

ZSL

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**Role of personality in behavioral
responses to new environments in captive
Asiatic lions (*Panthera leo persica*)**

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Outline

- Introduction
- Materials
- Methods
- Results and Discussion
- Conclusions



Introduction

Personality: “behavioral differences across individuals that are consistent over time and across contexts or situations.”

- Powell and Gartner, 2011



Introduction



Introduction

Applications of personality research:

- Husbandry
- Training
- Breeding programs
- Reintroduction programs



Introduction

Methods of creating personality profiles:

- Behavioral observations
- Observations of an animal's response to a specific test (e.g. novel object test)
- Keeper questionnaires



Aim: to evaluate the role of lion personality in their behavioral responses to new environments

Hypotheses:

- 1) Personality traits identified from keeper questionnaires and observation data create reliable profiles that associate with individual lion behavioral responses to new physical and social environments.
- 2) Because of individual personality variation, these new environments will alter individual time budgets and enclosure use.

ZSL | LONDON ZOO

Asiatic Lions Fact File

Asiatic lion (*Panthera leo persica*)

Status: Endangered

Found: In and around the Gir Forest, Gujarat, India

Body length: Up to 2.9 metres from nose to tail

Weight: males 160-190kg, females 110-120kg

Lifespan: 18-20 years

Diet: deer, antelope, boar and cattle



Materials : lions



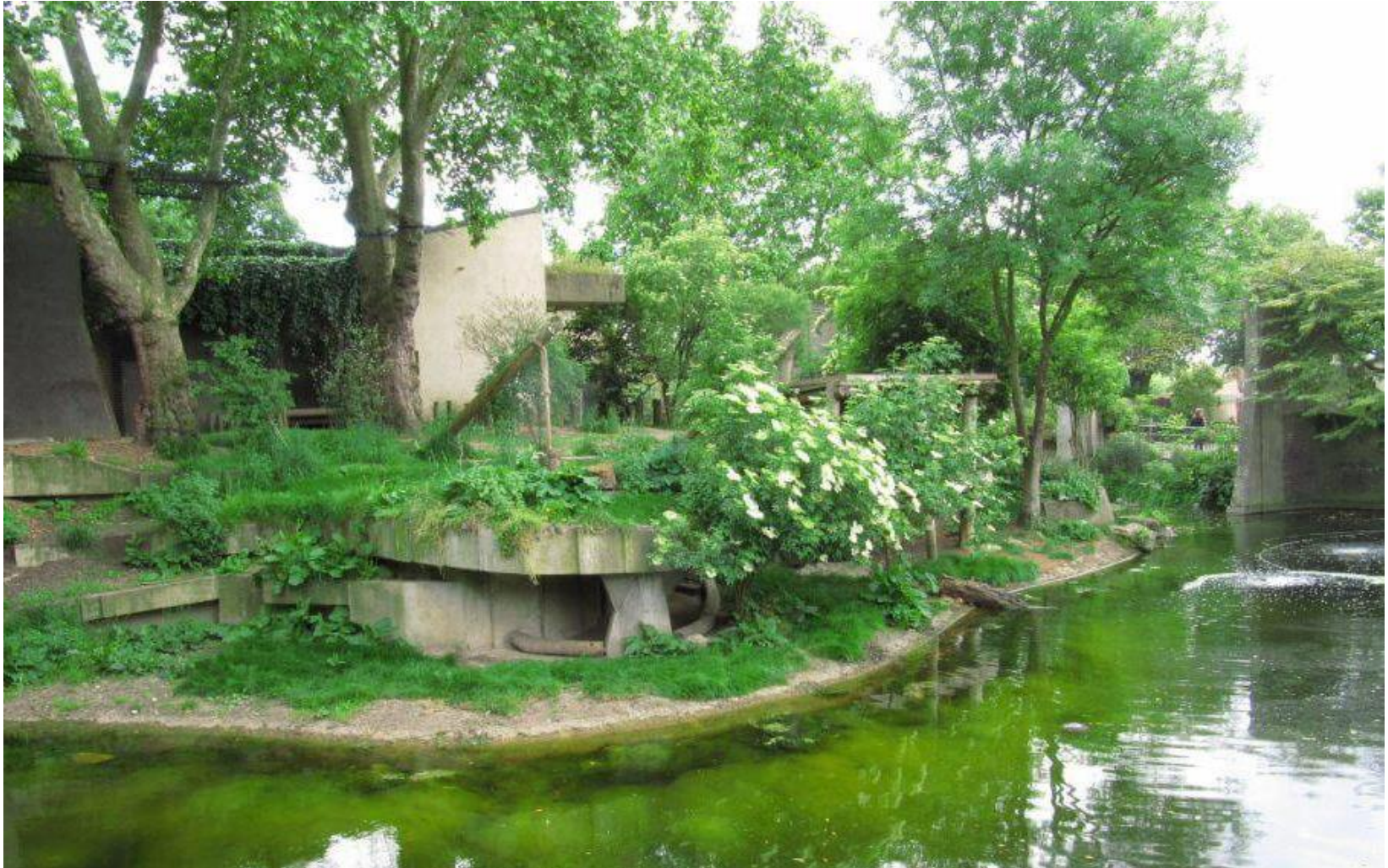
Materials : enclosure

London Zoo Lion terraces opened in 1976:



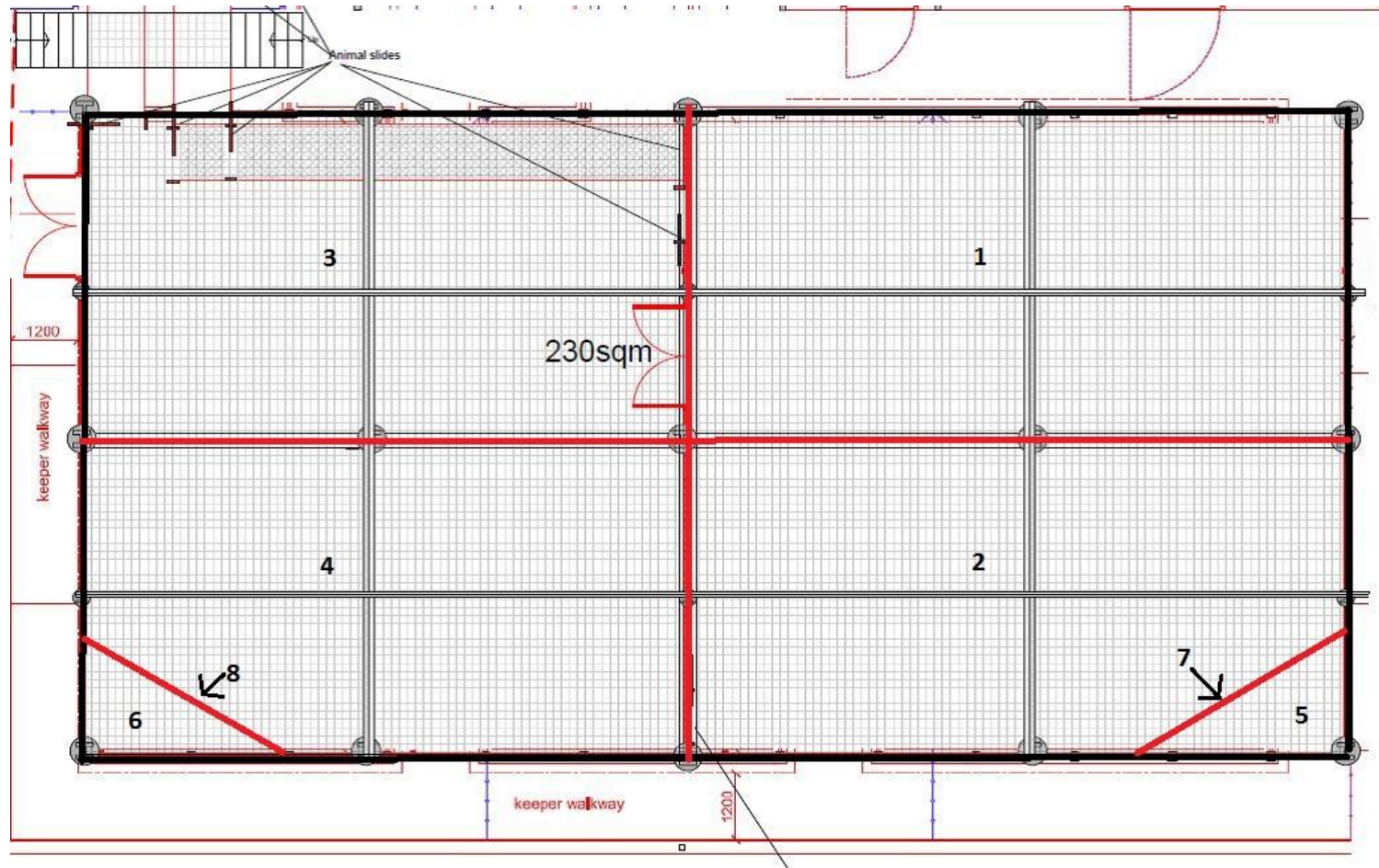
Materials : enclosure

London Zoo Lion terraces (1976-2014):



Materials

Whipsnade Zoo enclosure (2015):



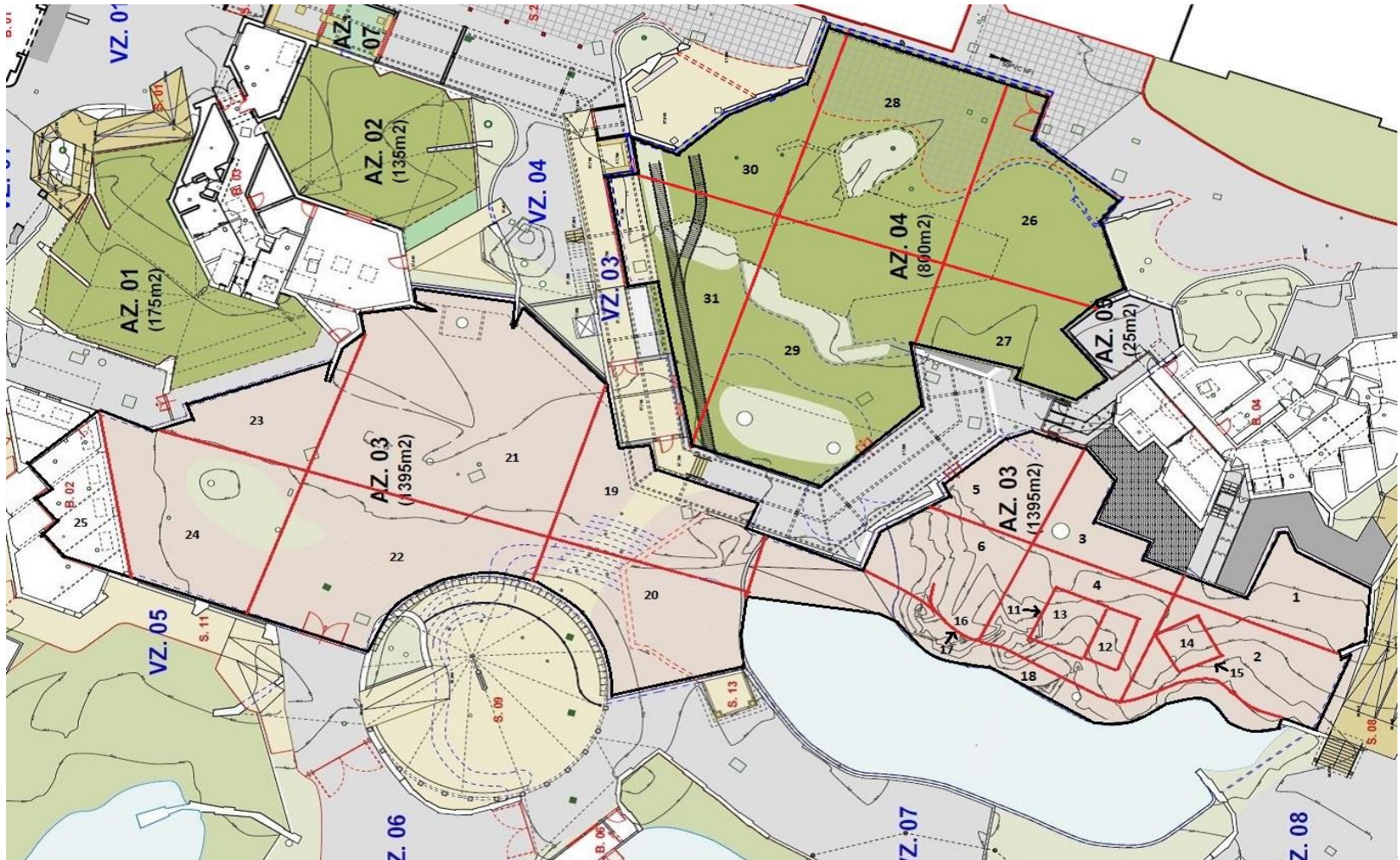
Materials

London Zoo Land of Lions enclosure opened in 2016:



Materials

London Zoo enclosure: Land of Lions (2016-now)



New stimuli : enclosures and evening events



Methods

Data collection:

- Focal animal observations using continuous sampling
- 3 observation periods: daytime, Sunset Safaris, control nights
- Total observation time: approximately 87 hours
- Keeper questionnaires



Methods

Data were used to:

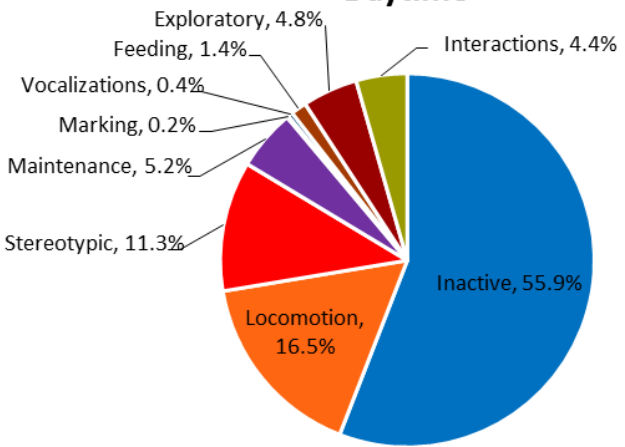
- Create time budgets
- Calculate enclosure use and Spread of Participation Index (SPI)
- Construct social diagrams
- Compare old and new enclosures and different observation periods
- Construct personality profiles



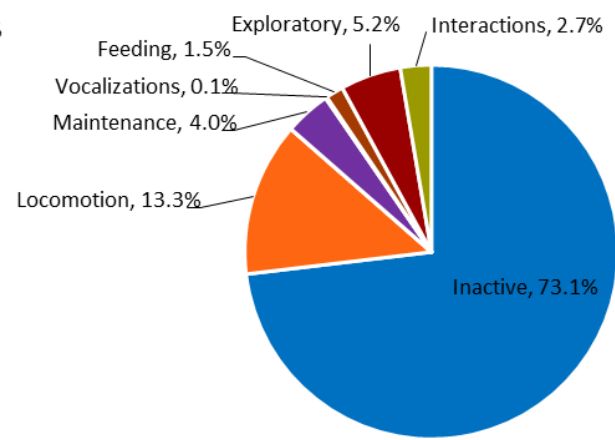
Results and Discussion

Time budget: Comparing observation periods at London Zoo

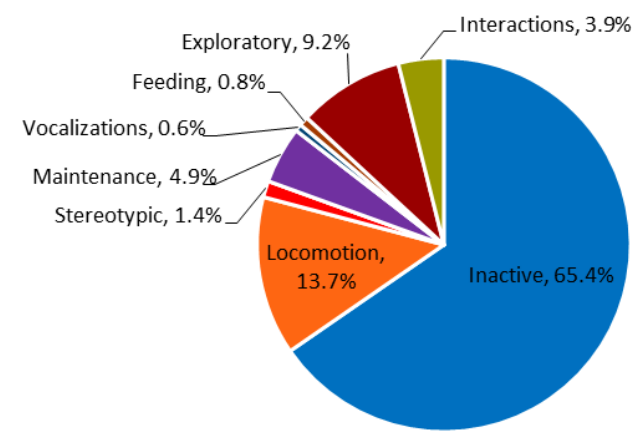
Daytime



Control Nights

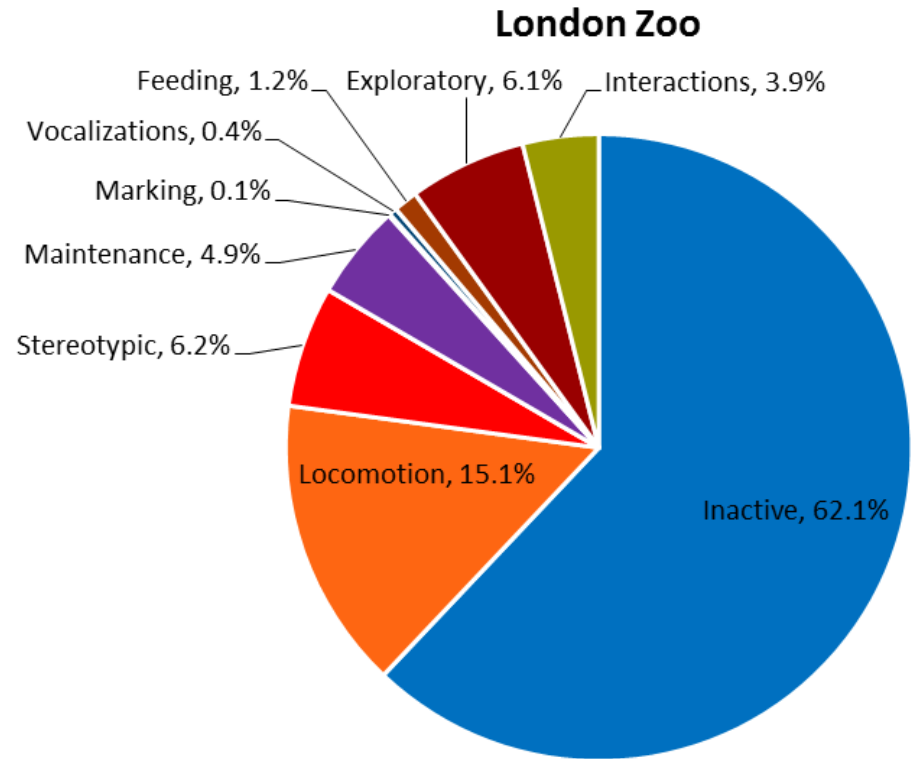
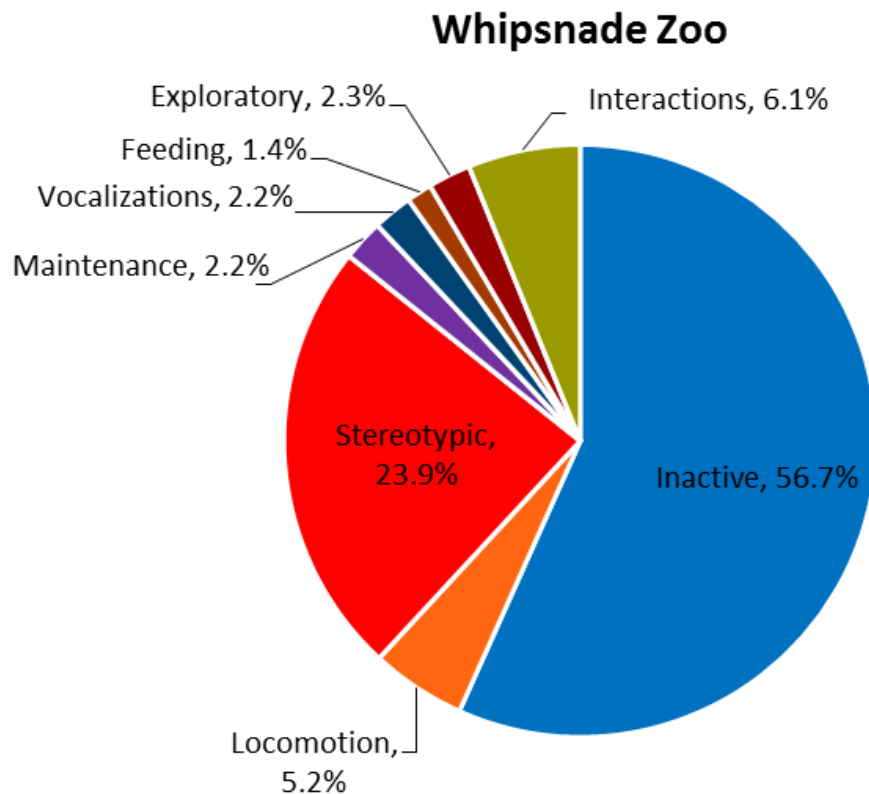


Sunset Safari



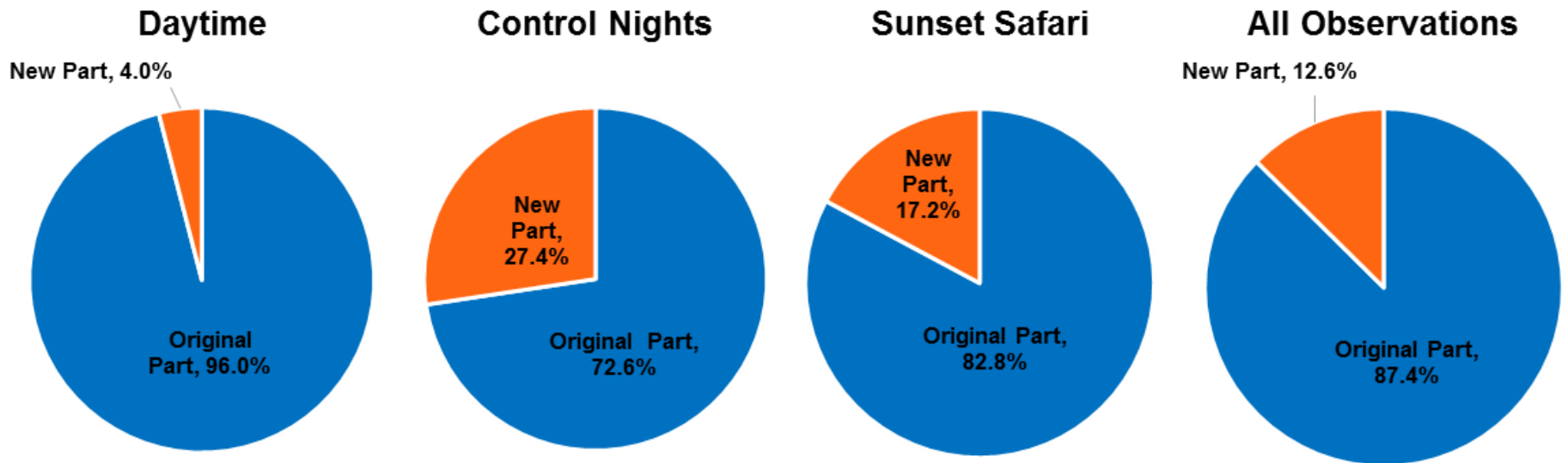
Results and Discussion

Time budget: Comparing Whipsnade Zoo and London Zoo



Results and Discussion

Enclosure Use



Results and Discussion

Enclosure Use: SPI

	<i>Whipsnade Zoo</i>	<i>Daytime</i>	<i>Control Nights</i>	<i>Sunset Safari</i>	<i>Overall 2016</i>
<i>Rubi</i>	0.69	0.78	0.87	0.70	0.72
<i>Heidi</i>	0.70	0.69	0.77	0.69	0.63
<i>Indi</i>	0.69	0.84	0.81	0.78	0.74
Overall	0.69	0.76	0.81	0.67	0.69



Results and Discussion

Enclosure Use: SPI

Table 4. Enclosure use values at London Zoo for each female and overall for each observation period, and in total for all observations.

	Daytime				Control Nights				Sunset Safari				All Observations
	Rubi	Heidi	Indi	Overall	Rubi	Heidi	Indi	Overall	Rubi	Heidi	Indi	Overall	
Zone 1	50.5%	46.5%	57.5%	51.5%	0.0%	1.3%	2.6%	1.3%	6.3%	1.4%	0.8%	2.9%	27.8%
Zone 2	9.2%	9.8%	23.4%	14.2%	6.7%	0.0%	0.0%	2.2%	6.6%	0.0%	0.0%	2.3%	8.4%
Zone 3	0.6%	1.3%	0.7%	0.9%	0.0%	0.4%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.5%
Zone 4	0.2%	6.7%	0.4%	2.4%	0.9%	0.4%	1.3%	0.9%	1.0%	0.0%	0.0%	0.4%	1.5%
Zone 5	0.6%	0.4%	0.9%	0.6%	0.0%	0.0%	0.0%	0.0%	5.2%	0.3%	0.0%	1.9%	0.8%
Zone 6	1.7%	1.6%	0.0%	1.1%	0.0%	2.1%	0.0%	0.7%	1.7%	0.7%	0.0%	0.8%	0.9%
Zone 11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.2%	0.1%
Zone 12	4.1%	3.8%	2.9%	3.6%	13.4%	8.1%	0.4%	7.2%	27.3%	0.0%	0.0%	9.4%	5.9%
Zone 13	14.4%	14.4%	5.6%	11.4%	57.6%	51.3%	66.8%	58.6%	31.8%	61.6%	72.0%	54.6%	33.0%
Zone 14	2.2%	0.2%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	1.9%	0.9%
Zone 15	11.6%	4.4%	7.6%	7.8%	0.0%	0.0%	0.0%	0.0%	9.1%	5.1%	0.0%	4.9%	5.3%
Zone 16	0.0%	1.8%	0.0%	0.6%	0.0%	0.9%	0.0%	0.3%	0.3%	5.1%	0.0%	1.9%	0.9%
Zone 17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Zone 18	0.7%	2.2%	0.2%	1.0%	0.0%	3.4%	0.4%	1.3%	0.3%	3.4%	0.8%	1.6%	1.2%
Zone 19	1.1%	2.5%	0.0%	1.2%	0.0%	1.7%	2.6%	1.4%	5.9%	2.1%	2.4%	3.5%	1.9%
Zone 20	0.4%	0.4%	0.0%	0.2%	0.0%	1.3%	0.9%	0.7%	0.3%	2.7%	3.1%	2.0%	0.8%
Zone 21	1.1%	1.8%	0.2%	1.0%	0.0%	3.8%	2.2%	2.0%	2.4%	5.1%	6.3%	4.6%	2.2%
Zone 22	0.2%	0.7%	0.0%	0.3%	0.0%	0.4%	2.2%	0.9%	0.3%	5.1%	0.8%	2.2%	0.9%
Zone 23	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.4%	0.1%	0.0%	0.7%	0.4%	0.4%	0.2%
Zone 24	1.1%	0.2%	0.0%	0.4%	0.4%	0.4%	0.4%	0.4%	0.0%	1.4%	0.0%	0.5%	0.4%
Zone 25	0.4%	1.1%	0.7%	0.7%	21.0%	24.4%	19.8%	21.7%	0.0%	5.1%	7.5%	4.1%	6.2%

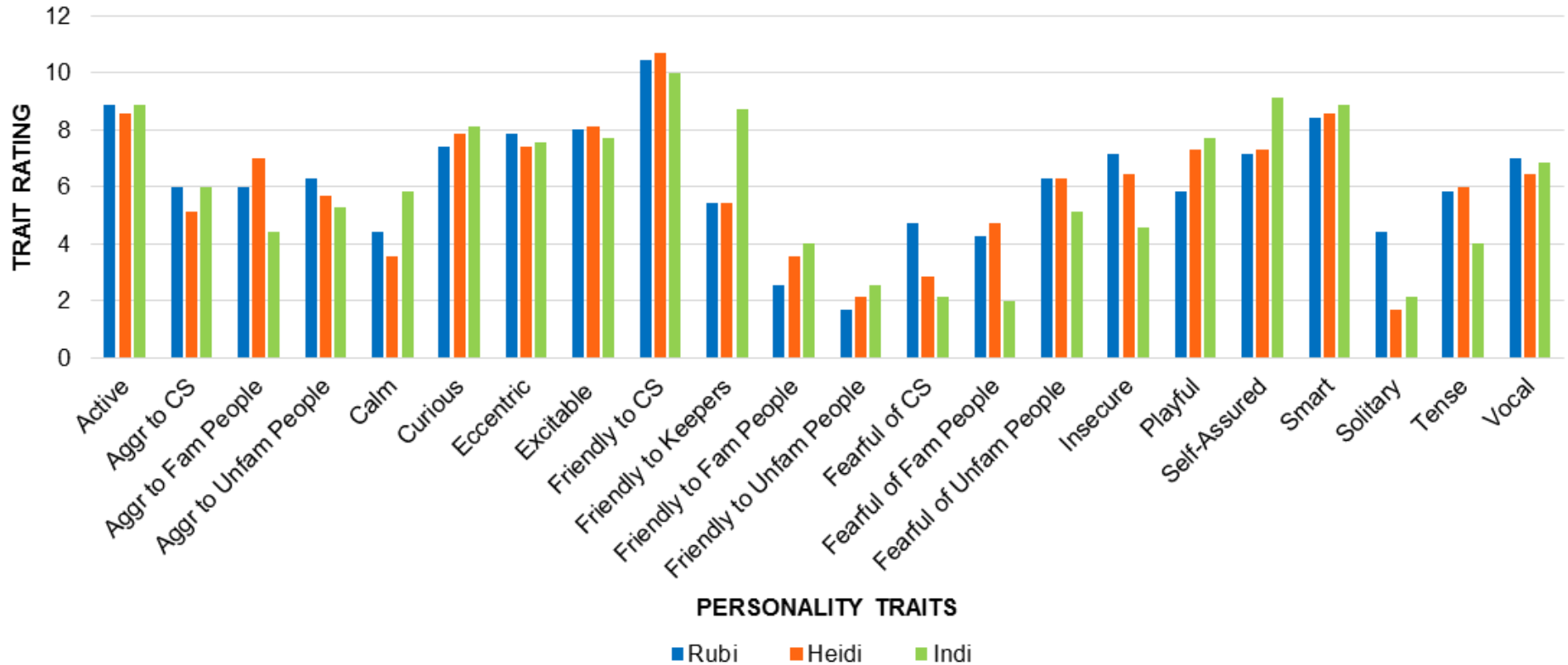
Results and Discussion

Personality

<i>Keeper</i>	<i>Sex</i>	<i>Experience with these lions</i>	<i>Hours/week with the lions</i>	<i>Average range between ratings</i>
1	M	6 months	25+	2.5
2	M	6 years	8	2.0
3	F	3.5 years	3	1.8
4	M	5 years	2	1.1
5	M	3 years	7	2.2
6	M	6 years	10	1.5
7	M	6 years	8	1.9

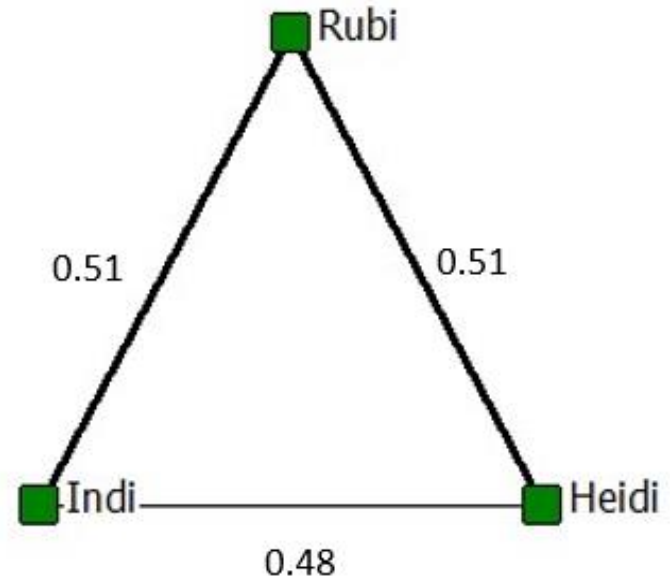
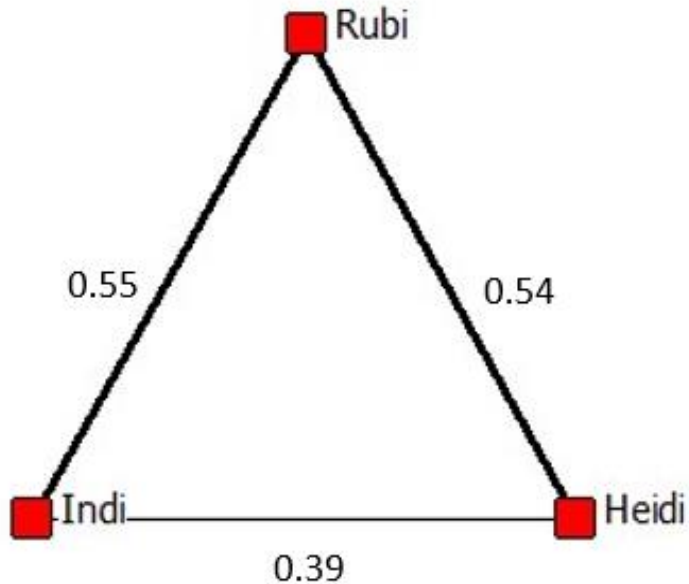
Results and Discussion

Personality



Results and Discussion

Sociality



Sociograms displaying the Association Index values for the relationship between the lions at Whipsnade Zoo (left) and London Zoo (right).

Conclusions

In summary:

- This study provided valuable behavioral and personality profiles for the lionesses at London Zoo.
- There was little difference in behavioral data between Sunset Safaris and control nights.
- The personality questionnaires were found to be a reliable method of assessing personality, however they showed little difference between the females.
- This research provides useful information for these specific lions to support individualized management decisions, and an interesting case study on individual animal adjustment to new environments.

Conclusions

- Limitations:
 - Short data collection period
 - Small sample size
 - Outdated questionnaires
- Potential future study:
 - Camera traps around Land of the Lions
 - Social structure of the new lion pride (male introduction)
 - Global personality study on all captive Asiatic lions

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Veterinary Medicine International

Volume 2017 (2017), Article ID 6585380, 17 pages

<https://doi.org/10.1155/2017/6585380>**Research Article****Role of Personality in Behavioral Responses to New Environments in Captive Asiatic Lions (*Panthera leo persica*)**Giovanni Quintavalle Pastorino,^{1,2} Anna Viau,^{1,3} Giulio Curone,² Paul Pearce-Kelly,¹ Massimo Faustini,² Daniele Vigo,² Silvia Michela Mazzola,² and Richard Preziosi⁴¹Institute of Zoology, Zoological Society of London, Regents Park, London NW1 4RY, UK²Department of Veterinary Medicine, Università degli Studi di Milano, Via Celoria 10, 20133 Milan, Italy³The Royal Veterinary College, Royal College Street, London NW1 0TU, UK⁴Division of Biology and Conservation Ecology, School of Science and the Environment, Faculty of Science and Engineering, Manchester Metropolitan University, Manchester M1 5GD, UKCorrespondence should be addressed to [Silvia Michela Mazzola](#)

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Abstract

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Thank you!

Any questions?

