

**A review of research on consumer response to nutrition information on food labels in Europe from 2003-2006**

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The link between diet and diseases such as obesity, diabetes, cardiovascular diseases, hypertension and some types of cancer is a continuing source of debate. In developed countries, these diseases account for an increasing proportion of deaths, and represent a growing challenge for the public health authorities. Attempts to change eating patterns through public information initiatives have been largely unsuccessful, despite the value consumers put on their health.

Nutrition labelling has been a major instrument for providing consumers with information at the point of purchase, enabling them to make healthy, nutritionally appropriate choices. Although consumers claim to use nutrition labels, there are indications that this is not always the case, or that the information is being misunderstood.

Research into consumer use and understanding of nutrition labels has been carried out for almost three decades, in a stream of studies of varying quality and design. In 2003, the European Heart Network (EHN) published a systematic review of all studies up to 2002, most of which had been conducted in the UK and USA.<sup>1</sup> They concluded that although reported consumer use of nutrition labels is high, actual use is considerably lower. Consumers also seem to understand certain key terms and apply them to simple tasks, but confusion increases with the complexity of the information and the task to which it should be applied.

Since 2002, there has been considerably more discussion on nutritional labels, with a particular focus on interpretational aids. One central idea has been the distinction between front and back package labels, where a simplified message on the front label ('signposting') summarises the more complex information that is given on the back of the product. An impressive amount of research has been done with consumers in this relatively short space of time, carried out in academia or through market research companies. Much of this work has been commissioned by key stakeholders in the European food sector.

A review of the studies that have become available from 2003 has recently been prepared for EUFIC by Professor Klaus Grunert of the Aarhus School of Business, Denmark. Altogether, 58 relevant papers or reports were identified, of which 13 were in the peer-reviewed literature. Analysis of the studies was guided by a theoretical framework in which the potential effects of nutrition labelling on consumers and their behaviour were considered. This framework considered search, exposure, perception, liking, understanding (subjective and objective), inferences and use. Aspects of consumer behaviour that are of particular interest are those related to purchase decision-making and to attitude formation and change.

People claim to look at nutrition labels, but less often under certain circumstances, such as when there are time constraints or when the label is difficult to read or understand. Fat, calories and sugar are the nutrients in which most people are interested.

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<sup>1</sup> European Heart Network (2003) A systematic review of the research on consumer understanding of nutrition labelling. Brussels: European Heart Network

Understanding of nutrition labels is still hampered by technical terminology, numerical calculations, and, for some people, percentages. Some nutritional terms (fat, sugar, calories, vitamins, salt) are better understood than others (saturated fat, sodium, fatty acids, cholesterol) and consumers appear to combine label information with their own stock of knowledge to make inferences about the product's nutritional qualities.

Some interesting differences are noted, which may reflect recent changes in the provision of nutrition information. Other than health logos, front-of-pack signposting was not generally available at the time of the EHN review. New front-of-pack formats with %GDA (guideline daily amount) information are now generally liked and believed to be understood.

Four major conclusions emerge from this review:

- There is *widespread interest for nutrition information on food packages*. Consumers generally understand the link between food and health, and many are interested in using information about the nutritional properties of the food they eat. However, the degree of interest differs between consumers and varies across situations and products. In addition, it can conflict with other interests in food, notably taste, traditional eating, and indulgence.
- Consumers *like the idea of simplified front-of-pack information* but differ in their liking for the various formats. These include health logos, 'traffic lights', GDA-based systems and energy labels. Differences can be related to conflicting preferences for ease of use, being fully informed, and not being pressurised into behaving in a particular way. For example, many consumers like colour coding, but some regard reds and greens on food products as too coercive.
- Most consumers *understand the most common signposting formats* in the sense that they themselves believe that they understand them and they can replay key information presented to them in an experimental situation.
- We still have *virtually no insight into how labelling information is, or will be, used* in a real world shopping situation, and how it will affect consumers' dietary patterns. Understanding on-pack nutrition information in isolation is very different from understanding what this information means in the context of a weekly shopping excursion or composing a balanced diet.

Addressing this last point is a key priority for future research. Ideally, such studies would also examine differences in interest and motivation across different consumer types, determinants of liking for different label formats, inferences that are drawn from nutrition labels, and dietary intakes in relation to use of label information.

For further information, please see EUFIC website : [www.eufic.org](http://www.eufic.org)

# A review of research on consumer response to nutrition information on food packaging

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# Aim

- To review research on consumer response to nutrition information on food packages
- Conducted in the EU 15 countries
- In the period 2003-2006

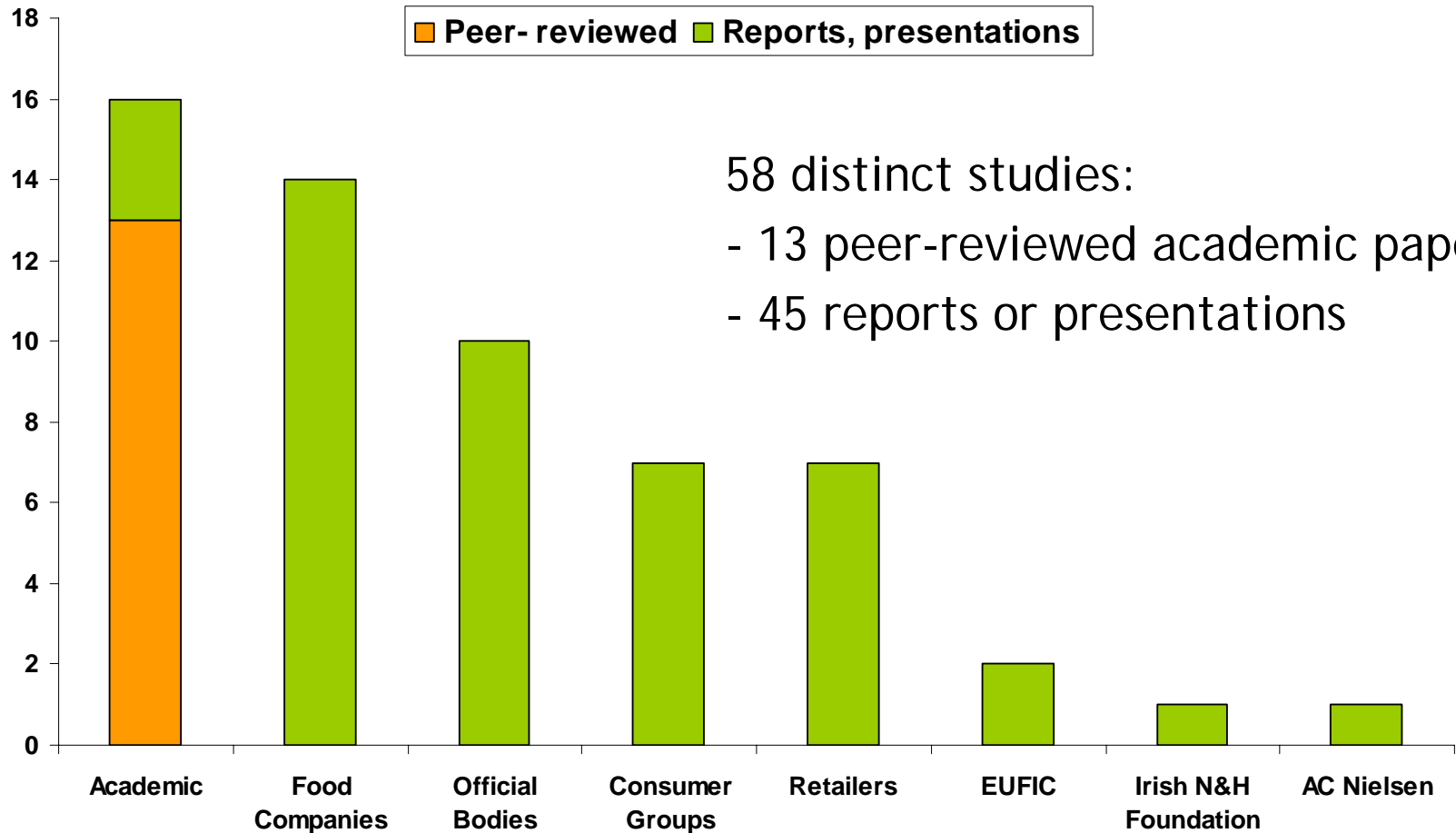
# Current nutrition labelling practice in EU

- EU Labelling Directives 90/496/EEC, 2000/13/EC
- Nutrition labelling: optional, but compulsory if making nutrition claim
- If using nutrition label, must use either Group 1 (energy, protein, fat, carbohydrates) or Group 2 (above, plus saturated fat, sugars, fibre, sodium), depending on claim
- Expressed per 100g/100ml. Energy as kJ and kcal
- Format: tabular or linear
- Current penetration highest in UK (about 85%)

# Search Methodology

- Databases searched for academic publications in refereed journals
  - Amed, Assia via CSA, Biological Science, Biosis Biological Abstracts, Blackwell Synergy, CAB Abstracts, CAB Health, Cinahl, Cochrane, Ebsco, Embase, Emerald, Eric, Jneb, Medline, Oxford Journals, Pyscinfo, Science Citation Index, Science Direct, Scopus, Social Sciences Index, Sociological Abstracts, Springer Link, Wiley interscience.
- EUFIC search, via EU Platform members
- Google search

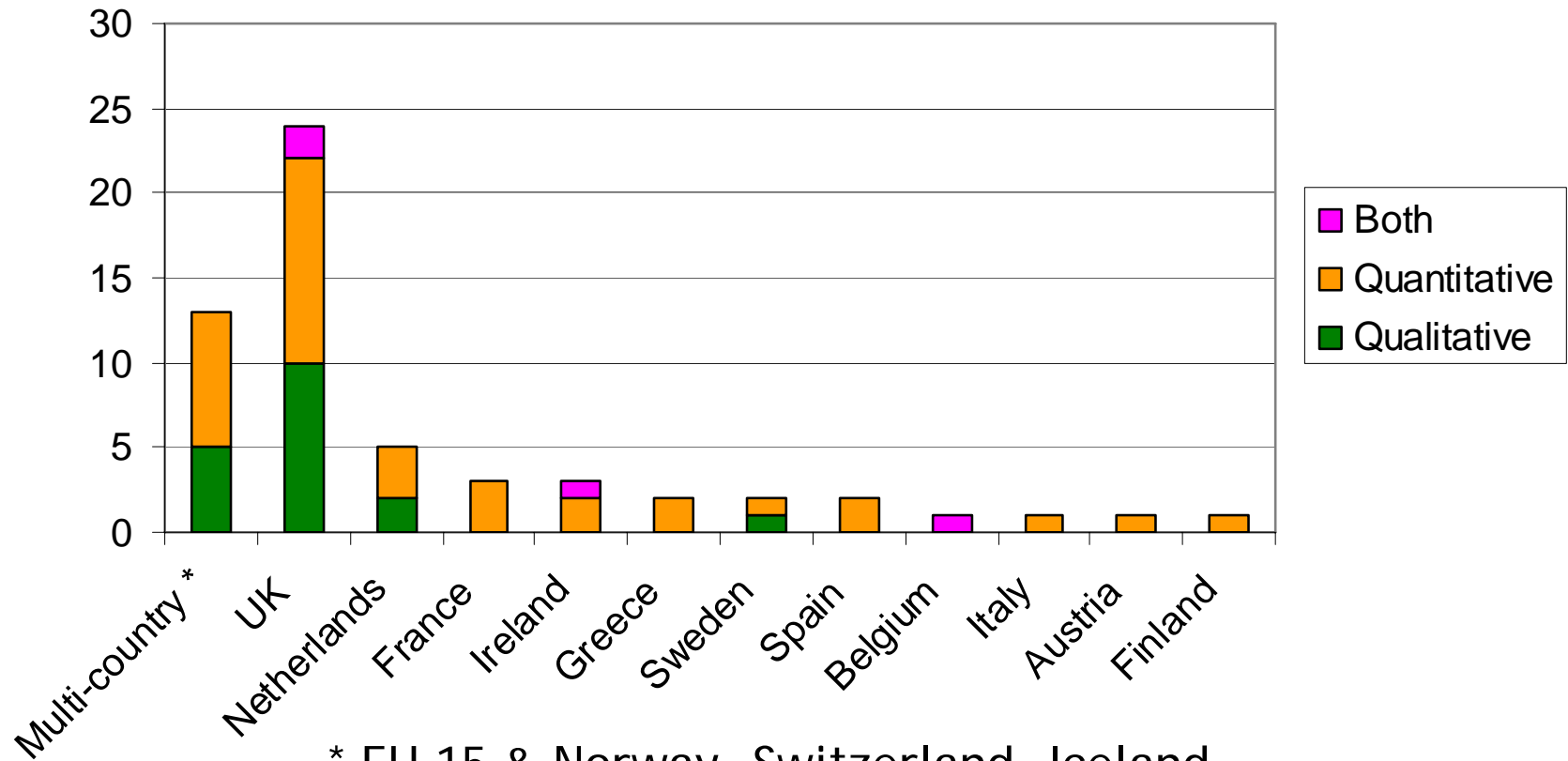
# Studies found



58 distinct studies:

- 13 peer-reviewed academic papers
- 45 reports or presentations

# Breakdown by country & basic methodology



\* EU 15 & Norway, Switzerland, Iceland

# Observations on studies

- Academic studies
  - small samples with limited representativeness
  - more advanced statistical methods
  - attempt explanation, not only description
- Stakeholder studies
  - large samples, often quota samples
  - methods employed are simple
  - results are mostly descriptive only
- Almost nobody uses any theory

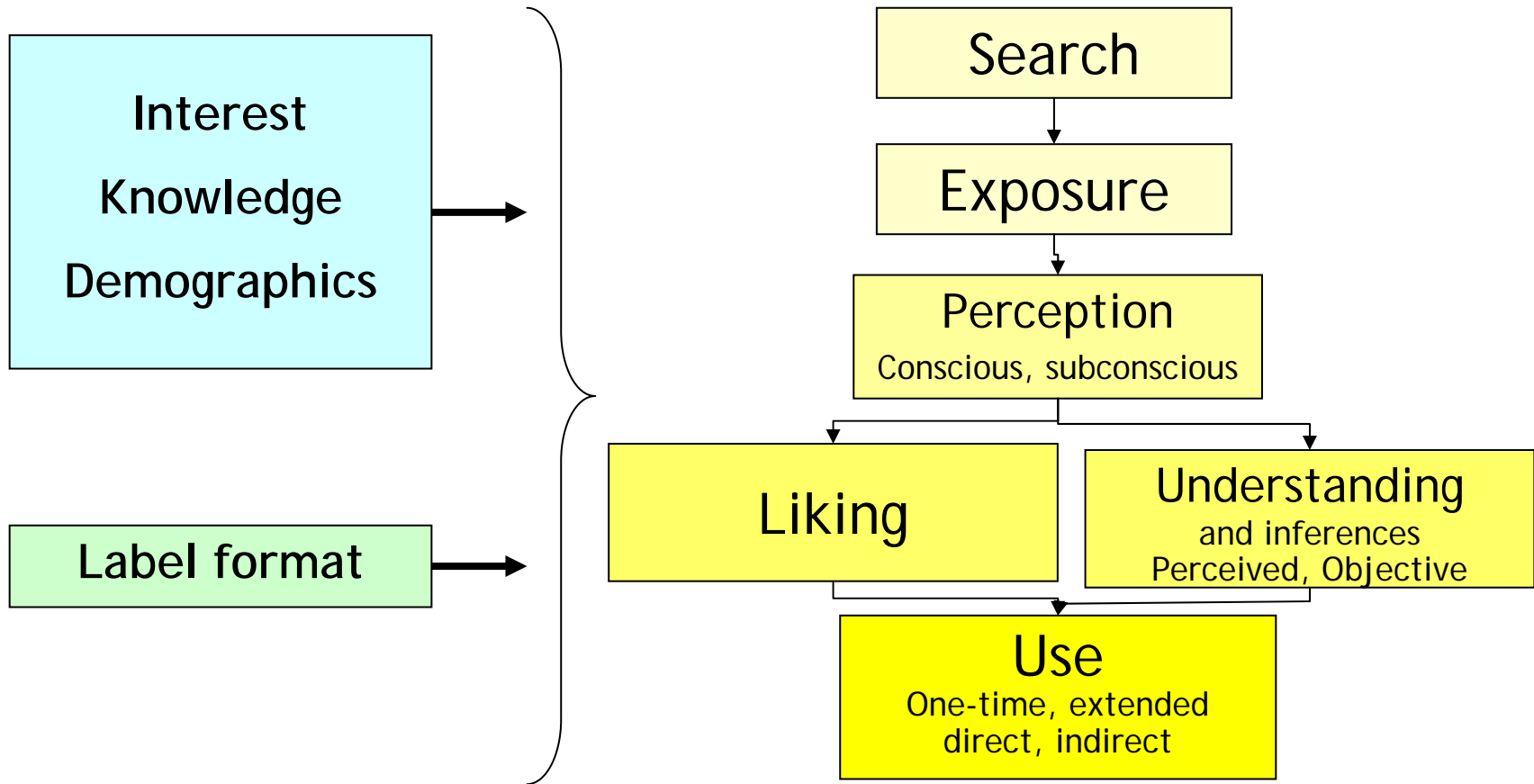
# Standards of documentation

- Academic publications and stake-holder initiated research - not reported to same standards
- Weighting:
  - Consistent results across several studies
  - Thoroughly documented studies that would be publishable in a refereed journal
  - Methodology or sampling employed unclear - noted

# Data Analysis

- All studies analysed
- Key information extracted, based on theoretical model
- Information entered into MAXQDA

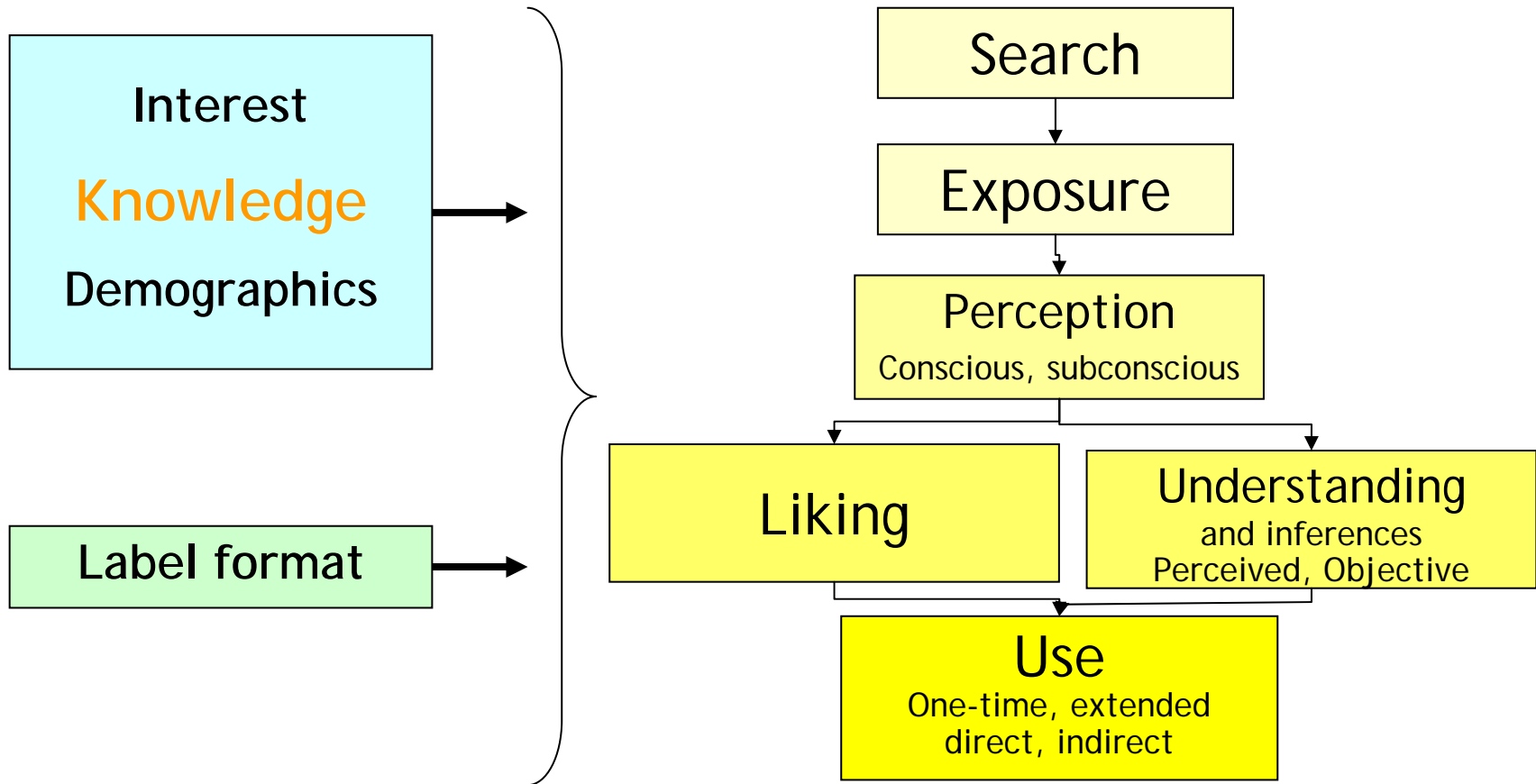
# Theoretical model



# Main results - interest

- Aware of link between health and nutrition, interested in getting nutrition information from food packages
- Nutrition and health not prime interest with regard to food
- Demographic differences: women, parents, older consumers, North/Central Europe more interested
- Interest mostly with regard to processed products
- Interest limited by time pressure, repeat buying, other buying motives

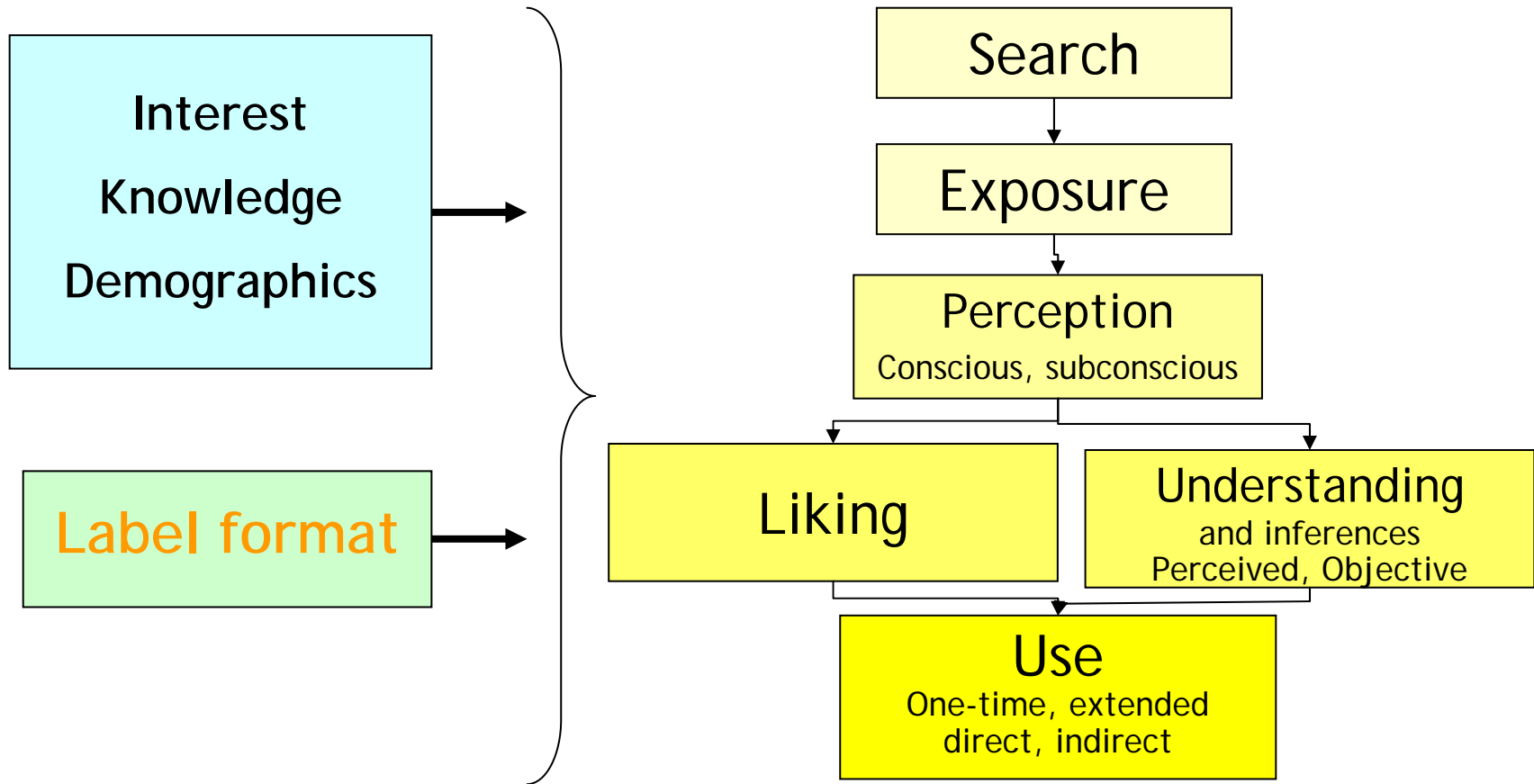
# Theoretical model



# Main results - knowledge

- Confusion and frustration over terminology, new and conflicting information
- Good understanding of calories
  - Followed by fat, then carbohydrates, sugar, salt
  - Saturated fat, fatty acids, cholesterol, sodium...less understood
- Aware that should decrease fat and sugar, increase fruit and vegetable consumption
- Don't know **how much** should be eating

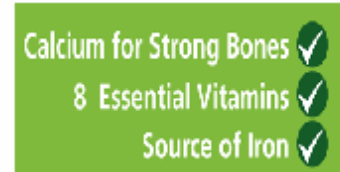
# Theoretical model



# Label Formats and Front of Pack

- Comparison of formats used
  - Traffic lights, GDAs, health logos
- Colour-coded with other systems
- Different formats of GDA-based labelling (pie-charts, bar charts, numbers, %)
- Per 100g/mls, per serving/portion/can

# Examples of label formats tested: FOP health indicators, logos

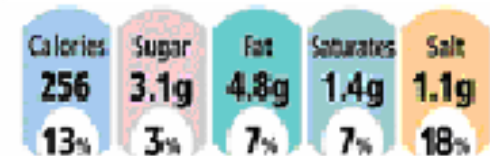
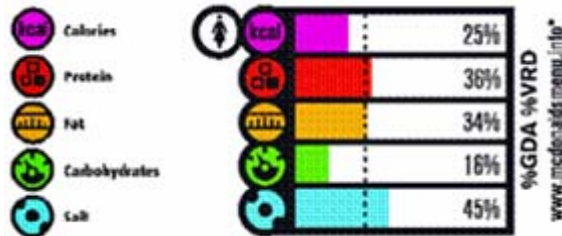
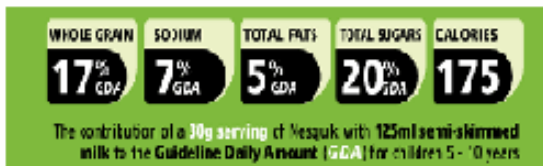


# Examples of label formats tested: energy labels, guideline daily amounts

Different executions of energy labels



Different executions of Guideline Daily Amounts

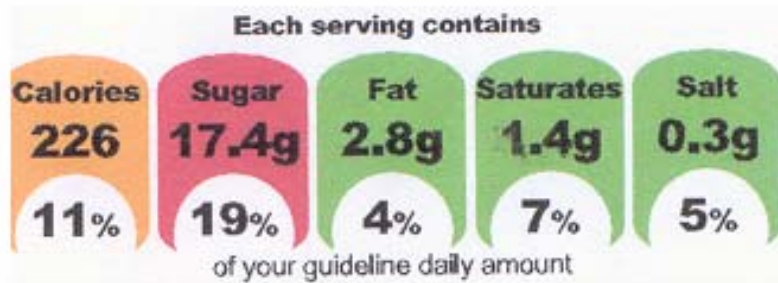


# Examples of label formats tested: colour coding

Different uses of traffic lights/low-medium-high



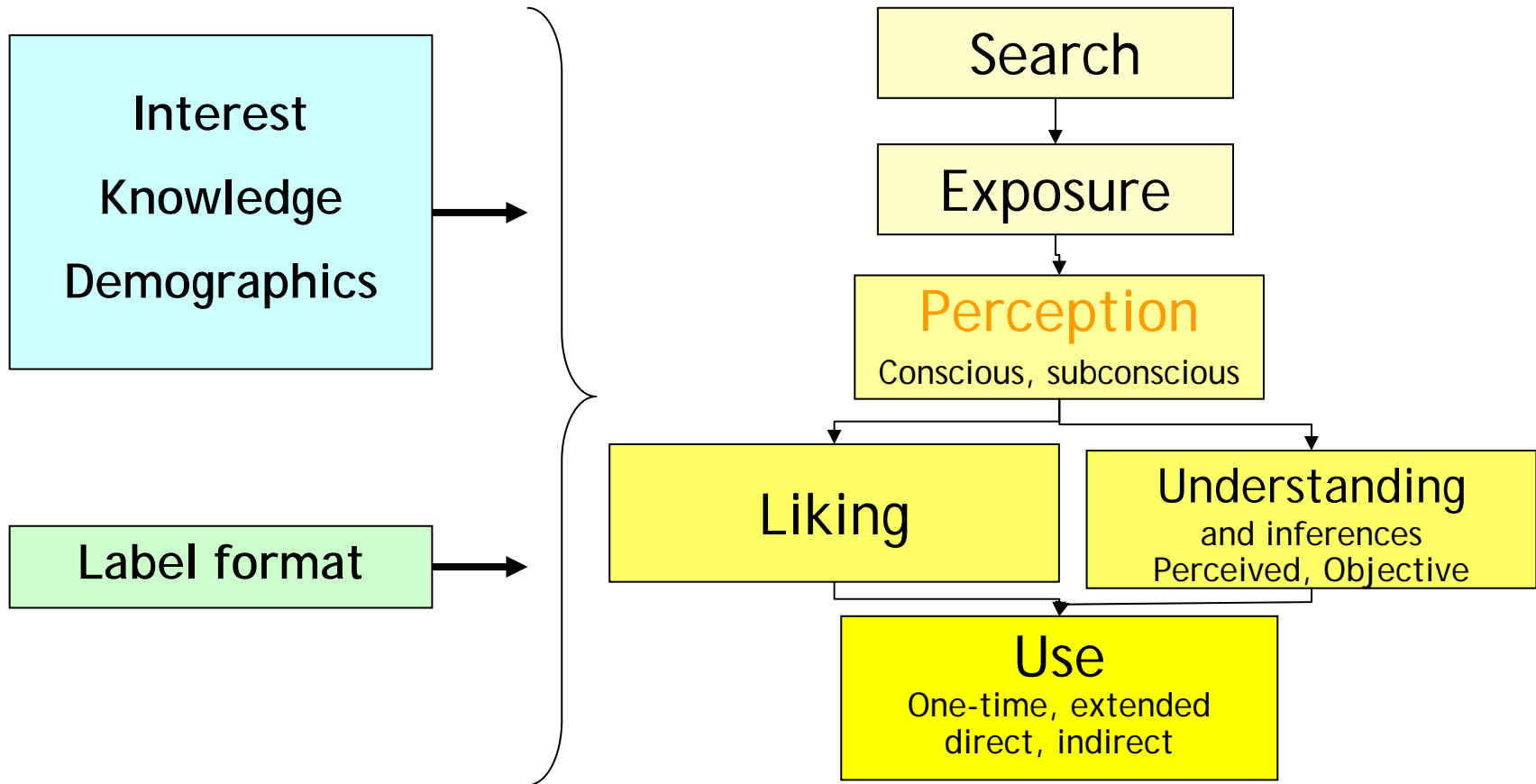
Combinations of traffic lights and GDA's



	Per serving	GDA
<b>FAT</b>	1.7g	70g
<b>SATURATES</b>	2.0g	20g
<b>SUGAR</b>	42.4g	40g
<b>SALT</b>	2.0g	6g

■ HIGH ■ MEDIUM ■ LOW

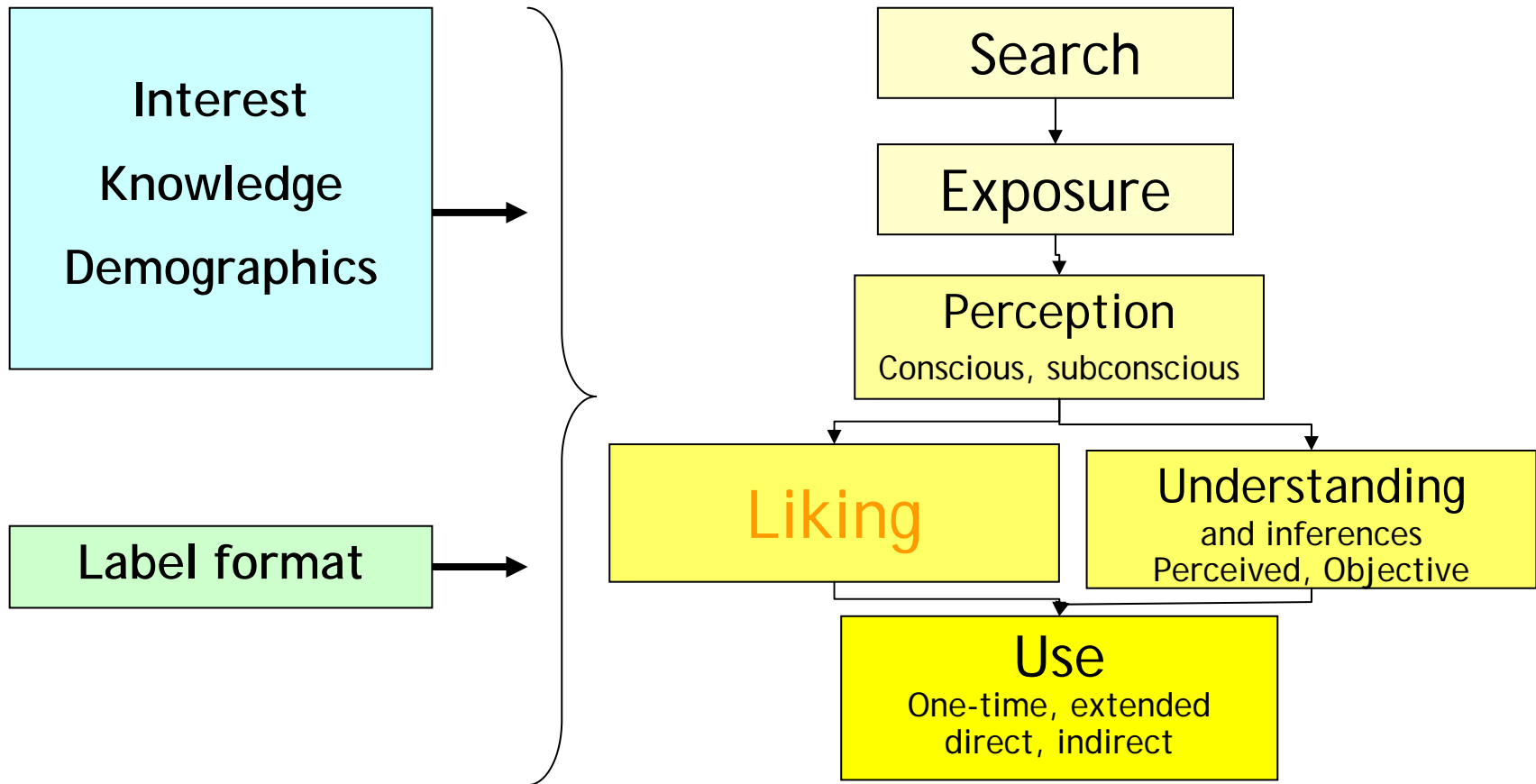
# Theoretical model



# Main results - perception

- Self-reported perception is high - 20% check labels always, and 50% at least occasionally
- Observational studies suggest lower rates
- Women, parents, older consumers report more reading
- More reading for first time purchases

# Theoretical model



# Main results - liking

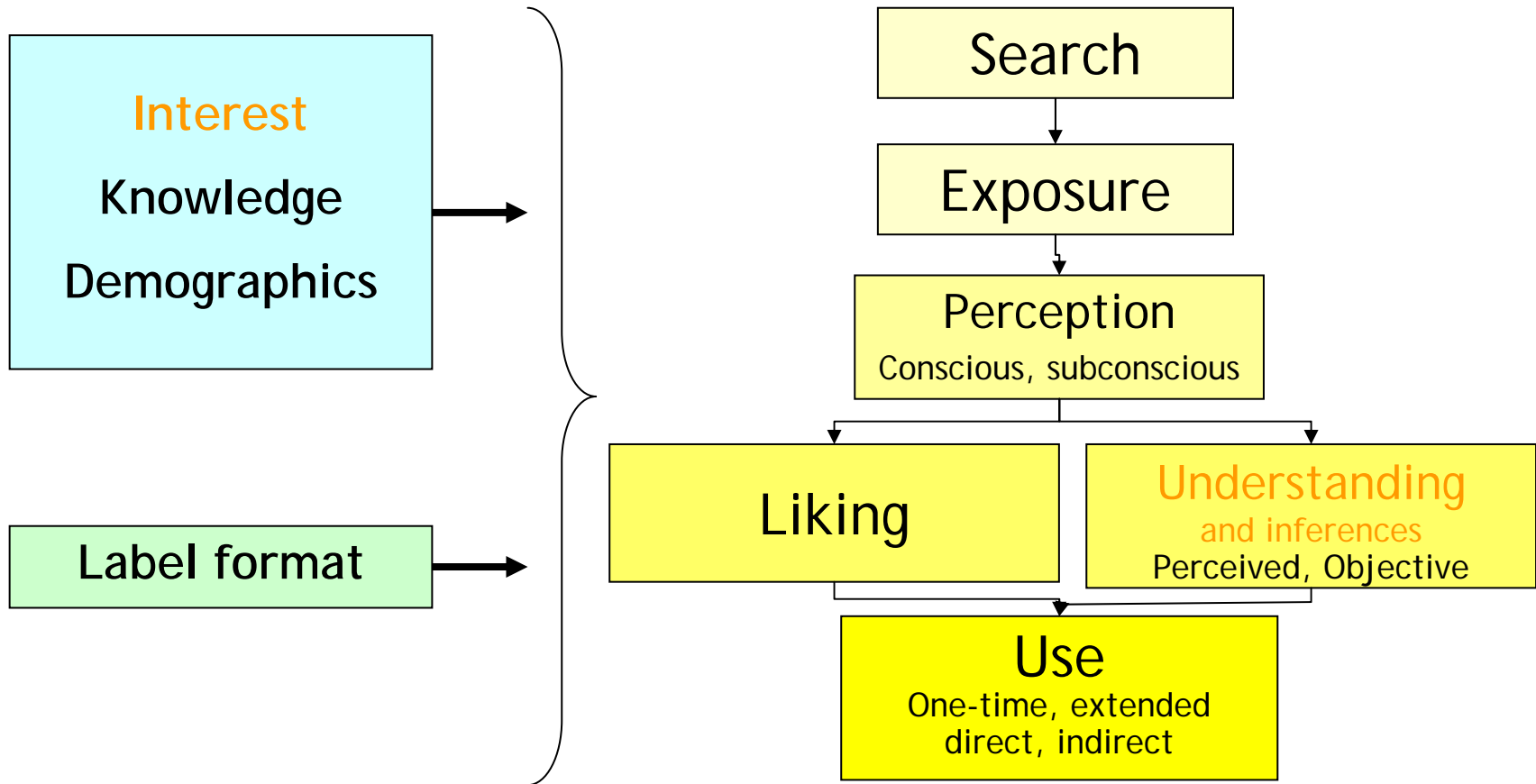
- Simplified nutrition labels and front of pack information generally "liked"
- Opinions differ considerably between consumers
- Degree of "Liking" determined by 3 dimensions:
  - Simplification
  - Complete information
  - Perception of Coerciveness

# Main results - liking

4 areas:

- **Simple traffic lights - GDA systems - health logos comparison:**
  - Simple traffic lights and health logos less liked
- **Multiple traffic lights - GDA systems comparison**
  - results not clear-cut. Some like colour-coding
- **Format for GDA system**
  - less liking for bar charts, pie charts
  - Some like percentages, some like grams and percentages
- **Per 100g/100ml or per serving**
  - Depends on how information used
  - Need clarity on what exactly is a 'serving'

# Theoretical model



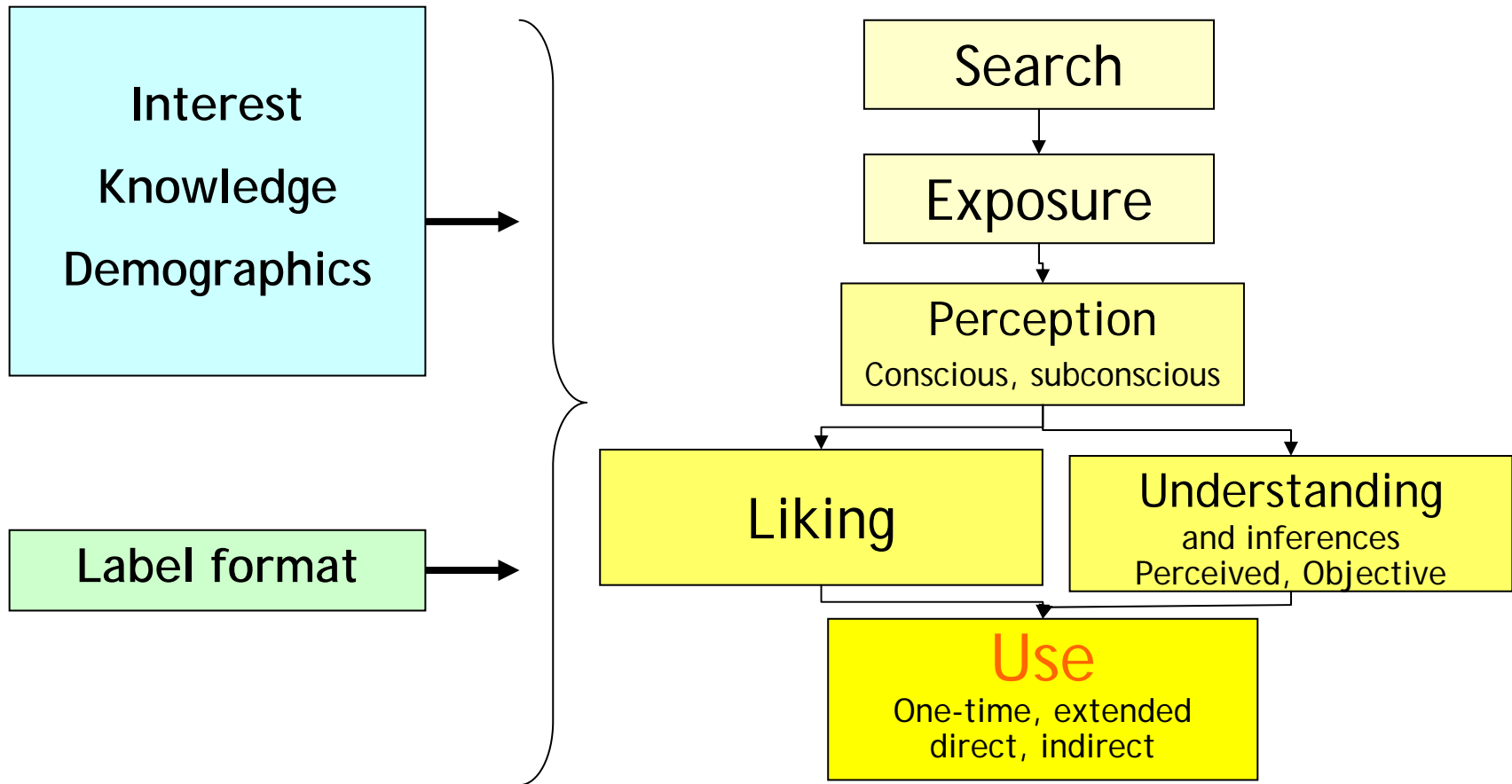
# Main results - perceived understanding

- Equivocal results:
  - high in quantitative studies
  - but critical about current nutrition tables in qualitative studies - unknown terms, confusing
- All simplified signposting schemes easy to understand
- Inferences about healthiness of product:
  - depend on format (health logos lead to higher perceived healthiness, rather than traffic lights, GDAs)
  - Lack of field research

# Main results - objective understanding

- Objective tests - repeat label information, evaluate a product or compare 2 products based on a nutrient, overall healthiness
- Consumers can mostly repeat information that is given on the label - facilitated by format (% > bar chart > pie chart)
- No strong demographic differences
  - Equivocal results with lower socio-economic groups
- No data from real life setting

# Theoretical model



# Main results - use

4 categories: self-reported, hypothetical, intention to buy, actual use

- ***Self-reported*** use is high and probably highly overreported
  - Demographic effects, situational factors
- ***Hypothetical use*** for signposting information
  - use to screen products
  - red lights not a deterrent over taste or treat
- ***Buying intentions*** for 'less healthy' products decrease when signposting information is available, not dependent on format
- Very little insight into ***actual use***
  - Observational Waitrose study
  - Sales figures reported by Tesco and Sainsburys
- Very little known about long term and indirect effects

# Main conclusions

- Widespread interest in nutrition information
- Like the idea of simplified front of pack information
  - But differ in their 'liking' of different formats
- Most consumers understand the most common graphic formats
  - Can apply to individual foods, but not understood how to apply to real-life shopping to compose meals
- Very little insight into how labelling information is/will be used in real life.

# Suggestions for future research

- Segmentation study on consumer interest in nutrition information
  - Determinants of liking of different formats:  
3 aspects: **simplification, complete information, co-erciveness**
- Real world label perception and low involvement learning
  - In shop studies, eye tracking, choice experiments
- Inferences made from labels
- Actual use of label information in decision-making
  - Scanner data, sales data, think aloud studies
- Indicators of nutrient level (colour coding, high/medium/low)
  - Needs further evaluation of consumer use
  - Needs evaluating in countries additional to UK

# Suggestions for future research

- Portion size:
  - consumers want per portion/serving as well as per 100 g/mls
  - Work needed in bringing clarity to portion size, on label
- GDAs:
  - Best format to gain understanding and use, European-wide?
  - Consistent use of same GDA amounts in all studies, for energy and individual nutrients .....with the exception of sugar

.....
- Academic input:
  - study design, interpretation, peer-review communication
- Study design to avoid possible bias:
  - possible subjective interpretation to satisfy a hypothesis, particularly in qualitative studies

- Thank you to all those stakeholders that submitted their consumer research