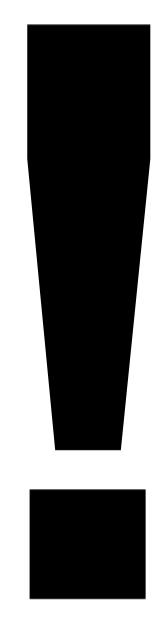


Mental Models for the Navigation in Adaptive Web-Sites and Behavioral Complexity

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Navigation in web-sites requires a mental model of the site. Adaptive web-sites aim at minimizing the complexity of this model. **How can we measure the complexity of the required mental model?**



We propose a measure which is called behavioral complexity. By **observing (1)** the behavior of a user an **individual state-transition network (2)** of the interaction is derived. **Behavioral complexity (3)** is computed based on this individual network. **Empirical results (4)** show that behavioral complexity is a useful measure.

1 raw data: observing users

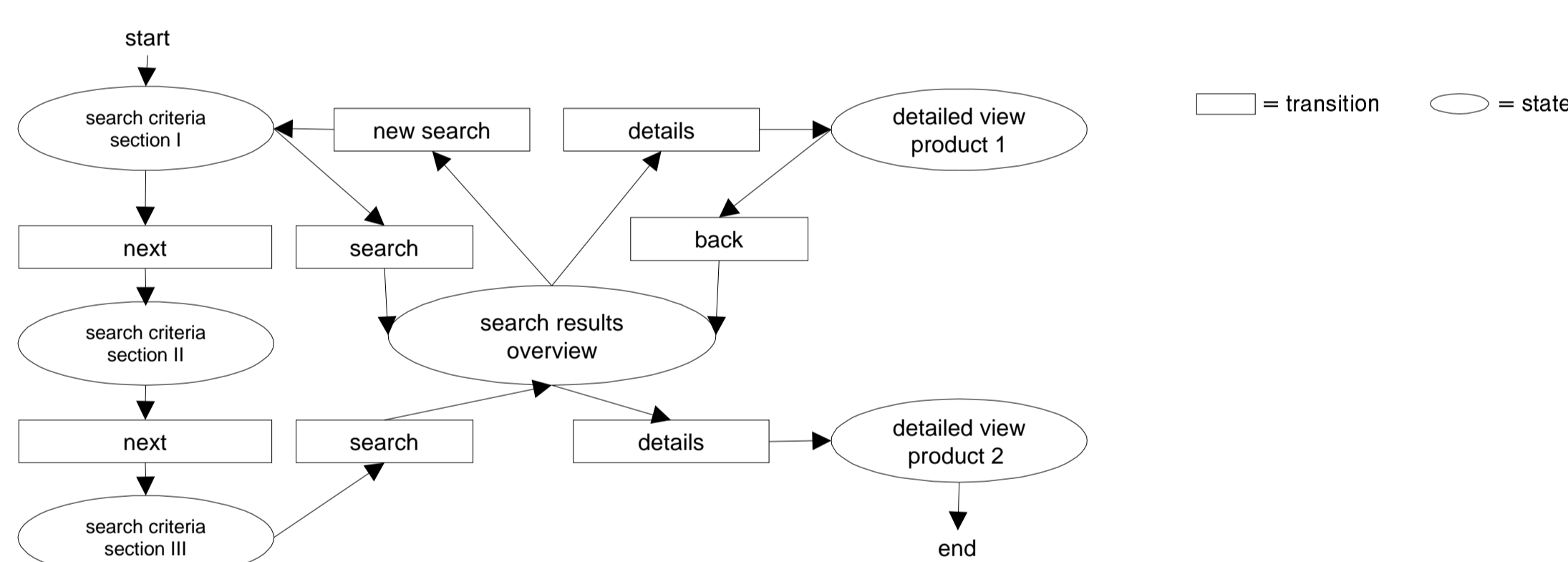
Extended log-files show which user accessed which page by which link.

```
( "20.07.1998 14:20:21" 3109926021 GET-PAGE 18001 "incops"
  "20.07.1998 14:20:52" 3109926052 GET-PAGE 21003 "Wahrnehmung" )
( "20.07.1998 14:20:57" 3109926057 GET-PAGE 21004 "Sens_Ged" )
( "20.07.1998 14:26:12" 3109926372 GET-HELP 73006 ( "11" "Sens_Ged" "vp107" "(\"Sens_Ged\")" ) )
```

link ID page

2 deriving state-transition-networks

An individual state-transition network can be derived from this observation. This network shows which system states (pages) have been accessed by a transition (link) from which previous state.



3 computing behavioral complexity

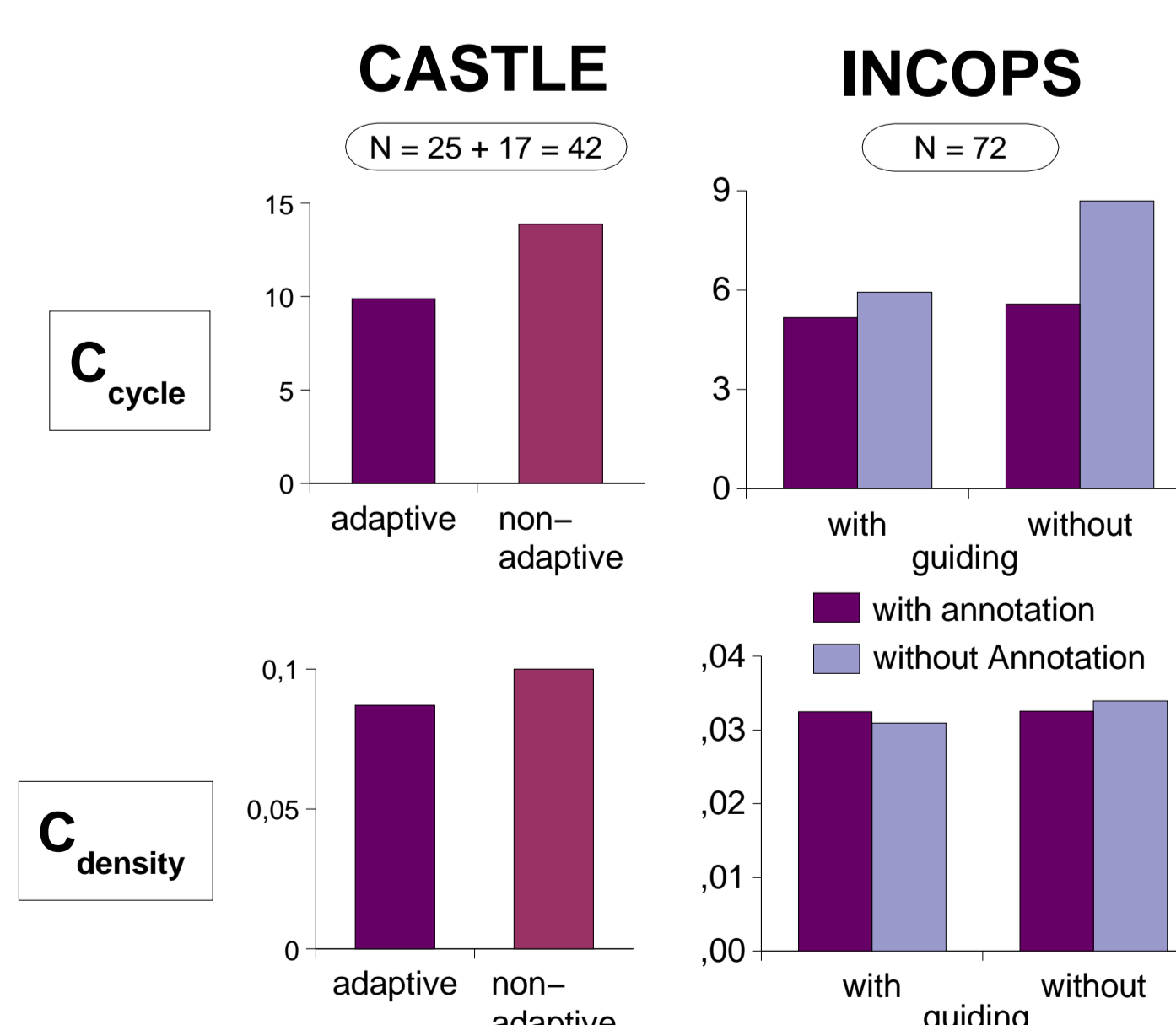
Two ways of computing the complexity of state-transition networks have been proposed (Rauterberg et al., 1997): the number of cycles in the network (C_{cycle}) and the relative network density (C_{density}).

$$C_{\text{cycle}} = T - S + 1 \quad C_{\text{density}} = \frac{T}{S \times (S - 1)}$$

4 empirical results

- I. Users who were supported by an adaptive version of the systems (a product recommendation system and an adaptive learning system) produced interaction networks of lower complexity.
- II. Divergent and convergent validity: Correlations with related measures are as expected.

Behavioral complexity of two systems in two different domains



Correlation of behavioral complexity in CASTLE

	satisfaction	total duration	computer experience	internet experience
C_{cycle}	-,04	,57	-,17	-,15
C_{density}	-,33	-,07	-,29	-,47

5 work in progress

Exploring the relation of objective behavioral complexity and subjective experienced complexity.

