

**The feeling of thinking**

**Processing fluency and web survey design**

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**Context effects in surveys**

- Mostly traced to what comes to mind
  - E.g., content of preceding questions
- Consistent with general focus in psychology
- Judgments and decisions are based on attributes of the targets.
  - The more positive attributes,
  - the more positive the judgment
  - the more likely your choice

**There's more to thinking than what comes to mind**

- Standard cognitive models ignore experiential information
  - Meta-cognitive experiences
  - Moods & emotions
  - Bodily sensations
- Informative in their own right
- People are sensitive to their feelings, but insensitive to where they come from
  - "About" what we're thinking about
  - Meaning changes with context and question asked

**Processing fluency**

Ease of processing new information

**Fluency**

- Perceiver variables: What's on your mind
  - Knowledge, expertise
  - Previous exposure
  - Goals and concerns
- Context variables: What's brought to mind
  - Anything that can influence accessibility of knowledge
    - Primes
    - Situational characteristics
    - etc

**Fluency**

- Presentation format
  - **Print font** vs. *print font*
  - Color contrast vs. *color contrast*
  - Long vs. short duration
- Text characteristics
  - Rhyme
  - Familiar vs. unfamiliar words
  - Easy vs. difficult to pronounce

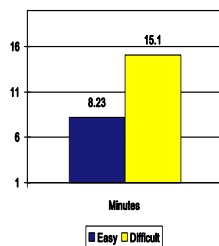
## Fluency, effort, and intentions

### Exercise instructions

- Tuck your chin into your chest, and then lift your chin upward as far as possible. 6-10 repetitions
- Lower your left ear toward your left shoulder and then your right ear toward your right shoulder. 6-10 repetitions

- *Tuck your chin into your chest, and then lift your chin upward as far as possible. 6-10 repetitions*
- *Lower your left ear toward your left shoulder and then your right ear toward your right shoulder. 6-10 repetitions*

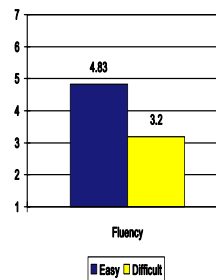
### How long would it take?



- Students read exercise instructions in easy vs. difficult to read print font
- Predict effort
  - Minutes open format
- $d = .9$

Song & Schwarz, *Psych Science*, 2008

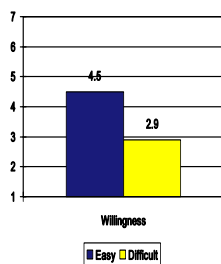
### Would it flow naturally?



- Would the exercise
  - Drag on?
  - Be boring?
  - Flow naturally?
- Index 1-7
  - 7 = flows well
- $d = 1.39$

Song & Schwarz, *Psych Science*, 2008

### Would you want to do it?



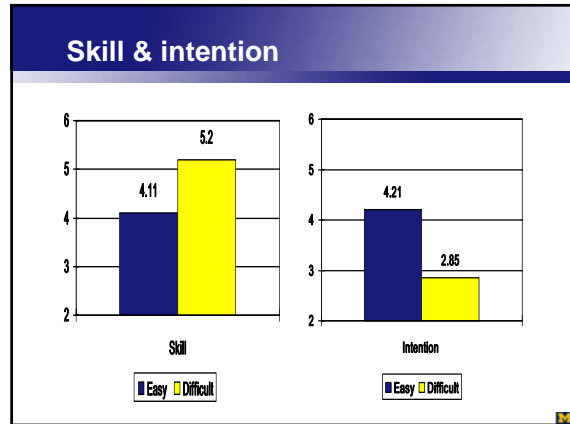
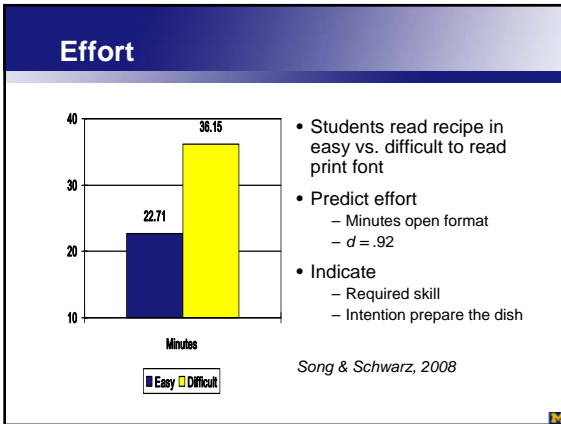
- Would you make it part of your daily routine?
  - 7 = very likely
- $d = .95$

Song & Schwarz, *Psych Science*, 2008

### Will this Japanese dish be easy to make?

- In a deep, wide dish, combine soy sauce, honey, garlic and ginger. Add tofu.
- In a large glass bowl, combine rice vinegar and sugar. Add rice in fourths, stirring well after each addition. Stir in scallions and sesame seeds; mix well.

- *In a deep, wide dish, combine soy sauce, honey, garlic and ginger. Add tofu.*
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- ### Implications for web surveys
- **People misread the difficulty of reading as indicative of the difficulty of doing.**
  - Text is always harder to read on screen than on paper (Larson, 2008)
  - Fancy fonts & cluttered design increase this problem
  - Likely to suggest high demands on time and skill

### Fluency and familiarity

- ### Ease & Familiarity
- Familiar material is easier to process
    - Easier to perceive, recognize, learn, & remember
    - Opposite does not hold
    - But people respond as if relationship were bidirectional
  - Any variable that increases ease of processing increases perceived familiarity
    - “I’ve heard / seen this before”
    - Unless attention drawn to the (irrelevant) source
      - What you think of the print font?

### Consequences 1: Popularity and consensus

### Popularity & consensus

- “If many people believe it, I probably heard it a few times.”
  - So it should seem familiar
- Familiarity = cue for popularity/consensus
  - Repetition
  - Easy to read print font
  - High figure-ground contrast

### “One repetitive voice sounds like a chorus”

Condition	%
1x	56.00%
3x/different	72.00%
3x/same	66.00%

- Homeowners’ discussion on open space
- Same opinion presented
  - Once
  - Three times, each time by a different person
  - Three times by same person
- Estimate % of homeowners who share opinion

Weaver, Garcia, Schwarz, & Miller, JPSP, 2007

### Popularity

Font	% estimate
Arial	62%
Mistral	51%

- American schools are no longer as good as they used to be.
- American schools are no longer as good as they used to be.
- How many out of 100 Americans agree? \_\_
- 8 statements, paper & pencil

### Replication in ALP

- 4 of the statements from lab experiments
  - American schools are no longer as good as they used to be.
  - American schools are no longer as good as they used to be. Out of 100 Americans, \_\_\_ would agree with this statement.
  - Presented in Arial vs. Mistral
- No reliable differences; huge variance
  - May change with some controls (but does not look likely)
  - Awareness of font?

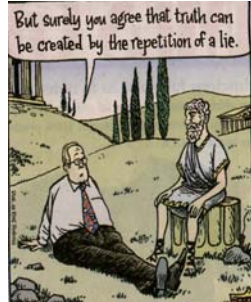
## Consequences 2: Truth and agreement

### Familiarity & truth

- “If many people believe it, there’s probably something to it”
  - Festinger (1954): “Secondary reality test”
  - Social consensus as cue for truth
- Any variable that increases perceived familiarity of a statement increases perceived truth

## Repetition

- Frequency of repetition increases acceptance as “true”
- Numerous examples in history & lab
  - E.g., Begg et al., *JEP:G*, 1992
- **Any other fluency variable does as well**



## Truth

### Figure-ground contrast

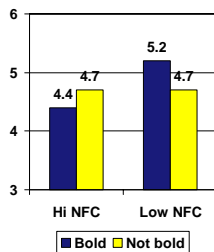
- “Orsono is a city in Chile”
- “Orsono is a city in Chile”
- More likely to be “true” when easy rather than difficult to read against a color background
  - Reber & Schwarz, *Consc & Cog*, 1999

## Truth

### Rhyme

- “Woes unite foes”
- “Woes unite enemies”
- Same content more likely “true” when it rhymes.
  - McGlone & Tofighbakhsh, *Psych Scie*, 2000

## Bumper stickers



### Fluency

- Don't Disparage Same Sex Marriage

- Don't Disparage Same Sex Marriage

### DV

- Agreement (9 = high)
- Significant effect over 12 items for low NFC
- No interaction w/ political orientation

Schuldt & Schwarz, 2008

## Conclusion


- Fluency influences
  - Perceived support (popularity)
  - Perceived truth
  - Agreement with political statements
- Any fluency variable can do so
  - Repetition
  - Ease of reading, pronunciation, etc.
  - Rhyme

## Consequences 3: Fluency & processing style

## How many animals of each kind did Moses take on the Ark?

## The Moses Illusion

(Erickson & Mattson, 1981)



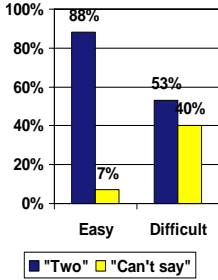
## Processing style

- Moses illusion presumably reflects superficial processing and reliance on surface similarities
- Novel, unfamiliar and potentially problematic material is processed more carefully than familiar material
- Is low fluency sufficient to elicit a shift in processing style?

## Moses illusion

- **“How many animals of each kind did Moses take on the Ark?”**
- *“How many animals of each kind did Moses take on the Ark?”*

## Moses illusion



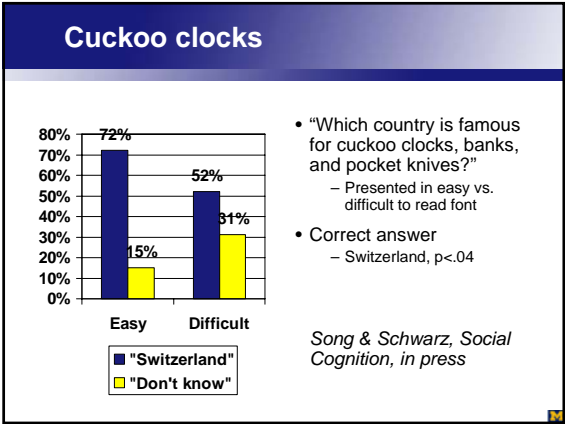
Condition	"Two"	"Can't say"
Easy	88%	7%
Difficult	53%	40%

- Students answer Moses question
  - Presented in easy vs. difficult to read font
- Correct answer
  - “Can’t say,”  $p < .02$
- “Illusion”
  - “2,”  $p < .01$

*Song & Schwarz, Social Cognition, in press*

## Moses & cuckoo clocks

- When the material seems unfamiliar, people
  - Pay more attention to detail
  - Are less likely to rely on the first thing that comes to mind
- If this helps or hurts depends on the task
  - Is the first thing correct or not?

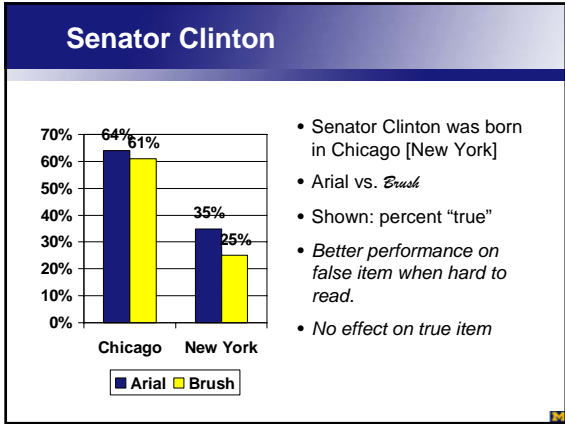


### True/false statements in surveys

- ### Predictions
- Seen in lab experiments
    1. Statements are more likely rejected as false when difficult to read
    2. Statements receive more careful processing when difficult to read
  - Different predictions for true/false questions
    1. Fewer "true" responses, independent of truth value
    2. More careful processing = more accurate answers

- ### Predictions
- Outcome may depend on
    - Actual knowledge
      - Low knowledge, high reliance on fluency
    - Processing motivation
      - Suggested by NFC findings

- ### ALP experiments
- Senator Hillary Rodham Clinton was born in Chicago [New York].
    - \_ True      \_ False
  - *Senator Hillary Rodham Clinton was born in Chicago [New York].*
    - \_ True      \_ False



### Other items

- Same patterns with smaller differences for other items
  - Obama's place of birth
  - Obama's law school
  - Clinton's law school
- So far no controls for age, knowledge, motivation, etc.

### Consequences 4: Risk perception & choice

"If it's familiar (and you have no bad memories), it hasn't hurt you in the past" (Zajonc)

### Risk & novelty

Category	Easy	Difficult
Harmful	3.76	4.68
Novel	3.69	4.72

- Students rate harmfulness of food additives
  - Easy vs. difficult to pronounce
    - Magnaloxate vs. Hnegripitrom
- Rate
  - Harm,  $p < .001$ ,  $d=1.67$
  - Novelty,  $p < .001$
  - Counterbalanced order
- Novelty mediates fluency effect on harm

Song & Schwarz, *Psych Science*, in press

### Replication in ALP

- Did not reliably replicate
  - Lots of noise across items

### Fluency & stock market

- Alter & Oppenheimer (*PNAS*, 2006)
  - IPO's on New York Stock Exchange
- IPO's with easy to pronounce ticker symbols do better
  - Strongest on first day of trading
    - \$1,000 yields excess profit of \$85.35
  - Still observable at end of first year
    - \$1,000 yields excess profit of \$20.25

### ALP Experiment: Investment allocations

Suppose you have \$5,000 to invest. How would you allocate this money to the investment options below?

Certificate of deposit	\$ ____	Certificate of deposit	\$ ____
Bond fund	\$ ____	Bond fund	\$ ____
U.S. stock market index	\$ ____	U.S. stock market index	\$ ____
Small cap growth fund	\$ ____	Small cap growth fund	\$ ____
International stock fund	\$ ____	International stock fund	\$ ____
Emerging markets		Emerging markets	
stock fund	\$ ____	stock fund	\$ ____
Sum of your investments	\$5,000	Sum of your investments	\$5,000

## Results

- Tiny differences in expected direction
- But all thoroughly swamped by equal allocation to all categories

## Something to worry about?

## Fluency in web surveys

- We did not observe large and consistent fluency effects in the ALP
  - Several lab experiments did not replicate in the ALP
  - The few observed effects were smaller than in the lab
- Why is unclear

## Fluency in web surveys

- Some differences
  - Heterogeneous population
    - Respondent variables not included (so far)
  - Paper & pencil vs. onscreen?
    - All reading is harder on screen, may attenuate differences
  - Experience not informative when not unique to item?
    - Worked on item set #1, not on later #2-4.

## Fluency in web surveys

- Some differences
  - General awareness of font?
    - R's volunteered complainus about fonts
- We'll see....

## Potential implications of lab results

- **Easy-to-process statements**
  - **Seem more popular**
  - **Are more likely to be endorsed**
  - **Receive less scrutiny**
- **Relevant variables**
  - Print font
  - Contrast
  - Glare on screen
  - Rhyme
  - Clutter on page

## Potential implications of lab results

- **Repetition increases familiarity and acceptance**
- Does item endorsement increase with item repetition?
  - Implications for panels?
  - Implications for multi-item scales when blocked vs. spread out over the survey?
- Older respondents more affected?
  - Education?
  - NFC & other satisficing variables?

## References

- Relevant papers are available online at

[http://sitemaker.umich.edu/norbert.schwarz/metacognitive\\_experiences](http://sitemaker.umich.edu/norbert.schwarz/metacognitive_experiences)