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**Comparative Psychopathology
of Captive Great Apes
(towards understanding psychological disturbances
in captive orangutans)**

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Title:**Comparative Psychopathology of Captive Great Apes
(towards understanding psychological disturbances in captive orangutans)****Abstract:**

The purpose of this paper is a qualitative insight into the problem of psychopathological phenomena in captive orangutans. The theoretical part deals with the elementary zoology of genus Pongo, and offers philosophical and ethical considerations of "animal kind", "captivity", "norm and psychopathology" as well as some methodological aspects of animal study. The aim of my empirical research design was to gather as much information as possible about the phenomena in question. This study is meant to provide preliminary ideas for further research and by no means aspires to cover the topic to the full.

There are 5 zoos in Czech Republic and Slovakia that have orangutans, and I have visited 4 of them. Each group of orangutans was reported on by at least 2 people in direct contact with these animals (caretakers, veterinarians or curators). I have attempted to objectify my findings by individually interviewing 10 professionals, all of whom have provided their reports independently and confidentially. The caretakers reported on a total of 16 animals in their custody, out of which, there were 7 adult males, 5 adult females, 3 sub-adult males and 1 male infant. Of these, 8 were Sumatran orangutans, 6 Borneans and 2 crossbreeds. Three animals that entered the record were no longer present at the zoo by the time applicable (deceased or relocated).

I have used non-structured and semi-structured interviews. The results of the interviews have been communicated by directly quoting my interviewees. The interviews are then listed in logical preliminary clusters based on human psychiatric symptomatology and in reference to individual animals in which the symptoms occurred. The records seem to support the notion that there are indeed clinical cases with orangutans that are very similar to human psychiatric conditions. These, like in humans, also appear to be multifactorial in their ethiology, where personality factors, rearing history, and early experience are believed to be as important as the fact of captivity itself. Some of the behaviors registered were only observed once and hence can not be generalized. Additionally, there were only a few constants across the sample. However, despite the limited number of animals studied, and the anecdotal nature of the behaviors in question, this paper gathered rather rich material fit for further exploration and aspires to raise interest in the psychological well-being of this still relatively understudied species.

Key words: Orangutan, Captivity, Psychopathology

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I wish to express my gratitude and appreciation to my consultant, Doc. Slávka Fraňková, PhD, DrSc for her kind and professional supervision and to Mgr. Stanislav Lhota PhD, who kindly revised the zoological section.

Special thanks to my family and friends for their patience and support.

I hereby declare that I have written the text that follows by myself, using only the materials cited in the bibliography.

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***This work is dedicated to
Miško Šebesta(1.6.1978-1.9.2007)
whom I will always try to impress,
even in heaven.***

***"Anyone who tries to improve the lives of animals
invariably comes in for criticism
from those who believe such efforts are misplaced
in a world of suffering humanity."
Jane Goodall***

Foreword: "Paradigm lost"

*"Your paradigm is so intrinsic to your mental process
that you are hardly aware of its existence,
until you try to communicate with someone
with a different paradigm."
Donella Meadows, The Global Citizen*

Writing this thesis was a very rewarding process. All my long-term interests, such as environmental issues and animal welfare are personal to me. The more I thought about the topic, the more it touched on ethics and philosophy rather than quantifiable psychology. For the sake of understanding of the text that follows better, I feel obliged to explain my philosophical and scientific standpoint.

It has been a while since I read Fritjof Capra's, "The Turning Point.". It stirred me to realize that there was a scientist, a physicist on top of it, who was capable of critical consideration of what is by the majority considered "scientific data". It was my first formal encounter with the notion that our deep social and environmental crisis was in fact a crisis of perception. I always had an impression that scientists felt obliged to reduce complex reality into a completely unrealistic "rational" frame for the sake of not ruining ones honorable reputation. Using the single benefit of not having one, I can afford to be more at ease with how I tackle the complexity of animal psychopathology.

When I saw a male orangutan from up close for the first time, he (Káma) was seriously sick. His eyes were sunken and his face ever so clearly reflected his suffering. I could not help being shocked by the striking similarity in expression to an ill, old prisoner, a veteran in an asylum or a child behind the bars of a hospital crib. It occurred to me that no man of common sense, needless to say, no man who has ever dealt with animals on a professional basis, could possibly ignore or misinterpret the misery he was going through. This may have

been the point when I decided to take a closer look at the practical value of this empathetic human experience.

I may not succeed in advocating the notion of evolved emotional lives and vivid psychological realms of animal kind, but I can legitimately examine what we, the animals of reason, interpret as the cues of mental states in our nonhuman relatives. If, by doing so, I happen to discover that these findings can lead to better treatment of animals under our trusteeship, that the unnecessary suffering can be eased, then I'll consider this work meaningful.

Capra depicted, quite expressively, the dominance of the masculine value system, which included a very "jang" perception of reality and the guiding and governing principles of rationality, formality, competition, analysis and logics. He also stressed the reduction and devaluation of the implicit or intuitive, and ignored all those things that can not be touched, dismantled, tested or proved... Capra emphasized that "masculine" and "feminine" are simply two complementary sides of a continuum, value-free by themselves. Mankind, blind to the fact that all natural systems oscillate around a very fragile equilibrium, attributed an extreme amount of power and moral judgment to the masculine values, especially in science. It doesn't take much effort to look around and see the outcome: an over-exploitation of nature, permanent warfare, a collapsing social system and the mistreatment of animals in our custody.

The consistent preference of "jang" values gave birth to a machinery of academic, political and economic institutions, each supporting each other while perpetuating the devastating imbalance in all fields of human activity (Capra, 2002). It seems we live in an ideological monopoly, with rigid beliefs regarding what is suitable for scientific examination and what are the "proper" means of extracting information. But what if all the concepts we are brought up to believe are real (from statistics to bulletproof methodology), are nothing but mere shadows in the cave of Plato, a single, out of numerous possible

outlooks on things, reductionist grey, far from the colorful, complex reality of the world outside the cave.

So, Capra asks, could there possibly be science not obsessed with measurement? Can we possibly aspire to capture reality in its qualitative complexity and still label it "scientific"? And his answer is, "yes". This physicist wrote that he was ready to consider "scientific" any approach to knowledge under two conditions. (1) That all the findings should be based on systematic study and that they must form a holistic, coherent model, however limited or approximate it may be. (2) Capra stated that "new psychology" should be legitimately able to explore the "immeasurable", the phenomena and values emerging from the lived experience. In this work, I shall try to produce a complex, holistic outlook on the problem of psychological disturbances in nonhuman subjects.

Having said that, I wish to justify the choice of topics covered in the theoretical part as well as the choice of method. In the theoretical part, I bring up many concepts from the realms of mankind and encourage fundamental rather than factual comparison. To the Cartesians it shall appear as comparing the incomparable, as an unjustifiable extrapolation. In fact, I'd like to challenge the very idea of what is allowed to "scientifically" reflect through the prism of authentic experience. To evaluate one phenomenon I shall use another, the direct witnesses' narration with all the subjectivity and irrationality it brings along, and anecdotal evidence, so much despised by the behaviorists. I believe that my source, the people in direct contact with animals, have a lot to say and their intuitive knowledge can shed a lot of light onto the problem.

And finally, my choice of language: to pay tribute to a new concept of academic writing, I shall try to address the topic as interdisciplinary as possible, in a reader friendly manner, and in a language comprehensible to whoever decides to dedicate his time to read this paper. I will also provide

footnotes with further reading, and internet references, as well as explanation of some vocabulary I consider hard to tackle. I will not avoid personal observation and opinions. I'm aware of their limited informational value, but they may raise questions, and provoke interest. I consider both very important assets to any scholarly paper. I hereby openly declare my subjectivity. By deciding to work on a theme so personally touching, I consider it a question of ethics to explicitly state that my findings might be distorted by my emotional involvement, however hard I'll strive for objectivity. I am sure I am not the first one to face this intrapersonal conflict. I shall try to exploit this source of inspiration to the benefit of all.

1 Brief zoological factsheet

1.1 Taxonomy

Suborder:Haplorrhini

Infraorder:Simiiformes

Superfamily: Hominoidea

Family: Hominidae

Subfamily: Ponginae ¹

Genus:Pongo

Species:abelii,pygmaeus

Subspecies: P. p. morio, P. p. pygmaeus, P. p. wurmbii ²
(Lang, 2005)

According to the IUCN red list³ of endangered species, the last findings regarding taxonomy (based on the last Population and Habitat Viability Assessment by Singleton et al. 2004) confirmed the third subspecies *Pongo pygmaeus morio*. Warren et al. (2001) used the control region of the mitochondrial DNA on six different Bornean populations. Four distinct, geographically clustered sub-populations were identified.

1.2 Geography

Bornean orangutans (*Pongo pygmaeus*) currently inhabit only the island of Borneo, excluding the southeast. Fossil evidence indicates that the past distribution of *Pongo pygmaeus sensu lato* included much of Southeast Asia.⁴ *Pongo pygmaeus* was until recently considered the only orangutan species. Sumatran orangutans (*Pongo abelii*) are now considered a separate species. (Zhang et al, 2001)

¹ The other subfamily Homininae includes Gorilla, Pan, and Homo

² Some authors still use the classification „family Pongidae“ which is by definition paraphyletic. Most taxonomists nowadays encourage monophyletic grouping. Thus Hominidae includes Pongidae as the subfamily.

³ (<http://www.iucnredlist.org/search/details.php/17975/summ>)

⁴ The ancestry of orangutans is disputed. While one hypothesis maintains that orangutans originated from *Lufengpithecus*, a South Chinese and Thai hominoid, another theory says they originated from *Sivapithecus*, a Miocene hominoid from Indo-Pakistan. (Stefan Lovgren for National Geographic News January 28, 2004)



(<http://www.learn.org.au/greatapes/maps.htm#orangmap> , 3.3.2009)

The current occurrence according to the subspecies:

P. p. pygmaeus: Northwest Bornean Orangutan:

- Sarawak (Malaysia)
- North West Kalimantan (Indonesia)

P. p. wurmbii: Central Bornean Orangutan:

- Southern west Kalimantan
- Central Kalimantan (Indonesia)

P. p. morio: Northeast Bornean Orangutan:

- East Kalimantan (Indonesia)
- Sabah (Malaysia)

(<http://www.iucnredlist.org/search/details.php/17975/summ>)

Orangutans dwell in forested areas varying from low-level swamps to mountainous areas of as much as 1500 m in altitude.⁵

1.3 Physical Description

Orangutans are sexually dimorphic. Females range from 30 to 50 kg, whereas males can reach up to twice the weight of a female. They have short, relatively weak legs (they might avoid "walking", but as far as the strength of the grip goes, they can still hang comfortably upside-down). They possess very strong arms, well adapted to their arboreal lifestyle, with a spread of about 2.2 meters. They are reddish brown in color. Males have large cheek pads (flanges/phalanges) of subcutaneous fat. These cheek pads continue growing for much of an adult male's life and seem to play an important role in social interaction and sexual signaling.



(Fully phalanged Sumatran male - note the prominent cheekpads - here Káma(Zoo Prague) photo by author, January 2009)

4 For more to Orangutan distribution please visit:
http://www.panda.org/about_wwf/where_we_work/asia_pacific/our_solutions/borneo_forests/publications/index.cfm?uNewsID=21039 and http://www.sumatranorangutan.org/site_mawas/UK/EDUCATIONAL/pag/Edu1.htm



(Fully phalanged Bornean male, Jago (Zoo Bojnice), photo by author, January 2009)



(Adult bornean female, here Nanga(Zoo Bojnice), photo by author, January 2009)

1.3.1 Reproduction

Orangutans are quite exceptional because of their long inter-birth interval (presumably dependent on environmental factors and food availability) that can be as long as 7 (in Schwartz, 1988) or 8 years (Cawthon, 2005). After gestation (between 233 to 263 days, median 245 in Schwartz 1988), a newborn orangutan weighs on average 1700 grams and is weaned at the age of 42 months. Babies nurse every 3 to 4 hours, and begin to take soft food from their mothers' lips at age 4 months. Females reach sexual maturity at the age of 7. In captivity, males aged 8 years have fathered infants, but in the wild, they have not been observed copulating younger than 10 years. Even so, their social maturity (as well as the full development of secondary sexual characteristics) may take as long as another 3-7 years (Schwartz, 1988).

This phenomenon is called bimaturism, and its specifics, as well as its adaptation purpose, are still discussed in the scientific community. Female orangutans have an estrous cycle of about 30 days in length with ovulation occurring around the 15th day. They do not exhibit genital swelling during estrous. Their mating system is polygynous.

Younger, smaller males are often unable to maintain home ranges of their own. Some theories state that this arrested development may in fact be a "byproduct" of the presence of a fully flanged male in the range of a sub-adult. Various mechanisms have been hypothesized, such as the decrease in male hormone production in sub-adults due to fully adult male acoustic (long calls) or perhaps olfactory (musk) stimuli (Caldecott, Miles 2005). According to Schwartz, sub-adult males may also mate, such copulations are generally forced, and it is believed that they usually don't result in pregnancy since they take place regardless of the fertility or sexual receptivity of the female. (Schwartz, 1988).

However, the current state of knowledge, at least in Sumatran orangutans, hints that there might be in fact two fully functional reproductive strategies and that the "sub-adults" reproduce quite successfully via forced copulations. There has been research that proved that some males simply do not reach the fully mature state at all and prefer to sneak around the territory of fully mature males. Their reproductive success in comparison to the fully flanged males seems to be comparable. In the Sumatran population, half of the offspring in last 15 years were sired by unflanged males (Caldecott, Miles 2005). The arrested development was long believed to be a genetic anomaly (like dwarfism) or an environmentally induced adaptation (due to food shortage etc).

According to Maggioncalda and Sapolsky, in male orangutans the cause of arrested development is in fact the animals' social environment. The presence of dominant adult males seems to delay the maturation of adolescent males in the same vicinity. It was believed that it was a stress-induced pathology, arrested development due to harassment by adult males. The more recent studies, however, suggest that arrested development among orangutans is not pathology but an adaptive evolutionary strategy. The arrested adolescent males are capable of impregnating females, and by staying small and immature (in terms of secondary sexual features), they minimize the amount of food they need and lower the risk of serious conflict with adult males. Of course, there is a disturbing aspect to this strategy and that is the fact that the sub-adults do indeed copulate forcibly with females. In other words, they rape (Maggioncalda, Sapolsky 2002).

Further reading on this phenomenon reveals that (according to ElizaBeth A. Fox) copulations initiated by sub-adult males increase during months of high fruit abundance, and most mating attempts were directed toward females with weaned infants. As Fox states further, females who stayed in proximity to

adult males received less harassment, while this adult female/adult male "alliance" did not always result in mating between the two (Fox, 2002).⁶

Therefore, as we can see, the fully mature males do not necessarily mate and the sub-adult males do not necessarily copulate "unsuccessfully" from the reproductive point of view. The reproduction, as well as the underestimated social system of the Pongo species, is apparently far more complex than originally assumed. One more note on the intriguing sexual practices of orangutans: "rape" is very different from rapes in humans. Male orangutan "rapists" were never observed to intentionally harm the female during copulation (Maggioncalda, Sapolsky 2002), and the question of some "implicit consent" not being obvious to an observer may be a factor.



(Sub-adult Sumatran male, Pagi (Zoo Prague), photo by author, January 2009)

⁶ Fox (2002) further proposes the idea that Females initiate protective services by adult males, in other words, it is a form of social tactic that female orangutans use to reduce sexual harassment.

1.4 Social Behavior

Orangutans in general do not form large social groups, although the Sumatran orangutans seem to be more sociable than the Borneans as studied by Biruté Galdikas. This difference is again explained by ecological factors. The abundance of fruit, particularly figs, in certain regions of Sumatra promotes more food sharing and lessens the competition for food. The areas of high fig tree density are also natural "meeting points". All these factors favor greater sociality (Caldecott, Miles 2005). As far as Bornean orangutans are concerned, Galdikas has reported that adult males are completely intolerant of each other. Grouping occurs between females and their dependent young. Males and females come together only to mate (90% of all adult male/female encounters are sexual consortships (Galdikas, 1985)), and otherwise they do not associate with one another. Adolescent females are generally the most sociable and usually travel together after encountering one another (Galdikas in Nadler 1996). Adult females tend to intimidate the adolescent females, and such contact is therefore very rare. Galdikas reported long-term associations between adolescent females and sub-adult males that did not result in any sexual attempts. He also reported short-term associations (less than a day long) that often involved resisted attempts at mating.

Males' home ranges differ according to author. Some authors state them to be from 0.5 to 0.6 sq km (Goldberg, J. 1998), while other sources claim them to be as big as 3 sq km in size (Schwartz, 1988). As for the size, the estimates might vary greatly, since they are too large to monitor completely (Caldecott, Miles 2005). These territories overlap the ranges of several females, even of other males, although the confrontations tend to be violent (Caldecott, Miles 2005). Males demark their territory by loud calls and seem to avoid encounter (Goldberg 1998), but can not be considered "territorial" *sensu stricto* since the males' ranges are not defended consistently.

Though somewhat more solitary than most great apes, orangutans display a wide range of interactions. Driven by their feeding needs, they have been observed forming aggregations in large fruiting fig trees while fig foraging. Individuals in these aggregations may engage in scrambling or other contest orientated competitions.

We shall now discuss some particularities of their social life in captivity. McNulty examined distancing behavior in captive orangutans. A zoo is a potentially high contact environment, and normally atypical for an orangutan. McNulty observed animals in Woodland Park Zoo, Seattle, Washington for 30 hours. The animals counted 1 subadult male, one adult male, and three adult females. Animals preferred to be solitary for more than 79 percent of time, especially in outside enclosures (McNulty, 2002). Since there is no complete ethogram, allow me to use the full table of distancing behavior, as adapted from Poole found in McNulty:

Ethogram of Orangutan Distancing Behaviors*

Behavior Code Definition and/or Description Distance to Closest Conspecific

Contact C A stationary individual who is touching a conspecific with any part of the body (includes grooming and social play). This category includes sexual behavior, defined as pelvic thrusting by a male against another individual. Touching.

Proximity 1 PX1 Two or more individuals are within one arm's length (about one meter) but not in physical contact. This category also includes supplanting behavior, defined as one individual that walks toward a conspecific, the latter gets up and moves away. Within 1 meter.

Proximity 2 PX2 Two or more individuals are within one to three meters. Between 1 and 3 meters.

Alone A Separated from all other individuals by three or more meters. Individuals may be engaged in various behavioral states or actions including forage/eat, self-play, object/tool manipulation or play. This category includes solitary play, defined as Making vigorous movements such as bouncing, twisting, rolling over and over, and running rapidly around but not making contact with conspecifics. More than 3 meters.

*Adopted from Poole [1987].

1.4.1 Communication

Orangutans have an interesting vocal repertoire. Most notoriously known is the male "long call" (MacKinnon, 1971 in Schwartz, 1988) that probably serves both as a territorial mark and as an estrous female attractor.⁷ A variation to this call is "the fast call" a vocalization very similar to the long call, composed of a long string of acoustically similar units, but delivered in a faster tempo (more units per time) (Galdikas, Insley 1988). In addition to vocal communication, tactile communication is used by these animals. Social grooming is an important activity in all primates. Facial expressions, gestures, and body postures are also used.

To my knowledge, there is still no complete ethogram of orangutans. Most of the assumptions are made based on the behavioral ecology of the species. As far as non-verbal communication is concerned, the repertoire of visual gestures was considered relatively small in comparison to terrestrial great apes, since their arboreal lifestyle restricts the range of vision and hence diminishes the importance of visual stimuli. On the other hand, the relative complexity of their social structure, in terms of unpredictability of social encounters due to their relatively egalitarian and somewhat solitary lifestyle, could compensate this deficit. The variety of gestures in confrontation with the "unfamiliar" could therefore be greater than in other species of apes, which live in a more stable group with more rigid hierarchy and more stereotyped social patterns. Their cognitive capacities point in the direction that a rather evolved system of non-verbal signals might be at place (Liebal, 2007).

The actual repertoire of gestures has been poorly investigated. MacKinnon has described a few facial expressions. Rijksen states that there are a number of gestures and postures involving a taxis component with reference to social partners, such as peer food-begging for example. In Liebal's study (Liebal, 2007), 16 orangutans (10 adults, 3 sub-adults, 2 juveniles and 1 infant out of

⁷ (To listen to Orangutan long call, visit http://www.orangutan.com/orangutanfacts/orangutan_facts.htm)

which 4 males and 12 females, all but one born in captivity) were observed by the traditional focal animal sampling method, 10 hours per individual. A total of 29 gestures were observed (14 tactile and 15 visual). Visual gestures included:

- Approach face (stare at mouth, rarely at the eyes in proximity)
- Bite intention (approach with open mouth, no physical contact)
- Extends arm (towards recipient)
- Headstand
- Hit-intention
- Hold hand in front of mouth
- Jerking body movements
- Offer arm with food pieces (pre-chewed food inserted in fur)
- Offer body part (for grooming)
- Offer food (extent arm holding food close to recipients mouth)
- Present genitals
- Present object
- Shake object
- Wave arm

Tactile gestures included:

- Bite in hand (gentle)
- Embrace (frontal or lateral)
- Formal bite
- Gentle touch
- Hold tight
- Lip touch
- Nudge
- Pull
- Push
- Face on face
- Hand on hand
- Slap
- Throw objects
- Touch with genital region

This study concludes that orangutans indeed use a wide range of different gestures across functional contexts, ¾ of the total volume of gestures being tactile, mainly in the context of access, affiliation, agonistic behavior, and play. Orangutans incorporate objects into their gesticulation (present or throw objects, or use them as tools for/in social interaction - for example the use of branches to hit one another). This study also reported a relative lack of greeting gestures and other behaviors initiating social interaction, which is explained by their semi-solitary lifestyle. However, in my brief personal experience, I noticed behavioral patterns that I interpreted as "greetings". It seems unlikely that animals living in a fission/fusion social system⁸ should lack a "mannerly" routine that prevents conflicts.

1.5 Locomotion and Food Habits

Orangutans are active during the day (diurnal) and are almost exclusively arboreal. They can be found at various levels in the trees. They locomote by brachiation (swinging on branches). They construct a platform-style nest 40 to 60 feet high in a tree on which they sleep. They can not swim. Orangutans are primarily frugivorous. They wander alone or in small groups as the fruit ripens. Figs make up an important part of the diet, particularly those known as the 'strangler' Ficus. Orangutans also eat other kinds of vegetation, such as leaves, bark, buds, and flowers. Occasionally they also eat mineral-rich soil, insects, possibly eggs or even small vertebrates. Because they are frugivorous, these animals play a significant role in seed dispersal.

1.6 Conservation Status

Pongo pygmaeus (all subspecies) are qualified as EN A2cd+3cd+4cd "ENDANGERED (EN) - A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future." (A=population decline, b, c, d are indexes of abundance, continuous decline in quality of habitat, level of exploitation.) *Pongo Abellii* is classified as

⁸ In primatology, a **fission-fusion society** is one in which the social group, reach quite large numbers as individuals gather together to sleep in one locality, but forage in small groups in separated locations during the day. This form of social structure occurs in several species of primates as well as carnivores, ungulates and fish. These societies often change their size and composition.

critically endangered "CR A2cd", since there has been an estimated decline of over 80% over the last 75 years. Both are listed in Appendix I of CITES.⁹ Bornean and Sumatran orangutan populations have been declining in both range and numbers for years. The species is now in danger of becoming extinct. Partially due to hunting and poaching, but even more importantly, particularly from the possible restoration point of view, the population is being devastated by the destruction of their natural habitat through deforestation.

2 Problems of definition

In this thesis, I shall operate with quite a few terms that require not only a thorough definition, but in fact a philosophical analysis. Precisely because I find this topic very shaky ground, I shall call upon authorities in the field to justify my framework. To start with, I shall try to assess the key concept of this work, which is the concept of "normality" and "psychopathology."

2.1 Normality

*"Abnormal is so common, it's practically normal."
Cory Doctorow, Little Brother, 2008*

The word "normal" can be understood in at least 4 different ways. Normality as a value, meaning that normal is the ideal. Normality as a statistical measure, depicted by the notorious Gauss distribution. Normality as an individual measure (a patient with a brain injury suffering mild cognitive deterioration - abnormal in his personal experience, but still reaching a solid average IQ by means of comparison to the rest of the population, and statistically normal). And the last but not least, normal as a typological measure, specifically for phenomena that are "normal" in all three above mentioned senses, but clearly pathological "en principe" (for example the anorectic models - they fulfill the "ideal", it might be statistically normal in occurrence etc, but anorexia is inherently a pathological state) (Sims, 2002).

⁹ For further information please visit <http://www.iucnredlist.org/> For further details regarding the classification of status please visit http://www.iucnredlist.org/info/categories_criteria1994#categories

One of the breakthrough works in the field of "normality" definition is that of Georges Canguilhem.¹⁰ The purpose of my empirical data collecting is the desire to enable us to "see" the "problem" the way he defines it: in order to act it is necessary to localize. To see an entity means to already foresee an action. In order to localize, by definition, we need a contrast field. Without contrast, there is no comparison; phenomena emerging are unbearably value free. Canguilhem further says that it is human nature to define, localize, categorize, compare and judge. He claims that our categories of "norm" and "pathology" are one of many products of man's "normative desires" (Canguilhem in Caplan et al, 2004). Despite the somewhat pejorative undertone of this statement, judgment and "labeling" can just as well be a good servant, not only a despotic master. The problem is that the comparison, just like truth or beauty, is in the eyes of the beholder.

Canguilhem draws a very nice example. If a patient comes to see a psychiatrist claiming he is Napoleon, or that he is persecuted by the communists, it can be declared as a symptom for as long as the psychiatrist believes that the man in front of him really isn't Napoleon and is not really persecuted by anyone. Claiming that whatever we perceive is a mental symptom involves rendering a judgment, covert comparison. The observer matches his own ideas, concepts and beliefs with the patient's, all within the ideological frame of the society they live in (Canguilhem in Caplan et al, 2004). So in fact, the term mental illness serves only as shorthand to describe certain types of behavior.

The question arises: what kinds of behavior are regarded as indicative of mental illness and by whom?¹¹ This very notion is crucial for understanding the standpoint of my empirical inquiry. I shall work with intuitive concepts of

¹⁰ Georges Canguilhem (1904-1995) french philosopher and physician, classmate of J.P.Sartre, professor at the Sorbonne. Author of □ Le normal et le pathologique, augmenté de Nouvelles réflexions concernant le normal et le pathologique (1966).La connaissance de la vie (1952). Etc.

¹¹ ...Either the patient himself, claiming that he feels deviating from the norm and by defining this seeks help, or it can be somebody else that declares the person deviant from the norm(relatives, legal authorities, society). Either way, the finding of a mental illness is made by establishing a deviance from a psychosocial, ethical or legal norm, but the treatment is often sought in medical framework. Thus we find ourselves in a situation in which deviation from other than "medical norm" is considered correctible by medical action.

"normality", as found in the tacit knowledge of my interviewees, and I will rely on their ability to make judgments and distinguish the abnormal, for all the practical implication it brings. In other words, if an irrational concept of "this is not normal and the animal shouldn't behave that way" arises, I shall explore the notion as viable information, despite the subjectivity of the observer and the dubious "norm" criteria, since there will be no clear-cut definition of the "pathological" nor a comparison with the "normal majority". I feel allowed to do so because my observers are qualified by years of face-to-face experience with animals and with themselves, confronted with their own cue interpretation. The concept of "norm" sensu Canguilhem enables us to operate outside the "statistical norm" framework. We can work from the clinical standpoint and treat the topic phenomenologically.

To recapitulate: In this work, I shall define the "normal" and "abnormal" solely as subjective judgments of people whom I believe to have enough experience and sound knowledge of the behavior of the animals in their care.

2.2 Psychopathology

We could probably find as many definitions as authors that have ever dealt with the problem. For purely utilitarian purposes, I shall use some of the most common. For instance, according to Sims, it is a systematic study of abnormal experience, cognition and behavior, or the study of the products of a disordered mind. He divides the discipline into two principal branches: explanatory (for example psychodynamic, behavioral etc) and descriptive. It is the latter of the two that I will try to approach in this work. As Sims states further, there are two distinct parts to descriptive psychopathology: observation of behavior and empathic assessment of subjective experience. By empathy he understands a clinical instrument that is achieved by "*precise, insightful, persistent and knowledgeable questioning, until the doctor is able to give account of the patient's subjective experience that the patient recognizes as his own*" (Sims, 2002, p.3)". Clearly, non-human primates can not

produce narration and can not verbally confirm our interpretation of their inner reality. Perhaps apart from the few participating in the great ape language project, they can not even be questioned.¹² But that does not discredit the use of the phenomenological method. In fact, if it were so, it would have to be claimed useless in all the cases where patients do not speak, for whatever reason. I find it a sound assumption that great apes can be, for practical reasons, treated as a non-speaking person of (to satisfy all those who would get offended by my proposed non-superiority of mankind) lower intelligence. (I personally strongly disagree with the notion of attributing any kind of "value" to different adaptations, and I consider human intelligence as one of many, giving us no reason to consider different forms inferior. However, since it has been a long tradition to make such a distinction between man and nonhuman animals, for the sake of getting further in the analysis, there is no reason to consider the apes "less intelligent".)

Since I shall operate with numerous terms torn out of context from human psychiatry, this topic needs to be treated separately. The "nosology" of mental disorders is shaky ground. The term itself could be technically translated as "knowledge of disease" and disease is defined by known ethiopathogeny, course of disease and prognosis (Smolík, 2002). The truth is, however, that when it comes to mental disorders, we can not fulfill these criteria. The psychiatric classification is therefore based solely on a description of symptoms, empirically grouped in order to enable some kind of orientation.

2.2.1 The classification

*"Crude classifications and
false generalizations
are the curse of organized life."
George Bernard Shaw (1856 - 1950)*

Psychiatric classification is supposed to serve three functions: denomination (labeling groups of related phenomena), qualification (that is putting an

¹² (For details on Orangutan language project, please visit <http://nationalzoo.si.edu/Animals/ThinkTank/ResearchProjects/OLP/default.cfm>)

informative value to the labeled category by clear definition of descriptive criteria, such as symptoms, age of onset, severity etc). In this function, we distinguish sensitivity of symptoms (the higher likelihood of occurrence of symptom in question, the higher the sensitivity) and specificity of symptoms (meaning that the symptom is highly unlikely to occur in any other BUT the disorder in question). Third function should be prediction, in other words, prognosis (Smolík, 2002).

The current model of classification faces a lot of just criticism. A "mental disorder" is for practical reasons defined by rather vague criteria, such as the subjective experience of discomfort, loss of self-control, impairment in professional or social functioning etc. Maybe precisely because of this enormous ambiguity, clinicians really linger on "precise" definitions of terms. This ambiguity, however, works in favor of my research design. It follows the same principle as the original categorization attempts in human psychiatry: logical grouping of symptoms, based on observation, declared as such by "theoretically saturated" people. Even in the case of rather well developed human psychiatry, the real life cases are always highly specific, and barely ever fit all the diagnostic criteria. Let there be no mistake about the nature of my findings. This is a preliminary, exploratory research. I do not by any means mean to imply that I could "diagnose" a mental condition in an orangutan. All I'm saying is that there are indeed "clinical pictures" very similar to human symptomatology. Furthermore, the term psychopathology is often used to denote behavior or experience clearly "extraordinary", in other words, those mental phenomena that are rare, and may be indicative of a mental disorder (hallucinations for example) even though the other criteria to determine a categorized disorder are never met.

3 Current state of knowledge in captive primate psychopathology:

Due to a relative lack of literature on great ape psychopathology (even less on orangutans), in this chapter I shall discuss recent findings in a broader context, fully aware of its limited value in inter-species comparison. However,

as a starting point, the research on primates in general shall give us an idea of possible fields of research in the case of Great Apes.

Throughout the entire paper, I operate under the notion as stated in Brune et Brune (2004), that captive great apes suffer from disorders homologous to human psychopathology, that these are in principle treatable and that they indeed deserve treatment.

3.1 How to objectify?

One obvious problem: how to objectify a psychiatric condition, is in fact not only an issue of comparison between nonhuman subjects and human patients. The problem remains untackled also in the cross-cultural comparative perspective. In this paper I shall operate with a subjective perception of "abnormality" as perceived by people whose "computing apparatus", sensu Lorenz (see chapter Ethology), has been fed by years of direct observation. In order to "objectify" the statements, I shall use triangulation with another relevant member of their staff. Details on methodology are treated in a special chapter. Granted, it is good advice to adopt a cautious approach to generalizations, no arguments about that. For the time being, we can consider all the findings applicable solely for the individuals in question; but let's not be paralyzed by our "incomparability" bias. I am convinced that with a decent sample, we will eventually be able to generalize in a useful, helpful way.

3.2 Inter-species comparison

Brüne et al. defines the context of inter-species comparison as follows: *"In using the term psychopathology we are indeed attributing a psyche as the basis for observable, behavioral deviations from the statistical norm. We are assuming that there is a "mind", which is bringing about the behavior of nonhuman and human animals alike. Now what does this mean? When using the term mind or psyche, we do permit for variability, just as the comparative morphologist allows for variability when identifying "hands" in various animals"*

(Brüne et al 2006, p.1274). In order to assess psychopathology in nonhuman animals it is mandatory to have a sound understanding of a species typical behavior including its individual variability. So, the methodological issue of statistical norm is at place, however, for the purposes of this study, I shall adopt a more "clinical" approach, and conditions regarded as psychopathologic should be given something other than a statistical definition. After all, as Brüne concludes: *"In our opinion the deviation from the statistical norm is the first step in identifying candidates for psychopathology. However, we would feel much more comfortable if clinical psychology and psychiatry would reach a point where diagnosis of a psychiatric condition would be rooted in a thorough understanding of psychic functioning, and psychiatric illnesses were defined as deficiencies in psychological functioning,"* (Brüne et al, 2006 p.1275).

The concept of this work shall adhere to the notion that due to sound evidence regarding our biological similarities, comparable function and malfunction can take place. Great apes, being our closest evolutionary relatives, possess anatomical structures and physiology in many aspects similar to our own. The long and complicated ontogeny associated with massive parental investment is also comparable. It is, therefore, justifiable to assume that our psychological functioning, including its defects, may also be similar. *"Many captive great apes show gross behavioral abnormalities such as stereotypies, self-mutilation, inappropriate aggression, fear or withdrawal, which impede attempts to integrate these animals in existing or new social groups. These abnormal behaviors resemble symptoms associated with psychiatric disorders in humans such as depression, anxiety disorders, eating disorders, and post-traumatic stress disorder"* (Brüne et al, 2006, p.1246). However, as far as the statistical norm is concerned, in this paper we use different criteria and normality is treated sensu Canguilhem (see chapter 2.)

3.3 Other primate models

The majority of research has been dedicated to the development and evaluation of animal models of human psychiatric disorders, however, there were some studies that explored at least the most obvious behavioral deviations. The information on Orangutan psychopathology was scarce and hard to find. The following text does not, by any means, represent the full scope of possible psychological disturbances in primates.

3.3.1 "Behavioral anomalies"

This "category" includes virtually any observable deviance in behavior. Please note it has nothing to do with the category F50-F55 in the human psychiatric diagnostic manual. This subchapter includes research on symptoms indicative of psychopathological processes similar to human disorders classified elsewhere, for example, Neurotic disorders etc. (stereotyped movements as possible "OCD symptom").

Malapur a Choudhury performed research on the behavioral anomalies of 11 species of nonhuman primates across 10 zoos in India. They recorded 4 types of abnormal behavior including "floating limb", self-biting, self-clasping, and stereotypic pacing. Additionally there were two types of "undesirable behavior" according to their classification: autoerotic stimulation and begging. The results were that there was a connection between the occurrence of this behavior and the sex of the subject (males exhibited higher levels of undesirable behavior than did females, but that is hardly a surprise since masturbation was in question). Further findings were, however, that animals confiscated from touring zoos, circuses, and animal traders exhibited higher levels of abnormal behaviors than did animals reared in reputable zoos. This piece of information may be indicative of the logical assumption that, a good portion of behavioral syndromes are closely linked to environmental conditions in which the animals are kept. It is a point of discussion whether or not the relationship is causal. From the ecological and evolutionary perspective (all malfunction and "pathology" being naturally

eradicated in the wild as argued elsewhere), I am strongly inclined to believe so.

Several studies on stereotyped behavior, defined as "uniform repetition of a motor pattern that occurs at a higher frequency than considered typical for a species when observed in a natural environment," argue that stereotypes usually indicate that an "animal's psychological welfare is at a suboptimal level" (Marriner, Drickamer 1994). Authors performed instantaneous scans at 30-sec intervals during 20-min observation periods with eight primate species at the St. Louis Zoo to determine frequency of occurrence of stereotyped behavior. They found a stronger connection between the influence of rearing method rather than environmental conditions. So far we have evidence for environmental determination and rearing method/human handling...In the case of the zoo, the two are often intertwined. It should be brought to attention that works on stereotyped behavior in primates appeared as early as in 1963(Davenport and Menzel's work on chimpanzees kept in restricted environments) or even in the Harlows' experiment, some of the behaviors recorded seem to fulfill the criteria for stereotyped behavior. (Hinde, 1974)

As for the clinical picture, Hugo et al.(2003) claim that stereotyped behaviors are reminiscent of human obsessive-compulsive or posttraumatic symptoms, which usually respond to selective serotonin reuptake inhibitors. They tested this hypothesis using Fluoxetine, as one of the SSRI drugs used in human psychiatry on 10 vervet monkeys. Subjects were randomized, and then 5 were given the drug and 5 were a control group. The occurrence of stereotyped behavior was recorded by a rater blind to the medication status of the subjects. The results were that Fluoxetine significantly decreases stereotypic behavior in primates. I am not aware of any such research on orangutans, but since the neurophysiological distances between men and apes is even smaller, there is a good probability of similar outcomes.

I found some further reading on stereotyped behavior and often connected self-injurious behavior in captive rhesus monkeys. Lutz et al (2003) have made

some seriously alarming observations: out of 362 animals surveyed, 321 exhibited at least one abnormal behavior, the most common behavior being pacing. Animals with a veterinary record of self-injury exhibited a greater number of self-directed stereotypies than those that did not self-injure, so there was a clear link found between the two. A correlation was found between a higher occurrence of stereotyped and self-injurious behavior and isolation/individual housing at early age, but also with a number of blood draws, nursery rearing etc. The author concludes that the development and maintenance of abnormal behavior in captive primates needs a multifactorial consideration, that some of these factors are intrinsic to the individual (e.g., sex effects), but others are linked to colony management practices, rearing conditions, and research protocols, in other words human handling (Lutz et al, 2003).

As I mentioned in the introduction to this chapter, the majority of comparative studies regarding psychopathology were naturally focused on finding and evaluating suitable animal models for human disorders. However, when reading between the lines, various relevant information supporting the validity of the reverse model can be revealed. For example: As far as the similarities in coping with stress between animals and humans are concerned, there is indirect evidence that there are indeed stress related pathological responses similar to human maladaptation.

Higley et al (1991) studied alcohol consumption in rhesus monkeys. Twenty-two 50-month-old rhesus monkeys were provided free access to an aspartame-sweetened 7% ethanol solution and an aspartame-sweetened vehicle before, during and after social separation. There were differences in rearing between groups (mother vs. peer reared), the results of the study were much like we would expect in human adolescents out of adult control: peer-reared subjects consumed significantly more alcohol than mother-reared subjects. More importantly for the purposes of this paper however, is the fact that when stress was increased (in the study via social separation, but other environmental stressors can be hypothesized) mother-reared animals

increased their alcohol consumption to a level nearly as high as that of peer-reared monkeys. A strong positive correlation between alcohol consumption and distress behaviors was also observed.

In other words, in these monkeys, even with normal upbringing, environmental factors would trigger a pathological coping mechanism (alcohol consumption) much like we can observe in humans subjected to extreme pressure. The study also used biological indices of increased stress, (plasma cortisol and corticotrophin) that were positively correlated with alcohol consumption. If the question of subjective experience of pressure or distress is considered, we might conclude that alcohol consumption might be a behavioral indice of subjective suffering. Nonhuman subjects appear to experience and evaluate their "well being", and they also use mechanisms to "alleviate" suffering when given the means to do so. Again, I have not found any similar study with great apes.

In addition to stereotyped behavior and alcoholism, there has also been research on the eating disorder circuit. Eating disorder symptomatology can be found in various captive species, monkeys and apes in particular. The direct observation of regurgitation and reingestion were operationalized as follows (in Gould, Bress, 1986):

Regurge/reingest: regurgitation of food into mouth, hand or substrate followed by reingestion of that food. This includes preregurgitation behaviors, for example, clearing space for the regurgitation, shaking the head, twisting or grabbing the stomach, bending over, or rocking prior to regurgitation. R/R may involve other animal's regurgitant.

Captive gorillas were also studied. Questionnaires regarding 117 gorillas at 17 zoos hint that social deficits during early development contribute to the occurrence of R/R later in life. Not surprisingly, wild-caught and captive-born/hand-reared gorillas show higher incidence of r/r than mother-reared infants (Gould, Bress, 1986).

3.3.2 "Affective disorders"

Before we even consider affective disorders in animals, we first have to recognize the existence of emotions in them. I do not have space to bring proofs, maybe only a few opinions:

Bateson states 6 proofs for the existence of subjective experience (including emotions) in animals:

(1) They possess receptors sensitive to the same stimuli as in humans. (2) They possess brain structures to analyze them accordingly. (3) They use the same type of neurotransmitters. (4) Analgesics, for example, reduce responses to noxious stimuli and are sought by animals if given a chance. Both humans and animals try to avoid noxious stimuli and both learn how to associate neural events with noxious stimuli through conditioning (in Plutchik, 2005, p.231). That would be the organic basis. (5) *"In the chimpanzee, we have a full picture of human anger in its three main forms: anger, sulking and temper tantrum...there is a purposive element that is also clear in a year old chimpanzee infant who takes surreptitious looks at his mother in between its attacks of choking to death or pounding his head on the floor."* (Hebb in Plutchik 2005, p.227.) (6) Not only are animals capable of strong emotions, but they even seem to demonstrate the understanding of the impact that these emotions provoke in others. In other words, they empathize.

We could talk in great length about altruism, happiness or love in animals, but for this paper, it is the "pathological circuit" that is relevant. It is important to be able to define and operationalize symptoms indicative of a pathological process and "label" it, at least preliminarily. There is always a question of the validity of this "label". Hebb, Masson and McCarthy argue that the validity lies in a practical value of being able to predict the animal's behavior. They will never be perfect, neither in the terminology nor in its operationalizations. Maybe people were unable to describe what exactly, down to every movement of the eyelid, depression in an animal looks like...That would be a scientific ideal. However, caretakers operate with their own gestalts, often

completely unaware that they are doing so. These consist of individually specific cues, which enable them to "read" the animal's "state of mind", every day.

There will always be attempts to generalize, but the majority of statements permit for a great variability, comparable to the acknowledged individuality of humans. "*...individual signs of the development of frustration responses are quite varied. They include the animal scratching himself, ducking his head, ...restlessness, moaning, whimpering and erection of hair...knowledge of the species has considerable importance in the interpretation of the associated behavior of emotional excitation...* (Hebb in Plutchik, 2005, p.228)." I would like to add that after my preliminary research, when it comes to apes, or orangutans, since they are in question, individual variances between animals was enormous. In the eyes of the caretakers it was far more important than "species typical behavior", which they had only limited knowledge of, due to the limited number of individuals they have encountered.

A common method for identifying emotions in animals is displacement behavior record. DB is a behavior of no obvious relevance to the situation in which it appears. In primates it is often scratching, yawning, self-grooming and body shaking. There is sound evidence that this behavior is responsive to anxiety reducing drugs (Plutchik, 2005).

According to Rosenblum and Paus (1984) nonhuman primates demonstrate behavioral and physiological reactions to social separation that suggest symptoms of clinical depression. It can be argued that in the case of certain affective disorders, including depression, nonhuman primate response to separation meets the criteria for validity. Foa et al. state that disturbances observed in animals subjected to unpredictable and uncontrollable aversive stimuli resemble post-traumatic stress disorder (PTSD) symptoms, and may be used as an animal model of this disorder. Animal symptoms indicative of generalized fear and arousal, discrete fear of a conditioned stimulus (CS), analgesia, and avoidance seem analogous to the PTSD symptom clusters of

persistent arousal, re-experiencing, numbing, and avoidance, respectively. (Foa et al. 1992)

Tarou et al. state that social separation negatively influences welfare via immunosuppressive effects that compromise physical health, corticosteroid increase (physiological stress response indice) and increased stereotypies/abnormal behaviors that compromise behavioral competence of the animal (Tarou et al 2000). Their report on a case study focused on maternal responses to separation, they name behavioral symptoms of primate infant distress, very similar to that of a human child. In the protest phase, there is an increase in vocalization, locomotion, and stereotypic or abnormal behaviors after separation. After some time, a despair phase follows, typical by apathy, a decrease of vocalization and locomotion and an increase in self-directed behavior. These responses have been observed not only after the infant was separated from the mother, but also after the separation of non-related primate infants, preadolescent juveniles and even adults after separation from their cagemates (Tarou et al, 2000). Even though the case study conducted concludes that there were no signs of despair in the mother, it is well worth mentioning, that the juvenile daughter in the case study was 6 years old. In nature, juveniles disperse from their mothers around this age naturally; hence the relatively normal outcome is understandable. I have not found any such research on maternal responses to separation from a new born, or a very young baby, however, I have addressed this issue in my empirical inquiry.

4 Captivity

*"I can't mate in captivity."
Gloria Steinem (1934 -)
on why she never married*

The subject of my research is well defined by the simple fact that animals of my concern are held in conditions quite distant from their natural surroundings. In this chapter I shall discuss the issue from four different standpoints. First, we can exploit the notion of captivity solely as a "spatial

limitation": as a sum of environmental factors with no further implications. Secondly, the suggestive prison parallel should be addressed. Apart from the rough similarities, I shall focus on "discipline" from a phenomenological perspective. The third outlook proposes a comparison in the broader context of animal welfare and draws parallels between the captive lives of animals in intensive livestock production. I find this point relevant, since it depicts the overall status of animals in our society and further illustrates the notion of "discipline". Finally, zoos are discussed in a historical perspective, which provides an introduction to the ethical questions that arise along the lines.

4.1 Capsule habitat

In many aspects, life in a zoo resembles life in a capsule habitat. By definition, capsule environments are isolated, confined environments (ICE). Suedfeld and Steel specified that in most cases these environments are extreme (their physical parameters are substantially outside the optimal range for survival) and/or unusual (meaning that conditions in C.E deviate seriously from the accustomed milieu).¹³ Capsule environments are typically remote from other communities (clearly, its a long way from Prague to Borneo), and are located in places where the physical parameters do not match normal life, hence the life supportive circumstances are man-induced (temperature, humidity etc in the pavilion). Capsule habitats are difficult to enter or leave (for most animals there is no such option, so their "difficulties" equal impossibility). Furthermore, they are inhabited by artificially composed groups. This is very often precisely the case of captive animals, due to the human management that decides with whom they will share their limited space and for how long. Finally, the sad fact of enclosures, their surroundings may be permanently uniform (Suedfeld, Steel 2000).

¹³ "ICEs located in non-EUEs include prisons, prison camps, resource-extraction communities (e.g. mining and logging camps), the habitats of hermits and lone prospectors, transoceanic vessels, stimulus-restriction laboratories, spaceship and other simulators, and the control areas of missile silos. ICEs located in EUEs that do involve extreme and unusual physical conditions include deserts, unpopulated islands, mountain peaks, and capsules." (Suedfeld, Steel 2000)

The various adverse effects of capsule habitats were stated in the study. These effects include physical stress resulting from lack of normal physical activity, a decrease of brachiating in orangutans, no foraging, no nest building, and an overall decrease in activity often resulting in weight gain (obesity). Additionally, their captive condition and human husbandry often disrupts their normal reproductive cycle, which in turn threatens the survival of females.¹⁴ Immune system disruptions due to the relative sterility of their environment are also common (for example, a great susceptibility to human diseases, though it should be noted that this applies not only to the captive population but to the free-ranging as well). Human diseases can threaten both, which should be taken into consideration in the context of conservation endeavors facing an expanding tourist industry in the area. Furthermore, the psychological disturbance resulting from high population density in a very small area (particularly interesting from the orangutan point of view, since these animals, especially adult males, are subjected to social stimuli and the normal dispersion of individuals is grossly violated).

Stimuli monotony, both physical and social, is another crucial part of overall distress in confined spaces. Troublesome communication and common conflicts (in the Slovak language quite adequately nicknamed "the submarine disease") are a common occurrence. Additionally, there may be distorted time perception, cognitive impairment, difficulty with schedule and above all, a lack of discipline. All of this is just a brief intro into how significant a factor the simple phenomenon of confined space may be.¹⁵ Now, all these findings are torn out of their context, of course, since we can hardly compare the psychological coping of a trained astronaut to that of an orangutan, but that may be precisely because we attribute less evolved mental capacities (including coping) to nonhuman primates, a question of even more acute

¹⁴ See Leif Cocks FACTORS INFLUENCEING THE WELL-BEING AND LONGEVITY OF CAPTIVE FEMALE ORANGUTANS (*PONGO PYGMAEUS*) for further details and statistics

¹⁵ The authors of the study stated there are in fact also "salutogenic effects of confinement" meaning that the people on spaceship missions or in polar regions often, in retrospect, find the experience highly rewarding, but we can probably agree that this would hardly be the case of any captive animal.

discomfort is at place. The possible psychopathogenic effect of life in captivity is therefore obvious.

Various authors argue that psychopathology might just as well occur in free-ranging populations. However, if we agree that pathological deviance in behavior is maladaptive, these individuals are less likely to survive and reproduce; the morbidity of the population is thus kept under control and is not likely to be significant. On the other hand, if the deviance serves the proximate and ultimate purpose, from the evolutionary perspective it can no longer be considered "pathological". Infanticide may seem "psychopathological" from our moralistic anthropocentric perspective, but may in fact be highly adaptive in certain cases and therefore shouldn't be regarded as a "disorder". For example, Van Schaik (2000) treats three conditions under which male infanticide increases the males' reproductive gain. Infanticide is adaptive if: (1) the chances that the male sired the offspring are close to zero. (2) The female can be fertilized sooner than she would have been. (3) The males probability of siring the next infant increases, for whatever reason (for example, changes in reproductive status), (Van Schaik, 2000). Having said this, I argue that we can indeed treat the psychopathology as a function of captivity/man-induced changes, compared to "normal" functioning.

4.2 Prison

Apart from some similarities between the capsule habitats as defined by environmental psychologists (a relatively morally neutral framework), there is one more disturbing parallel that is asking to be addressed. When entering the zoo, one can hardly ignore the resemblance between the cages for animals and prison cells. To take it matter-of-factly, the subjects of both institutions share quite a few things: both live in conditions very much different from their natural habitat, both involuntary for a long period, and some for life. They both have to cope with spatial limitation and a strict regime. They are both subjected to discipline, which alone can significantly influence their

behavior (and evidence points in the direction that it really does).¹⁶ This work is focused on psychopathology, and when exploring available literature on prisons, various abnormalities arose as distinctively typical for prisoners.

Two of the best-documented psychopathologies for captive animals are stereotypies and self-harm (self-mutilation). "Many forms of psychopathology in higher animals and humans include the production of maladaptive, repetitive behavior. Behavior, which is both repetitive and excessive in amount, can be described as stereotyped, whereas behavior which represents a restriction of behavioral possibilities without excessive production, can be described as perseverative. Both types of repetition can result from pathology in the neural mechanisms that control either the production of motor output or the organization of behavior at a higher level. A number of forms of repetitive behavior can be induced environmentally" (Ridley, 1994). As he states, further confinement in adulthood results in a functional disorder that subsides when normal conditions are restored, but confinement in infancy may have a permanent effect on the organism's ability to interact in a flexible and creative way with its environment (ibid).

Self-mutilation is regarded as a deliberate act of violence against one self, without suicidal motivation, that results only in shallow, light injuries that do not threaten life. Self-harm in people correlates positively with emotional disturbances, developmental disorders and, above all, behavioral maladaptation to one's surroundings (Thomas, Leaf et al. 2006). It is frequent in prisons and often occurs as a result of stereotypies in confined spaces. We can find all sorts of injuries that result from these repetitive action patterns. Tail and limb biting was documented as well as fur plucking until bald. Rhodes (in Thomas, Leaf et al. 2006) describes possible reasons for this pathological behavior in human prisoners. According to this author, the prisoners live in the

¹⁶ There are circumstantial evidences that some psychoapthological traits can be a function of space/movement limitation. Well documented for hog industry Novek states:,"Perhaps the strongest case for animal suffering under intensive confinement has been the prevalence of the physiological and behavioral disorders called stereotypies" (Singer, 1991; Baxter, 1989) These abnormal, repetitious, and, apparently meaningless behaviors—gnawing, bar biting, and tail biting—may go on for several hours each day (Halverson, 2001).

state of minimal physical existence, they are denied access to common comforts, they are radically limited in activity and they have limited or no control over other peoples access to themselves. Prison is also numbingly boring. Self-harm provokes at least some change. We can hardly attribute this motivation to captive animals (even though I have spoken to quite a few dog owners and it seems like a rather common practice that their pets simulated illness in order to gain some more attention). Nevertheless, it is a point of discussion whether this pathological behavior can be alleviated by adjusting the debilitating environment of captivity. In fact, the whole concept of environmental enrichment is based on a notion that sensory and intellectual stimulation positively influences the well-being of animals.

Another environmentally induced disturbance so strikingly common in prisons is the temporary deviance from "normal" sexual functioning. In human prisons, excessive masturbation, homosexual encounters between otherwise heterosexual partners and sexual violence of various types are common (Money, Bohmer, 1980). When it comes to animals in captivity, the disruption of normal sexual and reproductive behavior is also flagrant, a phenomenon well known to all who unsuccessfully attempted to breed certain species in captivity. To make the prison sexual pathology comparison clear: both prisoners and captive animals are choice-deprived when it comes to mating partners. They both share limited space that makes it close to impossible to avoid undesired sexual contacts. And by definition, the overall "abnormal" circumstances logically give rise to "abnormal" behavior, including the sexual.

There are also other disruptions to the sexual behavior of captive animals, but they can hardly be attributed solely to confinement. They are far more likely to be a result of "abnormal" ontogeny of individuals subjected to upbringing by humans. Other problems also result from the zoo husbandry practice. For example, in orangutans the average inter-birth interval varies according to author (see zoological fact file), but reaches up to 8 years. In zoos, we observe an interval as short as two years due to the hand-rearing of offspring.

Furthermore, hand-raised captive males seem to have difficulty mating. (It could be hypothetically attributed to a lack of natural dominance, missing adult models or fixation on humans – a failure to "recognize" appropriate mating partner.) The inability to copulate and violence can be observed even in the fully adult man-raised males. Sexual violence is not a rare occurrence between orangutans, but it is usually the sub-adult males that tend to practice it. Technically, the fully phalanged male should be an attractive mate and hence doesn't need to force copulations. Another interesting question, however, is the impact of forced social encounters between males and females in confined spaces. Free-ranging adult males do not seek the company of females and young (apart from mating occasions), but individuals in zoos are confronted with their permanent presence in intimate proximity. In other words, in the wild social encounters are for the most part sexual and, as a general rule, rather rare (at least between adult males and females). In the wild, male invitation and female response/choice comes into play. It seems logical that the disturbance of their social system (especially the impossibility to avoid contact and choice deprivation) can result in disturbed sexual behavior.

As far as other deviances in "normal" sexual functioning, I have observed a male orangutan masturbate with a plastic bottle in a rather persistent manner¹⁷, but I do not feel competent to estimate whether this behavior qualifies as "excessive" or deviant in any way. I hope to address this issue in the empirical part of this work. Either way, with a closer look at the pathogenic environmental effects, I find justifiable similarities between zoos and prisons, without any intention to vilipend either. One of the sad differences is the fact that human prisoners bear responsibility for their troublesome circumstances, while animals find themselves behind bars without a trial. It is precisely this point that shifts our framework from morally neutral to ethically highly disputable.

¹⁷ See picture file for „evidence“

4.3 Discipline

So far we have discussed physical environment factors, now let us take a closer look at what the sociologists have outlined as the concept of a "disciplinary society" that is typical for both institutions.

"The goal of social organization in disciplinary society is the efficient regimentation of docile bodies that - in the industrial sector - allows for continuous production under management control. The subjects of discipline lose control over their output and pace of production. In industrial societies, discipline tends to be increasingly technical in nature. This means that discipline is imposed on subjects through technical controls embedded in machinery, structures, and technological processes," (Edwards in Novek, 2005 p.223). According to Novek, these societies are not exclusively a question of the penitentiary system, in fact, many of the attributes can be found in hospitals, schools or factories.

By definition, these institutions impose rules and limitations on their subjects, more or less violating their natural tendencies to maintain order and "productivity" of the system. The similarity between captive people and captive animals was made obvious. According to Foucault (in Novek, 2005), in disciplinary society, bodies are reduced and dissected to their constitutional parts for easier manipulation, control or reeducation. To reach this goal, thorough time control is exercised (daily regime, feeding times, and breeding) and physical movement is limited to a minimum (a fact of confinement). Time and space turn into tools of control, their bodies are constantly supervised, there is intense pressure to fit in the norm and the hierarchal structure of authority has executive power over the subject. E Thus, enforcement is not only a means of punishment. Manipulation and control is justified as necessary treatment for the sake of those subjected to it. Isolation, segregation and other means of control also take place.

4.3.1 Zoo discipline

To make the comparability absolutely clear: in the case of zoos, the animals are subjected to all sorts of routines, starting with feeding procedures – the timing of which is of course determined by the caretaker. Their basic hygiene alone requires quite a choreography of movement between units divided by electronically controlled sliding doors (one of many safety measures that restrict contact with the caretaker). Furthermore, the animals can be observed, manipulated with, sedated or transported at any moment of the day. Their reproduction is under human control and their autonomous decision-making suppressed to a minimum. The groups are formed by authorities and can be divided temporarily or permanently according to the judgment of the humans in charge. Therefore, the question arises whether this discipline, routine, and the deprivation of autonomous decision-making, can be another psychopathogenic agent of life in captivity, especially in the case of great apes.

In my personal experience, the zoo had a different face, a lot more "humane" one, where the caretakers would really do whatever was in their powers to make their animals happy. They were warm-hearted people, truly affectionate with their wards. Some worked in the same zoo, and with essentially the same animals, for their entire professional lives. Nevertheless, the philosophical dilemma remains: do we or do we not possess the right to exercise our will over other sentient beings? There is no question in terms of whether we "can" (and in certain cases legitimately) take custody over nonhuman animals, but the question stands whether we "should", and if so, what should be the rules of conduct with them. There is no consensus over animal competencies, their awareness, and their capability to think and feel. It is, however, my strong conviction that it may be the very paradigm shift in the ethical and philosophical considerations of animals that can really make a difference.

Shiva (1997) states: "*When organisms are treated as if they are machines, an ethical shift takes place; life is seen as having instrumental rather than intrinsic value. . . . The reductionist machine view of animals removes all barriers of ethical concern for how animals are treated,*" (in Novek 2005, p.228).

4.4 Zoo in historical perspective

"Zoo: An excellent place to study
the habits of human beings."
Evan Esar (1899 - 1995)
Esar's Comic Dictionary

Last, but not least, we shall take a look at the history of zoos. It is long and complicated, and not really that important for the purpose of this work, but I shall, nonetheless, outline a very brief version, solely to illustrate the dubious motivation of people throughout its history. In the very beginning, the "longing to possess" and to exhibit one's extravagant wealth motivated "animal collectors". However, long before the first aristocratic "seraglios" appeared in 14th century, Italy, or later "maison des lions" in France, the domestication and taming of wild animals was common practice in ancient Egypt 4000 years b.c. The sacred animals were kept in proximity or even inside the temples. Two millennia later exotic beasts like lions and cheetahs were used in hunting and warfare. Queen Hatasou (Thebes) is supposed to have founded the first zoo ever. Since then it has been common practice to keep exotic animals in palace areas.

With expanding travel and warfare, more and more exotic species were captured in the wild and were brought to the countries of the great conquerors as a trophy (Baratay, Hardouin-Fugier, 1998). Antiquity brought about exotic animals as a display of luxury, symbols of status, as well as the infamous circus games. Roman consuls of the 3rd and 2nd century b.c. sophisticated the sadism by the odd custom of parading and massacring the elephants and big cats captured during their campaigns to demonstrate the power of Rome (Baratay, Hardouin-Fugier 1998). This custom gave rise to temporary "seraglios", where the animals used for the triumphal marches, as

well as for the gladiatorial combat, were kept. To cut this very long story short, the very beginning of animal possession is marked by considerable cruelty. This tradition went on for centuries, as beasts were kept imprisoned to serve as exotic hunting targets or symbols of wealth. Further down history, the exotic animals became an important diplomatic tool, being presented at luxurious gifts to kings and queens. Some time later this custom evolved into a flourishing trade. Further expansion of travel, and the golden age of colonial era, fed the market with new animals.

On top of the dubious purposes that the animals were to serve, great numbers died during transport, or simply didn't survive the acclimation. This is where, in fact, there is a historical record of a Bornean orangutan that disappeared in the Indian Ocean (in one of many shipwrecks), while being transported to be examined by Dutch scientist Peter Camper. Slowly but surely, the princely menageries became a ground for scholarly work. Inspired by Descartes and Bacon, the new era of observation of the living and dissection of the dead gave rise to comparative anatomy and systematic zoology (Baratay, Hardouin-Fugier 1998).

It was Dutch doctor, Nicolas Tulp, who gave the first description of an anthropoid ape in 1685. It was the golden age of the mechanistic conception of living beings, derived from the Cartesian philosophy of the era. The living machines were to be observed in function and dismantled into parts in order to understand the inner-processes of these functions. Almost a century after the first description, Peter Camper (1722-1789) studied live orangutans, particularly the mechanics of its mouth, which he stated he would never have been able to do on a dead specimen. He also studied their kinetics (joint movement, running, squatting, finger retraction) and came to the conclusion that this species is "constructed" to be arboreal (Baratay, Hardouin-Fugier 1998). I suppose this fact could have been revealed by the simple observation of its natural habitat; but, nevertheless, let us infer that interest in exotic animals moved to a somewhat nobler purpose, from pure sadistic

pleasure to satisfying ones scientific curiosity. However, as far as the welfare of animals is concerned, there had been very little progress.

The capture mortality could not even be calculated. James Fisher, an assistant manager of the London Zoo, estimated that one captured orangutan eliminates four in the wild, of which three would be potential mothers (Baratay, Hardouin-Fugier 1998). There were also deaths during transport, mortality due to unsuccessful acclimation, and finally, the very sad short life expectancy in confinement, all of this casting a great shadow on the existence of zoos. In fact, as late as the beginning of the 20th century, it has been considered a success to raise an orangutan up to 7 years of age.

Obviously, the zoo as an institution has evolved enormously since then. Improved sanitary conditions, veterinary care and nutrition have greatly reduced the mortality rate. Zoos now reach a higher average life expectancy in comparison to life in the wild.

There has also been lay public pressure to improve the environmental conditions in zoos. It was, after all, the public demand that created glass expositions instead of traditional cages. The implicit motivation might have been the liberation of the animals, but what it really brought was only an illusion of freedom. It was again, people, not the captive animals, whose suffering was eased. Now that there were no bars, people could walk around the expositions guilt-free, while, especially the monkeys and apes, with a lack of bars, lost a part of their climbing playground. It can also be disputed whether the bars may have served the animals as something that protects them from the invasion of visitors, but it is probably true that the glass better insulates them from noise and the odors. Then again, we can not exclude the possibility that the changing crowd of people can be "enriching" to a certain level. The hand-reared apes seem especially interested in interaction with people and sometimes attempt to communicate or show off. The physical conditions of the exposition and its impact on behavior and well-being is a

topic worth being treated separately, here I only wish to demonstrate the multidimensionality of the consideration.

I feel obliged to emphasize that so far we have only touched the relatively favorable conditions of the zoos. There are still far more hostile captive environments where animals suffer for this, that or the other human "just" cause. The infamous laboratories are just the top of the iceberg. This chapter meant to propose the idea that captivity is a multidimensional problem: it is well worthwhile to consider the philosophical, sociological and ethical background of captivity in order to appreciate fully the possible psychological impact on those subjected to it.

5 Ethology

*"Our expression and our words never coincide,
which is why the animals don't understand us."
Chazal*

This chapter should address three theoretical problems: first of all, a very brief excursion into some ethological concepts will take place. I do not aspire to provide a systematic historical outlook. I will only focus on a few key notions relevant for this paper's empirical section. Furthermore, some methodological frameworks should be outlined. I shall try to justify my choice of method as well as my choice of sample and thus place my research design within the concept of ethological studies. And finally, I shall try to shed some more light onto the "comparability" issue and bring some evidence that there is indeed a sound scientific background supporting the idea that great apes are our closest relatives from various points of view.

5.1 Ethology defined

Ever since giants like Lorenz and Tinbergen established ethology as a legitimate scientific approach, the definition states, more or less: "Ethology is a biological study of behavior." Tinbergen has identified four main problems of the field: causation, survival value, evolution and ontogeny. In other words,

mechanisms of behavior and their development in the life of an individual are the "proximate mechanisms", and adaptive purpose, along with its phylogeny, are the "ultimate mechanisms". As we shall see, these definitions, as well as their implications, are by far not as simple as they seem.

Medawar¹⁸ stated that it was not informative to study variations of behavior unless we know the norm from which the variants depart (In Tinbergen, 1992). As I have already addressed in the definitions, the norm is an ambiguous term, but it is clear that the reader will ask, "So they (the caretakers) said that orangutan XY looked sad...in comparison to what?" This brings about a few key terms; the credibility of the observer and the methodological problem of any observation: comparison to norm and the subjective evaluation of behavior observed. Lorenz's postulations about ethological methodology seem to justify my use of method. It was Lorenz that brought about the notion of "amateurism" as a potent scientific tool, and who came up with crucial "ethological principles". He said that it was a fundamental methodological error to isolate a causal relationship experimentally, or even conceptually, and to explore it in one direction only. He claimed to have overcome the phase when he too was convinced that only atomistic component analysis fulfills the requirements of an exact science, and came to the conclusion that organic systems require a special analytical methodology (Lorenz, 1981). Lorenz appears to me as a convinced Gestaltist who has always implicitly worked with the notion that "the whole" is more than a mere sum of its parts. This brings up one of the key concepts in the context of my work - complexity. It is of course useful to observe and encode well-defined behavior in precisely defined, randomized sequences. There are numerous, useful studies using standardized observation protocols as defined in Altmann.¹⁹ This "bulletproof" methodology has its undisputable benefits. Apart from other things, the simple reduction of data to be dealt with later is clearly a good sign of work that can

¹⁸ Sir **Peter Brian Medawar** (February 28, 1915 – October 2, 1987) Brazilian-born British scientist ,co-winner of the 1960 Nobel Prize in Physiology or Medicine , professor of zoology at the University of Birmingham (1947-51) and University College London (1951-62).(Wikipedia, 1.4.2008)

¹⁹ Classical paper by Jeanne Altmann: Observational study of behavior: sampling methods (1973, University of Chicago Illinois) a comprehensible guide to some of the most common observation protocols.

bring communicable results. However, we can hopefully agree that there is indeed more to be done than record and evaluate the frequencies of self-clasping and the duration of stereotyped pacing.

As Lorenz expands further: a "tremendous amount of data" must be fed into our brain's computing apparatus, and a "prodigious amount of time spent in presuppositionless observation" is necessary, in order to collect and store the factual material we need to be able to lift the gestalt from its background (Lorenz, 1981). Now, it is precisely this sentence that encourages me to call my method ethological, because it is indeed based on recording the description of gestalts that emerged from years of intimate contact with animals, even though the ever so desired "presuppositionlessness" is hard to maintain.

Maybe the caretakers don't exactly fulfill the criteria for an expert committee when it comes to psychopathology, but I strongly suggest considering this source of information "as good as it gets". I believe the idea of observing phenomena as a gestalt to be the very pillar of ethology. Then there is the notion of scientific value of "so called amateurism" - the love of animals as a prerequisite for sufficiently sustained observation (Lorenz, 1981). Since the caretakers, by job description, spend on average a couple of hours a day in direct contact with animals, I suppose it is reasonable to consider them fully competent to provide statements about their individual wards.

Further, it is often assumed that the ethological paradigm can only operate in the wild, but in fact, Lorenz himself distinguishes two types of ethologists: the hunters and the herders, considering himself the latter. He didn't find it problematic to observe domesticated animals and still call himself an ethologist. He even defined some benefits of observing captive individuals, since it enables simultaneous observation of different species. This juxtaposition could be indeed a powerful tool, and I hope I'm not deviating too far from the original notion when I say that it could be one of the

referential sources for "norm" in my research design. In other words: having a group of 3-5 individuals in custody for many years can give one a sound knowledge of their individual variance and enables comparison between the group members, which would be close to impossible in their natural habitat. This does not, by any means, justify their "imprisonment". I only meant to propose that ethological methods are applicable for captive populations. Furthermore, Lorenz stated that observation of performance failures in captivity can produce information about the nature of the behavior observed. He said that by studying behavioral disturbances one can very often learn something of great importance about "normal" functioning (Lorenz, 1981).

5.2 Comparability

In the perilous battle over definitions of the field, and of the subject, there have been a few constants, such as the everlasting discussion of whether phenomena so typical to mankind existed elsewhere. For instance, if there was such a thing as a smile, or laugh in animal kingdom, whether they could cry, whether it was culture that distinguished man from animals, and whether the very idea of extrapolating data from nonhuman species is methodologically, and even morally, acceptable. Somehow, it was more acceptable to use animal modeling and admit that these processes, though simplified, may have an informational value to mankind. There have been numerous experiments within this paradigm, some of them outrageously cruel. In this work, I propose a different approach: How about, for once, using a human model, and trying to figure out a meaningful application for the benefit of a nonhuman being. In order to do this, we should probably summon information on the "comparability" of the two.

With Darwin, being considered the first ethologist, close attention was drawn to the similarities between species on certain levels of complexity. It may have been Darwin who implicitly proposed the idea that despite the lack of objective measurement tools, even things that seem exclusively human (such

as complex emotions, language, culture and tool use) are very unlikely to develop "de novo" uniquely for one single species: Homo. In fact, it seems that what is considered scientifically relevant is solely a question of the prevailing paradigm. Darwin's protégé George Romanes gave rise to "anecdotal cognitivism", a psychological theory and animal cognition term based on the attribution of mental states to animals based on the observation of particular cases outside the controlled environment of the behaviorist's laboratory (Greenberg and Haraway, 1998). The infamous smart horse, "clever Hans", case was often quoted to discredit the usage of anecdotal evidence in assessing animal cognition. The question stands, what is methodologically more disputable: severe manipulation disguised as a scientific tool, which may just as easily distort any kind of "truth", or anecdotal evidence, naturally distorted by the subjectivity of the observer. For purely utilitarian purposes, I shall try to reintroduce the method of "anecdotal evidence" and reassess the value of subjective observation. After all, most of the reductionist approaches were eventually appropriately labeled as anecdotal, precisely because of their inability to explain complex behavior and social phenomena.

Loeb may have contributed greatly to the study of animal cognition, but we can probably agree that it is unlikely that the sophisticated games of mammals, or the elaborate social system (particularly in primates but also in other species) could be explained by simple "taxis" ²⁰(Vauclair, 2004). And since the biggest intellects in the field, Lorenz, Tinbergen and Frisch were awarded Nobel prizes (1973) for their findings without having to torture any animal out of its mind, or even to death in a laboratory, their non-invasive approach is probably worth serious thought.

Behavioral ecology, being another great inspiration for this work brings into light the remarkable contribution of inter-individual differences based on the environmental conditions of the individual. (See for example Krebs and Davies 1984, Alcock 1988)The sole notion that physical surrounding might have a very

²⁰ A **taxis** is an innate response of organism to a directional stimulus. A taxis differs from tropism by the fact that the organism is motile and performs guided movement towards or away from the stimulus.

significant impact on the behavior (and well-being) of animals (and men) raises rightful questions about the conditions in captivity, that are given proper space elsewhere.

So then what is it that enables us to compare man and nonhuman animals, or for the sake of relevancy for this paper, man and great apes? In evolution, everything that happens in the animal kingdom either has an adaptive value, or is doomed to be eradicated by the iron rule of natural selection. It is precisely the provable phylogenetic continuity that brings a logical implicit notion that various stages of development of a structure or function are not necessarily discrete categories, but may also form a continuum. We can operate with the notion that similar psychological phenomena may emerge due to similar biological substrates, and may manifest themselves in a similar manner. This intuitive between species extrapolation might have in fact been a survival tool since it was probably vital to be able to "read" the physiological and emotional state of a predator or prey and accommodate one's behavior accordingly. It seems logical that we are equipped with a certain level of interspecies understanding of nonverbal signals, even more so when the anatomy and morphology is as similar to our own as in the case of great apes.

5.2.1 Awareness

There has been a vivid discussion over the question of animal awareness and consciousness. As we can not explore the idea directly, we have to rely on comparison. We may determine which parts of the brain are functioning during different states of consciousness, then draw parallels between animal brains and test the regions by brain imaging etc. We may also, from an ethological point of view, observe animals and try to determine behaviors that are connected to a certain level of consciousness in mankind. According to Roth, there are various activities clearly requiring consciousness: Imitation in the sense of task principle learning; taking the perspective of the other in deception and counter-deception; anticipation of future events;

comprehension of underlying mechanisms in the use of tools; knowledge attribution/theory of mind (the "qualified" guess and anticipation of the reactions of others while taking into account what others are "thinking"); self-recognition in a mirror; teaching, and finally, the understanding and usage of simple syntactical language (Roth in Metzinger, 2000). All of the above listed qualities have been tested across different species, and great apes qualified as "possessing consciousness" by all these criteria.

5.2.2 "The brain"

From the neurological point of view, "*...all structures for attention, declarative memory, motivation, guidance for voluntary action and evaluation of action are present in a tetrapod²¹ brain. These structures essentially have the same connectivity and distribution of transmitters, neuromodulators etc...we have not yet found anything in the brain anatomy that would explain the factual or alleged superiority of humans regarding cognition or consciousness,*" (Roth in Metzinger 2000, p.77). So it seems that as far as an organic substrate is concerned, there is no limitation to the emergence of complex psychological phenomena. Furthermore, Brothers expands on the idea by introducing a notion of "the social brain" in primates. He defined social cognition as information processing that results in the understanding of dispositions and intentions of other individuals. He claims that primates have developed a capacity to perceive psychological facts (dispositions and intentions) about other individuals (Brothers in Cacioppo, 2002). The perception of these entities arises from various sources of information. An individual has to be able to evaluate identity, direction of movement, category of posture, facial expression, quality of vocalization, knowledge of which individuals are also present, and what are their mutual relations etc. (Brothers in Cacioppo, 2002). As he summarizes, we can clearly reconstruct an evolutionary specialization for perceiving and responding to social signals, while the trend is to develop capacities to detect features of mental states, not just overt behavior. These capacities were documented in great apes.

²¹ **Tetrapods** are vertebrates having four appendages

5.2.3 Sensory systems and cognition

Animals, including humans, extract information about their surroundings from two sensorial sources: they process the stimuli coming from the exterior, stimuli that are simply the product of their environment (allothetic information) and information from the inside of their bodies, which is the intrinsic record of their own movement in space (idiothetic information). The allothetic information is basically visual, auditory or olfactive stimuli, while the idiothetic information is produced by the vestibular system²², they are somatosensory²³ or proprioceptive²⁴ in nature (Vauclair, 2004).

We share the sources of information, though we justifiably differ in the sophistication of our evaluation of these stimuli. I would suggest avoiding the criteria of "higher" or "lower" intelligence. It is a common anthropocentric tool that supposedly proves the superiority of humans. As we have already discussed, the intelligence question is a methodological one and even within the species Homo, it has done a awful lot of injustice inter-culturally. Furthermore, It is highly impractical to judge this way. After all, what would humans look like in competition with dolphins in echolocation or with orangutans in their dexterity to orientate themselves and move in the trees?

Despite the ambiguity of the term, research on intelligence proves that great apes' abilities span from causal and logical reasoning, through counting, mental maps, insight and imitation, all the way to self-awareness, pretense, role-reversal, teaching, planning, intentional deception, rudiments of mind-reading, and proto-language (Russon & Bard, 1996). Their "human language skills" are longitudinally studied in the Orangutan Language Project, under the lead of Rob Shumaker, in the Smithsonian National Zoological Park, Washington DC. According to the web page: "The Orangutan Language Project (OLP) explores the abilities of orangutans to use symbols and syntax to

²² The **vestibular system** is a sensory system that provides the dominant input about movement/balance. Together with the auditory system, it forms the labyrinth of the inner ear.

²³ Somatosensory system is sensory system that detects experiences like touch/ pressure, temperature, pain

²⁴ proprioception is the sensation of muscle and joint position and movement, including posture, facial expression and visceral (internal) stimuli recognition, for example internal pain reception.

express their thoughts. The orangutans are learning to use a symbol-based language that is presented on a computer monitor," (<http://nationalzoo.si.edu/Animals/ThinkTank/ResearchProjects/OLP/default.cfm> 12.12.2008). The OLP dictionary contains about 70 symbols. All symbols are abstract and have no visual relation to what they represent. They used symbols to represent: foods, non-food objects, proper names of people, proper names of orangutans, verbs, adjectives and Arabic numbers. According to Brenda Tabor (2000) Arabic numerals were chosen on purpose, they are completely visually abstract, and in comparison to Roman numerals, their shape is not indicative of amount. Additionally, orangutans, if paid enough attention to, apparently acquire language voluntarily. They are not subjected to any kind of drill. The participating apes are being reinforced only by positive rewards: interest, curiosity, drive to learn and enthusiastic cooperation. All of these are common adjectives used to describe "bright" human students. Couldn't they also be indicative of evolved intelligence?

Yet another "proof" of cognitive capacities is tool use. It is a common, and in my personal opinion, a rather anthropocentric measure. Regardless, as we will discover in more detail later, orangutans can still impress.

Whether or not it would be highly maladaptive to invest energy into developing behaviors that one does not need for perfectly healthy functioning in the wild is something that should also be brought to the discussion. If there are no acute environmental pressures, why waste time developing tools? If wild populations of orangutans exhibit "limited" tool usage, it could just as easily be regarded as a lack of need for extending their capacities, which are already "sufficient enough for a comfortable life". In orangutans there are four evolutionary pressures that are assumed to have fueled their cognitive advance. Firstly, their body mass, which requires a lot of effort to gather a sufficient food supply. Their specific diet involves items that are hard to reach or to process. Secondly, arboreal travel (made even more difficult by their body size, and by the fact that food is hard to get) requires

sophisticated coordination²⁵ and it takes a lot of time to master arboreal feeding techniques. Due to the weight of an average adult man, they have to deal with supporting themselves in a complex and unpredictable environment (fragile branches, thorns etc) and use extremities to process food at the same time (Russon, 1998). And finally, prolonged ontogeny, which is attributed to the vital need of years of apprenticeship, triggered both by the social cognition development as well as the aptitude to pass the know how onto ones offspring. Russon studied juvenile ex-captive orangutans reintroduced to free forest life by the Wanariset Orangutan Reintroduction Project, East Kalimantan, Indonesia. She concludes that in the great apes, voluntary, learned behavior is organized hierarchically, and that imitation occurs at various levels. Russon describes with great precision the food-preparation techniques and imitative behavior of orangutans undergoing rehabilitation to the wild.

5.2.4 Tool use

In captivity, tool use in orangutans was documented by Lethmate and the most common observation was the use of tools when extracting or reaching for food. Imitation of observed human actions (Russon, Orangutan's imitation of tool use), such as constructing a simple bridge, sucking liquid by means of a "straw" etc was also observed (Vauclair, 2004). All these findings were reported in captivity. As far as a free ranging population is concerned, simple tool use, such as sticks or rocks was documented, with tools usually held in the mouth, not hands. In one of the works, processes of fruit extraction (Neesia) were evaluated, and since there were significant differences between populations, it was concluded that there had to be a social learning effect, not only ecological differences (see further in "Culture").

²⁵ Orangutans climb to the top of the tree and shift their weight in the direction they want to go. The tree bends to the point at which they are able to reach the next tree, they climb aboard and let go of the previous one. Van Schaik points out that this mode of transport requires advanced calculations. The height of the tree, its flexibility and reach as well as presumably some "safety" consideration... that is whether the tree top is solid enough to support the body weight...

Using branches to reach for another branch to facilitate locomotion was documented, as well as using leaves for hand and feet protection on thorny trees. Other non-food related tool use found in the same sample was amplifying sounds by using a rolled leaf next to the mouth. 13 out of 15 individuals used this method to amplify the "kiss-squeak" sound (Vauclair, 2004). It is therefore apparent that there might be a rich repertoire of behaviors never recorded due to the difficulty of observation in the wild, and that captive conditions are so altered they distort natural behavior.

5.2.5 Culture

"Five characters separate man from other hominoids—a large neocortex, bipedality, reduced anterior dentition with molar dominance, material culture, and unique sexual and reproductive behavior," (C. Owen Lovejoy: *The origin of man*, 1981, p.341). We have discussed anatomy, the mode of transportation, as well as some specifics of their reproductive behavior, but what about culture? Japanese primatologist Kinji Imanishi (1952) pointed out that culture in a biological sense of the word is simply socially transmitted innovation, in other words useful "behavioral updates" followed by diffusion (Van Schaik, 2004). One of the shorter definitions is brought up by Russ Tuttle: culture is a symbolically mediated shared system of meaning. If we stick to observable artifacts (ignoring the "values and opinions" that can not be scientifically accessed directly), what is left are geographically determined variations of behavior transmitted by non-genetic means, that is via some form of social learning (Van Schaik, 2004). Practically speaking, useful or popular innovations should be recordable on a well-defined region bordered by a clear geographical barrier, being locally specific, customary and persistent. As Van Schaik proposes, *"If we see geographical variation in behavior that we know reflects innovation and is transmitted through some socially mediated learning process, then we have animal culture and we can worry about how symbolic any of it is later on,"* (Van Schaik, 2004 p.139).

Imitation as a predisposition to culture has been well-documented even between species. Russon recorded orangutans washing clothes in a river and even attempting to make fire using gasoline siphoned from the tanks using hoses (in Van Schaik, 2004). As mentioned above, Van Schaik also observed the Sumatran orangutans creating tools for the collection of food - one for digging honey and termites from tree holes and another for extracting seeds from cemengang fruit (genus *Neesia*). In both cases the orangutans made the tools before climbing the trees. Van Schaik noticed that the "handles" of both tools were purposely left a bit longer than needed, to be trimmed after the orangutans climbed the trees to the precise length needed. It implies an understanding that too long is adjustable, while too short means having to start all over.

Van Schaik documented local differences in tool usage in food processing that could not be attributed to any other means of diffusion but via social learning/culture. To make this point even stronger, he tested his assumption in several ways. As expected, the cultural variance was greater in more distant sites. Furthermore, the ecological factor (implying that variants may result from individual learning when different individuals are confronted with the same environmental stimuli) had to be eliminated. In fact, coastal populations were no closer to each other than to the alluvial-upland populations, implying that it can not be assumed that the habitat properties alone can be the sole, or prime, determinant. Finally, the notion of "social transmission" was examined, and indeed, the repertoire richness correlated positively with increased opportunities for social learning. Groups in which individuals spent more time in association with others exhibited the most varied "culturally specific" behavior (Van Schaik, 2004).

So far I have outlined that orangutans are fully disposed and in fact express more than elementary intelligence, sociality, and traditions. They use tools, learn to speak, and teach their infants. They are conscientious, capable of

insight, and are able to anticipate and accommodate others actions. What remains nonhuman about them? Is it the so often discussed aspect of humor?

5.2.6 Humor

Humor is one of the indicators of mental functioning and was long claimed to be uniquely human. We recognize four stages of humor development in children: (1) inappropriate action, (2) incongruous labels, (3) incongruous features, and (4) multiple word meanings. All these are found among great apes, and they seem to appreciate and produce humor in a manner comparable to humans. Smiling and laughter serve as the most reliable indicators that a person has found humor in a situation. McGhee stated that humor is not behavior but a private experience that can be "evaluated" on the basis of behavioral cues usually related to humor such as vigorous laughter or other indices of a generally playful mood (in Gamble, 2001).

To expand on the notion that there is an evolutionary continuity between nonhuman animals and humans, there are theories of humor as an adaptation tool: *"Humor could be seen as a harmless alternative to the maladaptive consequences of physiological stress, requiring analysis of multiple meanings from incoming information that has survival implications. It has physiological concomitants resembling those accompanying the primitive responses to stress, frequently aroused by emotionally charged material, and in its tendency to process information helps to reduce the stress caused by information overload,"* (Haig in Gamble, 2001, p.165). There also seemed to be a consensus that humor, as well as intelligence, complex emotions and so forth, did not develop de novo uniquely in humans.

Apes, both free ranging and captive, demonstrate the playful behavior necessary for humor. In play, a clear agreement has to be communicated that whatever action follows, it is not meant to be offensive. Understanding of the "pretense" is crucial, and hints that there might be a symbolic behavior meaning "this is all just fun". Every dog owner knows the playful bow

preceding all sorts of behaviors that without this gesture of "playfulness" would be decoded as aggressive. *"These signals are asking a playmate to believe that he must not believe that the following attack will be real,"* (Gamble, 2001 p.163-179). Apes also display an appreciation of humor through smiling and vocalizations. Chimpanzees, gorillas, and orangutans all respond in a similar manner (through laughter or quick exhalations) to tickling (Fry in Gamble 2001).

Compared to wild apes, zoo animals seem to engage more in chasing, tickling and play activity, which is attributed to a relative lack of environmental stressors (no predators and sufficient food supply) and it may also be caused by environmental enrichment in the luckier cases, since the unfamiliar objects (rubber balls, t-shirts etc) provoke curiosity and games.

Language studies of apes have revealed that *"...the great apes can communicate with humans and other apes, refer to objects by characteristics, ask questions, respond to requests, express emotion, allude to events in the past and future, and intentionally deceive by conveying misleading information,"* (Gamble, 2001, p.172). The latter being a useful prerequisite for making jokes. Between 1974 and 1975 Patterson reported the use of personal pronouns and proper names as well as references to internal and emotional states, self-consciousness, humor, and deception in Koko, the gorilla in her custody (Patterson, in Gamble, 2001). Koko even demonstrated solitary fantasy play.²⁶ Gamble further discusses the clear demonstration of "understanding incongruities" and other evidence (metaphors, rhymes etc) hinting towards the existence of humor in apes that were expressed for the first time via the new competence of American Sign Language. According to Gamble, Dr. Patterson has directly stated that Koko could joke and that her ability to understand multiple meanings was obvious; therefore, she was

²⁶ "A teacher observed [Koko] create what appeared to be an imaginary social situation between two gorilla dolls. She signed, 'Bad, bad,' while looking at one gorilla and 'Kiss,' while looking at the other. Next, she signed, 'Chase tickle,' hit the two dolls together, and then wrestled with them. Following this, she signed, 'Good gorilla, good good.' At this point, Koko noticed that her teacher was watching the play session. She immediately put the dolls down."(Gamble)

believed to have exhibited stage 4 in humor development. Similar studies have shown that signing chimpanzee, such as Washoe (Fouts, 2000) exhibited similar capacities for the appreciation of humor (McGhee in Gamble 2001).

So, what about our Red Ape? Orangutans engage in a form of laughing, and exhibit facial expressions such as an open gaping mouth. Ross even documented something like a social contagion. She recorded that a "laughing individual" will provoke the same expression less than half a second later in another individual. The speed of imitation suggests an involuntary reaction or contagion. "In humans, mimicking behavior can be voluntary or involuntary. Until our discovery there had been no evidence that animals had similar responses. It is clear now that the building blocks of positive emotional contagion, and empathy that refer to rapid involuntary facial mimicry in humans, evolved prior to humankind," (Ross, in Telegraph.co.uk <http://www.telegraph.co.uk/earth/earthnews/3320349/Laughing-is-just-aping-our-ancestors.html> 3.3.2009). So, not only are orangutans capable of producing and appreciating humor, but they are even susceptible to social contagions.

5.2.7 Emotions

Back in 1960, when Jane Goodall (1987, 1999) first started studying her chimpanzees in Gombe, *"it was not permissible, at least not in the ethological circles, to talk about an animal's mind. Only humans had minds. Nor was it proper to talk about animal personality. It was not permissible to present even a mere "anecdote" as evidence for anything,"* (Goodall in Plutchik, 2005 p.13). Luckily, or shall I say, hopefully, those days are over, especially in aspects so provably evolutionarily rooted as emotions. Jane Goodall gives touching, detailed reports on depression in young chimpanzees who had lost their mothers. The description includes clearly observable behavioral patterns, such as rocking back and forth, fur plucking, staring into a void, fatigue in movement, curling up etc. Similar observations were made by Fossey with gorillas de Waal with chimpanzees, Strum with baboons (Plutchik, 2005).

We could talk in great length about the various traditions in approach to emotions, and the connected problem of animal emotions. But to cut the long story short, there seems to be a general agreement that there is indeed an evolutionary continuity when it comes to an organic substrate for emotions, hence it is a sound assumption that the function of this substrate shows similar continuity. Furthermore, it is believed that emotional expressions and the communication of intentions were crucial all along and favored survival as argued by Darwin. Walter Cannon defined emotions as subjective feelings (usually associated with the act of fight or flight) resulting from hypothalamic arousal. Again, yet another definition implying that whoever possesses the organic basis and demonstrates this behavior, does perceive emotions (Plutchik, 2005). As for further evidence regarding the existence of emotions in animal kind, we can mention numerous researches based on rating the emotions of all sorts of animals. So not only can we scientifically operate with the existence of animal emotions, we are believed to be able to name them, classify them, and even attribute the degree to which an animal in question is fearful, irritable, sociable, submissive etc.

People who work with orangutans consider questioning the existence of emotions ridiculous. It is so natural for them, it became a routine work-tool. Some attribute emotions completely unconsciously, some knowingly, but the empirical statements are always similar. According to Dr. Gary Shapiro (Vice President of The Orangutan Foundation International): *"Apart from their genetic similarity to humans, orangutans do share much with humans in terms of the richness in various personalities and emotions they display. They display moodiness, jealousy [and] anger, as well as gentleness, affection, and playfulness. One only has to spend time with orangutans to see how these various emotions and tendencies are reflected in their unique personalities,"* (<http://www.geocities.com/sunjara/greatapes.html> 5.12. 2008).

Based on the interviews, literature, and my personal observation, there is really no reason to doubt the existence of emotions in full scope of norm as well as pathology. I have observed a male orangutan gazing in his palms for many minutes without movement, non-responsive to caretakers. He was withering away before my eyes; he would refuse to eat and I saw him urinate and defecate without even moving from his sleeping nest, although he was physically capable of movement. Had you seen this in a human being, what would you think? In its behavioral manifestations, this behavior seemed analogous to human depression: obvious loss of interest, and lack of emotional response to stimuli that normally provoke a response (note that under normal circumstances when a female visitor enters the area, the excitement reaction is quite spectacular: Kama climbs on bars, exposes genitals, tries for contact etc.) Also, these are typical symptoms of depression: psychomotor retardation, loss of appetite, loss of weight, loss of sex drive, fatigue and so on.

Having said all this, I was hoping to portray orangutans as our "Asian cousin" with all the implications it brings along. They are indeed strikingly similar in many ways, and there is no reason to believe they could not experience similar psychological troubles. If there is a debate to expand basic legal rights²⁷ to nonhuman animals of certain complexity, orangutans are rightfully among the candidates. As for compassion, there are no criteria needed, so even if everything mentioned above failed to be true, the issue of suffering and its implications for the humans in charge remain.

²⁷ „ The Great Ape Project seeks to end the unconscionable treatment of our nearest living relatives by obtaining for nonhuman great apes the fundamental moral and legal protections of the right to life, the freedom from arbitrary deprivation of liberty, and protection from torture." <http://www.greatapeproject.org/> 1.4. 2008

*"Not everything that counts can be counted,
and not everything that can be counted, counts."
Albert Einstein*

The empirical part of this work will be :

A) A phenomenological survey. I will attempt to treat all phenomena "as they really are", or at least "as they appear", but not as they are normally perceived through the prism of preconceptions that we have about them. The way I understand it, the phenomenological approach has three functions. (1) The critical function, which questions the prevailing paradigm and methods used in the field of interest. (2) The heuristic function, which should encourage an entirely new outlook and an alternative consideration of the problem in question. (3) The descriptive function, which is a genuine attempt to provide deep insight into the problem from the perspective of the subject (Hendl, 2005).

B) A case study, where the term "case" is somewhat ambiguous. My "case" could be a whole group of orangutans in the zoo, as well as each individual animal within the group. I shall try to combine the two, since the individual life histories are so intertwined it would be impossible to assess one without the other.

C) A qualitative study based on a grounded theory approach as defined by Strauss and Corbin (1998)

6.1 Grounded theory

The theory in this approach is inductively derived from the data collected, it emerges from the qualitative study, and it is formulated and continuously evaluated along the research design. The researcher collects, encodes, and analyzes the data, and decides what and where to collect further based on how the theory emerges (Disman, 2002). Provided that grounded theory is proclaimed valid in a very specific situational frame, it could be possible to create one for the well-defined captive Pongo population. Another key notion of this methodological approach is theoretical sensitivity: defined as

the aptitude to distinguish nuances in the meaning of data collected. It can be increased by literature, but above all by means of personal and professional experience with the studied phenomena (Strauss, Corbin, 1998). Having volunteered extensively in zoos with orangutans, and having spent a decent amount of time with their caretakers, I hope my perception is more attuned. It has given me the confidence and understanding necessary for further work with the collection, categorization, and maybe even the interpretation of the data. I do consider this approach extremely difficult, but I readily accept the challenges it presents.

6.2 "Case studies"

Hendel states a category of "instrumental cases", where the focus is on a broader phenomenon, whereas the individual stories represent the phenomena. In other words, my main focus ought to be the "psychopathology of captive Pongo", and the stories of individual animals should be representative of these phenomena. To make matters worse, it may appear that this is, in fact, a biographical research design. I am indeed going to try collect data on each individual animal, possibly in its ontogeny, and surely within a social context, so from a certain point of view it is a collection of case studies. However, for practical reasons, I shall not cover each animal in full detail.

6.3 Conceptual frame

It is advisable to define a conceptual frame in research. What type of information I shall be working with and within what paradigm. I have already discussed in quite some detail why I have chosen to work with narratives of caregivers. I shall operate within the ethological and phenomenological perspective as defined above. My data will come mostly from interviews with caretakers, veterinarians, and primatologists, but I will not hesitate to use my personal observation if it appears relevant. I will use interviews, both non-structured and semi-structured to explore a phenomena of ape psychopathology. The non-structured part should serve as space for free

associations and anecdotal events that might be an important source of ideas for further research, and it should also facilitate the semi-structured part of the interview.

From its definition, qualitative research is inductive in nature. My data (caretakers' narratives) are collected longitudinal (non-focused, involuntary) observations that emerge in patterns that I attempt to compare with the knowledge of human psychiatric symptomatology, that is if (along the process of data collection) it proves to be too useful to apply a human diagnostic criteria model on nonhuman subjects.

7 Empirical part:

7.1 Sample

I have interviewed 10 professionals (caretakers, veterinarians, curators) from 4 zoos in Czech Republic and Slovakia. The caretakers reported on a total of 16 animals in their custody out of which 7 were adult males, 5 adult females, 3 subadult males and 1 male infant. This group consisted of 8 Sumatran orangutans, 6 Bornean and two crossbreeds. Three animals that entered the record were no longer present at the zoo by the time applicable (deceased or relocated).

Prague Zoo

Interviewees:

- 1) Head caretaker for Indonesian jungle exposition
- 2) Head veterinarian of the Zoo (**in bold**)

Animals: (4 Sumatran Orangutans)

- Káma – Adult male, 38 years old, hand raised.
- Upita – Adult female, 27 years old, method of raising unclear, hand raising probable.
- Filip – sub-adult male, 9 years old, hand raised/returned to mother at the age of 9 months.
- Pagi – Sub-adult male, 8 years old, raised by Upita.
- (Wilhelma) - Adult female deceased, raising method unknown.

Ústí nad Labem Zoo

- 1) Head caretaker
- 2) Caretaker (**in bold**)

Animals: (3 Bornean Orangutans, 1 crossbreed Ferda)

- Ňuňák - Adult male, rescued from smugglers, rearing unclear, estimated age 22 years.

- Ľuninka - Adult female, rescued from smugglers, rearing unclear, estimated age 22 years.
- Bady (male infant, 2 years old, Ľ+Ľ offspring, reared by the mother).
- Ferda - 39 Adult male (Kama's former companion, reared by humans).

Zoo Liberec

- 1) Head caretaker
- 2) Caretaker (**in bold**)

Animals: (present only 1 old Sumatran male)

- Jolo – 36 years old male, up to his 7 years of age in human family, after placed at a zoo with only an inside enclosure with removable roof, only visual and auditory contact with conspecifics until his 27 years of age.
- Oscar (deceased).
- Wilhelma (reported on by Prague caretakers, deceased).
- Ziki (not at the zoo, Wilhelma's infant).

Zoo Bojnice

- 1) Curator
- 2) Curator 2 (**in bold**)
- 3) Caretaker (marked Ct)
- 4) Caretaker 2 (marked Ct2 and **in bold**)

Animals: (currently 3 Bornean Orangutans)

- Tara (deceased) - Bornean adult female, died of epileptiform cramps after a concussion. It was a play/sexual pursuit related accident.
- Nanga (adult female).
- Jago (26 year old adult male).
- Momo (crossbreed male, castrated).

7.2 Procedure

In the first part, my interviewees introduce themselves and the animals in their custody, as well as provide brief reports on animals they used to look after in case they shall refer to them in the interview. They are prompted to associate freely on anything they have ever encountered that they considered odd or "abnormal" in the behavior of their wards. This part serves both as space for testimony on anecdotal events as well as it providing a useful benchmark for what the interviewee perceives as abnormal. In the semi-structured part, the interviewees are introduced to several psychopathological symptoms and/or categories, and are asked if they have ever encountered something of that kind in orangutans, and what did it look like.

7.2.1 Semi-structured interview tool development

As a starting point I have used the European diagnostic manual of psychiatric disorders. The diagnostic categories are mostly based on assumptions, estimates and convention. It is the overall consensus of clinicians that there are indeed certain characteristics that enable us to determine a "cluster" of patients with similar symptoms, clearly distinct from any another group of patients. Since I deal with animals, I have straight away eliminated :

- A) Disorders resulting from substance abuse (chapters F10-19).
- B) Schizophrenias and schizotypic disorders, which would be close to impossible to operationalize since most of the criteria are based on verbal reports. Maybe it is possible to observe behavior that implies that an orangutan is hallucinating, but we can probably agree that it would be about all we could tell, unless we were "lucky" enough to have at our disposal a hallucinating ape using sign language, providing us with an in-depth description of delusions. Therefore, chapter F20-29 is not treated in this research.
- C) Personality disorders, however intriguing this chapter is, although there is, in fact, research into the personalities of primates. (For example Bolig

et al 1992- personality in Rhesus monkeys, Figueredo et al 1995 in Stumptail Macaques, Gold et al 1994 in Gorillas, King et al in Chimpanzees). Caregivers agree that orangutans show well-defined and consistent traits that could indeed be considered a personality. Personality disorders are usually regarded as an "extreme deviation from the way an average person perceives, feels, thinks and constitutes relationships within a given culture" (Smolík, 2002). However, the diagnosis is again mostly based on verbal reports (with highly abstract criteria) and is extremely ambiguous even in humans, therefore chapter F60-69 is not included.

D) Organic disorders are not treated for practical reasons. By definition, this group of disorders is defined by the possibility to prove "organic" etiology, which is a somatic disease, such as a brain injury, or any other somatic condition leading to temporary or permanent brain dysfunction. Apart from injuries that could enter the records, all other data is practically unavailable for my interviewees and is unlikely to ever be revealed. In fact, dementia due to Alzheimer's and/or Parkinson's disease (which are the two most common neurodegenerative disorders) is considered unique to humans despite observation of age-related decline in cognitive and motor performance in nonhuman primates. In great apes, this topic remains completely unstudied (Galdikas et al, 2002). To my knowledge, apart from experimental designs including systematically induced brain lesions and follow-up observations, there has been no research or autopsies to determine the cause of "bizarre" behavior in orangutans (Ivona Foitova-personal communication MUNI).

The three categories that I shall deal with in this paper are therefore:

- Affective disorders (F30-39)
- Neurotic, stress related and somatoform disorders (F40-49)
- Behavioral syndromes (F50-59).

7.3 Records and results

In order to facilitate orientation in the text that follows, all reports are listed

A) with reference to individual animal, their name is underlined.

B) The second source (triangulation report, or additional information if the information has not entered the record yet) is written in **bold**.

C) My personal observations are noted in *italic*.

D) The individual zoo's reports are divided by a line -----

E) A short discussion/commentary follows each category.

Please note that the "symptoms" are grouped and labeled preliminarily, the labels DO NOT by any means denote the original human psychiatry categories. They are only meant to hint at similarities.

"Human dependency circuit": The problem of hand-raising, fixation on humans and connected behavioral disorders likely due to this way of upbringing, inappropriate attention seeking, "spoilt child syndrome".

- Comment on Káma's hand raising: "Back then, the hand-raising was what it was, diapers, dummies etc., just as with a human child. He is completely dependent on humans, he is extremely sensitive He is really fond of women."
- Káma: *When he is not feeling well*: "...we start the medication of course, but here it also reflects his relationship to people, because he really likes the attention, the treatment, so I think he actually enjoys himself sometimes."
- *In a stressful situation*: Káma would "...flight and very often he comes to the bars and reaches for me, he wants me to hold his hand. (*hmm...so he seeks comfort in you...*) Precisely."
- Káma: "...**he is fixated on humans, and it is obvious that attempts to integrate him in a group are therefore difficult. Especially after the new female (Wilhelma)... his fixation on people and consequently his**

submissiveness becomes secondarily a veterinary problem." (See somatic complications for further detail.)

Subcategory: human dependency - attention seeking and "hysteria": tantrums, over-reacting, loud and "inappropriate" manifestation of frustration...

- Káma: "I suspect that he actually enjoys being a patient, that he enjoys the way he is looked after, I feel like sometimes, when he feels that he is not getting enough attention, he might even fake it...but well, its hard to tell..."
 - Filip: "...he forces his will upon everybody, he gets hysterical when frustrated. He puts up tantrums (*What does a hysterical tantrum look like?*) Well, he is screaming like a madman..."
 - Filip: "...every time he doesn't like something, when he wants to force the others to give him some food... he starts jumping on the hay (*the stereotypic movement as described elsewhere*) and he winces...just winces...or screams like a small pissed off kid. Hysterical...like, "I want that mum..." (*makes an expression*)...I want, I want."
 - *My personal observation: I started working with Káma when he was severely sick. He was very cooperative and sought contact with humans. Solicited sexual contact immediately after he got a little better. Enjoys attention, shows minuscule or even non-existent wounds on his hands and in my interpretation solicits "sympathy".*
-
- Ňuňák and Ňuninka (*most likely orphaned, smuggled and maltreated in their early years*) "...they are humanized, yes, they needed a lot of attention and they are dependent on humans."
 - **Ň and Ň: "They are a little spoilt, they have no respect for people, because they were in intensive human care...they spit a lot."**

This category was abandoned after visiting to the first two zoos. Dependency on humans seems intrinsic to all zoo animals and by itself does not necessarily cause any serious problems, more or less just nuisances. Sometimes, quite the opposite, it enables effective cooperation with the caretakers. Smooth communication between the caretaker and the animal is likely to favor the animal's overall well-being. However, the undesirable results of this dependency remain relevant from the psychopathological perspective and are listed in the following categories.

"Eating disorders circuit": Different disturbances of feeding behavior: Overdrinking/ overeating and vomiting as the most flagrant symptoms, refusal of food in times of stress etc.

- Káma (when intimidated) "...he kept himself occupied by the typical "bottle-fed baby" activity, which is overdrinking and vomiting..."
- The regurgitation habit: "I think they (not specified) do it because they are bored and they keep themselves entertained this way. They chew on things, swallow and then throw it up, they eat it again and so forth...they can repeat this like 20 times in a row. Káma has been throwing up like this the whole time he has been here..."
- **Káma: "...just like bulimics, or anorectics, we have him regurgitating/ throwing up food..."**
- **Kama: "...eats, and then regurgitates... The question is if he is like playing that way, or if it causes him discomfort. He has been doing this ever since I have known him. I think it may be a kind of bad habit, then again, it could be also a pressure relief, a form of escape from stress. But it's possible that part of the time it could have been a function of irritated stomach, or some other somatic problem, I can not exclude the possibility."**
- Káma: *I have observed him throwing up and then sucking the liquids from the floor. He played with the "solids".*

- Ňuňák: *Impossible to classify, may have nothing to do with eating disorder circuit, but Ňuňák drinks Ňuninka's urine.* "He catches the urine as she pees, I don't know if its some kind of a bad habit or what..."
-

- Jolo: "... no, he doesn't do that (*regurgitate*) but the first male (Oscar) used to do that, the visitors kept on telling us that he is throwing up. Jolo doesn't do that."

- Jolo: "...he was used to getting human food, bread and pastries, he would refuse to eat citruses. He also used to get a lot of sweets and sugar, sweetened drinks, but I realized that all he was after was warm drink, he is happy with warm water."

- Oscar: "I don't think he was throwing up, he just took a mouth full, chewed on it, and then he spat it out like porridge, then he would lie next to it and eat it later or something."

- **Oscar: "Yes, he used to throw up, in fact that's how he died, he suffocated on the vomit."**

- **Animals in Liberec (Wilhelma, Ziki, Jolo, Oscar) "Before the amount of food was carefully controlled, they were getting a lot of food and yes, they would eat whatever they could reach, they would overeat themselves..."**
-

- Momo: "Came up with this pastime that he would chew food, hold it in his mouth and then he'd spit it out on some clothes or something, but it wasn't vomiting, I think."

- Jago: "When he came here, he was anesthetized twice during transport, and couple of days later he started vomiting everything he ate, it was certainly longer than 24 hours after the last anesthesia, and it lasted for some time."

- Jago : "When he vomits, he doesn't reingest, it's usually Momo that is likely to eat it up. Momo is really a filthy mouth."

- Momo: "He eats its own feces sometimes and urine, that's a common

occurrence. I'm not positive if he actually eats it, but he does put it in his mouth. Sometimes they paint with it ."

- All animals, non specified: (ct) "Yes, they do throw up, I think they even copy this behavior from one another and they eat it after each other."
- **All animals, non specified (Ct 2)** "...all three of them do it (vomit), with one feeding they can do it like three or four times over, usually the last feeding of the day, the fruit, that's what they like the most." (Question: are you sure its vomiting, aren't they just maybe holding it in their mouth?) **"No, they vomit, you can see that, they heave, they have to make themselves sick and it happens on everyday basis."** (Question: how do you explain this?) **"...maybe they are bored, sometimes they throw it up in the clothes we give them as enrichment and then they suck on it, or they smear it on the window and then they lick it."**
- Momo (Ct): "He eats his own feces and when Nanga urinates, he would go underneath and catch the urine in his mouth."
- **Nanga (Ct 2)**: **"Yes, they do that, but Nanga just puts it in her mouth, I have never seen her swallow her feces myself. Momo does."**
- *I have personally witnessed the regurgitation in Momo (he was seated next to a swing, he would hold onto the swing, heave for a moment, his stomach was obviously convulsing, then he threw up with no obvious signs of discomfort. He toyed about with the food for a while and then sucked the liquids off the ground. This pattern was similar to that of Kama).*

This particular behavioral anomaly was one of the few constants across the sample. It did not however appear in every animal. At first it seems to be a kind of pastime, a result of boredom. The caretakers from Bojnice have implied that it may be a function of a specific food, their observation was that their animals "particularly enjoy" regurgitating fruit. It would be very useful to determine whether regurgitation and reingestion appears at all in the free ranging population. To my knowledge, it has not been documented.

Based on the information we have regarding feeding behavior in the wild, there might be more to this problem than mere boredom. First of all, their foraging success is vastly dependent on the fig fruiting season, it is therefore possible that they are indeed prone to over-eating in times of fruit abundance, followed by a fasting period due to seasonal food shortage. In captivity the food supply is constant and it may be possible that the animals are permanently over-fed in comparison to the free-ranging population. (The common problem of obesity being one of the indices supporting this hypothesis.) It would be interesting to experimentally induce some irregularity in food availability. Maybe if the animals learned that the food resources are unpredictable and relatively scarce, much like in nature, they would choose to "economize".

Another possible reason why they regurgitate could be the fact that while foraging in nature, due to food source localization, the handling and processing of food consumes the most part of daily activities. It can be hypothesized that "food handling" is an instinctual behavior. Being deprived of normal food handling activities, the often witnessed "toying" with the regurgitant could be the behavioral alternative. As far as other feeding anomalies are concerned, coprophagia apparently does take place, although it doesn't seem to be nearly as common, for example, as in Gorillas. I have no other viable hypothesis regarding the two documented cases of urine drinking by the males other than maybe they were somehow trying to determine the females reproductive status. Overall, eating disorders seem to be a rather universal phenomena in the captive population, which asks for thorough further research.

"Anxiety circuit": Various manifestations of extreme anxiety, demonstration of fear, panic, anxious insomnia. I have included the description of behavior resembling depression, since it is hard to distinguish from dysphoric moods often associated with anxious withdrawal.

- Filip's reintroduction to his mother after separation for 9 months: "He was returned to the parents at the age of 9 months, he was extremely scared of them both (Upita and Kama) because apparently they (*the caretakers*) have not been showing him (Filip) to them (U + K)."
- Káma: "...because he was scared, he wouldn't leave the outside grounds, and as he was constantly watching his back, he was probably also sleep deprived. He probably didn't get any sleep at all, he was exhausted. He kept on watching his back and was anxiously expecting that the animal (Wilhelma) would walk in...and beat him up...so he didn't sleep, and probably due to the stress he stopped eating , stopped communicating with the caretakers, he was just lying completely devastated in his place."
- Káma being scared of Wilhelma: "...he was running away from her, backing away, climbing away, and he roared with fear...he was simply trying to escape from the object he was scared of. (*So a flight response and vocalization...?*) Yes, flight and very often he comes to the bars and reaches for me, he wants me to hold his hand."
- Wilhelma: "...she refused to get enclosed, not even for food, they (*the caregivers*) were of course trying to at least give her food to the feeding box. She used to take off her baby and put it under the sliding door, thus making sure they could not be closed."
- Wilhelma: "...she apparently has had trauma from earlier on, she simply wouldn't let herself be closed anywhere..."
- Upita and the young: "...the only thing they would never bring me was a dead bird, they won't touch a corpse. They also never interacted with other animals, like if a turtle crawled out of the pond or something..."
- "I have asked the Orangs (*unspecified*) to bring it (*corpse of a bird*) to me, repeatedly, but they never did...they would give me anything within 10 meter radius, but they simply wouldn't touch the corpse. (*Were they scared?*) No, they just...they seemed to be repulsed by it."

- **Káma**: (after the unsuccessful attempt to restore the group) "...**fear of the sliding doors, even though Denisa (the caretaker) was only trying to move him from one bedroom to another, just to clean up, the fear was obvious.**"

Subcategory: other behaviors indicative of "mood disorder" - Sudden and enduring apathy, negativity. The animal does not communicate nor cooperate with the caretaker, stops eating. Decrease of locomotion and activity altogether. Weight loss.

- Káma's maladaptation to introduction of Wilhelma : "...he stopped communicating, he was no longer coming to eat or drink by the bars...then he stopped eating altogether and afterwards he just lied there...and this was in the outdoor exhibition, it was starting to get cold, so he had to be sedated and transported to the "bedroom". He was 47 kilos back then."
- When disturbed: Káma: "...he stops eating, he looks sad, he has digestive problems, diarrhea...and when he gets his digestive problems, its all on the square one, tons of medication..."
- Upita after separation from her young: "...she was simply sad, she refused to eat, she was sitting in a corner somewhere, devastated."
- Káma: "He wouldn't react to any verbal prompts, he wouldn't even raise the eyes, he would not keep eye contact, he wouldn't come to the bars, he wouldn't give you his hand, he wouldn't let himself be scratched on the head."
- **Kama**: "...**seemed not to know what was happening to him, he used to sink in his own world, he was unable to react to everyday stimuli, you know as when someone looks through you...**"
- Káma: "...he is just psycho...psycho, you see...(What does it mean psycho?) Well, he is oversensitive, he gets upset about everything..."
- **Káma**: "...**we have repeated problems with diarrhea, we can not**

exclude ulcerosis...the main trigger seems to be stress, his problems is instability, he is particularly oversensitive."

- Ňuňák: "...he must have been maltreated, in the beginning he was extremely scared and protective of his hands, he always had to hold on to something, if not, he would become completely hysterical, he would scream, grab peoples feet..."

This category somewhat overlaps with the "Excessive Aggression" circuit as well as the "Psychosomatic circuit". Based on my personal observations as well as the narratives, these captive animals tend to either react aggressively toward noxious stimuli or turn the aggression towards themselves, thus developing a somatic syndrome. The rather detailed decryption of "depression" in Kama for example was closely linked to the overall bad physical condition of the animal that followed a very stressful period within the group. Drawing conclusions on the presence of a mood disorder is close to impossible. According to the caretaker, the trigger of his condition was that he was constantly bullied by Wilhelma (the newly introduced female). Kama had what the caretaker labeled as a "nervous breakdown". The causal chain appears to be: Social stressor – extreme anxiety and fear - chronic distress resulting in physical illness - and depressive symptomatology (clinical picture). Therefore, I included the description under "Anxiety" even though depression in human psychiatry is of course a discreet category. Distinct mood disorders did not enter the record, even though caretakers do report on great individual variance between the animals. The signs of depression were almost exclusively linked to animals being ill.

Back to the original dichotomy of anxiety/fear expression: I witnessed a series of very loud episodes when the animals, possibly intimidated or just irritated by my presence behind the bars, would first exhibit what I interpreted an anxious response (avoidance, distancing, misplaced behavior – self-grooming), and afterwards would furiously beat the bars, or vocalize ecstatically. This was

especially true for the males, Ňuňák and Jolo. It looked like when, for example, scared or cornered canines growl, bark, expose their teeth and by all possible means demonstrate aggressive intent. The trigger of this reaction, whether it was really fear/anxiety or "pure aggression", would require further study.

I have also included the anecdotal "corpse avoidance" within this category, which at first resembles some kind of phobia. Not having any additional data, I assume it may have been simply a fear of an unknown object, hence listed in this category. This is only a preliminary grouping.

"Reproductive cycle disruption": Starting with cycle disruption, to abnormal parental care and breast feeding routine etc...Possibly due to the unnatural grouping of animals (normally solitary, in captivity they are forced into a kind of family group) and due to spatial constriction it is impossible to avoid one another.

- Upita's "twin babies situation": "...because Filip was taken away from Upita, she restored her cycle and got pregnant almost immediately, so even though Filip was returned to her, within a year she had another baby, male Pagi."
- Upita: "...her first period after almost 8 years, before Wilhelma came to scene. When she came, Upita stopped breast feeding Pagi, but also stopped having period and she hasn't had one since...(even though Wilhelma died) and she (Upita) has been observed to breast feed Pagi again, I don't understand this."
- **Upita: "The only problem from veterinary perspective is the cycle disruption. But the cause is unknown, it could be an ovarian dysfunction, some morphological anomaly, or it could also be a break caused by the fact that the juniors still come to breast feed every now and again..."**
- *I have observed the young soliciting breast feeding from Upita, even*

though they are supposed to be weaned. Upita tolerated them. Pagi suckled for a while, but it was not possible to determine whether or not Upita still has milk.

This category only concerned Upita. The only other female that currently had a baby was Ľuninka. She did not exhibit any problems associated with parental care and/or cycle disruption whatsoever. However, if the zoos are meant to serve the conservation purpose, the question of reproductive health should be investigated not only from the veterinary perspective, but also from the ethological. I suppose that we can not go wrong by simulating natural conditions as precisely as possible; in other words, maintaining the normal reproductive pace (respecting the inter-birth interval), enabling female choice (technically close to impossible, but there seems to be an overall consensus that it would increase the chances of successfully breeding the animals in captivity) etc. This category is closely linked to human dependency circuit. As far as rearing is concerned, the less human handling the better. It seems that it is for the benefit of all involved, the mother, the infant and ultimately the caretakers to allow all the processes take place as naturally as possible.

"Excessive aggression circuit": Aggression towards one another, and/or towards the caretakers, reasons for which are not clear. Irritability and violence without determinable cause, bullying of the weakest, planned and systematic animosity.

- Upita : can be "Very aggressive" in disturbed environmental conditions (renovation of the pavilion) Feeding situation: "...instead of the bottle, she grabbed me, she grabbed my t-shirt, I was lucky, if she had grabbed me by the hand or hair, I would be in a lot of trouble. In this case I just quickly stripped in self defense, so she only got the t-shirt, she madly threw it back at me... as if "you can keep this, its YOU

I wanted"...they can be unpleasant, and with Upita, in our experience she is capable of being very aggressive."

- Wilhelma: "...she was extremely aggressive towards all of them, she picked up Kama as the weakest of the group, she was terrorizing him permanently, he was trying to escape her, but she would follow him, beat him up, pull at his hair, she would push him off the bench using branches, hit him with branches, bite him...She also attacked Upita."
- Wilhemina "Who would pull at her (Upita's) hair, and bite her back, but not seriously, there was no bleeding or anything."
- Filip harassing his father Káma: "Filip was harassing him also. Kama was hanging head down like a bat and Filip was pulling at his hair, biting him, beating him up. You see they are generally quiet, even when they fight, but when they're scared, they cry, and Kama was roaring with fear..."
- Upita's aggression: "Upita, sedated on Haloperidol, she was completely out of order due to the medication, but nevertheless, she would lie down and rest for 15 minutes, then regroup all her forces and pursue Kama violently. The scheme was similar, he was hanging head down, or sitting somewhere, and she would beat him up and bite him...this is how one day she bit him into the genital area (foreskin), he had a nasty wound."
- Upita versus another caretaker: "...she (*the caretaker*) turned her back on Upita...and she (*Upita*) tore her pants off."
- Upita: "...given opportunity, Upita is always ready to attack. With clear intent to hurt. In some cases she would intentionally try to break the locks to get to people, we saw her using all her might trying to destroy the locks etc..."
- *I have observed behavior indicative of aggressive intent: fur standing up, spiting, Upita would reach for the caretaker and/ or use sticks to reach her.*

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- Ňuninka (*supposedly in vengeance after the caretaker tried some*

disciplinary measure on her infant): "...she dealt with me all right...she bit me, she fought with me the way they fight together, biting legs and so on..."

- All the animals in Ústí: "I don't know how they learned that, but they all spit when angry, and Amos used to pee on us..."
- Ňuňák: "...when he was young and he wanted something, he would start hitting things, making noise, just to get attention. He still has the same habit, but now it's more like he is trying to intimidate me, he has the threat in the eyes..."
- *I have witnessed an episode of a quite spectacular attack of fury, Ňuňák would beat the bars with all his might and roared, I asked the caretaker about it and he replied that Ňuňák reacts this way sometimes, and he has no explanation of this behavior. (This statement off record unfortunately) It seemed to me as an intimidation attempt and/ or imposing. According to the caretaker, he hasn't to this day managed to "decode" this behavior, nor connect it to any specific trigger stimuli.*

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- Jolo : "He was always solitary, he used to be rather aggressive towards Wilhelma. He grabbed her a couple of times and bit her once, after that she was scared of him, they were avoiding each other completely..."

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- Nanga and Momo: "Nanga is very moody, something flips in her head and then she is openly aggressive towards the caretakers, she tries to grab or bite, with Momo it could be his way of playing, he is not aware of how strong he is, so he can be rough, but in him I wouldn't consider it an act of aggression, unlike in Nanga."

This category is, more than any other, likely to be distorted by personal perception biases. Some people seem more likely to get aggressive reactions from animals (the caretakers have their favorites, just as the animals have

their favorite caretakers). In addition, we all have individual measures of what we consider aggressive. However, it seems that compared to reports from the wild, where aggression has only been documented between two fully phalanged males or due to conflicts over food shortages, or compared to the sanctuaries (see, for example, Galdikas' works), zoo animals seem, overall, more aggressive. "More" not being only a quantitative measure (a notion I have no statistical evidence for) but a qualitative one.

A normal, free ranging male for example, has no reason to attack a fully mature and receptive female and remain on hostile terms with her for a long period of time (as in Jolo's case). Nor do the females/young ever attack a fully mature male. This aggressive behavioral anomaly is logically suspected to be directly linked to other forms of social pathology that develop in artificially formed groups in confined spaces. It would be worth treating separately if the occurrence of aggressive behaviors would decrease with the possibility of normal dispersal. It seems like a logical assumption. If nothing else, having more place to run and hide should at least statistically improve the chances of successfully avoiding "the bully". Bigger enclosures should also limit territorial conflicts, even though orangutans do not appear to be territorial *sensu stricto* (discussed elsewhere). They clearly like their privacy and most likely would appreciate space to avoid undesired social contact. I have personally observed (and photo-documented) a behavior indicative of desire for isolation. Both males and females alike often use cardboard boxes or clothes to cover their heads and use detached spaces in their enclosures for rest or feeding. The effect of population density on aggression is well studied in humans and animals (aggression does increase with the population density). This well-known fact raises rightful questions about the optimal design of enclosures. In conclusion, excessive aggression is likely to be linked to environmental conditions (limited space, high density, boredom...), or to environmentally induced "social pathology". It should be brought to attention that in orangutans, due to their semi-solitary life-style, it sounds like a logical

assumption that a forced coexistence in a stable group can generate problems. For example:

- Kámas adult male status: "...but the minute we left them, Káma, Upita and the young entered the expositions. All of them were after him, (Káma), including the gibbons. They all reacted with the utmost aggression, Upita, with support of Pagi, Filip held back a bit, but even the gibbons were harassing him... we can't explain it, we think they may have seen Wilhelma doing this and they just repeated what they saw...I think that after Wilhelma humiliated him, he has shown his weakness, he has behaved like a coward in front of the group..."
- Káma: "...he lacks the normal, dominant behavior of a male. He simply doesn't have it. When things were quiet, he had his position somewhat established...but in the conflict, he behaved like a ultimate loser..."
- Káma: "...physically, he was more than able to beat her up, if he had slapped them one (the young, or even Upita) all would have been ok. But that never happened, he was running away, crying with fear..."
- **Kama : "... is definitely abnormally submissive, that is the core of all his troubles..."**
- **Káma: (a propos of being submissive and harassed by the females):
"...as a result of this harassment, we were dealing with bitten fingers, arms, torn and badly healed foreskin, all this was just an outcome of the behavior.."**

Another case where the environmentally induced "social conflict" took a tragic turn was the case of Tara, deceased in Bojnice after being dropped on the head by Momo. Prior to this incident, she was permanently harassed by him. The official report written by the curator says that she was exhausted and could no longer resist the rough handling from the male (unclear if there was a hostile intent, or just a rough game). He used to lift her by the fur and drop her on the ground, pursue her and force copulation on her (again, something that would not happen in the wild). Chronic harassment (as

opposed to occasional "rapes" by subadults as discussed elsewhere) can only take place because there is no avoiding each other.

Jolo, an old male, seems to be just fine in his solitude. An extreme case from the other end of the spectrum, is the unprecedented family harmony I have observed in Ústí. Ňuňák and Ňuninka seem to be a perfectly happy couple, Bady a perfectly happy junior and Ferda - living in isolation from the group - seems to have a lifestyle similar to Jolo. Ňuňák exhibits paternal care I have never heard of, nor have I found any records of such behavior. He is a gentle and caring father that initiates and encourages games (for example he hides in a big T-shirt and waits for Bady to come and explore the situation - a kind of orangutan peek-a-boo). He lets his junior use him as monkey bars, patiently lets him pull on his hair and even wears his junior around his neck. There seems to be no "sexual harassment" between the adults. Ňunak does demand sexual attention a lot, but Nuninka apparently barely ever resists. According to the caretakers, she is very cooperative. So, again, my logically sounding assumption that forced "group" existence is a source of all sorts of troubles does not seem to be universally valid. The effects of captivity in terms of disrupting a "normal" social system requires further study.

"Psychosomatic/health problems circuit": From paresis of the legs, presumably due to a lack of environmental stimuli, to an irritable digestive tract (supposedly stress related and/or a post-traumatic reaction) up to menstrual cycle disruptions in females, it is clear that psychosomatic disorders are common. Additional complaints include gastrointestinal problems, obesity, proneness to infectious diseases and possible immune system disruptions.

- Káma: "You see when he starts having psychological problems like this, he immediately gets sick, the digestive apparatus to start with. He gets so disturbed that he starts throwing up, gets diarrhea , as a result he gets dehydrated of course...he had normal appetite, but he vomited everything he swallowed...that was hellish...ever since he collapsed

(after the unsuccessful introduction of a new female) was he has been in separation."

- Káma's hind legs paralysis: "...he didn't walk for a while...he stopped using his hind legs, he'd just lie around somewhere..."
- Reference to adult male from Liberec (Jolo): "...didn't walk anymore, it sometimes happens when they do not have enough stimuli to move. He was brought up alone in a pavilion with only a removable roof (*but no outside exhibition*) so he didn't have much room to move or motivation to do so."
- Wilhelma: "...then she had some bacterial infection on top of that...so stress, organism weakened, loss of weight due to her behavior, her liver didn't function properly, we had to admit that we simply lost the case with Wilhelma."
- Káma's notorious health problems: "...he had many episodes in his life when he was ill for whatever reason, he was sick and cured a hundred times already...I think it was due to the confinement, lack of space and lack of enrichment, maybe he was under the impression that there was no need for him to move, so he didn't. And you see the muscles, they deteriorate really quickly..."
- Wilhelma: "She was extremely obese when she came here..."
- Káma's: "...digestive problems...he spent his childhood throwing up, so he was harming his epithelia constantly... With careful feeding it gets better, but every time he is stressed is starts acting up again. God knows if he has ulcers or something..."
- Káma: "...every time he is stressed he starts throwing up and gets diarrhea, he dehydrates massively..."
- Káma: "...because he was mentally not well, of course he fell physically sick, one always follows another, the minute he has a nervous breakdown, he starts throwing up, gets diarrhea, loses weight and all together..."
- **Kama** : "...had something we assumed could have been a liver

problem, clinically it looked like the onset of diabetes, but from my perspective, that's just my opinion, this is really psychosomatic...of course, I can not prove this. But then again, clinically speaking, based on the tests, there is no organic reason to his symptoms, bacteriologically he is in norm, and if they get out of control, that seems to be also stress triggered..."

- **Kama**: "...the very recent problems were probably triggered by the changes around him, there were some reconstructions going on. He was developing his symptoms (diarrhea etc...). He was medicated, apart from other things we used Oxazepam, sedative, that has a mild anti-depressive effect and is a mild tranquilizer as well. I can not say, yes, Oxazepam saved his life, but it was a part of complex treatment. We can not prove it was this particular drug that eventually calmed his digestive (*but he got better*). It may be like with people, when under stress, before an exam or something, they get diarrhea too...(laugh)."
 - **Káma**: "...very depressed mobility of pelvic extremities..."
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- **Ferda**: "When he first came, he would move only in a tire, he would sit in it and use his arms to push himself around. He has hind leg paralysis and moves solely by means of arm movement."
- **Ňuňák, Ňuninka**: "**Due to intensive human care**, (*in the beginning - being most likely poaching orphans, they were severely malnourished*) ...when they got better and didn't need extra food, they were always well fed. They are a little overweight..."
- **Ňuňák**: "Had ugly ulcers on his throat pouch, there were attempts to determine what it was, the vet claimed it could have been folliculitis, the hair roots got inflamed one from another as he scratched. It was ugly, they were all connected, Amos (*one of the offspring no longer in the zoo*) was trying to "cure" him. He was probably just spreading the infection. He (*Amos*) could keep himself occupied by sucking on the wounds for hours, as he was bored, it was a really inappropriate behavior."

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- Jolo: "He is old and ill, he does not use his hind legs...he stopped using them 4 years after he came. There were veterinary checks, but they found no organic reason, no articulation problem, nothing."
 - Jolo: "he is capable of using the hind legs, we used to give him some corn between the bars and he would climb the bars using his hind legs, I think it is due to the fact that he is kept on concrete...if he was kept on grass, where he wouldn't be able to just slide on his butt he would start walking again."
 - **Jolo: "Because he used to get a lot of sweet drinks, he has rather bad teeth, but it is also due to his age."**

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- Momo: "...we always had problems with diarrhea, it seems to happen when he gets scared of something, an unexpected sound or something...but it can also be due to the fact that he is quite filthy, he puts no matter what in his mouth."
 - Momo: (Ct) "We have been having problems with Momo, he often has diarrhea, we thought it could have been due to some dietetic mistake we were making, but it turns out that it's his reaction to strangers, or if there was a renovation or maintenance of enclosures or something, so it's his reaction to stress, or when he gets scared and so on."

Somatic health is for obvious reasons one of the priorities of both the zoo and the caretakers. Two distinct groups of problems were recorded: A) gastrointestinal complications/proneness to infectious disease B) Locomotor deterioration possibly resulting in hind leg paralysis and/or obesity. The first being linked to environmental stressors, the second quite the opposite, to the debilitating stimuli-poor environment. Much to my pleasant surprise, all of the professionals I have interviewed acknowledged and implicitly operated with the notion that physical health of the animals is connected to their mental well-being. All of the caretakers have noticed that some trigger stimuli result in a psychological disturbance that demonstrate itself as some somatic

problem, diarrhea/ digestive apparatus malfunction and proneness to infectious disease being the most common.

Symptomatic treatment usually takes place, animals are put on some sort of diet and/or medication. I have not recorded any attempt to address this problem by psychological means, and having very limited knowledge of the possibilities in this field, I do not dare to propose any such intervention. It is quite remarkable however, that most caretakers demonstrated what I labeled "lay psychological support". Despite my attempts to be as non-intrusive as possible, the interviews often took place by the enclosures and the animals did, in one way or another, interact with me. The caretakers, aware that I was a new element, would try to verbally and/or gesturally introduce me. When the animals exhibited arousal or discomfort, they were more attentive towards them, responded immediately to solicitation of contact, talked to them a lot, used their names, gave them treats and touched them in a comforting manner. I decoded this behavior as an instinctive psychological intervention to prevent/alleviate stress reaction.

There are numerous situations in the everyday functioning of a zoo that are potentially distressing: various renovations, maintenance of the enclosures, the visitors that often harass the animals, group management problems (for example, the introduction of a new animal or the separation of "family members"), routine veterinary procedures, etc. Some can not be avoided, but careful management could certainly eliminate the rest. The question stands, can the negative psychological impacts be treated by psychological means? If there is a way to help the animals become more resistant and resilient as a preventive measure, and help them cope with the distress when acute, then the answer is yes. This concerns the group of somatic syndromes seemingly linked to environmental stressors and this topic alone deserves more in-depth research.

The second group of problems is locomotor deterioration, such as hind leg paralysis, appear to be directly connected to the design of the enclosures that are by far not fit for these originally arboreal animals. Even though the more "modern" enclosures are usually equipped with climbing ropes, nets and branches, it is obvious that maybe apart from the more playful youngsters the animals are not very motivated to use these "facilities". In some zoos, the animals are still kept on concrete. Not only does this surface facilitate regurgitation/reingestion, as discussed elsewhere, it also enables the "lazy" animals to move by "sliding" instead of "walking". Orangutans are in nature almost exclusively arboreal and hence the most natural locomotion for them is brachiation. Most of the enclosures I have seen neither allow, nor encourage this locomotion style. Also, the way of feeding (for the most time animals are served directly) does not demand any physical activity. I have seen Ferda, with full paralysis of the hind legs, Jolo who is suspected of simply not being bothered to use his hind legs, although seemingly able to do so, and Kama, who had a record of hind leg paralysis but by the time applicable moved normally. All three individuals happened to be adult males, which could be a mere coincidence. However, it appears that males are overall less active than females and their bigger body mass may make it significantly more energy demanding to brachiate, hence they may be more prone to this problem.

However, the records point in the direction that the decreased mobility is environmentally induced, and that lack of stimuli encouraging movement only makes matters worse. There is a sound assumption (and Kama being a living proof) that this condition can be treated by adjustments to the design of enclosures (the need to "orangutanize" their living space) and by means of enrichment that forces the animals to move naturally (for example feeding that would require brachiation such as food handling in the branches etc).

"Sexual behavior disorders": "parafilia" (humans, Gibbons), sexual incompetence (disability to copulate properly), "hypersexuality".

- Kama is an: "...erotomaniac", he is very fixated on women, so it was enough for him to see a pretty woman and he was immediately ready to copulate...and so he was copulating with her (Upita) almost non-stop, though the copulation attempts were "not worth much" because he was jumping on her back and so on..."
- Káma: "...takes women as sexual objects. (*How can you tell?*) He is activated by their presence, he actively grabs your hand and leads you, he sticks out his genitalia, he forces you to touch him, to masturbate him...if not fellate (*laugh*)... he is quite unbelievable in that aspect...he tries all the time, for example, even though he wouldn't eat, he still wanted this..."
- Káma "...he would climb on her back or wherever really, he didn't care...and she would just hold and drew patterns on the floor with her fingers..."
- The young (Filip, Pagi) : "...they practiced (copulation) already with the gibbon female, they are training you see...I don't see anything bad in that, of course sometimes they try it on their own mother...they are just like that, erotomaniacs...they are both healthy young males, they have seen copulation from up close many times, and since they have no better option and the gibbon female cooperates..."
- Káma: "... A "normal male" would not be attached to human females like this, right? He wouldn't get aroused by women..."
- Káma: "...he elicits help from us, mainly. He can't do it (masturbate) himself, manually, apparently, so he uses the bottle, I don't know how he invented that, maybe it was just nice when there was warm drink, such as tea in it, that's to start with. He puts it (*his penis*) in warm liquids, and plus there is a hole, of course...but mainly he forces us (caretakers) to touch him".
- Káma: "...every time he gets excited, in his case over some good looking woman, he goes and jumps on Upita, he couldn't care less how, on her head, on her back, in the armpit, for as long as she

cooperates and he climaxes. That's all. But he apparently managed to copulate properly as well (*since he sired two offspring*)".

- **Káma**: "His sexual orientation is clearly pathological, he doesn't perceive Upita as a mating partner, it is surprising that they conceived two offspring together, I don't know if she had been extremely receptive and cooperative, or if he had had a bright moment when he felt "on the horse" (*hyped, proud, dominant*)...anyways I'm sure that this is a deviation, that he is fixated on human females. He doesn't consider Upita, his conspecific, a sexual partner."



Káma- Prague Zoo, masturbating with a plastic bottle, picture by author, January 2009

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- **Ňuňák**: "...when he sees a blond (human) especially if she is well developed, or wears nail polish or something, he gets excited, chases Ňuninka and violates her. She tolerates that. He always lies on his back, always. He holds her on top of him."

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- **Jolo** : "...no sexual interest in Wilhelma, he was always a very solitary guy..."
 - **Oscar** : "...used to be really fond of Bela (the caretaker) he would climb the bars and expose his genitalia, wanting to be touched or masturbated."
 - **Wilhelma**: "We have once witnessed Wilhelma forcing copulation on

her son Ziki, because she didn't have contact with the adult male, she would lie on her back, grab him, move him around and try copulating with him. But he couldn't do it. We assume that they have to observe it to learn and he never had the example. In the era, Wilhelma was together with Jolo, and with him it didn't work, so she would compensate it this way."

- Momo: "He copulated and successfully impregnated his own mother at the age of 4, 5 years, that's rather common in zoos, though clearly pathological, presumably due to the confinement and closed group."
- **Momo: "He is hypersexual, he demanded copulation a lot, unaware of his own physical power he tends to be pretty rough."** *He was harassing both females one of which Tara he dragged by the hair onto the sleeping bench during one pursuit and dropped her down, she landed on the head. Died as a result of this incident.*
- Jago: "When he first came, we had them all together, with Momo and Nanga. Jago used to draw attention to himself, he would masturbate with him, or even forced oral sex on Momo..."
- **Jago: "Jago started copulating with Momo straight after he (Jago) got here, he preferred him over Nanga. Maybe Momo was trying to prevent the actual intercourse, so he came up with this oral sex practice."**
- Jago was observed forcing anal sex on Momo.
- Momo: "We were hoping he would become more effeminate after the castration but he didn't. He continued copulating with Nanga..."
- Jago (Ct) : "We were very surprised when he first came to us, 'cause he was permanently raping Momo...in the beginning it was not even rape, because Momo didn't resist, he didn't fight..."
- **Jago and Momo (Ct 2)**: "And then Jago would force Momos head towards his genitalia, he was forcing him to do it."

As I argued in the theoretical part, aberrant sexual behavior is a common feature in captivity, in men and animals alike. There are at least these problematic points:

- A) As discussed in the "social pathology" paragraph the limited space and unavoidability of unsolicited social or sexual encounter - resulting in chronic harassment of ceaselessly available females, receptive or not. As a result, various forms of "sexual violence" present even from animals that do not normally "rape" - adult, fully phalanged males, juniors, even females!
- B) The problem of sexual choice deprivation - a possible cause of limited reproductive success in captivity, excessive? masturbation (hard to say how much time the free ranging orangutans devote to this activity, but in some captive individuals it seemed like their only pastime (Kama, Jago, Momo).
- C) Deviations in object other than humans (Gibbons). Also possibly due to lack of appropriate mating partners.
- D) "Homosexual behavior" as either a result of choice deprivation, or it can also be, hypothetically, an act of establishing social hierarchy, as observed in other primate species. However, in the wild, orangutans do not form stable groups, their "fission-fusion" society does not have a "maintained" hierarchy. Hence, this motivation could be considered only as an artifact of captivity.
- E) The human rearing (often connected to captive conditions) suspect of causing "deviation in object" towards humans. The mechanism behind this phenomena is possibly analogous to "imprinting" sensu Lorenz.
- F) Lack of "normal reproductive behavior" models - minimal opportunity to observe adults mate, resulting in incompetence when attempting to copulate.
- G) Hypersexuality? Again, more of a qualitative measure, since quantitative data are unavailable for the time being. The qualitative

difference being that possibly due to non-stop availability of females, sexual behavior grew independent on reproductive status of a female.

All these notions would have to be tested of course. But when we look at the repertoire of behaviors encoded in this study there seems to be a sound empirical base to form a testable hypothesis.

Stereotyped behavior, "compulsive circuit": repeated, useless behavioral patterns, possibly resulting in self harm.

- Filip: "...he has this stereotypical movement, you know, he grabs the hay, makes a bundle, puts it underneath him and bounces his head on it...it looks funny, the visitors often laugh on it, well, I don't find it funny at all, I think its some kind of neurosis, that's what I think."



(Filip, Prague Zoo, hugging and "bouncing" on his pile of hay in a stereotyped manner, picture by author, January 2009)

- **All of the animals in Prague : "...whether they have a stereotyped behavior of whatever kind...but the question stands, whether the regurgitation is not something like this"**

-
- Amos : "Had bald back, he had almost no fur, it turns out that he was rubbing himself against the wall, and used to slide on concrete on his back... so I don't know if this could be the case of stereotyped behavior, his mother, Ľuninka, she likes to scratch herself too, she can do that for 10 minutes no problem, until she has white marks on her skin, long strokes, starting from her feet up to her head... but it doesn't come across as weird or disturbed..."

-
- Nanga : "...she has been plucking her fur ever since she was young..."
 - Nanga: "It (excessive fur plucking) seems to be connected with boredom, or as psychological reaction to change."
 - **Nanga: "Main problem seems to be the fur plucking, on her forearms and even higher up. She came with it."**
 - Nanga: "**She seems to do it more in winter and early spring, when they are all bored, since they can't go outside. When she first came, she used to also pluck the fur of Tara, her sister, not violently , it was more like excessive grooming.**"
 - **Nanga (Ct): "She plucks her fur a lot, she gets bald patches also because of Jago, he keeps pulling her hair, but when she gets nervous or something she does this to herself."**
 - Nanga (CT2) : "She is like pinching on herself and then pulls her hair, usually in winter, maybe she is bored...yes, she uses her teeth and plucks her arms."

This category was "poorer" than I originally thought, possibly because the other repetitive behavior patterns such as regurgitation/reingestion, persistent masturbation etc, are classified elsewhere. There is a sound suspicion however, that these behaviors do have a compulsive character. No case of

intentional "self-mutilation" was documented, although the excessive self-grooming did result in fur loss. Again, further study would be needed to confirm these patterns as compulsive.

7.4 Discussion

"The topic"

First of all, I am aware that I have entered the fragile interdisciplinary world. I understand that there might be objections against the very core of this paper, which is the notion of psychiatric conditions in sub-human species. However, let there be no mistake about the nature of diagnostic criteria in human psychiatry. There is only a limited knowledge about the ethiopathogeny of psychiatric conditions. We have is the lowest level of diagnostic validity. (Smolík, 2002) We operate, in all due respect, with only a little more than clusters of empirically observed phenomena and a consensus of experts. As I outlined in the "psychopathology" section, the manual dealing with psychiatric conditions operates with the term "disorder" not disease, since the criteria for a nosological unit are never met: with psychiatric conditions, we do not know to date, its precise ethiopathogeny, course and prognosis.

In the beginning of human psychiatry, there was also had mere observation, case studies, preliminary labeling and more or less successful attempts to define and categorize symptoms. I have attempted to copy this approach, which proved to be clinically useful, meaning that we can and do, on an everyday basis, work with the categories we agreed on. I am aware that my "categorization" attempt is crude, but considering the ultimate lack of information about this topic, any logically justifiable speculation should be allowed, provided that there is expected further research to test the viability of these speculations.

"Research design"

This design logically raises questions about what was my sample: was it the people I interviewed, or the Orangutans they referred on? I shall argue it was both. (For practical reasons we can consider the interviewees a panel of experts and hence my choice was purposive sampling.) I do see, however, at least two possible downfalls in this approach: Firstly, with the choice of subjects and sample size: I implicitly considered the captivity and husbandry practices as main psychopathogenic factors (as discussed elsewhere, the prevalence of psychological disorders in the wild is likely to be kept insignificant by means of natural selection. If any deviation from norm survives, it means it is adaptive and hence can not be considered pathological anymore). If I was to operate within this assumption, a significantly bigger and more varied sample should have entered the record. For example, "captivity" should have been examined in all its forms (laboratories, rescue and reintroduction centers, "pet" conditions, sanctuaries etc). Unfortunately, it would simply not be feasible for me to finance and perform a research of such extent. Therefore, I operated with a limited number of subjects and a single type of "captivity" - the zoo. While there seemed to be many problems (observable and reported on) in some zoos, others appeared to be virtually problem free. I have not observed any direct link between the physical environment (enclosure size, materials used etc) or caretakers' practices and occurrence or absence of aberrant behavior.

With my sample, I must admit, the phenomenon of captivity and human care did not appear to be pathogenic by themselves, however logical it sounded. Other reasons for aberrant behaviors need to be brought to discussion, personality factors being one of the most intriguing. It seems like there are, just like in people, individuals more likely to "break" under pressure, while others cope with it well. In addition, rearing method, life history, early experience, physical condition, social "background" etc could be some of numerous possibly significant factors in development of aberrant behavior. The relative uniformity (zoo animals) does not enable any kind of generalization on

"captive population" and the sample size does not enable any generalization on " zoo population". However, this paper attempted to be a qualitative, preliminary study, with no aspiration to generalize, nor draw any causal conclusions.

The second downfall of this design is that there is another possibility why the logically sounding concept was not supported by the data: a methodological error on my side. I can not, for the time being, exclude the possibility that despite my triangulation efforts, the subjective perception played a more important role than the occurrence of the behavior itself. Maybe my interviewees from "problem free" zoos are simply less attuned to interpret the behaviors in question as pathological, or even "lift it from the background" as Lorenz would say. Having worked in the field of human resources, I am aware of the "corporate culture" phenomenon. It is possible that people working in the same zoo provide similar, positive reports, not so much because there are indeed no problems with the animals, but simply because this is the way they, as part of a "company", deal with problems.

Of course, the optimal plan would include detailed, extensive, focused observation of all animals that were reported on. My research design counted on years of "ad libitum" observation and anecdotal records of my interviewees. I am aware that relying on one's memory, especially memories subjectively distorted, is threatening both the validity and reliability of my findings. However, the topic is fairly new to research, and especially in orangutans there was virtually no referential literature to lean on. In this stage, being a completely orangutan-naïve researcher, my observations were not likely to be relevant. Therefore, I chose this method as the first step to gather preliminary information. I tried to correct methodological insufficiencies by means of triangulation as well as some, however limited, personal field notes. I hope to observe, describe and if at all possible, quantify the abnormal behaviors using more standard ethological methods (observation sensu

Altmann) in my future works. This method surely attuned me to what I may be looking for.

Another good reason for a qualitative approach was that the phenomena of my interest were often very "anecdotal" in nature and therefore might never be recorded by any standard sampling method. I believe that this research design proved to be quite appropriate, despite the limitations it brought along.

The results are, considering the limited sample, rather rich. It is useful not to get too frivolous in interpretation of course. Morgan stated that a scientist shouldn't try to interpret an action by means of attributing complex, superior skills if the same action can be interpreted by simple means (in Vauclair, 2004 p.5). I do not mean to imply that I determined mental disorders as operated with in human psychiatry. However, just like it is simpler to call an animal "sad" for practical purposes, rather than say assessing his hormonal levels and describing fractions of his facial expression, the "categories" might serve as useful shorthand for further research.

"Methodological framework"

The grounded theory approach I aspired for was very hard to tackle. This concept works completely without a pre-fabricated hypothesis (Disman, 2002). As previously mentioned, even though it was not postulated as a hypothesis, I did indeed work with the implicit notion of captivity being the psychopathogenous factor as discussed above. I am not sure what the distinguishing point is between a logical assumption that precedes all scientific endeavor, and a hypothesis that delimits the choice of method in research. I shall hope that the discovery of the assumptions during my research does not discredit the use of grounded theory approach as such.

Also, the semi-structured part of the interview may seem as if it was against the "no prefabrication" imperative. However, the "diagnostic categories" were

used solely as verbal prompts for the interviewees, and they emerged from the hours of my volunteer work with the animals and from the discussions with the head caretaker of Prague zoo. These "verbal prompts" hopefully qualify as allowed "adjustments" in the process of data collection. I did not mean to test the hypothesis that the proposed diagnostic categories actually appear in captive population. In fact, if the non-structured interview was fruitful, and the interviewees were producing enough information spontaneously, I barely used the questions. The relative non-standard "administration" of the interviews was the most intriguing, and most constructive part of this approach. However, I am aware that precautions apply as discussed above. Personality factors and subjective distortion has to be taken in account in this type of interaction, and on both sides, the administrator and the interviewee. But, after all, I intended to simply collect as much information as possible, from any relevant source available, and do my best to integrate these findings into a solid database of ideas for further research. I am afraid that within this thesis, it is impossible to reach "theoretical saturation" sensu Strauss, but I tried to provide a decent starting line.

"Validity"

I base my research on a post-positivist approach, aware that all measurements are fallible, all observations are theory-laden (despite my utmost effort to approach the problem preconception-free) and we are all inherently biased. For validity criterion, I shall use the definition of William M.K. Trochim (2006) that states that validity is the best available approximation to the truth of a given proposition, inference or conclusion. Considering that I explored a phenomenon that can not be studied directly, and that my subject couldn't provide a verbal report of their inner states, I consider the caregivers' reports to be the best available approximation.

"Reliability"

As far as reliability goes, with a qualitative research design based on subjective verbal statements, the consistency and repeatability of measure is

a tricky target. I proposed inter-observer cross-check, hence the reason why at least two independent reports were used for each group of animals. I must admit however, that the reports were often more complementary rather than confirmatory as the caretakers did not always provide report on the same phenomena. For qualitative design however, Trochim (2006) proposes an alternative "credibility criteria": "the results of qualitative research are credible or believable from the perspective of the participant in the research. Since from this perspective, the purpose of qualitative research is to describe or understand the phenomena of interest from the participant's eyes, the participants are the only ones who can legitimately judge the credibility of the results," (Trochim, (<http://www.socialresearchmethods.net/kb/qualval.php> 22. 2.2009)). I plan to discuss the findings of this research with the caretakers. I'm hoping to have the information re-assessed, re-evaluated and corrected precisely by the group of people who provided the statements in the first place, therefore, I consider this criterion met.

7.4 Conclusions

The findings of this preliminary study could be summarized as follows:

Captive orangutans do exhibit behavioral anomalies similar to humans.

These anomalies appear to be multifactorial in ethiology, with captivity being one, but possibly not the most, important factor. However, an array of aberrant behaviors do seem to be directly linked to the physical factors of captive environments.

The method proved to be a rich source of information. It is clear, however, that extensive observation is vital to further investigate the nature of phenomena that were reported on.

It appears that the usage of a human diagnostic model could be a productive approach, provided that all the symptoms to be investigated would be operationalized specifically for orangutans.

Orangutans being our "Asian cousins" capable of complexity comparable to humans, should be studied accordingly, in a broader context, including philosophical and ethical considerations. This notion delimits the choice of acceptable research methods.

Further research into the psychopathology of orangutans should be focused on more precise definitions and descriptions of symptoms, investigation of possible causes and correlations, as well as treatment options.

Due to physiological and psychological comparability, various treatment options can be proposed, starting from environmental adjustments through psychological intervention, to controlled, ethical experimental usage of human psychiatric medication.

I have been working on this topic for almost two years and my outlook has evolved greatly since the beginning. I feel that writing this paper was both professionally, and personally, one of the most rewarding experiences I have had. I must say that I started with absolutely unrealistic ambitions, went through ultimate frustration and skepticism, and ended, hopefully, in at least a constructive attempt to shed some light onto this topic. I have gathered a lot of material that teases my scientific curiosity. Orangutans are fascinating creatures and deserve a lot more attention than they are given credit for. I was privileged to be able to observe them.



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