Does mindfulness affect persistence with behaviour change?

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The process of behaviour change: Example

Behaviour	Short-term outcomes	Long-term outcomes
Smoking	• Satisfaction of craving • Tool for dealing with unwanted emotions	Health issues
Not smoking	• Absence of long-term outcomes • Withdrawal symptoms	Better health

Persistence: A common feature to behaviour change

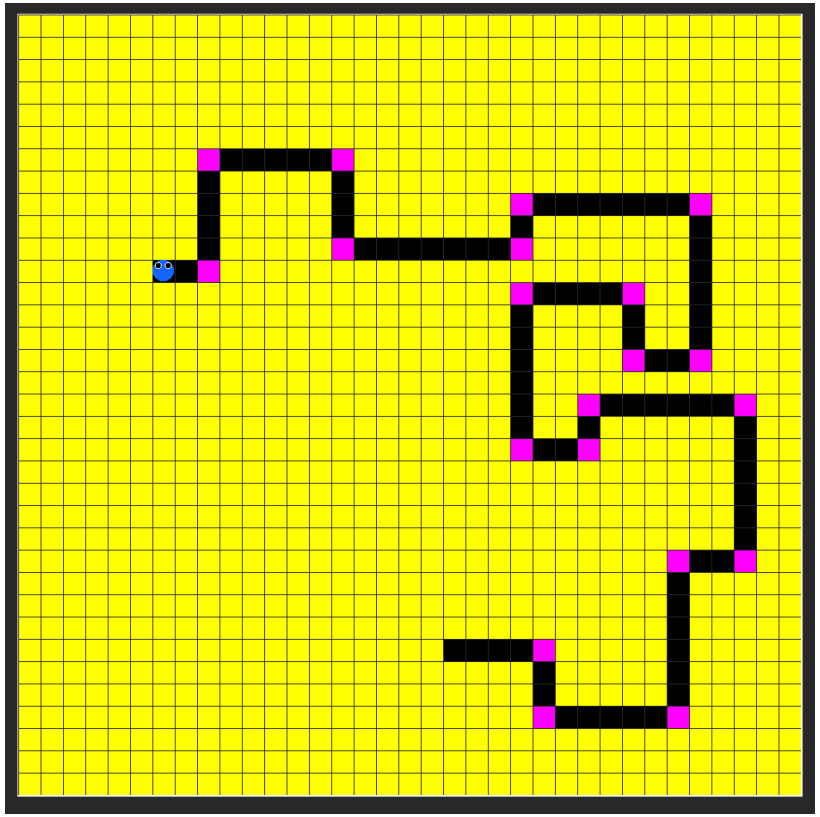
Persistence paradigm: The aims and main task

Aims of the paradigm:

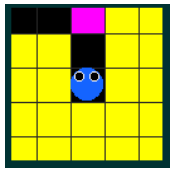
- To simulate the struggle one faces in the process of changing from the habitual to new behaviour
- To design an experimental, “game-like” paradigm which would resemble real life as much as it is possible given a lab setting
- The paradigm would then enable us to measure persistence and how it is affected by various factors

The main task:

- Complete a path with a chosen avatar within a fixed time frame
- The path is depicted in black, the purple fields represent the turning points
- Only the immediate context is seen
- People complete 51 trials, each with qualitatively different (e.g. different starting point) but quantitatively same (e.g. the length of the path) properties

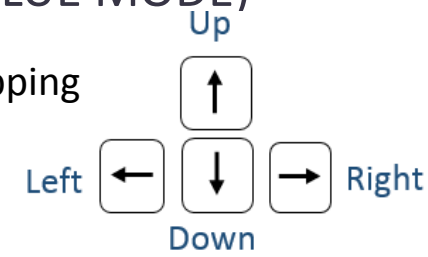


Persistence Paradigm: “Blue” vs. “red” mode

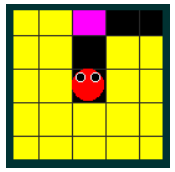


HABITUAL BEHAVIOUR (BLUE MODE)

- Standard key to response mapping

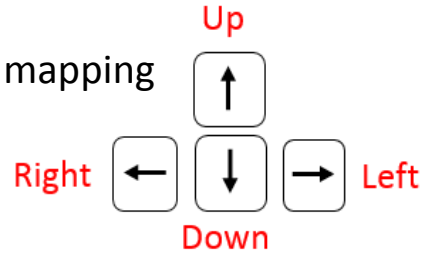


- One blue coin for each correct turn -> 20 blue coins per trial
- One blue coin is 0.5 pence -> maximum of 10 pence per trial earned
- It is easy to earn the blue coins throughout all the trials
- Blue coins represent the regular, small reward for the habitual behaviour



NEW BEHAVIOUR (RED MODE)

- Novel key to response mapping



- One red coin if all turns are correct -> 1 red coin per trial
- One red coin is 25 pence -> either 0 or 25 pence earned per trial
- It is difficult to earn the red coin, especially at the beginning, but it becomes easier and more beneficial in the long run given one persists
- Red coins represent the long-term positive outcome of the new behaviour
- People can switch from the red mode to the blue mode during each trial (relapse)

Mindfulness influence

- Will people persist through the frustrating beginning of the paradigm if they are more mindful?
- Mindfulness is intentional, present moment awareness with a set of attitudes including acceptance, openness, and compassion.
- Previously found mindfulness effects which could relate to our paradigm:
  - **Persistence on difficult tasks:** non-judging and non-reactivity facets of mindfulness positively correlated with a greater time spent on solving anagrams (Evans, Baer, & Segerstrom, 2009)
  - **Behavioural change:** mindfulness was related to an increased occurrence of health behaviours (Gilbert & Waltz, 2010), a greater reduction of cigarette smoking (Davis et al., 2007), alcohol use (Black, Semple, Pokhrel, & Grenard, 2011), severity of dependence (Bowen & Enkema, 2014), and self-reported cravings (Witkiewitz, Bowen, Douglas, & Hsu, 2013)
  - **Sustained attention:** mindfulness was found to lead to a greater sustained attention (Gala et al., 2012; MacLean et al., 2010)
  - **Emotion regulation:** mindfulness was related to better emotion regulation (Luberto et al., 2014; Lyvers, 2014)

Methodology

- **Mindfulness manipulation** - two opposing conditions in the form of a listening exercise (Watkins & Teasdale, 2001):
  1. **Low analysis condition:** present moment focus (a mindfulness meditation)
  2. **High analysis condition:** past and future focus (thinking of answers to a set of questions)
- **Dispositional mindfulness measure:** CAMS-R scale (Feldman et al., 2007)
- **Participants:** university students and staff (42 women and 35 men, mean age = 24)
- **Procedure:**
  1. Practice trials (path familiarising, habitual keys completion, main instructions), 10 minutes
  2. Mindfulness manipulation, 14 minutes
  3. 51 Choice trials, around 30 minutes
  4. Demographics, CAMS-R scale

Mindfulness manipulation: Results

- **Main Experimental variables:**
  1. Proportion of new choices -> willingness to change
  2. Persistence proportion -> willingness to change and sustain the focus (relapse considered)
  3. Red coins earned -> success rate after the change
- **General characteristics of data:**
  1. Experimental variables were not normally distributed (most values in the extremes)
  2. High individual differences which could be classified into four distinct strategies resembling real life:
     I. Mostly habitual choices
     II. Mixed choices
     III. Mostly new choices but low success (high relapse)
     IV. Mostly new choices and high success (low relapse)
- **The effect of the manipulation**
  - The generalized linear mixed model (based on logistic regression) was applied
  - No significant differences between the conditions and main experimental variables found

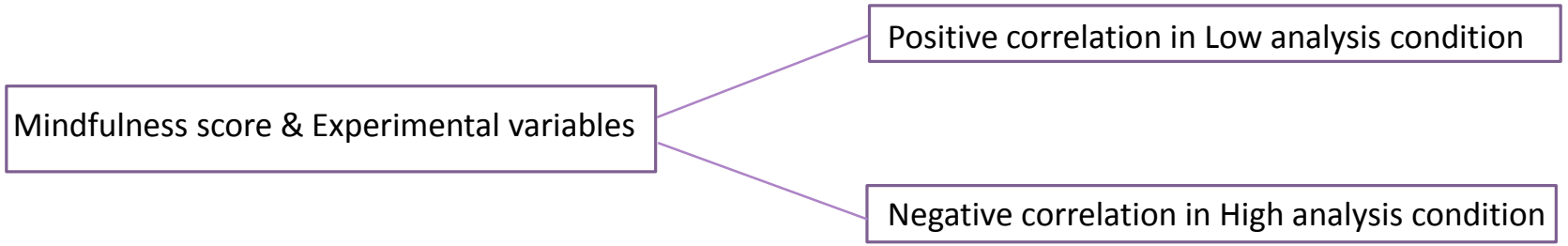
Mindfulness manipulation: Discussion

Possible reasons for the null results:

1. **No theoretical relationship** between mindfulness and persistence with behavioural change
   - Contrasts with related literature but there are some previous null results in the attention literature (Josefsson, Lindwall, & Broberg, 2014) and some domains of health behaviour (Salmoirago-Blotcher et al., 2013)
   - Paradigm lacks an important aspect from real life
2. **Insufficient effect of the manipulation**
   - Varied reactions to the mindfulness manipulation, e.g. mindfulness is not rewarding to all (Brewer, Davis, & Goldstein, 2013)
   - The effect of mindfulness induced in the short-term is weaker than that of the long-term (e.g. Farb et al., 2007)
   - Some important aspects of mindfulness like openness and acceptance may be missing

Dispositional mindfulness: Results

- An unexpected trend in the trait mindfulness questionnaire was detected:



- This trend was especially prominent in men

Table1. Kendall correlational coefficients between dispositional mindfulness and experimental variables for men

	Low analysis	High analysis
Proportion of new choices	0.51**	-0.42*
Persistence proportion	0.52**	-0.20
Red coins earned	0.45**	-0.30

Note. ** p < .01, * p < .05

Dispositional mindfulness: Discussion

- Attributions based on the experience might have been made, suggesting the effect of context on the trait questionnaire.
  - If the condition focused on being present, people believed they are generally more mindful the better they did on the task.
  - If the condition focused on past or future, people believed they are generally less mindful the better they did on the task.
- However trait questionnaires should be distinct from state questionnaires (e.g. Bergomi, Tschacher, & Kupper, 2013) and hence remain unaffected by immediate context.
- Why was the trend more prominent in men than women?
  - Women did generally worse, so they may not have been represented well in the sample.
  - Women might have a higher global focus.

Conclusions

- Although this study found no effect of mindfulness on persistence with behavioural change or its success, it has brought two interesting insights about mindfulness measures:

1. It is not clear what effect a short-term mindfulness induction can produce.

2. Trait questionnaires might not be immune to the effects of immediate context.

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