

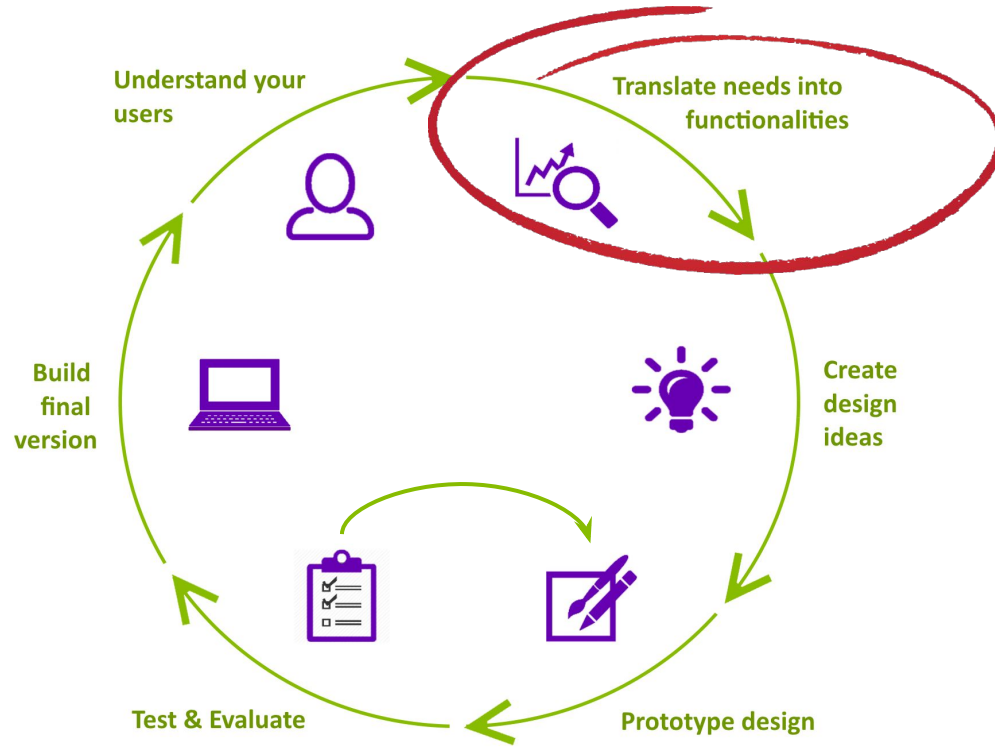
# CS449/649: Human-Computer Interaction

Winter 2018

Lecture VI

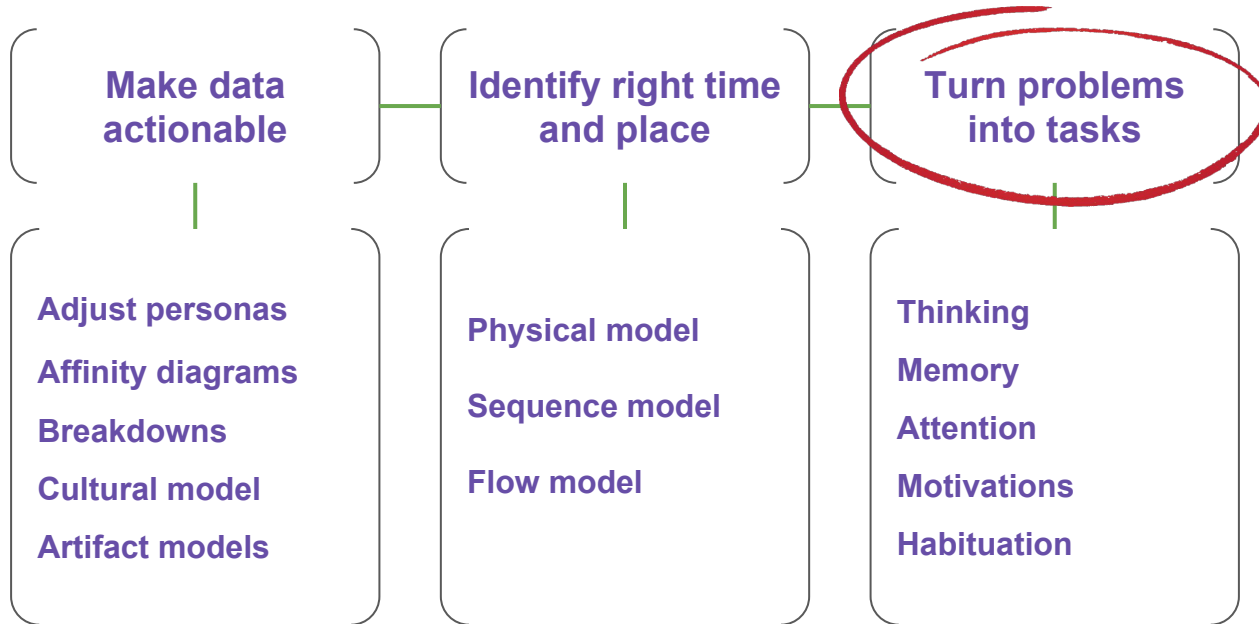
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Anastasia Kuzminykh





## Translating Needs Into Functionalities





## Translating Needs Into Functionalities

**Turn problems  
into tasks**

**Thinking**

Memory

Attention

Motivations

Habituation

**Dual process theory**



## Translating Needs Into Functionalities

Fast

Effortless

Emotional

Stereotypic

### System 1

#### Can do:

- Roughly assess distance
- Localize the source of a specific sound
- Complete famous expressions
- Do 2+2 sort of calculations
- Well-automated activities in easy conditions (drive a car on an empty road)
- Read and understand simple sentences

### System 2

#### Can do:

- Roughly assess distance
- Point your attention where needed
- Dig into your memory
- Determine the desired behaviour in a social setting
- Tedious cognitive tasks
- Activities in unusual conditions
- Complex logical reasoning

Slow

Effortful

Logical

Calculating



# Translating Needs Into Functionalities

Jonathan St. B. T. Evans  
1975

## The heuristic-analytic theory of reasoning: Extension and evaluation

JONATHAN ST. B. T. EVANS  
University of Plymouth, Devonport, England

An evolutionary process model explains the form of reasoning as governed by underlying processes of perceptual and conceptual change. The form of reasoning is determined by the nature of the problem to be solved. Reasoning is a process of problem solving that is governed by a set of heuristics that are used to generate a solution. The form of reasoning is determined by the nature of the problem to be solved. Reasoning is a process of problem solving that is governed by a set of heuristics that are used to generate a solution. The form of reasoning is determined by the nature of the problem to be solved. Reasoning is a process of problem solving that is governed by a set of heuristics that are used to generate a solution.

In recent years, a number of researchers in the psychology of thinking and reasoning have advanced dual-process theories of reasoning. These theories have distinguished between fast, automatic, and intuitive processes (System 1) and slow, deliberate, and analytical processes (System 2). The form of reasoning is determined by the nature of the problem to be solved. Reasoning is a process of problem solving that is governed by a set of heuristics that are used to generate a solution. The form of reasoning is determined by the nature of the problem to be solved. Reasoning is a process of problem solving that is governed by a set of heuristics that are used to generate a solution.

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**The heuristic-analytic theory of reasoning,**  
Jonathan St. B. T. Evans, 1975

Advances in Experimental Social Psychology  
Volume 19, 1986, Pages 123-225



## The Elaboration Likelihood Model of Persuasion

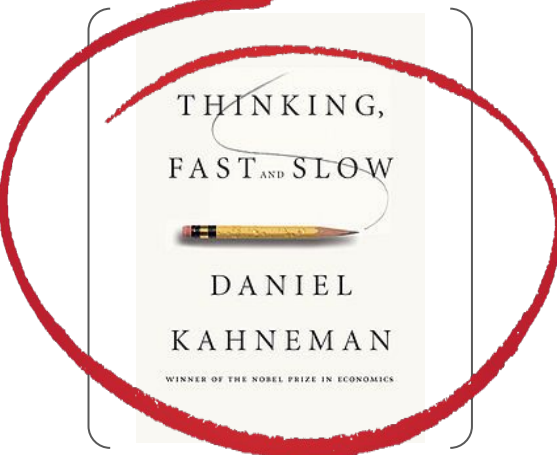
Richard E. Petty

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https://doi.org/10.1016/S0065-2601(86)02114-2

### Publisher Summary

This chapter outlines the two basic routes to persuasion. One route is based on the thoughtful consideration of arguments central to the issue, whereas the other is based on the affective associations or simple inferences tied to peripheral cues in the persuasion context. This chapter discusses a wide variety of variables that proved instrumental in affecting the elaboration likelihood, and thus the route to persuasion. One of the basic postulates of the Elaboration Likelihood Model—that variables may affect persuasion by increasing or decreasing accuracy of message arguments—has been highly useful in accounting for the effects of a seemingly diverse list of variables. The reviewers of the attitude change literature have been disappointed with the many conflicting effects observed, even for ostensibly simple variables. The Elaboration Likelihood Model (ELM) attempts to place these many conflicting results and theories under one conceptual umbrella by specifying the major processes underlying persuasion and indicating the way many of the traditionally studied variables and theories relate to these basic processes. The ELM may prove useful in providing a guiding set of postulates from which to interpret previous work and in suggesting new hypotheses to be explored in future research.

**The elaboration likelihood model,**  
Richard E. Petty, John Cacioppo,  
1986



**The intuition-reasoning theory,**  
Daniel Kahneman,  
2003

Reflective and Impulsive Determinants of Social Behavior  
Fritz Strack and Roland Deutsch  
Department of Psychology  
University of Würzburg

## Reflective and Impulsive Determinants of Social Behavior

The present article examines the role of reflective and impulsive processes in determining social behavior. It is argued that social behavior is determined by the interaction of these two processes. The reflective process is characterized by deliberate, goal-directed, and conscious thought. The impulsive process is characterized by automatic, fast, and unconscious thought. The interaction of these two processes determines the form of social behavior. The form of social behavior is determined by the nature of the problem to be solved. Social behavior is a process of problem solving that is governed by a set of heuristics that are used to generate a solution.

In the history of attempts to describe the causes of human behavior, the most influential explanation has been the assumption that human beings do what they do because of their internal states. This view has been challenged by the idea that human beings do what they do because of the external environment. The interaction of these two processes determines the form of social behavior. The form of social behavior is determined by the nature of the problem to be solved. Social behavior is a process of problem solving that is governed by a set of heuristics that are used to generate a solution.

Although there is no doubt that there has been a great deal of progress in our understanding of human behavior, it is clear that we still have a long way to go. The interaction of these two processes determines the form of social behavior. The form of social behavior is determined by the nature of the problem to be solved. Social behavior is a process of problem solving that is governed by a set of heuristics that are used to generate a solution.

**The reflective and impulsive determinants theory,**  
Fritz Strack, Roland Deutsch, 2004



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## The heuristic-analytic theory of reasoning: Extension and evaluation

JONATHAN ST. B. T. EVANS  
University of Plymouth, Devonport, England

An evolutionary process model is presented. It consists of a system of processes supporting three processes of functional thinking. The first process involves the automatic and deliberate processes and the second process involves the automatic and deliberate processes. The third process involves the automatic and deliberate processes. The model is based on the idea that the human mind is a system of processes that are designed to solve problems. The model is based on the idea that the human mind is a system of processes that are designed to solve problems. The model is based on the idea that the human mind is a system of processes that are designed to solve problems.

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One theory comes with a list of theoretical hypotheses that are derived from the dual-process perspective and are supported by a number of studies. The theory is based on the idea that the human mind is a system of processes that are designed to solve problems. The theory is based on the idea that the human mind is a system of processes that are designed to solve problems. The theory is based on the idea that the human mind is a system of processes that are designed to solve problems.

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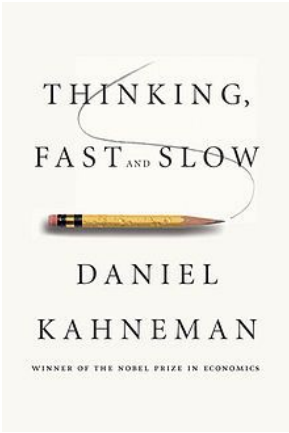
Advances in Experimental Social Psychology  
Volume 19, 1986, Pages 123-225  
Elsevier logo

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Richard E. Petty  
https://doi.org/10.1016/S0065-2601(86)0214-2

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## Reflective and Impulsive Determinants of Social Behavior

Fritz Strack and Roland Deutsch  
Department of Psychology  
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**The reflective and impulsive determinants theory,**  
Fritz Strack, Roland Deutsch, 2004



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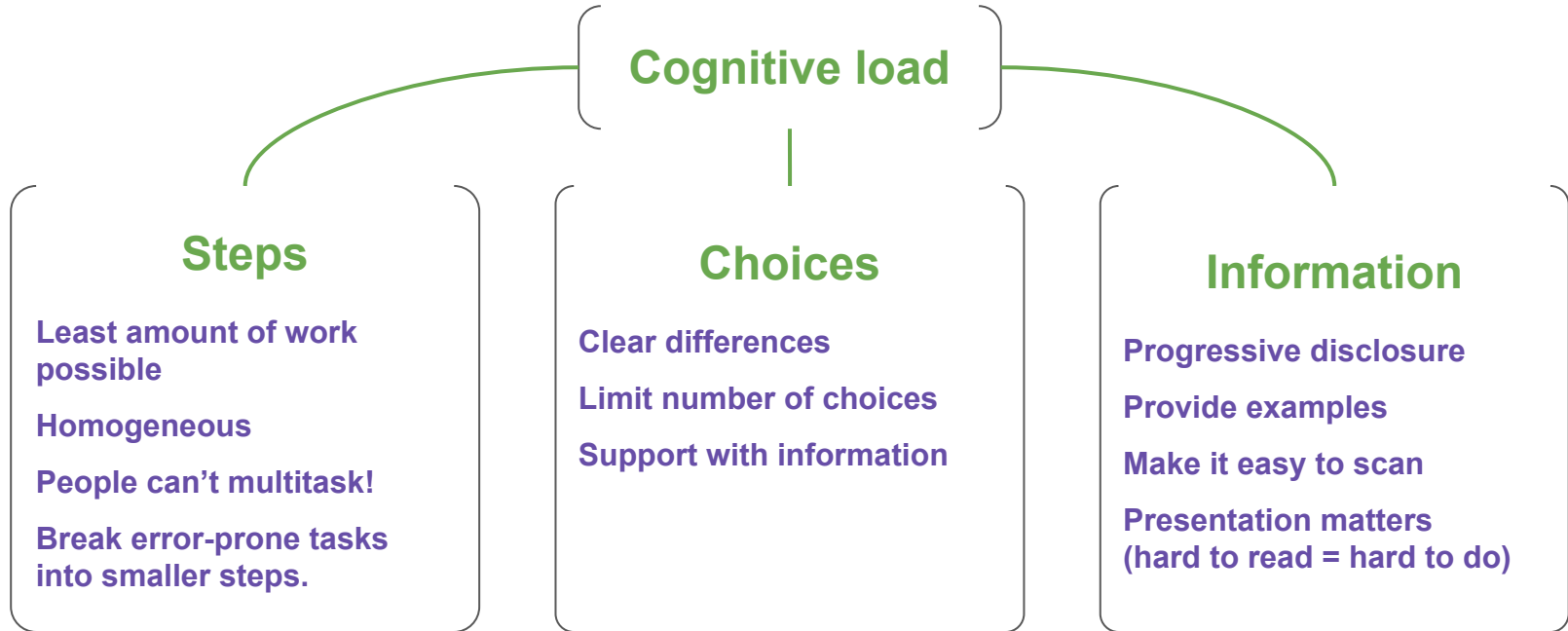
**Dual process theory**

**Cognitive load**





## Translating Needs Into Functionalities





## Translating Needs Into Functionalities

**Turn problems  
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**Dual process theory**

**Cognitive load**

**Anticipate mistakes**

(should be easy to undo, avoid error-prompt tasks)



## Translating Needs Into Functionalities

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**Cognitive load**

**Anticipate mistakes**

(should be easy to undo, avoid error-prompt tasks)

**Perception biases**

(expectations determine perception)



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**Dual process theory**

**Cognitive load**

**Anticipate mistakes**

(should be easy to undo, avoid error-prompt tasks)

**Perception biases**

(expectations determine perception)

**Age, socioeconomic status, cognitive  
abilities influence decision making**



## Translating Needs Into Functionalities

**Turn problems  
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Thinking

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**Perception - storage - retrieval**



## Translating Needs Into Functionalities

**Turn problems  
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**Perception - storage - retrieval**

**Recognition rather than recall**



## Translating Needs Into Functionalities

**Turn problems  
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**Perception - storage - retrieval**

**Recognition rather than recall**

**People can remember ~3-4 items at a  
time.**



## Translating Needs Into Functionalities

**Turn problems  
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**Perception - storage - retrieval**

**Recognition rather than recall**

**People can remember ~3-4 items at a  
time.**

**Zeigarnik effect - interrupted tasks are  
easier to remember** (depends on the  
importance of the interrupted task for the  
person)





## Translating Needs Into Functionalities

Turn problems  
into tasks

Thinking  
Memory  
**Attention**  
Motivations  
Habituation

Focused attention is limited and  
selective



## Translating Needs Into Functionalities

**Turn problems  
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**Focused attention is limited and  
selective**

**Inattentional blindness**



## Translating Needs Into Functionalities

**Turn problems  
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**Focused attention is limited and  
selective**

**Inattentional blindness**

**Surface** (awareness of features) **and**  
**content attention** (awareness of  
information)



## Translating Needs Into Functionalities

**Turn problems  
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Memory

**Attention**

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Habituation

**Focused attention is limited and selective**

**Inattentional blindness**

**Surface** (awareness of features) **and content attention** (awareness of information)

**Attention is dynamic - allow hierarchy**



## Translating Needs Into Functionalities

**Turn problems  
into tasks**

Thinking

Memory

Attention

**Motivations**

Habituation

**Tension from unmet needs  
(based on formed expectations)**



## Translating Needs Into Functionalities

**Turn problems  
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**Tension from unmet needs  
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**Work must be meaningful**



## Translating Needs Into Functionalities

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**Tension from unmet needs  
(based on formed expectations)**

**Work must be meaningful**

**Reward wisely**



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**Tension from unmet needs  
(based on formed expectations)**

**Work must be meaningful**

**Reward wisely**

**Desire to belong to a group**

In-group/out-group biases





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**Tension from unmet needs  
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**Work must be meaningful**

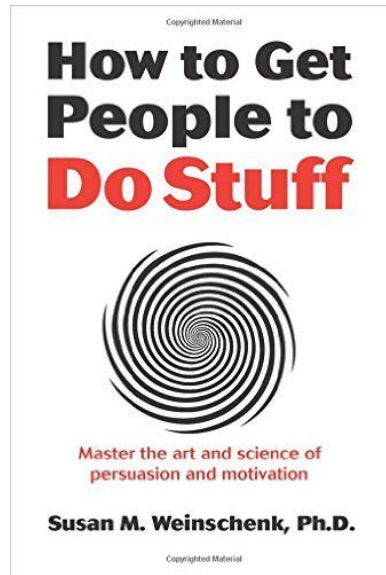
**Reward wisely**

**Desire to belong to a group**

**In-group/out-group biases**



## Translating Needs Into Functionalities





## Translating Needs Into Functionalities

**Turn problems  
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**Habituation**

**Pavlov's conditioning**

**Skinner's operant conditioning** (with  
reinforcement)



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**Pavlov's conditioning**

**Skinner's operant conditioning** (with  
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**Based on formed patterns**



## Translating Needs Into Functionalities

**Turn problems  
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Motivations

**Habituation**

**Pavlov's conditioning**

**Skinner's operant conditioning** (with reinforcement)

**Based on formed patterns**

**Creating new habits: stimulus - response; breaking the pattern**



## Translating Needs Into Functionalities

