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Categorisation of decision situations affecting induced preferences.

Some empirical tests of a formal framing model.

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Overview:

Introduction Framing Theory

- why?
- what for?
- how?

Exemplary application(s)

- Tversky & Simonson (1992)
- review of other work

Perspectives

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Actor models popular in sociology:

- homo sociologicus
- homo economicus
- ‘emotional man’

→ heterogeneity: unsatisfactory.

→ integration: necessary?

→ framing theory as response: best choice?

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Framing model is warranted only…

… when different behaviour types can be distinguished,
… when these correspond to different action modes.

Examples:

– normative behaviour,

– relational signalling,

– self-command problems,

– other, e.g.:
  • attitude-behaviour inconsistency,
  • ‘anomalies’ of choice literature.

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Underlying assumptions of framing theory:

– utility backbone (*consequential*)
– goal hierarchy (production functions)
– stimuli relate to utility via multiple paths (ambiguity)

Core assumption of framing theory:

– actors behave as if a decision situation related via only one path to the utility production ('goal dominance')

Auxiliary assumptions of framing theory:

– processes of goal selection can be *non-consequential*
  • previous goal pursuit (accessibility / priming),
  • bottom-up process of situational matching (salience / cueing).

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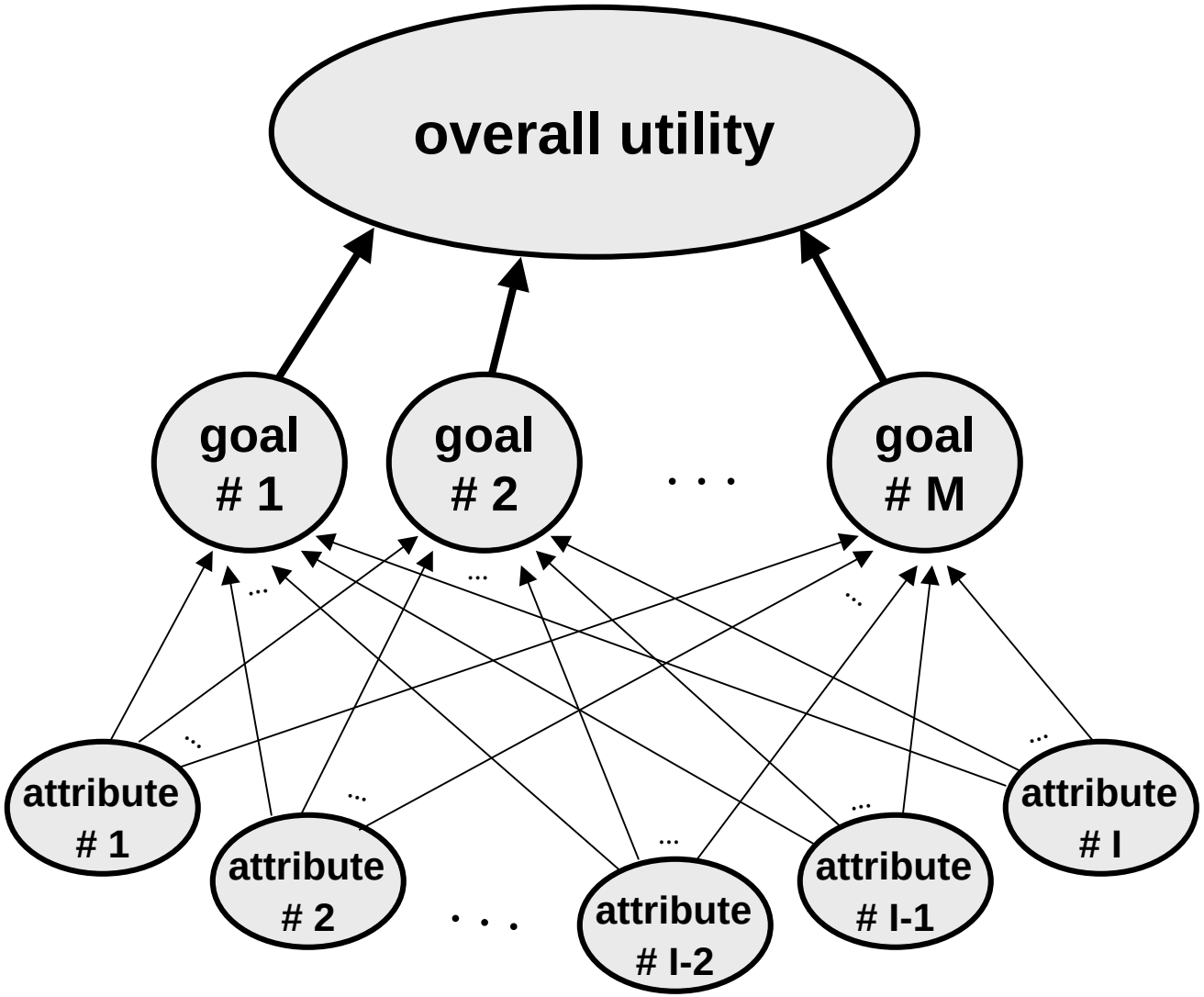

Incentive structure (attribute distribution) relates via multiple paths to overall utility.

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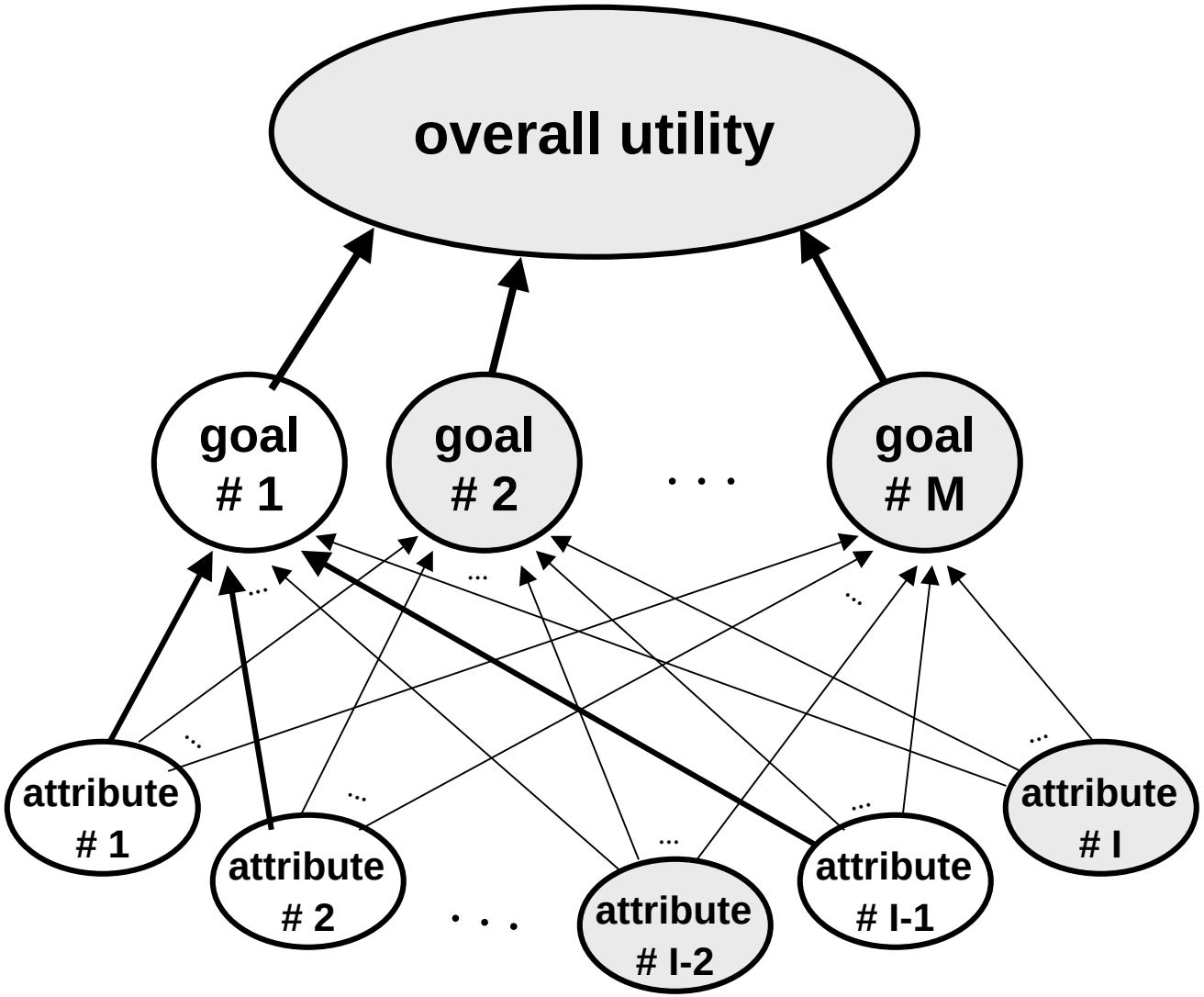

Framing highlights but part of the incentive structure (selective attention) and of the production function (schematic processing).

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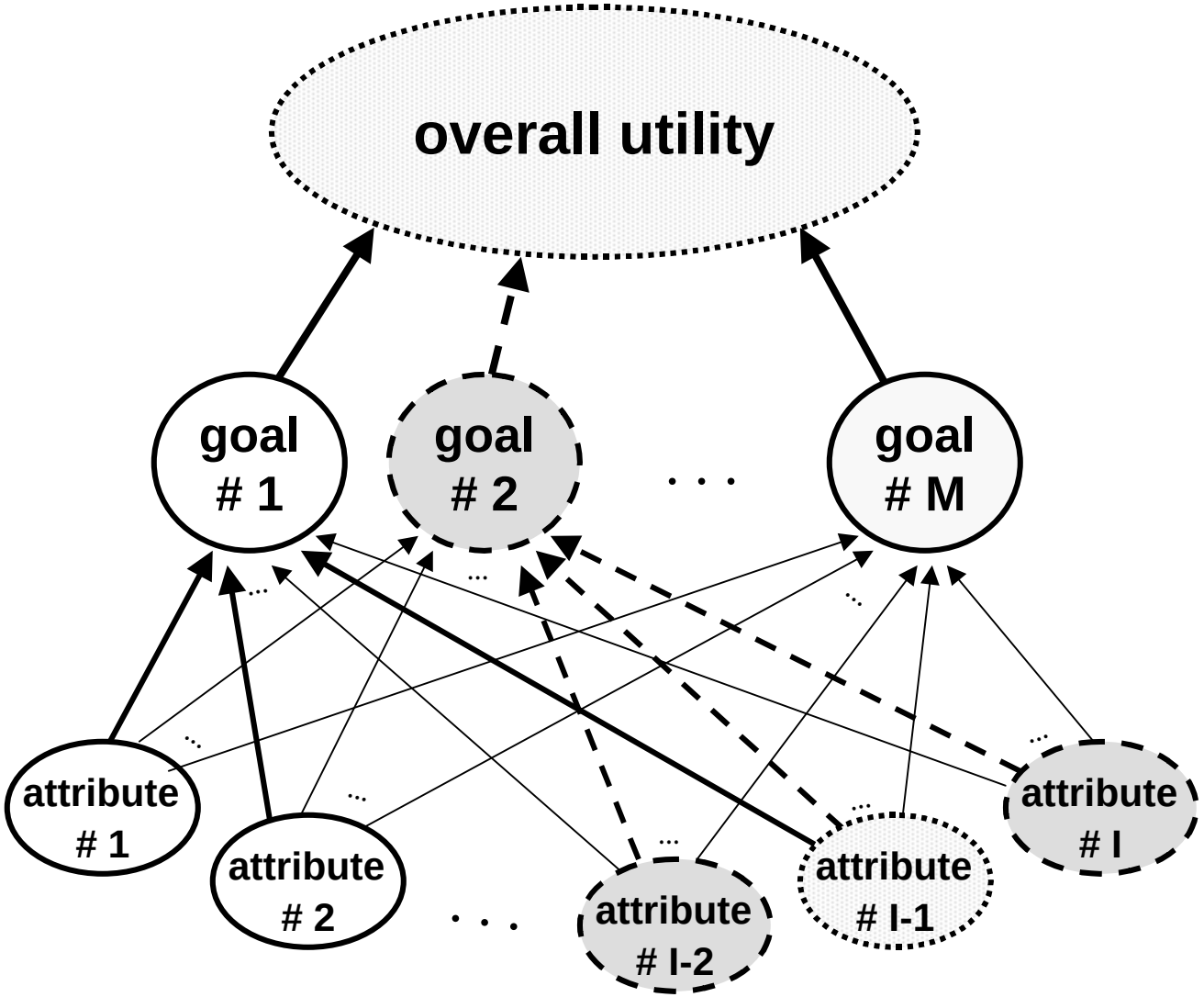

Alternative framing can lead to inconsistent evaluation and interpretation of available information (goal conflict).

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Social production function theory: an example for a goal hierarchy

diagram taken from van Bruggen (2001)

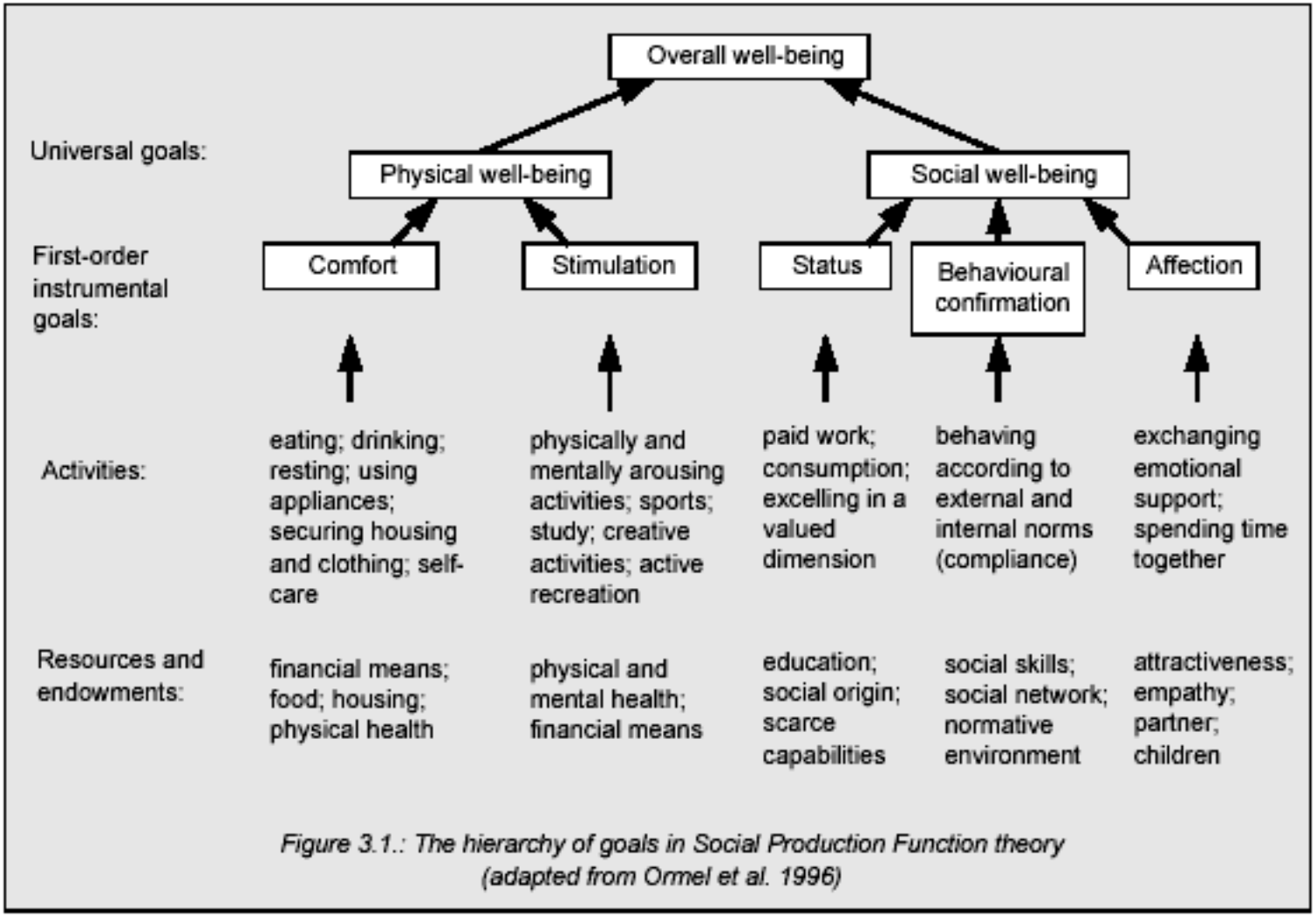

Figure 3.1.: The hierarchy of goals in Social Production Function theory (adapted from Ormel et al. 1996)

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Explanatory framework requires:

- set of ‘goal schemata’ to work with,
- set of ‘cognitive’ mechanisms expected,
- incentive structure of the decision situation.

Under the above conditions, formal modelling can start.

Two-stage model:

① goal identification (initial goal probabilities and goal transition probabilities; non-consequential)

② goal pursuit (choice probabilities per option, given goal and incentive structure)

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Example from anomalies literature:

Simonson & Tversky's (1992)
»*background context effect.«*

choice set	option	warranty (1000 miles)	price ($)	background set S' (n=111)	background set S'' (n=109)
S'	A'	55	85	12 %	
	B'	75	91	88 %	
S''	A''	30	25		84 %
	B''	35	49		16 %
T	A	40	60	57 %	33 %
	B	50	75	43 %	67 %

Table7.3.1: Stimulus material and response percentages of the *car tires* experiment (from TVERSKY & SIMONSON 1993, p.1182).

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The authors' interpretation: memorized attribute tradeoffs.

Framing re-interpretation:

- The background decision acts as priming event,
- the chosen option indicates the goal pursued.

Testing the re-interpretation:

- Priming has typical effects:
  - wears off over time,
  - can be caused by sparse information.
- Goal switches should coincide with salience mismatches.

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Priming hypothesis: Compared to short delays between background and target task (immediate succession), longer delays are predicted to result in weaker background context effects. Delay will most strongly diminish the effect for background choice sets in which a chronically weak goal schema is primed.

Selectivity hypothesis:
Frame switches between background task and target task will occur with higher probability when, in the target task, memory of the option chosen in the background task diminishes the relative salience of the goal pursued in the background task.

Sufficiency hypothesis:
The background contrast effect in the first place relies on the option chosen in the background task (previous behaviour), not on other aspects of the background choice set (like memorized tradeoffs).

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Own study:

n=124 respondents, 2 task domains, 3 exp. conditions
each respondent chooses once in each domain

		car tires		swimming baths	
choice set	option	warranty (1000 km)	price (fl.)	distance (min)	price (fl.)
S'	A'	110	170	15	850
	B'	150	182	0	9,–
S''	A''	60	50	40	4,–
	B''	70	98	35	6,–
T	A	80	120	30	650
	B	100	150	20	8,–

Table7.3.2: Stimulus material of Study **3**. In the *replication* and *delay* conditions, respondents chose from a background set, while in the *sparse* conditions, the background sets were replaced by their relatively superior option (**B'** in **S'** and **A''** in **S''**).

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Results:

	car tires			swimming baths		
	percentage difference	standard error	signifi-cance	percentage difference	standard error	signifi-cance
replication	32 %	15 %	0.013	18 %	15 %	0.113
delay	5 %	16 %	0.376	-5 %	14 %	0.631
sparse	26 %	14 %	0.026	35 %	13 %	0.004

Table 7.3.4: Differences in choice percentages between different backgrounds, per experimental domain and background type. The negative value for the *delay* condition in the *swimming baths* domain indicates an effect opposite to the predicted direction of the *background context effect*.

Priming hypothesis:

		car tires			swimming baths		
		percentage difference	standard error	signifi-cance	percentage difference	standard error	signifi-cance
back-ground	S'	20 %	15 %	0.088	6 %	14 %	0.333
	S''	-7 %	16 %	0.323	-16 %	15 %	0.135

Table 7.3.5: Differences in choice proportions (option **A**) in the target task, between the *replication* and *delay* condition, given the same background task.

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Sufficiency hypothesis:

		replication (chosen)	sparse (primed)	s.e.(dif)	sig.
car tires	B'	86 % (n=14)	81 % (n=21)	13 %	0.71
	A"	44 % (n=18)	55 % (n=22)	15 %	0.52
swimming baths	B'	93 % (n=15)	90 % (n=20)	9 %	0.72
	A"	61 % (n=18)	55 % (n=20)	16 %	0.7

Table 7.3.8: Choice proportions of option **A** in the target task, given the same background option either chosen (replication condition) or exogenously primed (sparse condition). Significance values are two-sided.

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Selectivity hypothesis:

	car tires				*swimming baths*			
	A'	**B'**		**A"** **B"**	**A'**	**B'**		**A"** **B"**
A	3	12	15	8 1 9	2	14	16	11 0 11
B	3	2	5	10 2 12	5	1	6	7 2 9
	6	14	20	18 3 21	7	15	22	18 2 20

Table 7.3.6: Bivariate choice data (target choice by background choice) for the *replication* conditions.

			success of background task	
			yes	**no**
car tires	**goal switch**	**yes**	69 %	44 %
		no	31 %	56 %
			(n=32)	(n=9)
swimming baths	**goal switch**	**yes**	64 %	56 %
		no	36 %	44 %
			(n=33)	(n=9)

Table 7.3.7: Reversals in attribute decisiveness (goal switch) by susceptibility to background manipulation.

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Formal modelling:

- two goals $\mathbf{g}^{\mathbf{A}}$ and $\mathbf{g}^{\mathbf{B}}$,
- initial goal identification according to

$$\text{logit}(\Pr(\mathbf{G}^{(1)} = \mathbf{g}^{\mathbf{A}} \mid \mathbf{S}^{(1)})) = \boldsymbol{\alpha} + \boldsymbol{\sigma}\mathbf{bg}(\mathbf{S}^{(1)})$$

- deterministic decision rules per goal

$$\Pr(\mathbf{Y} = \mathbf{A} \mid \mathbf{G} = \mathbf{g}^{\mathbf{A}}, \mathbf{S}) = 1 = \Pr(\mathbf{Y} = \mathbf{B} \mid \mathbf{G} = \mathbf{g}^{\mathbf{B}}, \mathbf{S})$$

- goal updating according to

$$\text{logit}(\Pr(\mathbf{G}^{(2)} = \mathbf{g}^{\bullet} \mid \mathbf{G}^{(1)} = \mathbf{g}^{\bullet}, \mathbf{Y}^{(1)}, \mathbf{S}^{(2)})) = \boldsymbol{\gamma}^{\bullet}$$

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Estimates:

	α	σ		γ^A	γ^B
		s'	s''		
car	0.282	-1.203**		0.506	6.91
tires	(0.332)	(0.326)		(0.627)	(11.51)
	57 %	-29%	+25 %	62 %	100 %
swimming	0.541*	-1.709**		0.838	7.82
baths	(0.417)	(0.409)		(0.614)	(16.03)
	63 %	-40 %	+27 %	70 %	100 %

Table 7.3.9: Parameter estimates for the framing model when fitted to the data of Study **3** (***p<0.1, **p<0.01**). For ease of interpretation, estimates are also rendered as percentage values.

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Comparison of different rationality models:

car tires

model	#par's	deviance	diff(M)	sig(M)	diff(R)	sig(R)
R	0	113.7	29.8	0.000	0.0	
U	2	97.7	13.8	0.008	16.0	0.000
F	4	95.8	11.9	0.003	17.9	0.001
M	6	83.9	0.0		29.8	0.000

swimming baths

model	#par's	deviance	diff(M)	sig(M)	diff(R)	sig(R)
R	0	116.4	36.1	0.000	0.0	
U	2	95.9	15.6	0.004	20.6	0.000
F	4	85.2	4.9	0.085	31.2	0.000
M	6	80.3	0.0		36.1	0.000

Tables 7.3.9: Fit values for various model specifications for the data of Study **3**. The deviance values are visualized in Diagram **7.3.1** (p.242).

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Once more visually:

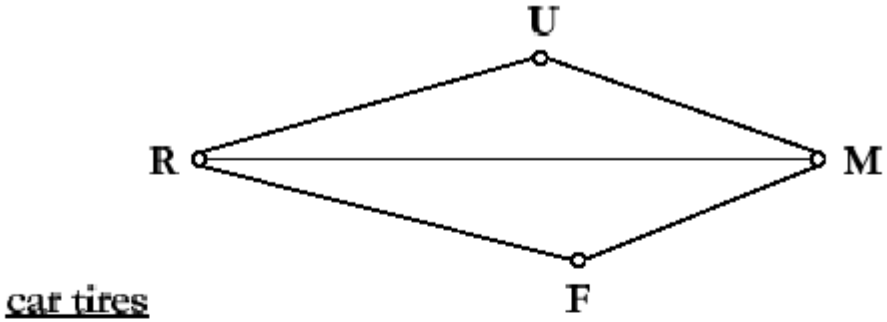

Diagram 7.3.1: Model fit of an utility model **U**, the framing model **F**, and reference models **R** and **M**, per choice domain. The only insignificant difference in model fit is between models **F** and **M** in the swimming baths domain (**p>0.05**).

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Other examples tested:

- asymmetric dominance effect,
- similarity effect,
- effects of non-diagnostic information,

- normative behaviour in public goods dilemma.

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Summary

- Framing theory as integration / generalization of economic *and* sociological model of man.
- Model is geared to sociological applications (macro phenomena), but it is validated also on the individual level.
- Model outperforms utility models in a class of situations where the latter fails.
- Stochastic version of the model allows for simultaneous data analysis and testing of model assumptions.

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Conclusion