

**CONCEPTS AND CATEGORIES:
THEIR REPRESENTATION, STRUCTURE, AND PROCESS**

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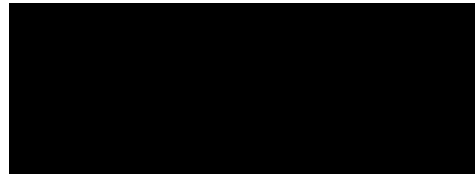
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CERTIFICATE

I certify that the substance of this thesis has not already been submitted for any degree and is not being currently submitted for any other degree.

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in the thesis.



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ABSTRACT

This thesis examines people's mental representation, membership structure and categorization processes with respect to concepts and categories. The aim of Experiment 1 was to discover whether three category-types (natural superordinate, property and ad hoc types) have graded structure. The study looked at two possible underlying causes for the gradience commonly found in the production frequencies of category instances: statistical artifacts or typicality structures. Results supported the hypothesis that people consult a common representation when they produce exemplars according to their degree of typicality. These results imply that all the instances in the three category-types have a normative, graded structure. The next experiment compared a normative graded structure with an idiosyncratic organization of membership.

The aim of Experiment 2 was to test four assumptions made by the unitary approach to categories, which assumes that human cognition directly reflects the naturally occurring categories in the world. The empirical aim was to discover whether people used typicality or direct experience as a basis for their generation of instances and their membership decisions. Mental representation was measured by the exemplar generation to a category label task; categorization processes were measured by the membership decision task on a computer; and internal membership structure was measured by the membership decision response times converted into ranks.

Two kinds of word stimuli were used: the frequency norms collected in Experiment 1 (normative stimuli); and the individual exemplars each participant generated to a category label (idiosyncratic stimuli). Overall, the idiosyncratic stimuli seemed to elicit a more finely-tuned performance from participants. Concerning membership decision, when the data were analyzed as to whether people were using a one stage process of categorization (as advocated by the unitary approach), or a two stage processing of potential instances, a greater number of significant results were found with the idiosyncratic stimuli. It was concluded that people use a two stage processing of potential instances. Concerning representations of the three category-types, people did not include typicality information (as a significant predictor of the representation criterion) when their own idiosyncratic exemplars were used as stimuli; but typicality became a significant predictor also when normative stimuli were used. It was found that all three category-types differed on the basis of what information was represented about them. Their membership structures, however, did not in that all three types had graded structures. Clear-cut boundaries were evident when data gained with the normative stimuli were analyzed, but fuzzy boundaries

were the result when idiosyncratic stimuli were used in the membership decision task.

The overall finding of Experiment 2 was that the unitary view's four assumptions lacked empirical support. The main conclusion was that the participants' mental representations do not reflect only typicality or experiential information or rules, since the semi-partial correlation values for these predictors were small. The implication was that participants were using conceptual knowledge as a basis for their exemplar generation and membership decision, and this possibility was investigated in Experiment 3.

Experiment 3 compared the use of conceptual knowledge, physical appearance, knowledge of function-parts, and essential features in people's judgments of typicality, similarity and categorization. The stimuli consisted of stories whose common theme was one of transformation, either of an animal or of an artifact. The control condition consisted of stories where the animal or artifact was simply described and nothing else. In the six experimental conditions, something happened which changed the animal/artifact's appearance, essence or functions. In story conditions 5, 6 and 7, various kinds of explanation for the event were either explicitly stated or implicitly provided.

The overall conclusion was that conceptual knowledge (such as explanations) influences people's judgments of similarity, typicality and category identity. More specifically, the greatest rate of change (as compared to the control condition) in the participants' judgments was elicited by the story condition which detailed personal details about the animal, such as its goals, needs, or preferences. One unpredicted finding was that story descriptions of alterations to physical appearance achieved just as high a rate of changed judgments, as did the story condition where an explanation for the alteration was provided. It was concluded that whilst theory-based concepts do give the best account of people's concept and category behaviours, participants are also judging the credibility or plausibility of any explanation given. People make use of their subjective knowledge (such as the needs of creatures, and functions of artifacts) gained through their interaction with the world, to decide whether an explanation is plausible or credible.

The thesis suggests that empirical studies should take the importance of subjective knowledge (as well as normative knowledge) into consideration when further empirical studies are carried out, for example, by using idiosyncratic stimuli. Theoretically, the three studies have shown that we have the categories we do because of the concepts we construct (rather than concepts being inductively derived to fit the naturally occurring categories in the world).

TABLE OF CONTENTS

CERTIFICATE	ii
ACKNOWLEDGEMENTS	iii
ABSTRACT	iv
TABLE OF CONTENTS	vi

CHAPTER ONE: THEORIES ABOUT CONCEPT

1.00	Chapter overview	1
1.01	Thesis questions and aim of chapter	2
1.02	Theories of conceptual meaning	7
	1.02.1 Concepts as word definitions	8
	1.02.2 Concepts as (lay) stereotypes	9
	1.02.3 Concepts as fuzzy prototypes	11
	1.02.4 Concepts as explanatory beliefs	13
1.03	Evaluation of views	15
	1.03.1 Stability through ultimate truth	16
	1.03.2 Stability through similarity structures of appearance	18
1.04	Argument and hypothesis: Stability through theory-embedded concepts	20

CHAPTER TWO: REVIEW OF RESEARCH INTO CONCEPTS AND CATEGORIES

2.00	Chapter overview	23
2.01	Issues and aims of chapter	24
2.02	Classical models	27
	2.02.1 Logical hierarchies	27
	2.02.2 Rational algorithms	30
	2.02.3 Evaluation	32
2.03	Fuzzy prototype models	34
	2.03.1 The prototype as an abstract amalgamation	36
	2.03.2 The prototype as an independent feature list	37
	2.03.3 The prototype as a specific exemplar	38
	2.03.4 The prototype as a bundle of correlated features	40
	2.03.5 Evaluation	43
2.04	Explanation-based models	45
2.05	Aims and hypotheses of the thesis	48
	2.05.1 Coherence of items into comprehensible categories	49
	2.05.2 Flexibility of relations	49
	2.05.3 Hypotheses	52
2.06	Empirical studies of the thesis	52

CHAPTER THREE: EXPERIMENT ONE

3.00	Chapter overview	55
3.01	Issue and aim of Experiment 1	55
3.02	Gradient structure and category-types	57
3.03	Two accounts of gradience found in production frequency data	58
3.03.1	Learning order of items determines their later recall	59
3.03.2	Typicality structures determine production order	60
3.04	Probability of production of different exemplars: Predictions	62
3.05	Method	64
3.06	Results	65
3.06.1	First analysis: production frequency of same exemplars as the dependent variable	65
3.06.2	Second analysis: production of different exemplars as the dependent variable	69
3.07	Discussion: category-type differences and representations	74
3.07.1	Category-type differences	75
3.07.2	Participants share a common representation	76
3.08	Implications	78
3.08.1	Category represented as a structure or as content	78
3.08.2	Comparison of idiosyncratic and normative stimuli in Experiment 2	81

CHAPTER FOUR: EXPERIMENT TWO

4.00	Chapter overview	83
4.01	Question and issues of Experiment 2	84
4.02	Definedness and the unitary approach	85
4.03	Categorization of members	89
4.04	Internal membership structure	94
4.05	Mental representation of categories	98
4.05.1	Typicality as a basis for internal graded structure	99
4.05.2	Experience as a basis for internal graded structure	99
4.06	Aims of Experiment 2	101
4.07	Rationale for tasks chosen as measures of representation, structure and process	102
4.07.1	Categorization process	102
4.07.2	Internal membership structure	102
4.07.3	Representation of the category in memory	103
4.08	Method	104
4.09	Results: Categorization process	109
4.10	Results: Internal membership structure	116
4.11	Results: Representation of categories	124

4.12	Discussion: interpretation of results	131
4.12.1	Categorization process	131
4.12.2	Internal membership structure	134
4.12.3	Representational models	135
4.13	Implications of results	140

CHAPTER FIVE: EXPERIMENT THREE

5.00	Chapter overview	144
5.01	Issues and aim of Experiment 3	144
5.02	Stimulus context: the story content	147
5.02.1	Control condition (story condition 1)	148
5.02.2	Family resemblance (story condition 2)	148
5.02.3	Classical essentialism (story condition 3)	149
5.02.4	Function-part relations (story condition 4)	150
5.02.5	Two-tier representation (story condition 5)	151
5.02.6	Psychological essentialism (story condition 6)	152
5.02.7	Ideal prototype (story condition 7)	153
5.03	Inherent nature of the entity: animal or artifact?	153
5.04	Tasks and their informational demands	155
5.05	Hypotheses and predictions	158
5.05.1	Story content and the conceptual core	158
5.05.2	The structure of artifact and animal concepts	160
5.06.3	Tasks and information processing	160
5.06	Method	162
5.07	Results	165
5.08	Discussion: interpretation of results	174
5.08.1	Two-tier representation versus ideal prototype	175
5.08.2	Physical appearance versus unseen essence	176
5.08.3	Functional relations: core versus explanatory core	176
5.09	Implications for thesis questions	180

CHAPTER SIX: CONCLUSION

6.00	Chapter overview	182
6.01	Summary of the main findings	183
6.02	How do concepts arise?	184
6.03	Why do we have the categories we do?	186
6.04	The role of concepts in cognition	190
6.04.1	A flexible categorization of creatures and objects	190
6.04.2	A coherent structure for categories	192
6.04.3	A stable representation for concepts	194
6.04.4	Constructed worlds	196

REFERENCES

R.1

APPENDICES:

A	Glossary	A.1
B	Philosophical Background	A. 3
C	Rosch's early studies	A.11
D	Frequency norms	A.14
E	Task Instructions, Experiment 2	A.17
F	Statistical Tables, Experiment 2	A.20
G	Descriptions of animal and artifact stories	A.24
H	Instructions and practice booklets, Experiment 3	A.34
I	Fourteen story-stimuli	A.44
J	Structure of the environment	A.67