The Spread of Fear
and Avoidance

Presented in association with
N.U.I.M. Psychology Society

by
Sean Boyle,
Postgraduate Researcher
N.U.I. Maynooth
• B.A. (Hons) Psychology, N.U.I.M. 2012
  Symbolic generalisation of fear and avoidance: Testing a behavioural model of anxiety

• M.Sc. Psychology, N.U.I.M. 2014
  Examining the transfer of fear and avoidance response functions through real-world verbal relations
Leslie and O’Reilly (1999) cautioned that the experimental analysis of behaviour and applied behaviour analysis are the “science and technology of behaviour”
Experimental behaviour analysis

1904

Pavlov wins Nobel prize for research into dog physiology

1913

Watson introduces the experimental study of behaviour and Behaviourism is born

1927

Pavlov’s “Conditioned Reflexes” describes what later becomes known as Classical Conditioning

1938

Skinner’s “The Behaviour of Organisms” introduces the concept of Operant Behaviour

1957

Skinner’s “Verbal Behaviour” examines language as behaviour and provides support for experimental behaviour analysis

1958

Journal of Applied Behavioral Analysis is launched

1968

Journal of the Experimental Analysis of Behavior is launched
Generalisation of fear is the transfer of fear between physically similar or categorically related objects or events.

Fear is a natural occurring physiological response, however the resulting behaviour can become problematic e.g., Phobias and anxiety disorders.
The Problem With Generalisation
Avoidance

Anxiety inducing threat from stimulus

Reinforcement of stimulus as threat & Reinforcement of avoidance as behaviour

Immediate reduction in anxiety

Avoidance behaviour

Reinforcement of stimulus as threat
SPIDER ALERT
Indirect Avoidance

- CUE
- Anxiety inducing threat from stimulus
- Immediate reduction in anxiety
- Avoidance behaviour

Reinforcement of cue as precursor to threat & Reinforcement of avoidance as behaviour
Cognitive model

Expectancy

Cue  →  Threat  →  Anxiety  

Avoidance  ↓  No Threat  ←  Avoidance
Behavioural model

Taken from Acceptance and Commitment Therapy (1999) by Hayes, Strosahl & Wilson.
Stimulus Equivalence

"SPIDER"

Taught
 Derived

SPIDER

"SPIDER"
Comparative training
DERIVED RELATIONS, FEAR AND AVOIDANCE


PHASE 1: Stimulus equivalence

PHASE 2: Threat & safety conditioning

PHASE 3: Probes for avoidance

\[ n = 25 \]
AVOIDANCE V EXPECTANCIES

Percentage Avoidance

Phase 2                               Phase 3

Mean Expectancies

Phase 2                                      Phase 3
Implications

• Stimulus equivalence can facilitate a derived (i.e., not learned) transfer of threat function between arbitrary stimuli.

• Lack of memory of various derived relations would makes it difficult to treat original basis of an acquired phobia in a real world setting (and encourages cognitive theorising),

• The causal status of cognitive process in avoidance is questioned given this new model of anxiety.
CATEGORICAL CONDITIONING & FEAR GENERALISATION


n=24

CS+  →  SHOCK  (50% CONTINGENCY)

CS-  →  😊  (100% CONTINGENCY)

Their findings:
Participants quickly learned contingencies between object categories and shock.
“Differential autonomic responses emerged “ between categorically reinforced stimuli (CS+) and the safe category (CS-).
Memory of the CS+ stimuli was greater than for those involved in the CS- conditioning, 24 hours after the experiment even if the stimulus had not previously been accompanied by a shock.

“higher order cognitive systems interact with basic conditioning mechanisms” - Dunsmoor et al., 2012
Experiment 1
Fruit vs Furniture

Phase 1:
Conditioning

CS+
Avoidance
Aversive Image & Sound
Blank Screen

CS-
Avoidance
Blank Screen

Blank Screen

Phase 2:
Probes

CS+
Avoidance
Aversive Image & Sound
Blank Screen

CS-, DCS+ or DCS-
Avoidance
Blank Screen

Blank Screen

Blank Screen
Results - Avoidance
## Possible confounds

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Possible confound</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pre-training</td>
<td>No pre-training</td>
</tr>
<tr>
<td>Categorically related Stimuli</td>
<td>Not sufficiently related</td>
</tr>
<tr>
<td>Aversive images</td>
<td>Not sufficiently aversive</td>
</tr>
<tr>
<td>Avoidance</td>
<td>Avoidance</td>
</tr>
</tbody>
</table>
DaH-DaH-DaaaaaaaH!
Phase 1: operant conditioning

Phase 2: Probes

Weep – Cry  Fight – Brawl  Soup – Broth  Sick – ill
## Avoidance

<table>
<thead>
<tr>
<th>Phase</th>
<th>Stimulus</th>
<th>Mean % of trials on which there was avoidance</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2: Probes</td>
<td>CS+: Learned Threat</td>
<td>97.12</td>
<td>10.786</td>
</tr>
<tr>
<td></td>
<td>CS-: Learned Safety</td>
<td>1.92</td>
<td>9.806</td>
</tr>
<tr>
<td></td>
<td>DCS+: Inferred Threat</td>
<td>66.35</td>
<td>44.126</td>
</tr>
<tr>
<td></td>
<td>DCS-: Inferred Safety</td>
<td>0.96</td>
<td>4.903</td>
</tr>
</tbody>
</table>
Avoidance comparison

Mean percentage avoidance demonstrated by participants in the current study using synonym pairs and those recorded by Dymond et al. 2011 who employed pairs of stimuli from laboratory established derived equivalence relations. (DCS+/- refers to an untrained stimulus probe)
## Avoidance v SCR v Expectancy

<table>
<thead>
<tr>
<th>Response</th>
<th>Stimulus</th>
<th>% trials on which avoidance was/was not produced</th>
<th>SCR (uS per cm²)</th>
<th>Shock Expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoidance</td>
<td>Learned Threat (CS+)</td>
<td>97</td>
<td>0.163</td>
<td>1.12</td>
</tr>
<tr>
<td></td>
<td>Learned Safety (CS-)</td>
<td>2</td>
<td>0.102</td>
<td>2.04</td>
</tr>
<tr>
<td></td>
<td>Inferred Threat (DCS+)</td>
<td>66</td>
<td>0.191</td>
<td>1.56</td>
</tr>
<tr>
<td></td>
<td>Inferred Safety (DCS-)</td>
<td>1</td>
<td>0.129</td>
<td>2.20</td>
</tr>
<tr>
<td>No Avoidance</td>
<td>Learned Threat (CS+)</td>
<td>3</td>
<td>0.163</td>
<td>4.69</td>
</tr>
<tr>
<td></td>
<td>Learned Safety (CS+)</td>
<td>98</td>
<td>0.102</td>
<td>1.19</td>
</tr>
<tr>
<td></td>
<td>Inferred Threat (CS+)</td>
<td>34</td>
<td>0.191</td>
<td>3.27</td>
</tr>
<tr>
<td></td>
<td>Inferred Safety (CS+)</td>
<td>99</td>
<td>0.129</td>
<td>1.31</td>
</tr>
</tbody>
</table>
Self reported expectancies

Expectancies that did NOT control behavior as effectively as experimental contingencies
Implications

- Avoidance provides a more reliable indication of threat appreciation than either physiological or self report measures.

- No significant relationship between experimentally measured physiological fear levels or anxiety trait measures and overt avoidance.

- Possible disconnect between fear levels and threat appreciation.
Possible disconnect

- Fear (SCR) does not correlate with avoidance (Me; Szpiler et al., 1976)

- Expectancy does not correlate with avoidance (Me; Dymond et al., 2011; Declercq & DeHouwer, 2009)

- Expectancy does not correlate with fear (Schwerdtfeger, 2004)

- Anxiety propensity does not correlate with fear or avoidance (Me; Derakshan et al., 2007)

- Neural areas involved in threat appreciation different to those involved in activation of SNS (LeDoux, 2014).
Advantages of a behavioural explanation

• Fear, appreciation of fear, threat assessment, avoidance may all be “by-products” of underlying behaviour (Dymond et al., 2011).

• Stimulus equivalence and RFT research provides almost 25 years of research supporting the behaviour.

• Treatments involving merely extinction of fear would leave the underlying behavioural patterns intact.

• Recent study shows (Luciano et al. 2013) acceptance based intervention provides for a lack of avoidance and fear.
From here?

1. Parameters and processes involved in overt avoidance.
2. Role of individual differences and coping strategies in propensity to avoidance.
3. Prototype of assessment instrument or computer based analog to identify propensity to avoid.
4. Ultimately, by understanding the processes, contribute to effective interventions to address dysfunction.
Thank You

sean.boyle@nuim.ie