ISRCTN16746619 https://doi.org/10.1186/ISRCTN16746619

The impact of aversive labelling on approach and avoidance behaviour towards foods: an online study

Submission date
04/08/2020

Recruitment status
No longer recruiting

Registration date
10/08/2020

Overall study status
Completed

Last Edited
27/05/2022

Condition category
Other

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims:
Recent research suggests health warning labels on high energy-dense snack foods (e.g. chocolate bars) could reduce their selection and consumption. However, we don't yet fully understand how the health warning labels achieve this effect. The current study investigates how health warning labels might work.
One possible explanation is that health warning labels reduce the selection of high energy-dense snacks because they make people think about their health. The health warning message might be used in their decision-making process to not choose a product that may be harmful to them. Alternatively, they may simply be put off by the visually unpleasant nature of the label. If the latter is true, then the health message may not be essential to the effects of health warning labels, and a warning label should work even if it has nothing to do with health, as long as it causes a negative feeling.
To distinguish between these two possible explanations, we are investigating the effects of displaying health warning labels, versus health-irrelevant warning labels, on wanting and liking of high energy-dense snacks.

Who are our participants?
Adults over the age of 18, who eat milk chocolate at least once a week.

What does the study involve?
The study involves completing some questionnaires and two main computer tasks. Participants will start by answering questions on their hunger levels, and the time since they last ate. Next, they will be asked to rate four unlabelled chocolate bars. Participants will also be asked similar questions about four control stimuli (stationery items) for comparison. They will then give their education level, income, age, gender and ethnicity.

Next, participants will complete the manikin task, in which they have to move a stick figure on the screen in response to images of chocolate bars and stationery items. Depending on the participants' randomised group, they will be presented with images of chocolate bars, which are either unlabelled, display warning labels related to overconsumption of food, or display labels

containing unpleasant images that are not related to overconsumption. The task includes two rounds, which have different rules regarding how participants must move a stick figure on their screen in response to the images presented. In one round participants must approach the image if it depicts a chocolate bar, and must avoid the image if it depicts stationery. In a second round this rule will be reversed. To approach or avoid the images, participants press keys which control the movement of the stick figure on their screen. They will be asked to respond as quickly as they can, and will be able to practise responding to the images based on the different rules for each round before starting.

Immediately after, participants will be presented with two selection tasks of eight food items and asked to select the item they would most like to eat now. The eight items will include the four chocolate bars from the manikin task and four healthier snacks (e.g. fruit). In the first selection task food items will be unlabelled (in their original branded packaging). In the second selection task the chocolate bars will be labelled depending on participants randomised group.

Participants will then complete the second computer task - the go/no-go task. They will be randomised to the same group as in the manikin task. The go/no-go task will include two rounds - in the first round participants have to press the space bar if they see a chocolate bar, but not if the image is of stationery, and in the second round the rule is reversed.

Participants will then repeat the food choice tasks, and the questions about how much they like and want the four chocolate bars and the four stationery items. However, unlike the first time they are asked, this time the chocolate bars will be labelled differently. Lastly, participants will answer questions on their eating behaviour and food purchasing and consumption habits. We will also record their height and weight.

What are the possible benefits and risks of participating?
Participants will be paid standard market research panel rates for participating in this study. There are no known risks of participating in the study.

Where is the study run from?
Behaviour and Health Research Unit, University of Cambridge (UK).

When is the study starting and how long is it expected to run for?
February 2020 to October 2020

Who is funding the study?
Wellcome Trust (UK)

Who is the main contact?
Professor Paul Fletcher
pcf22@cam.ac.uk

Contact information

Type(s)
Scientific

Contact name
Prof Paul Fletcher

ORCID ID
https://orcid.org/0000-0001-8257-1517

Contact details
Douglas House
18b Trumpington Road
Cambridge
United Kingdom
CB2 8AH
+44 (0)1223 336988
pcf22@cam.ac.uk

Type(s)
Public

Contact name
Ms Emily Pechey

ORCID ID
https://orcid.org/0000-0002-2288-2652

Contact details
Institute of Public Health
Forvie Site, Robinson Way
Cambridge
United Kingdom
CB2 0SR
+44 (0)1223 762569
ep472@medschl.cam.ac.uk

Type(s)
Scientific

Contact name
Ms Minna Ventsel

ORCID ID
https://orcid.org/0000-0001-8308-9140

Contact details
Department of Public Health and Primary Care
Forvie Site
Robinson Way
Cambridge
United Kingdom
CB2 0SR
+44 (0)1223 762510
mv491@medschl.cam.ac.uk

Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
WT 206853/Z/17/Z

Study information

Scientific Title
The impact of aversive labelling on approach and avoidance behaviour towards energy-dense snack foods: an online study

Study objectives
1. Exposure to aversive labels (both health warning labels and health-irrelevant labels) reduces implicit motivation for the labelled food
2. This effect is greater for health warning labels than health-irrelevant aversive labels
3. Exposure to aversive labels (both health warning labels and health-irrelevant labels) reduces selection of energy-dense foods (chocolate bars)
3.1. This effect is greater for health warning labels than health-irrelevant aversive labels
3.2. This effect is greater when products in the food selection task display aversive labels, compared to when they are unlabelled

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 16/07/2020, Cambridge Psychology Research Ethics Committee, University of Cambridge, (School of the Biological Sciences, 17 Mill Lane, Cambridge, UK; +44 (0) 1223 766894; Cheryl.Torbett@admin.cam.ac.uk), ref: PRE.2019.111

Study design
Online between-subjects randomised controlled trial

Primary study design
Interventional

Study type(s)
Other

Health condition(s) or problem(s) studied
Excess calorie consumption

Interventions
The study investigates potential mechanisms underlying the impact of health warning labels on wanting and liking of energy-dense snacks. If health warning labels work by targeting model-based responding, then health warning labels emphasising the relationship between the action and the outcome, i.e. depicting consequences that are causally related to engaging in the

behaviour, would produce a bigger effect. Conversely, according to the model-free perspective, i.e. a Pavlovian aversive association with the stimulus, the outcome need not be causally related to the behaviour and the label should instead be selected on the basis of its capacity to drive general aversive conditioning. Thus causally irrelevant aversive stimuli, i.e. irrelevant warning labels, should produce as great an effect.

To investigate this, in an online study, using a between-subjects design, a general population sample of adults will be randomised to one of three label conditions: (i) health warning labels (HWLs), (ii) irrelevant aversive labels (IALs) or (iii) no label. Participants will be screened for eligibility, and give consent via the Qualtrics software. Participants will start by answering questions on their hunger levels, and the time since they last ate. Next, they will give baseline explicit measures of wanting and liking, where they will be asked to explicitly rate the four unlabelled chocolate bars by using a cursor to place their response on a scale ("How much do you like this chocolate bar generally?" and "How much do you want one of these chocolate bars right now?"). Participants will also be asked to explicitly rate the four control stimuli (stationery items) ("How much do you like this product generally?" and "How much do you want this product right now?"). They will then give their demographics with questions on their education level, income, age, gender and ethnicity.

Next, participants will be randomised to their condition via the Qualtrics software and transferred to Inquisit Web to complete an implicit motivation task - the manikin task - in which they have to move a stick figure on the screen in response to images of chocolate bars and stationery items. Depending on the participants' randomised label condition, the four chocolate bars will be presented displaying either i. three different HWLs; ii. three different IALs; iii. no label on three occasions. The task includes two blocks, which have different rules regarding how participants must move a stick figure on their screen in response to the images presented. Each image will be presented twice per block. In one block participants must approach the image if it depicts a chocolate bar, and must avoid the image if it depicts stationery. In a second block this rule will be reversed. To approach or avoid the images, participants press keys which control the movement of the stick figure on their screen. They will be asked to respond as quickly as they can, and will be able to practise responding to the images based on the different rules for each block before starting. The order of the two blocks will be randomised.

Immediately after, participants will be presented with two selection tasks of eight food items and asked to select the item they would most like to eat now. The eight items will include the four chocolate bars from the manikin task and four healthier snacks (e.g. fruit). In the first selection task food items will be unlabelled (in their original branded packaging). In the second selection task the chocolate bars will be labelled depending on participants randomised label condition (i.e. displaying i. HWLs, ii. IALs, iii. no labels).

Participants will then complete the second implicit motivation task - the go/no-go task. They will be randomised to the same condition as in the manikin task. The go/no-go task will include two blocks - in the first block participants have to press the space bar if they see a chocolate bar, but inhibit this response if the image is of stationery, and in the second block the rule is reversed. The order of the two blocks will be randomised.

Participants will then repeat the food choice tasks. Afterwards, they will repeat the explicit measures of liking and wanting of the four chocolate bars and the four control (stationery) items. However, unlike the baseline explicit measures, this time the chocolate bars will be labelled depending on participants' randomised label condition (i.e. displaying either i. HWLs, ii. IALs, iii. no labels). Lastly, participants will give measures of eating behaviour and purchasing and consumption habits. We will also record their height and weight to calculate BMI.

Intervention Type
Behavioural

Primary outcome(s)
Measured at a single time point:
1. Implicit motivation assessed by reaction time (ms) using the Manikin task:
The reaction time (RT) will be measured from the onset of a stimulus until the first key press. Trials with errors as well as RTs below 200 ms and above 1500 ms will be excluded from the RT analysis.
2. Food choice assessed using the food choice task:
Two hypothetical food selection tasks will be completed. The selection will comprise eight items, including the four chocolate bars and four healthier snacks. Participants will be shown the selection and asked to select the food product they would most like to eat now

Key secondary outcome(s))
Measured at a single time point:
1. Implicit motivation measured by counting errors and reaction time (ms) in the Go, No-go task :
The number of commission errors (falsely pressing the space bar in no-go trials), omission errors (falsely not pressing the space bar in go trials) and mean RTs for correct go responses will be calculated for the chocolate bars and the stationery items in each condition. Implicit motivation will be assessed by an approach bias towards the stimuli. A higher number of commission errors, a lower number of omission errors and a lower (therefore faster) RT indicate an approach bias, which in turn is indicative of a higher implicit motivation towards the stimuli.
2. Explicit liking and wanting will be assessed using a 100mm visual analogue scale to two questions
Liking: “How much do you like this chocolate bar generally?”
Wanting: “How much do you want one of these chocolate bars right now?”
For control stimuli the questions will read: “How much do you like this product generally?” and “How much do you want this product right now?”. A mean liking and wanting score will be calculated for the chocolate bars and the control stimuli

Completion date
11/10/2020

Eligibility

Key inclusion criteria
1. Aged over 18 years old
2. Like milk chocolate and consume it at least once a week
3. Basic computer literacy, i.e. able to use a computer for simple tasks
4. Able to provide written informed consent

Participant type(s)
All

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Total final enrolment
1382

Key exclusion criteria
Non-fluent English speaker

Date of first enrolment
20/08/2020

Date of final enrolment
20/10/2020

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
University of Cambridge
Institute of Public Health
Forvie Site
Robinson Way
Cambridge
United Kingdom
CB2 0SR

Sponsor information

Organisation
University of Cambridge

ROR
https://ror.org/013meh722

Funder(s)

Funder type
Charity

Funder Name
Wellcome Trust

Alternative Name(s)

Funding Body Type
Private sector organisation

Funding Body Subtype
International organizations

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be stored in a publically available repository.

Added 18/11/2021:
All anonymised data/code will be made available on the Cambridge Repository upon manuscript acceptance to the journal. Approved by the Psychology Research Ethics Committee of the University of Cambridge (ref: PRE.2019.015 [Study 1] and PRE.2019.111 [Study 2]). All research was performed in accordance with the Declaration of Helsinki. Written informed consent was obtained from participants for Study 1 and informed online consent was obtained from participants for Study 2.

IPD sharing plan summary
Stored in publicly available repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		14/05/2022	27/05/2022	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes