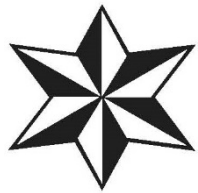


# Using data mining to refine digital behaviour change interventions

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# Acknowledgements

- › Joint work with:
  - John Kingston (Knowledge Engineering Group, U. of Brighton)
  - Miltos Petridis (Dept. of Computer Science, U. of Middlesex)
  - Ben (C) Fletcher (Dept. of Psychology, U. of Hertfordshire; Do Something Different Ltd)
  
- › Supported by **Innovate UK** via KTP project 10152

# Overview


- › **Do Something Different** programmes are **digitally delivered behaviour change interventions**
  - Consisting of a series of personalised “**Dos**” – small recommended activities to help people **practice behaving in new ways and breaking their habits**
  - Programmes for e.g. **smoking cessation, healthy weight, stress reduction, diabetes self-care** etc.
  - **Delivered by smartphone app**, or SMS or email
  - Based on decades of psychological research, including controlled trials
  - Over 16,000 people have now participated in a Do Something Different programme
- › Our paper is about **running data mining algorithm on the data collected** by the DSD system
  - to **better understand which elements of the programmes provide the most benefit for people**
  - Using **correlation networks and regression models** built from questionnaire data
  - Present selected results; see the paper for a more in-depth account



- > Here is an example “Do”
- > Simple, immediate and not daunting
- > Action-based
- > “It's easier to act your way into a new way of thinking than to think yourself into a new way of acting.”


←  **Healthy Options Day.**  
No Diet Diet

✓ 12 people completed this Do


Replace your usual drink with veg juice, herbal tea or plain water today. Swap your usual snack for fruit, nuts or crunchy raw veg.


**Completed** 


 **Add Comment**  **Rate**



Home Do's Feed Messages


← **Healthy Options Day.** 






This a great thing that i do today in uni ❤️

← ❤️ 1

**Coach Jenny** 

Hey! That looks really good well done

❤️



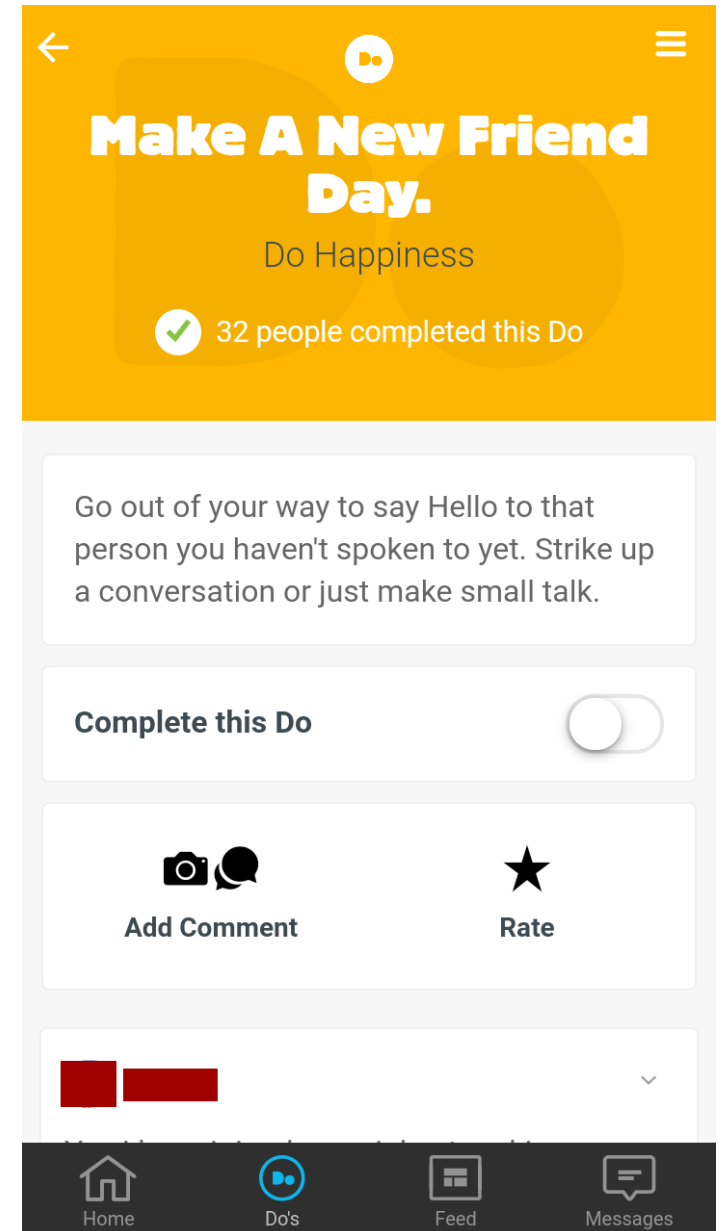
Yeah! Thank you ❤️

❤️ 1

Home Do's Feed Messages

# Expanding behavioural flexibility

- › Some “Dos” address specific health and wellbeing-related habits
- › But DSD programmes also include a component about trying out new ways of behaving, which people may find useful in their lives generally
  
- › The DSD system contains “Dos” prompting 30 kinds of behaviour:
  - E.g. **assertiveness, extroversion, spontaneity, etc.**
  - You can develop these by practice!



## Fletcher and Pine's "Behaviour Rater"

(shows 30 behaviours  
in the DSD system)

### Which of the following describes you best?

Click on the behaviours below that best describe you.  
Select as many or as few as you like, so long as they  
describe how you generally are. There are no right or  
wrong answers.

Firm	Unpredictable	Individually-centred	Behave as others want you to	Behave as you wish
Reactive	Lively	Definite	Calm/Relaxed	Gentle
Play it safe	Proactive	Not lively/Laid back	Open-minded	Assertive
Introverted	Systematic	Extroverted	Predictable	Conventional
Flexible	Trusting	Group-centred	Spontaneous	Risk-taker
Wary of others	Unconventional	Single-minded	Unassertive	Energetic/Driven

## Fletcher and Pine's "Behaviour Rater"

(shows 30 behaviours in the DSD system)

### We wanted to know:

- How are these 30 behaviours linked to wellbeing?
- Which are the most important to promote through "Dos"?

With data from almost 16k people, including scores from wellbeing, anxiety and depress. questionnaires for each person, we can answer that

## Which of the following describes you best?

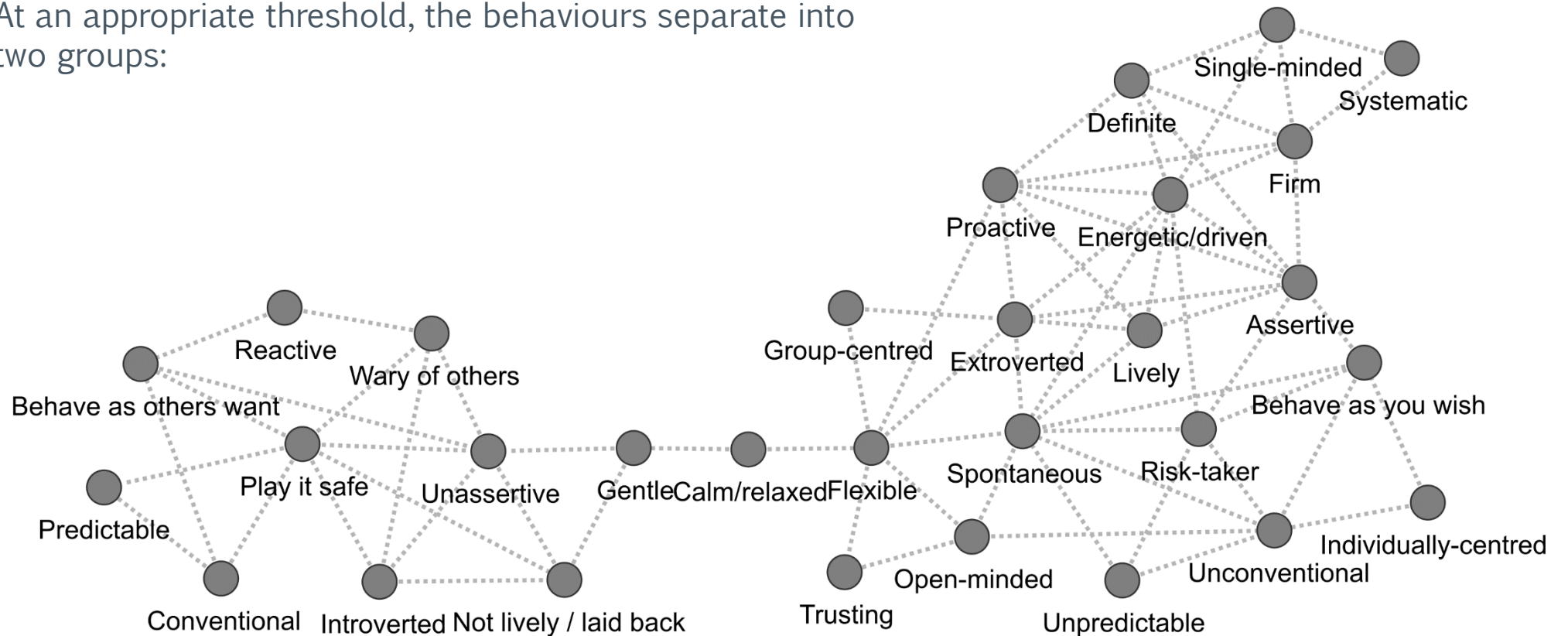
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# Correlation networks of the behaviours

We used a graph layout algorithm to display correlation networks of the 30 behaviours, with a range of thresholds.

At an appropriate threshold, the behaviours separate into two groups:



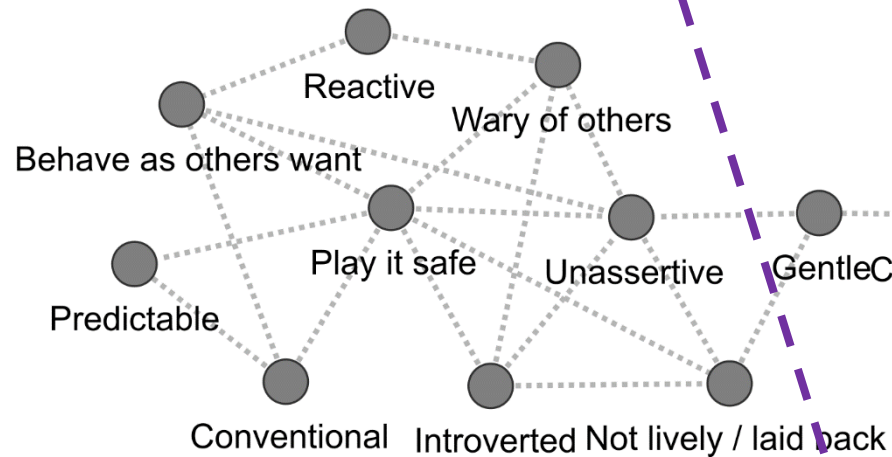


# Correlation networks of the behaviours

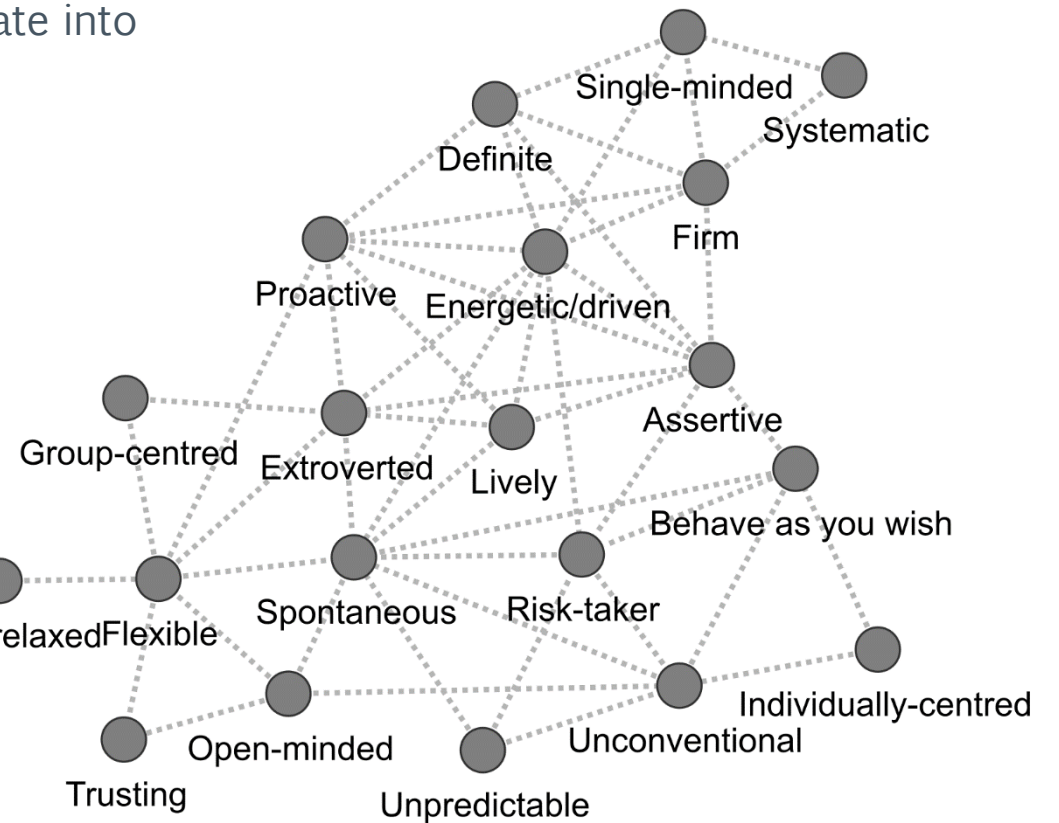
We used a graph layout algorithm to display correlation networks of the 30 behaviours, with a range of thresholds.

At an appropriate threshold, the behaviours separate into two groups:

**“Inhibitory” behaviours**  
linked with poorer scores on wellbeing questionnaire



**“Facilitatory” behaviours**  
linked with better scores on wellbeing questionnaire



# Selected results

- › Behaviours separate into two groups:
  - **Facilitatory behaviours (those that help you to do things) are associated with better wellbeing scores, and lower anxiety and depression scores**
  - **Inhibitory behaviours (those that stop you doing things) are associated with poorer wellbeing scores, and higher anxiety and depression scores**
- › After following a Do Something Different programme, **people's behaviours have shifted** while their **wellbeing has increased**:
  - Participants report fewer inhibitory behaviours post-programme, but more facilitatory behaviours
- › **Changes in behaviour are correlated with changes in wellbeing**
  - E.g. the more facilitatory behaviours a person adds (at post-programme compared to pre-programme) the more their wellbeing tends to increase
- › These findings have fed into the programme design process

# The End

- › See the paper for detailed results, including regression and propensity scoring models
- › Find out more about Do Something Different at <http://dsd.me/>
- › See evidence base for Do Something Different at <http://dsd.me/healthcare/the-evidence/>
- › Do a 3-week Do Something Different programme for free at <http://dsd.me/get-started/>