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Individual Differences in Ownership Reasoning: A Twin Study

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ABSTRACT

This study is the first to investigate the extent to which environmental and genetic factors contribute to aspects of ownership reasoning. 65 pairs of adult monozygotic (MZ) twins, and 16 pairs of same-sex dizygotic (DZ) twins completed a 24-item ownership questionnaire, which included items on new ownership and appropriate transfers of ownership. MZ correlations were larger than DZ correlations for both aspects of ownership reasoning, and univariate model fitting indicated that genetic and non-shared environmental factors could account for all individual variation, with shared environmental factors contributing non-significantly. Heritabilities ranged from .36-.57 over both factors. The results support the notion that individual differences in ownership reasoning have a significant genetic basis.

INTRODUCTION

Ownership and property are imperative for survival in all species, and include a variety of consequences psychologically, behaviourally, and socially.

Inferring ownership in adults

- use of heuristics including first possession heuristic (first possessor as owner), and judging whose actions were necessary for possession

Evidence for a genetic influence on ownership reasoning:

- Use of adult-like heuristics at young age:
- Favor first possessor as owner of objects (age 2) and ideas (age 6)

INTRODUCTION

(Cont'd)

Cross-Cultural Similarities

- Age 5+: communal (kibbutz) vs. American show similar understanding of property
- Cultures without private land laws (East Timor) favor a first possession rule
- Evidence of first possession heuristic in animals (e.g., butterflies, birds, baboons)

Hypotheses:

H1: MZ will be greater than DZ correlations

H2: Genes will contribute significantly to response variance in model fitting analyses

METHOD

Participants: 65 pairs monozygotic (MZ) twins, 16 dizygotic (DZ) twins (ages: 19-82)

Measures: 24-item ownership questionnaire measuring two factors (12 items each):

- (1) Who is the owner of a non-owned item?
 - (2) Is it appropriate to borrow without permission?
- Each item involves a short story followed by a statement. Participants rate their agreement on a 7-point scale.

Data Analysis: Correlations for MZ and for DZ twins; univariate model fitting: estimate role of environment (common [C] and unique [E]), and genetic influences (A) on response variation.

RESULTS

- MZr are greater than DZr, implies genetic influence
- A and E components account for data; suggests importance of unique environment and genetics.
- Heritabilities range from .36 - .57

TABLE 1

Factor	α	Correlations(r)	
		MZ	DZ
Ownership	.905	.58	.39
Borrowing	.949	.72	.56

TABLE 2

Factor	Model	Parameter estimates (95% CI)			AIC
		a ²	c ²	e ²	
Ownership	ACE	.37 (.00-.59)	.04 (.00-.53)	.59 (.41-.81)	-5.04
	AE	.41 (.19-.59)		.59 (.41-.80)	-7.04
Borrowing	ACE	.36 (.00-.71)	.20 (.00-.65)	.44 (.29-.64)	-5.30
	AE	.57 (.37-.71)		.43 (.29-.63)	-7.10

DISCUSSION AND CONCLUSION

Findings support our hypotheses, there appears to be a significant genetic influence to ownership reasoning:

- consistent with authors postulating a genetic component, and with research on personality traits
- Opposes purely environmental explanations

Limitations:

- Small n for DZ
- Only covers a fraction of all ownership facets
- Possibility for errors or bias in self-report

This study addresses a long posed question and opens the door for further research.