeck, K., Schmidt, A. F., Quikha, K., & Baner, R. (2010, September). Are there any clinical implications to be drawn from indirect measures of sexual interest? Poster presented at the 11th International Association for the Treatment of Sexual Offenders Conference, Oslo, Norway.