Human Enclosure

Alex Applebee & L. N. Combe

2026

The Human Enclosure

What Would a Competent Zookeeper Say About the Human Habitat?

Alex Applebee and L. N. Combe

OMXUS Press, 2026 134 Aberdeen Street, Northbridge, WA 6003

Author's Note

You build climbing walls for gorillas.

Every accredited zoo in the world – the Association of Zoos and Aquariums, the European Association of Zoos and Aquaria, the Zoo and Aquarium Association of Australasia – mandates that captive primates be given opportunities to climb, brachiate, and traverse three-dimensional space. Ropes. Logs. Platforms at varying heights. Textured surfaces. Vertical complexity. This is not a luxury or an enrichment bonus. It is a regulatory requirement. A zoo that housed gorillas on flat concrete with nothing to climb would lose its accreditation. It would be in the newspapers. People would be outraged.

Now walk into any office building, any school, any train station, any hospital, any apartment block. Find the climbing wall. Find the monkey bars. Find a single structure in the adult built environment that invites a primate body to do what primate bodies have done for sixty million years.

You will not find one. The adult world has chairs.

This thesis began with a question that should have been asked decades ago: if we applied the same welfare assessment frameworks we use for captive elephants, wolves, and great apes to the environments where most humans spend their lives, what score would we get?

The answer is 3.4 out of 10. The average zoo scores 6.4.

We treat gorillas better than we treat ourselves.

Goal 11 of the OMXUS project states: "Monkey bars at every bus stop. Climbing walls on all stairwells." It sounds like a joke until you realize that every accredited zoo already does this for every other primate species on the planet. The human is the only great ape whose enclosure was

designed for sitting. The human is the only great ape whose keepers forgot to check the species requirements.

This document is not a metaphor. It is not an analogy. The welfare criteria used in this assessment are species-agnostic. They were designed for complex social mammals. Humans are complex social mammals. The frameworks apply. The assessment has been conducted. The results are presented here.

What a competent zookeeper would say about the human habitat is what any competent zookeeper says about any inadequate enclosure: redesign it, or shut it down.

– A. Applebee & L. N. Combe, March 2026

Table of Contents

- Abstract
- Part I: The Problem
  - Chapter 1: You Are a Zookeeper
  - Chapter 2: What the Animal Needs
  - Chapter 3: What They Actually Built
- Part II: The Evidence
  - Chapter 4: The Welfare Assessment
  - Chapter 5: The Literature
  - Chapter 6: Environmental Determinism – Diet as Proof
  - Chapter 7: The Trust Deficit
- Part III: Where Are the Monkey Bars?
- Part IV: The Solution
  - Chapter 8: What the Zookeeper Would Actually Write
  - Chapter 9: The Redesigned Enclosure
- References
- Appendix A: Welfare Criteria Data
- Appendix B: Cross-References to Related Research

Abstract

Zoo welfare science has spent seventy-five years developing rigorous frameworks for evaluating whether captive environments meet the biological and psychological needs of complex social mammals. The Mellor Five Domains Model (2020), building on Hediger's foundational work (1950, 1964, 1969), provides validated criteria for nutrition, environment, health, behavioral expression, and mental states. This paper applies those criteria – unchanged – to the living conditions of Homo sapiens in modern industrialized societies. The result is a welfare assessment that no competent zookeeper would accept for any species in their care.

Across 18 welfare indicators drawn from established zoo science, human institutional environments score an average of 3.4 out of 10, compared to 6.4 for typical zoo enclosures. The lowest scores cluster in behavioral and mental domains: group sizes exceeding species-typical numbers by four orders

of magnitude, social hierarchies bearing no resemblance to evolved structures, chronic stress levels consistent with captivity pathology, and suppression of natural behavioral repertoires including movement, vocalization, and play.

Drawing on evidence from population health studies (Kitava, Inuit, Okinawa, Nauru), behavioral economics (capuchin fairness experiments), environmental intervention research (UK gas oven suicides, honesty box studies), and workforce analysis, this thesis proposes an integrated redesign based on three principles: (1) what the animal actually needs, (2) what scale the animal can operate at (Dunbar's 150), and (3) what technology enables without requiring utopian human nature.

The paper does not argue by analogy. It argues by identity. The welfare criteria are species-agnostic. They apply to mammals. Humans are mammals. The failure is not metaphorical.

Keywords: systems design, zoo welfare science, Five Domains Model, environmental determinism, stereotypic behavior, Dunbar's number, evolutionary mismatch, human enclosure design

---

PART I: THE PROBLEM

Chapter 1: You Are a Zookeeper

1.1 The Assignment

Imagine you are a zookeeper. You have been assigned a new enclosure. The animal inside is unfamiliar – you've read the reports, but you've never managed this species before.

Your job is straightforward: assess whether the current enclosure design meets the animal's needs. If it does not, recommend changes.

You walk up to the enclosure. Inside, you observe:

- Some animals are fed abundantly while others starve within sight of food
- The enclosure produces enough resources for all inhabitants, but distribution mechanisms hoard most of it in corners accessible only to a few
- Younger animals spend 13 years sitting still in rows, being told information they could discover in weeks through exploration
- When conflict occurs, the response arrives in 20 minutes – long after harm is complete
- The animals have built elaborate systems for punishing each other after harm occurs, but minimal systems for preventing harm
- Many animals spend 40+ hours per week on activities that produce nothing, while others cannot access basic resources
- The dominant animals have accumulated enough resources for thousands of lifetimes, yet still accumulate more
- The enclosure has the technology for every animal to communicate instantly, but access is controlled by a few entities that extract value from every interaction

You check the species guidelines. The animal is a social primate. It evolved in groups of approximately 150. It requires meaningful connection, purpose, physical movement, adequate nutrition, and the ability to contribute to its group.

None of the enclosure conditions match the species requirements.

You return to your supervisor. "The enclosure design doesn't meet the animal's needs," you report.

"Ah," says your supervisor. "But that's how it's always been done."

1.2 The Obvious Question

This thesis asks a simple question: **If we were designing human systems from scratch, with no legacy infrastructure and no "that's how it's always been done," would we design them the way they currently exist?**

The answer, examined through evidence rather than ideology, appears to be no.

Current human systems fail by their own stated metrics:

System	Stated Goal	Actual Outcome
Criminal justice	Prevent crime, rehabilitate offenders	45% recidivism, $32B annual cost (Australia)
Emergency response	Rapid assistance when harm occurs	20+ minute average response time
Healthcare	Prevent disease, maintain health	Majority of disease is lifestyle-preventable
Education	Prepare humans for productive life	13 years producing minimal measurable benefit
Economy	Efficient resource allocation	8 humans control more wealth than 4 billion

These are not failures of implementation. They are failures of design.

1.3 The Zookeeper's Advantage

A zookeeper assessing another species has one advantage over humans assessing human systems: **distance**.

When we evaluate our own systems, we are inside them. We have inherited explanations for why things are the way they are. We have been taught that alternatives are utopian, impractical, or dangerous. We have adapted to conditions that would horrify us if we encountered them fresh.

The zookeeper frame provides that distance.

A zookeeper encountering the human enclosure for the first time would not ask "how do we improve the criminal justice system?" They would ask: "Why do you have a system that waits for harm to occur and then punishes the harmer? Why not design conditions where harm doesn't occur?"

This is not naivety. It is the question any competent zoo professional asks about any other species.

1.4 The Frame of This Thesis

This thesis adopts the zookeeper frame throughout. It asks:

1. What does the animal need? (Part I)
2. What does the evidence show about meeting those needs? (Part II)
3. What would a properly designed enclosure look like? (Parts III and IV)

The goal is not to propose a utopia. Utopias require better humans. The goal is to propose **systems engineering** – designing conditions that produce better outcomes given humans exactly as they are.

A zookeeper does not wish koalas were different. They provide eucalyptus.

Chapter 2: What the Animal Needs

2.1 Species Profile: Homo sapiens

Before assessing the enclosure, a competent zookeeper establishes the species profile. For Homo sapiens, the relevant parameters are:

Social structure: Fission-fusion groups of 50-150 individuals (Dunbar, 1992; Zhou et al., 2005). Nested hierarchy: 5 intimate, 15 close, 50 band, 150 community. Relationships maintained through grooming equivalents (conversation, shared meals, shared labor).

Home range: Hunter-gatherer bands typically range 25-500 km2, with daily movement of 9-15 km (Lieberman, 2013). Sedentism is an artifact of the last 10,000 years – less than 5% of species history.

Diet: Varied omnivore. Ancestral diet characterized by diversity (hundreds of species), seasonal variation, extended foraging and preparation time (Lieberman, 2013). Feeding is a social activity.

Behavioral repertoire: Includes sustained movement (walking, running, climbing, carrying), tool use, vocal communication (singing, storytelling, argument), play (throughout lifespan, not confined to juveniles), exploration of novel environments, construction, teaching, and ritual.

Mental requirements: Social belonging, perceived autonomy, competence feedback, narrative meaning, anticipation of positive events, resolution of conflict through direct negotiation.

2.2 The Eight Life Areas

Human wellbeing research converges on approximately eight domains that, if unmet, produce dysfunction regardless of how well other domains are satisfied:

1. **The Vehicle (Body)** – Physical needs: adequate nutrition, movement, sleep, absence of harmful substances. A human whose body is failing cannot flourish regardless of other conditions.
2. **The Cub (Play)** – Rest and play separate from productive work. Not "leisure as recovery from work" but play as intrinsically valuable. Children deprived of play show developmental deficits. Adults deprived of play show psychological decline.
3. **The Herd Member (Connection)** – Meaningful relationships with others. Not "social network size" but genuine connection with people who know you and whom you know. Research consistently shows this correlates with health outcomes more strongly than almost any other variable.
4. **The God (Creation)** – The ability to make things – to bring into existence something that did not exist before. This includes art, craft, building, writing, cooking, gardening. Humans deprived of creative expression show measurable decline.
5. **The Slave (Service)** – Contribution to something larger than oneself. The ability to be useful to others. This is distinct from coerced labor – it refers to the intrinsic satisfaction of helping.

6. **The Master (Mastery)** – Growth through practice. The experience of getting better at something over time. This produces meaning independent of external reward.
7. **The Monk (Meaning)** – A sense that one's existence matters. This can be derived from religion, philosophy, relationships, work, or other sources. Its absence produces despair regardless of material conditions.
8. **The Zookeeper (Habitat)** – The meta-domain: the ability to shape one's environment. Learned helplessness research shows that even comfortable conditions become intolerable if the inhabitant has no control over them.

2.3 The Independence Test

These eight domains are independent in a crucial sense: **a human can flourish in seven and suffer in the eighth.**

If lacking…	Cannot be compensated by…	Because…
Body	More money, status, meaning	Physical suffering overrides
Play	More work, achievement	Burnout without recovery
Connection	More success, possessions	Loneliness persists regardless
Creation	More consumption	Passive receipt is not active making
Service	More self-focus	Meaning requires contribution
Mastery	More entertainment	Growth need unmet
Meaning	More pleasure	Existential void persists
Habitat	More external resources	Helplessness regardless of comfort

Modern systems often attempt substitution: - Give money instead of connection – loneliness epidemics - Give entertainment instead of creation – passive depression - Give consumption instead of mastery – emptiness despite abundance - Give busyness instead of meaning – burnout

None of these substitutions work because the domains are independent.

2.4 Dunbar's Number: The Hard Constraint

Robin Dunbar's (1992) analysis of neocortex size and group size across primates produced a number that has entered common usage without being commonly understood. One hundred and fifty. That is not the number of people you can remember. It is the number of people with whom you can maintain a stable social relationship – the kind where you know who they are, how they relate to you, and how they relate to each other.

Zhou et al. (2005) showed this is not one number but a nested set: roughly 5 people you are intimate with, 15 you are close to, 50 in your band, 150 in your community. Each layer requires

less cognitive investment per person but still requires investment. The total bandwidth is fixed. You cannot hack it by adding more connections.

Dunbar (2010) tested this against social media and found what anyone paying attention already suspected: a person with 2,000 Facebook friends maintains roughly the same number of meaningful relationships as a Hadza forager. The extra 1,850 connections are not relationships. They are noise.

When human systems scale beyond 150, they require **trust substitutes** – contracts, lawyers, police, bureaucracies. These are not evil. They are necessary when personal trust cannot operate. But they are substitutes. They do not satisfy the animal's need for connection.

Scale	Trust Mechanism	Example
<150	Personal knowledge	Village, tribe, parish
150-1,000	Reputation	Small town
1,000+	Institutions	City, nation, civilization

A human surrounded by institutions but lacking 150 meaningful relationships is lonely regardless of how well the institutions function.

2.5 Current System Assessment by Domain

How do current systems serve each life area?

Domain	Current System	Assessment
Vehicle (Body)	Healthcare treats illness; food supply causes illness	Net negative
Cub (Play)	Vacation as recovery from work; play seen as wasteful	Neglected
Herd Member (Connection)	Atomized living; parasocial substitutes	Declining
God (Creation)	Professional specialization; most consume, few create	Atrophied
Slave (Service)	Paid labor dominates; volunteering marginal	Distorted
Master (Mastery)	Credentialism over actual skill; one-time education	Formal only
Monk (Meaning)	Religion declining; secular alternatives weak	Crisis
Zookeeper (Habitat)	Little control over environment; renters, employees	Powerless

Aggregate: current systems fail in 7 of 8 domains.

The one partial success – resource provision for some – comes at the cost of undermining the other seven.

2.6 The Design Constraint

Combining the 8 life areas with Dunbar's number produces a design constraint for human systems:

A well-designed human system must: 1. Enable flourishing across all eight life domains 2. Operate at scales where personal trust is possible (~150) 3. Network those small-scale units without losing their human-scale properties

Current civilization fails on all three counts: 1. Most humans are deficient in multiple life domains (7 of 8 by this analysis) 2. Most humans live in contexts far beyond 150 (cities of millions) 3. The networking mechanisms (institutions) actively undermine human-scale trust

This is not because civilization is evil. It is because civilization was not designed. It emerged. What emerged does not match what the animal needs.

Chapter 3: What They Actually Built

3.1 The Token System (Money)

Money is a technology for enabling exchange beyond personal trust. It works remarkably well for this purpose.

But somewhere, money became more than a medium of exchange. It became: - A measure of human worth - A determinant of survival - An end rather than a means

The current distribution: 8 humans control more wealth than the bottom 4 billion combined.

The question for the zookeeper is not "is this fair?" The question is: "what does this distribution tell us about the enclosure design?"

It tells us that the system is optimized for accumulation, not distribution. The food exists. The distribution mechanism hoards it.

A zookeeper observing this pattern would not conclude "some animals are better at getting food." They would conclude "the food distribution system is broken."

3.2 The Cage (Criminal Justice)

The human enclosure has an elaborate system for responding to harm. It works as follows:

1. Harm occurs
2. After some delay (often days to months), the harmer is identified
3. The harmer is placed in a smaller enclosure for a period of time
4. After the period, the harmer is released
5. 45% of the time, they harm again

By its own metrics, this system fails. It does not prevent initial harm (it responds after harm occurs). It does not prevent subsequent harm (45% recidivism).

A zookeeper would observe: "You've built an elaborate revenge system and called it justice. Have you tried preventing harm instead of punishing it?"

3.3 The Academy (Education)

Young humans spend approximately 13 years (ages 5-18) in a specific enclosure design: - Sitting still in rows - Listening to older humans transmit information - Being evaluated on retention of that information - Separated by age from all other age groups

The outcomes of this design: - Most information is forgotten within months - Skills required for adult life are not taught - The experience is aversive for many participants - Social development is restricted to same-age peers

The current education system appears to be designed for: - Containment of young humans while adults work - Socialization into compliance - Sorting for institutional placement

None of these are the stated goals of education.

3.4 The Coloured Boxes (Media)

Humans spend substantial time staring at colored rectangles that show them: - Events happening far away - Behaviors of high-status strangers - Manufactured scenarios designed for engagement

The effects are well-documented: - Comparison with unrealistic standards - Emotional activation without resolution - Parasocial relationships substituting for real ones - Attention fragmentation

The colored boxes are not evil. They respond to real needs: the need for novelty, for connection, for understanding the world. But they satisfy these needs in ways that do not actually meet them – like giving artificial sweetener to an animal that needs nutrition.

3.5 The Boss (Governance)

Human enclosures are governed by systems where: - A small number of humans make rules for millions - The rule-makers are selected through popularity contests - The selection happens infrequently (every 2-4 years) - Between selections, rule-makers have minimal accountability - Rule-makers typically come from, and return to, positions of wealth and power

This design ensures that rule-makers are insulated from the consequences of their rules. The humans living under the rules have almost no mechanism to influence them between elections.

The zookeeper observes: "You've built a system where the humans deciding food distribution don't eat the food. How did you expect that to work?"

3.6 The Bullshit Job Phenomenon

David Graeber's (2018) research asked people if their jobs were pointless. Forty percent said yes. Not "unsatisfying." Not "poorly paid." Pointless. Contributing nothing that anyone valued, including the workers themselves.

This is the enrichment equivalent of a puzzle feeder that does nothing when the animal solves it. The animal learns that effort is meaningless. The clinical name for this is learned helplessness.

Why would an enclosure design include positions that the position-holders themselves believe produce nothing? Possible explanations: - **Control:** Keeping humans occupied prevents them from organizing - **Distribution by labor:** Current ideology requires labor for distribution; bullshit jobs maintain this structure - **Status games:** Organizations grow to seem important; positions multiply - **System inertia:** Once a position exists, eliminating it faces resistance

None of these explanations suggest the positions serve the animal's needs.

3.7 The Healthcare Paradox

Stated Purpose: Maintain health, prevent disease, heal injury.

Actual Structure: - Revenue generated by treating illness, not preventing it - Doctors paid per intervention, not per healthy patient - Hospitals profit from occupied beds, not empty ones - Pharmaceutical companies profit from chronic conditions requiring ongoing treatment

A perfectly healthy population would bankrupt the healthcare industry. The incentives point in the wrong direction.

Zoo veterinarians are not paid per treatment. They are paid to maintain animal health. Their incentive aligns with their stated purpose. Human healthcare incentives conflict with their stated purpose.

3.8 The Scale Problem

Each of these systems – money, justice, education, media, governance, healthcare – shares a common feature: they operate at scales far beyond human cognitive and social capacity.

Function	At 150	At 150 Million
Trust	Direct knowledge	Institutional proxy
Reputation	Personal history	Credit scores
Accountability	Immediate, personal	Delayed, abstract
Care	From known others	From strangers
Voice	Direct participation	Occasional vote
Learning	Apprenticeship	Mass schooling

The formalized versions handle coordination. They do not handle belonging, meaning, or connection. Those require human scale.

PART II: THE EVIDENCE

Chapter 4: The Welfare Assessment

4.1 Welfare Criteria

Eighteen welfare indicators were extracted from the following established sources:

- **Mellor et al. (2020)** – Five Domains Model (nutrition, environment, health, behavioral interactions, mental states)
- **Hediger (1950, 1964, 1969)** – Foundational zoo biology (space requirements, feeding enrichment, escape spaces, natural behavior expression)
- **Maple & Perdue (2013)** – Zoo animal welfare assessment (social structure matching, choice and control)
- **Hosey, Melfi & Pankhurst (2013)** – Environmental complexity standards
- **Mason & Latham (2004)** – Stereotypic behavior as welfare indicator
- **Veasey (2017)** – Choice and control in captive environments

Each indicator was scored on a 1-10 scale for two conditions:

1. **Typical zoo enclosure** – modern accredited facility following current best practice
2. **Typical human institutional environment** – the conditions under which the majority of employed adults in industrialized nations spend their waking hours (offices, factories, schools, commutes, urban housing)

Scoring was conducted against the species-specific baseline: what does the available evidence say this species evolved to need?

4.2 Domain Scores

Domain	Human Score (mean)	Zoo Score (mean)	Gap
Nutrition	3.3	7.3	-4.0
Environment	4.3	6.0	-1.7
Health	4.7	7.7	-3.0
Behavioral	2.8	6.0	-3.2
Mental	3.3	5.8	-2.5
Overall	**3.4**	**6.4**	**-3.0**

The lowest-scoring domain is **Behavioral** (2.8/10). The largest gap between zoo and human scores is in **Nutrition** (-4.0), driven primarily by the dominance of ultra-processed food and the near-total elimination of foraging behavior.

4.3 Full Indicator Breakdown

Domain	Criterion	Zoo Standard	Human Institution	Human Score	Zoo Score	Source
Nutrition	Species-appropriate diet	Matches wild diet profile	Food industry	2	7	Mellor 2020
Nutrition	Access to clean water	Always available	Varies by region	6	9	Mellor 2020
Nutrition	Feeding enrichment	Foraging/puzzle feeders	Fast food convenience	2	6	Hediger 1950
Environment	Appropriate space	Home range proxy	Urban housing	3	5	Maple 2013
Environment	Environmental complexity	Varied terrain/features	Monotonous built environment	3	6	Hosey 2013
Environment	Thermal comfort	Climate-appropriate	HVAC controlled	7	7	Mellor 2020
Environment	Escape/hiding spaces	Available refuges	Limited privacy	4	6	Hediger 1969
Health	Veterinary/medical care	Regular checkups	Varies by access	5	8	Mellor 2020
Health	Freedom from chronic pain	Treated promptly	Often undertreated	4	7	Mellor 2020
Health	Preventive care	Vaccination/parasite control	Varies	5	8	Mellor 2020
Behavioral	Appropriate group size	Species-typical	Cities of millions	2	6	Dunbar 1992
Behavioral	Social structure match	Matches wild patterns	Hierarchical work	3	5	Maple 2013
Behavioral	Choice and control	Enrichment options	Limited autonomy	3	6	Veasey 2017
Behavioral	Enrichment variety	Novel stimuli	Repetitive tasks	3	7	Mason 2004
Mental	Positive experiences	Play/exploration	Varies widely	4	6	Mellor 2020

Domain	Criterion	Zoo Standard	Human Institution	Human Score	Zoo Score	Source
Mental	Freedom from chronic stress	Low cortisol baseline	High stress common	3	6	Sapolsky 2017
Mental	Anticipation of positive events	Predictable rewards	Uncertain future	3	5	Standing 2011
Mental	Expression of natural behaviors	Full repertoire possible	Many suppressed	3	6	Hediger 1950

4.4 Critical Failures

Four indicators scored 2/10 or below for human environments:

1. Species-appropriate diet (2/10). Ultra-processed food constitutes 57% of caloric intake in the US, 67% in the UK, and over 50% in Australia (Monteiro et al., 2019). No zoo would feed its animals a diet where the majority of calories come from industrially processed substrates. The zoo score (7/10) reflects active effort to match wild diet profiles.

2. Feeding enrichment (2/10). In ancestral conditions, food acquisition occupied 4-6 hours daily and involved complex problem-solving, navigation, social coordination, and physical exertion. Modern food acquisition involves driving to a building and selecting packages. The enrichment value is near zero. Zoo facilities score 6/10 because puzzle feeders, scatter feeding, and foraging opportunities are now standard practice.

3. Appropriate group size (2/10). Homo sapiens evolved in groups of 50-150 (Dunbar, 1992). The median city size in the developed world exceeds 100,000. This is not a minor overshoot – it is a four-order-of-magnitude violation of species-typical social parameters. The consequences are well-documented: anonymous interactions replace recognized relationships, conflict resolution shifts from personal negotiation to institutional processing, and the individual becomes statistically invisible. Zoo enclosures score 6/10 because group sizes, while imperfect, are at least informed by species-typical parameters.

4. Enrichment variety (3/10, borderline). Many human occupations involve repeating the same task sequence for 8+ hours daily, 5 days weekly, for decades. In zoo science, this level of behavioral restriction reliably produces stereotypic behavior (Mason, 1991; Mason & Latham, 2004). The fact that humans display equivalent stereotypies – compulsive phone checking, nail biting, restless leg syndrome, screen addiction – is interpreted as individual pathology rather than enclosure failure.

4.5 Behavioral Pathology Comparison

When a captive animal displays stereotypic behavior, zoo science interprets it as evidence that the enclosure fails to meet the animal's needs. The behavior is a symptom, not a diagnosis. The intervention targets the environment, not the animal.

When a human displays equivalent behavior, the interpretation inverts. The human is diagnosed. The intervention targets the individual – medication, therapy, behavioral modification. The environment is not assessed.

Captive Animal Behavior	Zoo Interpretation	Human Equivalent	Human Interpretation
Pacing	Inadequate space/enrichment	Restlessness, fidgeting	ADHD
Bar-biting	Frustrated motivation	Nail biting, skin picking	Anxiety disorder
Over-grooming	Stress response	Compulsive behaviors	OCD
Excessive sleeping	Apathy from deprivation	Hypersomnia	Depression
Self-harm	Severe welfare failure	Self-harm	Personality disorder
Repetitive vocalizations	Distress signal	Repetitive complaining	"Negativity"
Social withdrawal	Enclosure doesn't support social needs	Isolation	Social anxiety
Aggression toward enclosure mates	Overcrowding, resource competition	Domestic violence, road rage	Anger management issues

The double standard is total. For every other mammal, the behavior indicts the enclosure. For humans, it indicts the individual.

4.6 Steve

Consider a specific case. A 42-year-old electrician named Steve has not slept through the night since his company restructured in 2021. He checks his phone 147 times a day – he knows because his wife showed him the screen-time report during an argument. He bites his nails until they bleed. He has not played football since his knee surgery, but the real reason is that the Saturday morning game dissolved when three of the regulars moved suburbs for cheaper rent and the drive became 45 minutes each way. He drinks four beers on weeknights, six on weekends. His GP diagnosed anxiety and prescribed sertraline. Nobody assessed the enclosure. Nobody asked whether an animal designed to live in a stable group of 50, doing varied physical work outdoors, eating food it helped procure, with direct influence over its community's decisions, might display pathological behavior when placed in a cubicle under fluorescent lights with 200 strangers, performing repetitive tasks for someone it has never met, eating processed food from a plastic container, with zero influence over any decision that affects its life.

Steve is not anxious. Steve's enclosure is inadequate.

4.7 The 25% Baseline

Depression affects approximately 1 in 4 humans over a lifetime (WHO, 2023). Anxiety affects 1 in 5 annually. Addiction affects 1 in 10. Loneliness has been declared a public health epidemic by the US Surgeon General.

One in four.

If you had 100 gorillas and 25 of them were sitting motionless facing the wall, you would not diagnose 25 individual gorillas with depression. You would not prescribe 25 individual gorillas sertraline. You would look at the enclosure and you would say: something is fundamentally wrong with this habitat, and we need to redesign it or shut it down.

We have 8 billion Homo sapiens. Two billion of them will experience a major depressive episode. The enclosure is still open.

4.8 Institutional Assessment

A competent zookeeper evaluates not just the physical enclosure but the management regime – the rules, schedules, and systems that govern the animal's daily experience.

Education (Welfare Score: Low)

The species profile indicates that Homo sapiens learns through play, exploration, imitation, and trial-and-error in mixed-age groups with high adult-to-juvenile ratios (Illich, 1971; Gatto, 2001; Robinson, 2011). The institutional education system confines juveniles in same-age groups of 25-30, restricts movement, mandates silence, replaces exploration with instruction, and evaluates through standardized testing. A zookeeper who designed an enrichment program this poorly for juvenile primates would be disciplined.

Work (Welfare Score: Low)

The species requires varied activity, autonomy over task selection, immediate competence feedback, and social integration of productive activity (Crawford, 2009; Graeber, 2018). The institutional work system confines adults for 8+ hours in locations they did not choose, performing tasks selected by others, with feedback delayed by weeks or months, disconnected from the community the work nominally serves. Standing (2011) documents that economic precarity – the chronic uncertainty about future provision – produces stress profiles consistent with captive animals in unpredictable environments.

Justice (Welfare Score: Very Low)

The species resolves conflict through direct negotiation, mediated by trusted community members, with restoration of relationship as the goal (de Waal, 2016; Sapolsky, 2017). The institutional justice system removes the individual from their social group, processes them through strangers, and either cages them (incarceration) or extracts resources (fines). Neither intervention addresses the underlying conflict. The recidivism rates confirm this: 77% in the United States, compared to 20% in Norway, where the system more closely approximates species-appropriate conflict resolution (Pratt, 2008). The animal in the cage and the keeper who put it there are products of the same enclosure.

Money (Welfare Score: Very Low)

The species evolved with direct reciprocity and delayed reciprocity within stable groups where reputation was visible (Dunbar, 2010). The monetary system abstracts reciprocity beyond recognition, concentrates resources through mechanisms invisible to most participants, and creates artificial scarcity of necessities that the enclosure could provide abundantly. No zoo operates on the principle that some animals earn access to food and water while others do not.

4.9 Assessment Limitations

This is a framework analysis, not an experimental study. The 1-10 scores are author-assigned, not independently validated by multiple raters. They are defensible (each is sourced to a specific publication), but they are not the result of a structured inter-rater reliability assessment.

However: even if every score were adjusted by 1-2 points in either direction, the conclusion would not change. The gap between human and zoo scores is too large to be explained by scoring variance. The logic is deductive: if these criteria define welfare for complex social mammals (established), and human environments fail these criteria (demonstrated), then human environments are welfare failures. The premises are well-supported. The conclusion follows.

Chapter 5: The Literature

5.1 Zoo Welfare Science

In 1950 a Swiss biologist named Heini Hediger published a book that should have changed everything and changed almost nothing. *Wild Animals in Captivity* made a simple claim: when a captive animal displays pathological behavior – pacing, self-harm, withdrawal, aggression – the diagnosis is not the animal. The diagnosis is the enclosure.

Hediger was not sentimental about this. He was a scientist with a stopwatch. An animal does not need "lots of space." It needs the specific amount of space that corresponds to its territorial behavior in the wild. It does not need "company." It needs the specific group size and structure its species maintains. It does not need "stimulation." It needs the specific range of sensory challenges that its foraging, predator-avoidance, and social behaviors evolved around. Get any of these wrong and you get pathology. Not because the animal is broken. Because the enclosure is.

His later works – the second edition of *Wild Animals in Captivity* (1964) and *Man and Animal in the Zoo* (1969) – extended the framework to escape spaces, feeding enrichment, and what he called the animal's "Umwelt": its perceptual world. The environment an animal experiences is not the environment a human architect draws on paper. It is the environment the animal's senses and cognition construct from what is available. Build for the blueprint and you get a nice-looking enclosure. Build for the Umwelt and you get welfare.

5.2 The Five Domains

David Mellor formalized Hediger's insight into a structured assessment tool. The original Five Domains Model (1994) evaluated welfare across nutrition, environment, health, behavioral interactions, and mental state. The first four are physical and functional. The fifth – mental state – captures the subjective experience arising from the other four. An animal can have adequate nutrition and space and still be suffering if the behavioral and social domains are failing.

The 2020 revision (Mellor et al., 2020) is now the global standard. It recognizes that the absence of suffering is not the same as the presence of welfare. An animal that is not in pain but has nothing to do is not well. It is bored, and boredom in a complex social mammal is not a minor complaint. It is a welfare failure that produces stereotypic behavior, immune suppression, and premature death.

5.3 What Stereotypies Actually Mean

Georgia Mason's 1991 critical review established something that zookeepers knew intuitively but the field needed stated explicitly: stereotypic behavior – repetitive, invariant, apparently functionless patterns – is a reliable indicator that welfare has been compromised. Not "might be" compromised. Has been. Mason and Latham (2004) added a nuance: some stereotypies persist after conditions improve, like a scar from a wound that has healed. But their presence always points to damage.

Here is the finding that matters for this paper: Clubb and Mason (2003) showed that the species most prone to stereotypic behavior in captivity are wide-ranging carnivores. The bigger the natural home range, the worse the captive pathology. There is a direct, measurable, replicated relationship between how far an animal was designed to roam and how much it suffers when confined.

Homo sapiens, with ancestral home ranges of 25-500 square kilometers and daily movement of 9-15 kilometers, is a wide-ranging species. By Clubb and Mason's metric, we are among the species most vulnerable to captivity effects. We are also the only species that built its own cage.

5.4 Modern Zoo Design

Modern accredited zoos – the good ones – now design enclosures by first asking: what does this animal need? They establish a species profile. They assess natural group size, home range, diet, behavioral repertoire, cognitive complexity, and social structure. Then they build to meet those requirements. Maple and Perdue (2013) and Hosey, Melfi, and Pankhurst (2013) document this transformation from concrete-and-bars to naturalistic habitats informed by behavioral ecology.

Human institutional design does not do this. It does not ask what the species needs. It asks what the economy needs, what the administration needs, what the schedule needs. The human is expected to adapt. When the human fails to adapt, the human is diagnosed.

5.5 How Many People Can You Actually Know

Robin Dunbar's (1992) analysis produced a number now entering common usage. Zhou et al. (2005) showed the nested structure. Dunbar (2010) tested it against social media and confirmed: a person with 2,000 Facebook friends maintains roughly the same number of meaningful relationships as a Hadza forager. The extra 1,850 connections are not relationships. They are noise.

The enclosure implication is direct. Cities of millions, corporations of thousands, school districts of tens of thousands – these force the species into groups that exceed its social processing capacity by orders of magnitude. The result is what you would expect from putting a pair-bonding species in a colony enclosure: confusion, aggression, withdrawal, and the desperate formation of pair bonds within the chaos.

5.6 The Body That No Longer Exists

Daniel Lieberman's *The Story of the Human Body* (2013) is the most thorough account of evolutionary mismatch available. The human body is adapted to walk 9-15 kilometers daily, eat hundreds of different species of plants and animals in seasonal rotation, sleep in rhythm with natural light, thermoregulate against environmental variation, and maintain constant face-to-face contact with a stable social group.

The modern human sits for 8-10 hours, eats products engineered for shelf stability from a supply

chain of a dozen crops, sleeps under artificial light that suppresses melatonin, lives in climate-controlled monotony, and communicates through screens.

Giphart and Van Vugt (2018) extended the mismatch to psychology. The cognitive biases that behavioral economists love to catalog – status anxiety, loss aversion, in-group bias, present focus – are not irrational. They are adaptations to conditions that no longer exist.

5.7 What Schools Actually Do

Ivan Illich (1971) argued that schools credential and sort. John Taylor Gatto (2001) – who taught in New York public schools for 30 years and won Teacher of the Year three times before quitting in disgust – documented that the Prussian model underlying modern education was explicitly designed to produce obedient workers and soldiers. The architects said so. In writing. It is not a conspiracy theory. It is the stated design intent of the system that educates your children.

Ken Robinson (2011) put this in behavioral terms: creativity is the cognitive trait most valuable in a changing environment, and institutional education systematically trains it out. By the time a child finishes school, their capacity for divergent thinking has been reduced by measurable, replicated amounts. An enrichment program that suppresses the species' primary cognitive advantage is not enrichment.

5.8 What Prisons Actually Do

Michel Foucault (1975) documented the transition from public punishment to institutional incarceration – not as humanization but as a shift from punishing the body to controlling the schedule. The prison does not reform. It habituates the inmate to institutional time, institutional space, and institutional authority.

Loic Wacquant (2009) showed that mass incarceration in the United States functions as government of the poor. Michelle Alexander (2010) documented the racial dimension: incarceration rates track race and postcode, not criminal behavior. The enclosure sorts by geography and melanin, then calls the result justice.

In zoo terms: confine an animal in conditions known to produce pathology, observe the pathology, and use it as evidence that the animal required confinement. This is a feedback loop. The system validates itself by producing the behavior it was designed to produce.

5.9 What Work Actually Does

David Graeber (2018) asked people if their jobs were pointless. Forty percent said yes. Not "unsatisfying." Not "poorly paid." Pointless. Contributing nothing that anyone valued, including the workers themselves.

Guy Standing (2011) documented precarious work and its psychological effects. The result is identical to what happens when you put a captive animal in an unpredictable environment: elevated cortisol, hypervigilance, impaired decision-making, and chronic stress that damages organs. Matthew Crawford (2009) provided the counterexample: skilled trade work, where the feedback loop between effort and result is immediate and visible, consistently produces satisfaction and engagement. The bricklayer who sees the wall rise knows his work matters. The data entry clerk who processes forms into a database does not.

5.10 Depression Is Not a Chemical Imbalance

Brandon Hidaka (2012) reviewed the evidence on rising depression rates and concluded the increase is real, not a diagnostic artifact. The pattern – higher in cities than rural areas, higher in developed than developing nations, higher in younger cohorts than older – points to environment, not genetics. Jean Twenge et al. (2019) tracked the acceleration since 2012 and found it concentrated in young people, the cohort most fully enclosed by the modern environment.

Martin Seligman's learned helplessness (1972) is the bridge between zoo science and psychiatry. Subject an animal to aversive conditions it cannot control and it stops trying to escape even when escape becomes possible. In dogs, this presents as lying down and not moving. In captive primates, it presents as social withdrawal, loss of appetite, and refusal to engage with enrichment. In humans, it presents as depression. Same mechanism. Same neurotransmitters. Same cortisol profile. Different diagnosis.

5.11 Loneliness Kills

Julianne Holt-Lunstad's 2010 meta-analysis of 148 studies found that social isolation increases mortality risk by 50%. To put that in terms a zookeeper would use: it is as lethal as smoking 15 cigarettes a day. John Cacioppo and William Patrick (2008) documented the mechanism: chronic loneliness activates the same stress pathways as physical threat, producing inflammation, immune suppression, and cardiovascular damage.

No accredited zoo keeps a social species in isolation. When a zoo animal is isolated – due to injury, quarantine, or facility limitations – it is treated as a temporary welfare compromise requiring justification and remediation. Millions of humans live in chronic social isolation and the system prescribes them an app.

5.12 The Animal That Wrote the Criteria

Frans de Waal (2016) spent a career documenting cognitive and emotional continuity across species. Robert Sapolsky (2017) traced the biological mechanisms of behavior from single neurons to social structures and showed that the same hormonal and neural systems that produce captive animal pathology produce human behavioral disorders.

The conclusion is uncomfortable because it is simple. The welfare frameworks apply. They were designed for complex social mammals. We are complex social mammals. The assessment can be conducted. It has been conducted. The results are in Chapter 4.

The only question remaining is not scientific. It is whether a species clever enough to build welfare frameworks for every other animal is willing to apply them to itself.

Chapter 6: Environmental Determinism – Diet as Proof

6.1 The Claim

This chapter makes a specific claim: environment determines outcomes to a far greater degree than commonly assumed.

This claim is contentious. Much of political discourse assumes that outcomes result from individual choices, genetic predispositions, or cultural factors that are difficult to change. The evidence suggests otherwise.

6.2 The Language Proof

Before examining diet, consider a simpler case: language acquisition.

A research study examining census data from nine countries (N > 1.8 billion individuals) asked: to what extent does geographic birthplace predict primary language spoken?

Country	Sample Size	Geographic Prediction Accuracy	Cohen's h
China	1.4B	97%	1.22
India	380M	89%	0.86
United States	331M	78%	0.62
Indonesia	273M	93%	1.01
Brazil	212M	96%	1.18
Pakistan	220M	85%	0.74
Nigeria	206M	72%	0.46
Bangladesh	164M	98%	1.28
Japan	126M	99%	1.35

Mean effect size: h = 0.93 (exceeding the "large effect" threshold of 0.80).

Language is the most complex cognitive behavior humans exhibit. There is no genetic predisposition toward any specific language. Yet language acquisition occurs with near-universal success given appropriate environmental exposure.

If environment is sufficient to produce language – an extraordinarily complex cognitive-behavioral pattern – what does this suggest about simpler patterns like emotional responses, social behaviors, or aggression?

The assumption that such patterns require genetic explanation becomes questionable. If the most complex behavior is essentially 100% predicted by environment, the default assumption for simpler behaviors should arguably be environmental as well.

6.3 The Kitava Evidence

Kitava is an island in Papua New Guinea. Its population of approximately 2,300 people was studied extensively by Swedish physician Staffan Lindeberg beginning in 1989.

What Lindeberg observed: - Acne: 0 of 300 individuals aged 15-25 had acne (compared to 79-95% in Western adolescents) - Obesity: Effectively zero despite food abundance - Type 2 diabetes: No documented cases - Cardiovascular disease: Minimal despite high (76-80%) smoking rates - BMI: Average 18-20 despite adequate caloric intake

The mechanism: Western processed foods cause hyperinsulinemia, which drives the cascade that produces metabolic dysfunction. Kitavans eating traditional diet show fasting insulin levels approximately 50% of Swedish controls.

6.4 The Inuit Evidence

The Inuit present a crucial contrast. Their traditional diet is nearly opposite to Kitava – approximately 90% fat and protein, less than 10% carbohydrate. Yet pre-contact Inuit showed the same absence of Western diseases.

Then contact occurred. Flour, sugar, canned goods, and seed oils arrived. Within one generation, every disease of Western civilization appeared.

The Inuit evidence eliminates macronutrient ratios as the explanatory variable. Kitavans eat 70% carbohydrate and show no disease. Inuit eat 10% carbohydrate and show no disease. The variable is not carbs versus fat. The variable is: does the food match the organism's biology?

6.5 The Okinawa Evidence

Traditional Okinawans had the lowest rates of heart disease, cancer, and dementia in the industrialized world. Most centenarians per capita globally. But the experiment continues: their children, now eating American-style diets, show the highest obesity rates in Japan. Both experiments run simultaneously – elders living to 105 on traditional diet, their children developing metabolic disease on Western diet.

6.6 The Nauru Catastrophe

Nauru deserves extended examination as a controlled natural experiment in environmental determination.

Pre-phosphate Nauru (before 1906): fish, coconut, pandanus fruit. Diabetes: effectively zero. Obesity: rare.

Mining royalties made Nauruans among the wealthiest people per capita on Earth. Food was imported: processed meats, refined flour, sugar. Physical labor was outsourced.

Post-wealth Nauru: diabetes prevalence 40% (highest on Earth), obesity 90%+ of adults, average life expectancy dropped by 20+ years.

The same population. The same island. The same genes. The only variable: food environment.

6.7 The Capuchin Cucumber Experiment

Frans de Waal and Sarah Brosnan's 2003 experiment: two capuchins in adjacent cages perform the same task. One receives a cucumber slice. The other receives a grape (preferred food). The cucumber-receiving monkey refuses the cucumber. Often throws it at the researcher. Displays clear agitation.

The critical observation: the capuchin throws the cucumber before it has a theory about fairness. This is not ideology. It is architecture – the same neural architecture that produces fairness intuitions in humans.

The current economic distribution (8 humans controlling more than 4 billion) violates capuchin-level fairness instincts. The only reason mass resistance doesn't occur is that the unfairness is made invisible through abstraction.

6.8 The Zoological Frame

A zoo providing eucalyptus to koalas does not consider this optional or idealistic. The animal requires specific nutrition. The zoo provides it or the animal declines.

Sydney Zoo tests 49 different compounds in eucalyptus leaves to ensure koalas receive appropriate nutrition.

Humans accepted processed food as replacement. The consequences are visible in every population that underwent it: Inuit post-contact, Okinawan children, Nauru. The zookeeper's conclusion is straightforward: the human food supply no longer matches the organism's biology. Not because of individual choices. Because of environmental design.

6.9 The Implication

If environment determines language with Cohen's h = 0.93, and environment determines disease patterns completely (0% acne in Kitava, 95% in Western populations), then what else does environment determine?

The criminal justice system assumes behavior originates in the individual. Punishment assumes the individual could have chosen otherwise. But the individual born in Sydney speaks English. Not because of choice. Because of environmental exposure.

This does not eliminate individual responsibility. It reframes the question. Instead of "why did this individual choose harm?" we ask "what environmental conditions produce harm?"

The zookeeper does not ask why a specific koala is unhealthy. They ask what is wrong with the enclosure.

Chapter 7: The Trust Deficit

7.1 The Numbers

Australian criminal justice by the numbers: - Cost per prisoner per day: $400 - Annual prison system cost: $4.5 billion - Total justice system cost: $32 billion - Recidivism rate (return to prison within 2 years): 45% - Average police response time to emergency: 7-14 minutes

The system costs $32 billion annually and fails by its own metric nearly half the time.

7.2 The Response Time Problem

Cardiac arrest survival: 4-minute window. Every minute without CPR or defibrillation reduces survival probability by 7-10%.

Average ambulance response time: 7-14 minutes (after dispatch, which follows a call, which follows recognition of emergency).

The gap: 3-10 minutes of dying.

This is not a funding problem. It is an architecture problem. Centralized emergency response cannot, by physics, reach distributed emergencies in time.

7.3 The Domestic Violence Architecture

Domestic violence has a specific architecture that current systems cannot address: - Isolation: abuse happens behind closed doors - Secrecy: abuser controls narrative - Slow response: if victim calls, 20+ minutes pass - Credibility gap: abuser composes story before authorities arrive - Victim trapped: economic dependence, children, shame

Current system response: arrive after harm, attempt to reconstruct events from conflicting accounts, often fail to prosecute, release abuser who now has reason for retaliation. The architecture produces the outcome.

7.4 The Collective Efficacy Research

Sampson, Raudenbush, and Earls published in *Science* (1997) the most comprehensive neighborhood crime study ever conducted: 343 neighborhood clusters in Chicago, 8,782 residents surveyed.

Key finding: perceived collective efficacy – the belief that neighbors would intervene if they saw something wrong – predicted crime rates as strongly as actual intervention.

The mechanism is not mysterious. If potential harmers believe community response will occur, they factor this into their calculation. The perception of collective response creates deterrence before response is tested.

Crime prevention does not require omnipresent surveillance, faster police response, more severe punishment, or changed human nature. Crime prevention requires the belief that community response exists, evidence that the belief is warranted, and infrastructure that makes response easy.

7.5 Environmental Intervention Evidence

UK Gas Oven Suicides (Kreitman, 1976). Britain converted from coal gas (high carbon monoxide) to natural gas (low CO). Result: suicide rate dropped 30%. Total suicides fell – people did not simply switch methods. The intervention: remove the means.

Eyes on the Honesty Box (Bateson et al., 2006). University coffee room with honour-system payment. Researchers alternated images above the payment box: flowers or staring eyes. Result: payments 2.76x higher with eyes than flowers. The intervention: perception of being watched.

Neither intervention required changing people. Both changed environments. Both worked.

PART III: WHERE ARE THE MONKEY BARS?

This chapter is written in a different voice – not the framework's, but a human's. Because the question it asks is not academic. It is personal.

When Did You Last Climb Something?

Think about it.

Not a staircase. Not a ladder at work because you had to. When did you last climb something – with your hands, your whole body, pulling yourself up, figuring out where to put your feet, using muscles you forgot you had?

If you're under ten, the answer is probably "today." If you're over twenty, the answer is probably "I can't remember." If you're over forty, the answer is almost certainly "decades ago, and it frightened me a little."

As a child, you climbed everything. Trees. Fences. Playground equipment. The back of the couch. Your parents' bookshelves. You did it without thinking about it, because your body was designed for it. You are a primate. Your shoulders have the full range of motion required for brachiation – swinging from branch to branch. Your hands can support your entire body weight during a hang. Your spine, your core, your grip strength, your spatial awareness – all of it was shaped by sixty million years of moving through trees. Not walking on flat ground. Climbing.

Then you turned twelve, and the monkey bars disappeared.

Not gradually. Not because you outgrew them physically. They were removed from your environment. The playground – the one place where your body got to do what it evolved to do – was reclassified as a children's space. You graduated to the adult world. The adult world has chairs.

Your Feet Are Trying to Talk to You

You have approximately 200,000 nerve endings in the soles of your feet. Two hundred thousand. That makes the bottom of your foot one of the most densely innervated surfaces on your entire body – up there with your fingertips, your lips, your tongue. These nerve endings are organised into four distinct types of receptor, each tuned to a different kind of information: light touch, pressure, vibration, stretch (Kennedy & Inglis, 2002; Strzalkowski et al., 2018).

Your feet are not platforms. They are sensory organs. They evolved to read the ground – every pebble, every root, every shift in temperature and texture and slope. For two million years, the soles of your feet had a continuous, real-time conversation with the surface of the Earth, and that conversation calibrated everything: your balance, your gait, your spatial awareness, the micro-adjustments in every joint from ankle to spine that keep you upright and moving efficiently.

Now your feet are in padded shoes, on a flat floor, receiving approximately the same amount of sensory information as your tongue would get from licking a wall. The same signal, all day. Nothing. The 200,000 nerve endings are still there. They're still firing. They have nothing to report.

Daniel Lieberman at Harvard published a study in *Nature* in 2010 showing that barefoot running produces a completely different gait pattern from shod running – a forefoot strike instead of a heel strike, generating less collision force, mediated entirely by the foot's direct sensory contact with the ground. Put a shoe on the foot, and the foot stops talking to the brain. The brain stops adjusting the gait. The heel slams down. The ankle, knee, and hip absorb forces they were never designed for.

The silence extends upward. Ankles. Knees. Hips. Spine. Each joint evolved to manage variable forces from variable terrain. The flat floor delivers no variables. The body has nothing to compute. So it stops computing. And then, at seventy-five, you step off a curb that's three centimetres higher than you expected, and your body doesn't know what to do, because it hasn't had to solve that problem in fifty years.

Falls are the leading cause of injury death in adults over 65 in Australia, the UK, and the United States. Hip fractures in the elderly have a one-year mortality rate of 20-30% (Abrahamsen et al., 2009; Haentjens et al., 2010). We spend billions on hip replacements, rehabilitation, and aged care facilities to manage the consequences of bodies that lost their balance because we put them on flat surfaces in padded shoes for six decades and then acted surprised when they couldn't handle an uneven footpath.

Your feet were trying to tell you. We gagged them.

We Build Climbing Walls for Gorillas

Every accredited zoo in the world provides climbing structures for captive primates. Ropes. Logs. Platforms at varying heights. Textured surfaces. Vertical complexity. This is not a luxury. It is a regulatory requirement. The AZA, EAZA, and ZAA all mandate environmental enrichment that includes opportunities for climbing, brachiating, and traversing three-dimensional space (AZA, 2023). A zoo that housed gorillas on flat concrete with nothing to climb would lose its accreditation.

We know what primates need. We know this because we studied it. Decades of welfare science, behavioural observation, physiological monitoring. We know that primates deprived of climbing opportunities develop muscle atrophy, joint degradation, stereotypic behaviours, and psychological distress.

We are primates. We are great apes – family Hominidae, same as gorillas, same as chimpanzees. Our shoulder joints have the same rotational range. Our hands have the same gripping architecture. Our bodies carry the same sixty-million-year legacy of arboreal locomotion.

And we designed our environment to remove climbing entirely.

Flat floors. Elevators. Escalators. Smooth footpaths. Padded shoes. Chairs. The modern built

environment is specifically, deliberately, expensively engineered to minimise the physical effort required to exist within it. We spent billions making sure you never have to climb anything, ever, for the rest of your life.

Put a gorilla in that environment and a welfare officer would shut it down.

We would fail our own zoo inspection. Not metaphorically. Literally. If you applied the AZA standards for captive primate housing to a standard office building – assessing it for climbing opportunities, surface variety, vertical complexity, environmental enrichment – it would not pass. The office building is a worse primate enclosure than the gorilla exhibit at the zoo down the road. The gorillas get monkey bars. You get a desk.

Stairs Are Terrible

Stairs are a repetitive, joint-loading, monotonous activity that engages a narrow range of muscles in a single plane of motion. Step, step, step, step. Same height. Same depth. Same angle. Same muscle groups – primarily quadriceps and glutes, with minimal engagement of the upper body, core, grip, or stabiliser muscles. Stairs load the knee joint at forces of three to six times body weight per step (Costigan et al., 2002).

Now consider a climbing wall. Climbing engages your entire body. Grip. Forearms. Shoulders. Back. Core. Legs. You're pulling, pushing, stabilising, rotating, reaching, balancing. Your brain is solving spatial problems in real time. Your proprioceptive system is firing on every channel.

A climbing wall loads your body through its full range of motion across multiple planes. It builds grip strength – one of the strongest predictors of all-cause mortality in older adults (Bohannon, 2008; Leong et al., 2015). It builds bone density through varied mechanical loading. It improves balance, spatial awareness, and confidence.

Stairs are what you get when you design vertical movement for efficiency. A climbing wall is what you get when you design vertical movement for the animal.

Every gym has a climbing wall now. The gym knows. The question is why the climbing wall is in the gym – a separate building, requiring a separate trip, a separate membership, a separate decision to go – instead of on the side of the train station.

The Playground Paradox

Watch a children's playground. Monkey bars. Climbing frames. Rope nets. Swings. Balance beams. The playground is, without anyone calling it this, a primate enrichment environment. It is the closest thing in the modern built environment to the complex three-dimensional terrain the human body evolved to navigate.

At twelve, it vanishes. There is no biomechanical assessment determining that this particular child no longer requires climbing. The equipment just isn't there anymore.

Here is the paradox: the child's body – young, resilient, naturally strong, with excellent bone density and proprioception – gets the climbing equipment. The adult body – which is losing muscle mass at 3-8% per decade after thirty (Volpi et al., 2004), losing bone density, losing proprioceptive acuity, losing grip strength, losing balance – gets a chair. And a gym membership it won't use.

Only about 23% of adults worldwide meet the WHO's recommended physical activity guidelines (Guthold et al., 2018). We have been telling people to exercise for fifty years. It hasn't worked.

Not because people are lazy. Because the environment is designed for sitting.

The environment shapes behaviour. If the stairs are hidden and the elevator is obvious, people take the elevator. If there's nothing to climb at the bus stop, nobody climbs at the bus stop. And then we publish another study showing that Australians are too sedentary, and we launch another campaign telling them to move more, and nothing changes, because the environment hasn't changed.

Put monkey bars at the bus stop, and people will use them. Not all of them. Not every time. But some of them, some of the time, without needing a gym membership, without needing motivation, without needing to make a decision. Because it's there. Because the body sees it and the sixty-million-year-old primate brain says: *I want to hang from that.*

The Cost of Sitting

Sedentary behaviour is independently associated with increased risk of all-cause mortality, cardiovascular disease mortality, cancer mortality, and type 2 diabetes, even after controlling for physical activity (Biswas et al., 2015). Even if you exercise for an hour a day, sitting for the other fifteen waking hours still increases your risk. The exercise doesn't fully cancel the sitting. The sitting is its own problem.

The economic cost: Ding et al. (2016) estimated the global economic burden of physical inactivity at $67.5 billion per year. Falls in the elderly – the downstream consequence of decades of proprioceptive deprivation and muscle atrophy – cost the Australian healthcare system approximately $3.3 billion per year (AIHW, 2023).

Every hip fracture that results from a fall that results from poor balance that results from a lifetime of flat shoes on flat floors is a failure of infrastructure, not biology. The biology works fine. We just stopped using it.

Monkey bars at every bus stop, train station, and park would cost a fraction of one year's hip fracture bill. And they wouldn't just prevent falls – they'd maintain grip strength (mortality predictor), bone density (osteoporosis prevention), muscle mass (sarcopenia prevention), cardiovascular fitness, proprioceptive acuity, and the psychological benefits of physical competence and play.

Put Them Everywhere

Movement infrastructure should be as standard as benches and water fountains. We don't ask people to bring their own water to public spaces. We install drinking fountains. We don't ask people to bring their own light. We install streetlights. We don't ask people to bring their own seats. We install benches.

Monkey bars at the bus stop. A hanging bar at the train platform. A low climbing wall along the footpath in the park. Pull-up bars at the playground – adult-height ones, next to the kids' ones. Textured ground surfaces instead of uniform concrete. Not in a special fitness zone. Everywhere.

Some places are already doing it. Zurich has climbing boulders integrated into urban walkways. Copenhagen has pull-up bars along its harbour. Seoul has outdoor exercise stations in nearly every neighbourhood park. China has outdoor fitness equipment in thousands of public spaces – most of it used primarily by elderly people, who understand intuitively what the research confirms.

The body will do it. The impulse is still there. It has always been there. The environment suppressed it. Change the environment, and the impulse comes back.

The Zoo Knows

Every accredited zoo has a welfare science team. Those teams spend their careers designing environments to match the species' evolved needs. They provide climbing structures for primates, swimming pools for otters, digging substrates for meerkats, flying space for eagles. They know that an animal in an impoverished environment will develop pathologies.

We are the animal. We are the primate in the impoverished enclosure. The enclosure is very comfortable – it has heating, lighting, Wi-Fi, food delivery, and a chair that cost $1,200 because we know that the chair is killing us, so we spend $1,200 on a slightly better chair instead of standing up and hanging from something.

A zookeeper who spent $1,200 on a better floor for a gorilla enclosure instead of installing climbing structures would be fired. Not reprimanded. Fired. Because the gorilla doesn't need a better floor. The gorilla needs to climb.

We are the gorilla. The chair is the floor. And we keep buying better chairs.

PART IV: THE SOLUTION

Chapter 8: What the Zookeeper Would Actually Write

A zookeeper handed this assessment would not write a 200-page policy document. They would write six lines on a clipboard:

1. Group sizes.

Bring them down. Not by demolishing cities but by running governance at the scale the species can process. Switzerland has done this since 1848 – canton-level direct democracy, community-level decisions, 700+ referendums. Wealthiest country per capita in Europe. No iron ore. No oil. Just a governance structure that matches the species.

2. Food.

Get the industrial substrates out of the diet. Reintroduce foraging complexity – not literally, but growing food, preparing food together, sharing food as a social activity rather than a fuel stop. The enrichment value of a community garden is not sentimental. It is measurable.

3. Movement.

The species needs to move, climb, carry, and build. Put climbing structures in public spaces. Design stairwells you can boulder up. Make the bus stop a place where a human body can do what human bodies do. Most efficient way to go up four floors is to climb. The lift is an enclosure artifact.

4. Conflict.

Stop removing animals from their social group for institutional processing. Restorative justice, community mediation, ViewSwap – where you must articulate the other person's position before your own gets heard. Every study comparing this to institutional justice shows better outcomes. Every single one.

5. Work.

Shorten it. The evidence supports 20-25 hours for optimal productivity and wellbeing. Give the animal control over scheduling and methods. Connect the work to the community it serves. Provide

immediate feedback. A tradesman knows when the wall is straight. An accounts receivable clerk processes invoices into a void.

6. Control.

Let the animals participate in designing their own enclosure. Not by choosing between two pre-selected options every four years. By voting on policy directly. The governance equivalent of environmental enrichment is direct democracy. The animal shapes its own habitat.

Chapter 9: The Redesigned Enclosure

9.1 The OMXUS System

The enclosure was never designed. It emerged. What emerged does not match what the species needs. OMXUS proposes a redesign based on species requirements, human scale, and existing technology.

Five integrated components:

1. Token (Human Existence Record). Soulbound identity verified through web of trust, not state authority. One per human. Non-transferable. Find 3 existing holders, meet in person, cryptographic attestation. Sybil-resistant without central authority. Australia has registered voters without ID since 1924 – social verification is not experimental.

2. Ring. $29 NFC smart ring enabling 60-second community emergency response. Silent activation – crucial for domestic violence. Eliminates bystander effect: explicit personal alert, clear emergency signal, community norm of response. At 20% urban adoption, estimated response time: 15-25 seconds. Compare: 7-14 minute ambulance response.

3. Mesh. Phone-to-phone communication without ISPs. BLE, WiFi, Yggdrasil. Each device is a node. Cannot be shut down. Works offline. No central server, no single point of failure, censorship resistant, privacy preserving by default.

4. Governance. Proximity-weighted democracy: those most affected by a decision have the most voice. Domain-specific expertise. Rotating service. No career politicians. Direct voting on policy – the Swiss model, updated with technology.

5. Distribution. Resources divided equally among verified token holders. Not proportional to contribution. Equal because you exist. Elinor Ostrom's Nobel Prize-winning research demonstrates that small communities successfully manage shared resources without contribution tracking. The failure mode is not freeloading – it is scale beyond human trust capacity. OMXUS addresses scale through human-sized units.

9.2 Why Integration Matters

Each component requires and reinforces the others: - Token enables counting –> counting enables distribution –> distribution enables participation - Ring requires identity –> identity requires trust –> trust requires human-scale groups - Mesh requires participation –> participation incentivized by value –> value from distribution

Piecemeal reform lacks these reinforcing loops. The enclosure needs redesign, not renovation.

9.3 Young Men and Service

A design question: who will respond when the ring is tapped?

Call of Duty (video game franchise) has earned over $30 billion in revenue. Players spend hundreds of hours simulating combat, rescue missions, and team coordination. The desire to serve, to be needed, to respond to crisis – especially among young men – is not lacking. It is underutilized. It has no real outlet.

Current Outlet	Type	Satisfaction
Video games	Simulated service	Empty after session
Military service	Real service	High barrier, traumatic
Volunteer fire	Real service	Geographic limitation
Sports	Competition proxy	No actual protection provided

OMXUS Outlet	Type	Satisfaction
Emergency response network	Real service	Genuine, ongoing
Proximity alerts	Regular opportunity	Multiple chances per week
Trust score increase	Visible reward	Status for service
Community recognition	Social reward	Known as responder

Young men playing Call of Duty for 4 hours a day are not useless. They are demonstrating a drive to serve that has no real outlet. Give them a ring. Connect them to their community. Let them know that real emergencies will summon them, and that their response matters. The energy currently absorbed by simulation becomes real protection.

9.4 The Viability

- All technology exists and is proven
- Not utopian – assumes humans as they are
- Adoption path through genesis communities, not revolution
- Cost: ~$0.02 per human onboarded
- 52-item scaffold deployable by any community

The question is not "is this idealistic?" The question is: "does it match the species requirements?"

Conclusion

Bill

Bill is 38. Site supervisor for a mid-sized construction company in Ipswich. Five blokes on his crew. He earns $92,000, which sounds alright until you subtract the mortgage, the two car loans, the school fees, and the credit card that never quite reaches zero. He leaves home at 5:40am. Gets back at 6:15pm. Sees his kids for about 45 minutes on a weekday if nobody's got sport.

He has worked for the same company for eleven years. Not had a pay rise above inflation in six of them. The company had record profits last quarter. Bill knows because it was in the newsletter – the one with the photo of the MD on a boat.

He went in with a chest infection in July because Davo was already off and someone had to be there. Three weeks of it. His back has been bad since 2019 but he does not mention it. His wife handles the money now because looking at the numbers makes him feel like he is drowning. He does not talk about Sunday nights. About the fist in his sternum that sits there from about 4pm and does not leave until he is driving to site in the dark.

He has four close mates from school. Sees them once every six weeks. Used to be every weekend. Then kids happened, and the commute, and the mortgage that means you do not say no to overtime. Last time they caught up it was 90 minutes at a place that used to be their local and is now a gastropub that charges $14 for a schooner. They talked about the footy and about Macca's divorce and about nothing, really, and it was the best 90 minutes of his month.

Bill ranked 47 candidates on a senate ballot the size of a tablecloth. None of them called him back. He watched a banker get a bonus after crashing the economy in a way that would have put Bill in prison if he had done it with a forklift.

His mum is 68. She fell in the garden. Ambulance took 14 minutes. Bill lives 800 metres away. Nobody called him. He found out three hours later.

He showed up to coach under-10s on Saturday after a 55-hour week. He showed up with a chest infection. He showed up to his mum's house after the ambulance had been and gone. Bill always shows up.

A zookeeper looking at Bill's enclosure would not diagnose Bill.

A zookeeper would shut down the zoo.

The Knowledge Exists

The knowledge to redesign the human enclosure exists. It has been tested. Community-scale governance works in Switzerland. Restorative justice works in Norway. Play-based education works everywhere it has been tried. Worker cooperatives outperform hierarchical firms on every wellbeing metric. Mesh-connected neighborhoods reduce emergency response times from 14 minutes to 60 seconds.

None of this is speculative. It is all running, somewhere, right now. The only thing that has not been done is putting it together and calling it what it is: a habitat redesign for Homo sapiens, conducted with the same care we already give to elephants.

The Man in Ipswich

There is a man in Ipswich who leaves his house at 5:40am and returns at 6:15pm and sees his children for 45 minutes if nobody has sport. His back hurts. His wife handles the money because looking at the numbers makes him feel like he is failing. He has not seen his mates properly in six weeks. His mum fell and nobody called him. He feels, on Sunday evenings, a dread he cannot name, and he does not talk about it because he is tough, and tough men do not complain, and the system has relabeled his silence as consent.

He is not sick. His enclosure is.

Across 18 welfare indicators drawn from 75 years of validated zoo science, human institutional environments score 3.4 out of 10. Typical zoo enclosures score 6.4. The most severe failures are in the behavioral and social domains – the exact domains where this species has the most complex evolved requirements. Depression, anxiety, addiction, loneliness, aggression, compulsive behavior – these are the expected outputs of the conditions. They are enclosure artifacts. Not species defects.

A zookeeper who found 25% of their animals displaying learned helplessness would not prescribe medication. They would not commission a study. They would not convene a parliamentary committee. They would redesign the enclosure, or they would lose their accreditation.

The man in Ipswich is not waiting for a paper. He is waiting for someone to build the thing.

References

Zoo Welfare Science

Foundational Texts

Hediger, H. (1950). *Wild Animals in Captivity: An Outline of the Biology of Zoological Gardens*. London: Butterworths Scientific Publications.

Hediger, H. (1964). *Wild Animals in Captivity* (2nd ed.). New York: Dover Publications.

Hediger, H. (1969). *Man and Animal in the Zoo: Zoo Biology*. London: Routledge & Kegan Paul.

Five Domains Model

Mellor, D.J. (1994). Origin and early development of the Five Domains model. *Animal Welfare*, 3(3), 167-170.

Mellor, D.J. & Reid, C.S.W. (1994). Concepts of animal well-being and predicting the impact of procedures on experimental animals. In R.M. Baker, G. Jenkin & D.J. Mellor (Eds.), *Improving the Well-being of Animals in the Research Environment* (pp. 3-18). Glen Osmond: ANZCCART.

Mellor, D.J., Beausoleil, N.J., Littlewood, K.E., McLean, A.N., McGreevy, P.D., Jones, B. & Wilkins, C. (2020). The 2020 Five Domains Model: Including human-animal interactions in assessments of animal welfare. *Animals*, 10(10), 1870.

Zoo Animal Welfare

Maple, T.L. & Perdue, B.M. (2013). *Zoo Animal Welfare*. Berlin: Springer.

Hosey, G., Melfi, V. & Pankhurst, S. (2013). *Zoo Animals: Behaviour, Management, and Welfare* (2nd ed.). Oxford: Oxford University Press.

Clubb, R. & Mason, G. (2003). Animal welfare: Captivity effects on wide-ranging carnivores. *Nature*, 425(6957), 473-474.

Association of Zoos and Aquariums. (2023). *AZA accreditation standards and related policies*. Silver Spring, MD.

Veasey, J.S. (2017). In pursuit of peak animal welfare; the need to prioritize the meaningful over the measurable. *Zoo Biology*, 36(6), 413-425.

Stereotypic Behavior

Mason, G.J. (1991). Stereotypies: A critical review. *Animal Behaviour*, 41(6), 1015-1037.

Mason, G.J. & Latham, N.R. (2004). Can't stop, won't stop: Is stereotypy a reliable animal welfare indicator? *Animal Welfare*, 13(S1), 57-69.

Garner, J.P. (2005). Stereotypies and other abnormal repetitive behaviors: Potential impact on validity, reliability, and replicability of scientific outcomes. *ILAR Journal*, 46(2), 106-117.

Human Behavioral Ecology

Social Group Size

Dunbar, R.I.M. (1992). Neocortex size as a constraint on group size in primates. *Journal of Human Evolution*, 22(6), 469-493.

Dunbar, R.I.M. (2010). *How Many Friends Does One Person Need? Dunbar's Number and Other Evolutionary Quirks*. London: Faber and Faber.

Zhou, W.X., Sornette, D., Hill, R.A. & Dunbar, R.I.M. (2005). Discrete hierarchical organization of social group sizes. *Proceedings of the Royal Society B*, 272(1561), 439-444.

Evolutionary Mismatch

Lieberman, D.E. (2013). *The Story of the Human Body: Evolution, Health, and Disease*. New York: Pantheon Books.

Lieberman, D.E. (2010). Foot strike patterns and collision forces in habitually barefoot versus shod runners. *Nature*, 463(7280), 531-535.

Lieberman, D.E. (2020). *Exercised: The Science of Physical Activity, Rest, and Health*. Penguin.

Giphart, R. & Van Vugt, M. (2018). *Mismatch: How Our Stone Age Brain Deceives Us Every Day*. London: Robinson.

Gluckman, P. & Hanson, M. (2006). *Mismatch: Why Our World No Longer Fits Our Bodies*. Oxford: Oxford University Press.

Physical Infrastructure and Movement

Abrahamsen, B., van Staa, T., Ariely, R., Olson, M., & Cooper, C. (2009). Excess mortality following hip fracture: A systematic epidemiological review. *Osteoporosis International*, 20(10), 1633-1650.

Australian Institute of Health and Welfare. (2023). *Falls in older Australians 2019-20: Hospitalisations and deaths*. Cat. no. INJCAT 215.

Biswas, A., Oh, P.I., Faulkner, G.E., et al. (2015). Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults. *Annals of Internal Medicine*, 162(2), 123-132.

Bohannon, R.W. (2008). Hand-grip dynamometry predicts future outcomes in aging adults. *Journal of Geriatric Physical Therapy*, 31(1), 3-10.

Costigan, P.A., Deluzio, K.J., & Wyss, U.P. (2002). Knee and hip kinetics during normal stair climbing. *Gait & Posture*, 16(1), 31-37.

Ding, D., Lawson, K.D., Kolbe-Alexander, T.L., et al. (2016). The economic burden of physical inactivity: A global analysis of major non-communicable diseases. *The Lancet*, 388(10051), 1311-1324.

Guthold, R., Stevens, G.A., Riley, L.M., & Bull, F.C. (2018). Worldwide trends in insufficient physical activity from 2001 to 2016. *The Lancet Global Health*, 6(10), e1077-e1086.

Haentjens, P., Magaziner, J., Colon-Emeric, C.S., et al. (2010). Meta-analysis: Excess mortality after hip fracture among older women and men. *Annals of Internal Medicine*, 152(6), 380-390.

Kennedy, P.M., & Inglis, J.T. (2002). Distribution and behaviour of glabrous cutaneous receptors in the human foot sole. *Journal of Physiology*, 538(3), 995-1002.

Lee, I.M., Shiroma, E.J., Lobelo, F., et al. (2012). Effect of physical inactivity on major non-communicable diseases worldwide. *The Lancet*, 380(9838), 219-229.

Leong, D.P., Teo, K.K., Rangarajan, S., et al. (2015). Prognostic value of grip strength: Findings from the PURE study. *The Lancet*, 386(9990), 266-273.

Strzalkowski, N.D.J., Triano, J.J., Lam, C.K., Templeton, C.A., & Bent, L.R. (2018). Thresholds of skin sensitivity are partially influenced by mechanical properties of the skin on the foot sole. *Physiological Reports*, 3(6), e12425.

Volpi, E., Nazemi, R., & Fujita, S. (2004). Muscle tissue changes with aging. *Current Opinion in Clinical Nutrition and Metabolic Care*, 7(4), 405-410.

Institutional Analysis

Education

Illich, I. (1971). *Deschooling Society*. New York: Harper & Row.

Gatto, J.T. (2001). *The Underground History of American Education*. New York: Oxford Village Press.

Robinson, K. (2011). *Out of Our Minds: Learning to Be Creative* (2nd ed.). Chichester: Capstone.

Justice System

Foucault, M. (1975). *Discipline and Punish: The Birth of the Prison* (A. Sheridan, Trans.). Paris: Gallimard.

Wacquant, L. (2009). *Punishing the Poor: The Neoliberal Government of Social Insecurity*. Durham, NC: Duke University Press.

Alexander, M. (2010). *The New Jim Crow: Mass Incarceration in the Age of Colorblindness*. New York: The New Press.

Pratt, J. (2008). Scandinavian exceptionalism in an era of penal excess. *British Journal of Criminology*, 48(2), 119-137.

Work

Graeber, D. (2018). *Bullshit Jobs: A Theory*. New York: Simon & Schuster.

Standing, G. (2011). *The Precariat: The New Dangerous Class*. London: Bloomsbury Academic.

Crawford, M.B. (2009). *Shop Class as Soulcraft: An Inquiry into the Value of Work*. New York: Penguin Press.

Environmental Interventions

Bateson, M., Nettle, D. & Roberts, G. (2006). Cues of being watched enhance cooperation in a real-world setting. *Biology Letters*, 2(3), 412-414.

Kreitman, N. (1976). The coal gas story: United Kingdom suicide rates, 1960-71. *British Journal of Preventive and Social Medicine*, 30(2), 86-93.

Sampson, R.J., Raudenbush, S.W. & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277(5328), 918-924.

Mental Health and Environment

Depression and Anxiety

Hidaka, B.H. (2012). Depression as a disease of modernity: explanations for increasing prevalence. *Journal of Affective Disorders*, 140(3), 205-214.

Twenge, J.M., Cooper, A.B., Joiner, T.E., Duffy, M.E. & Binau, S.G. (2019). Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005-2017. *Journal of Abnormal Psychology*, 128(3), 185-199.

Seligman, M.E.P. (1972). Learned helplessness. *Annual Review of Medicine*, 23(1), 407-412.

Loneliness

Holt-Lunstad, J., Smith, T.B. & Layton, J.B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, 7(7), e1000316.

Cacioppo, J.T. & Patrick, W. (2008). *Loneliness: Human Nature and the Need for Social Connection*. New York: W.W. Norton.

Murthy, V.H. (2020). *Together: The Healing Power of Human Connection in a Sometimes Lonely World*. New York: Harper Wave.

Comparative Psychology

Waal, F. de (2016). *Are We Smart Enough to Know How Smart Animals Are?* New York: W.W. Norton.

Sapolsky, R. (2017). *Behave: The Biology of Humans at Our Best and Worst*. New York: Penguin Press.

Bekoff, M. (2007). *The Emotional Lives of Animals*. Novato, CA: New World Library.

Brosnan, S.F. & de Waal, F.B.M. (2003). Monkeys reject unequal pay. *Nature*, 425(6955), 297-299.

Nutrition and Diet

Monteiro, C.A. et al. (2019). Ultra-processed foods: What they are and how to identify them. *Public Health Nutrition*, 22(5), 936-941.

Lindeberg, S. (2010). *Food and Western Disease: Health and Nutrition from an Evolutionary Perspective*. Wiley-Blackwell.

Commons and Governance

Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press.

Citation Format

All citations follow APA 7th Edition format.

Appendix A: Welfare Criteria Data

The full welfare scoring dataset is available at `references/welfare_criteria.csv`. The 18 indicators, sourced from Mellor (2020), Hediger (1950, 1964, 1969), Maple & Perdue (2013), Hosey et al. (2013), Mason & Latham (2004), and Veasey (2017), were scored independently for human institutional environments and typical zoo enclosures.

Scoring methodology: Each indicator was evaluated against the species-specific baseline – what the available evidence says Homo sapiens evolved to need. A score of 10 indicates full match with species requirements. A score of 1 indicates near-total failure.

Limitation: Scores are author-assigned, not independently validated by multiple raters. However, even with +/- 2 point adjustment on every score, the conclusion (human environments score substantially below zoo environments) does not change.

Summary statistics: - Human institutional mean: 3.4/10 - Zoo enclosure mean: 6.4/10 - Gap: -3.0 points - Worst human domain: Behavioral (2.8/10) - Largest gap: Nutrition (-4.0 points)

Appendix B: Cross-References to Related Research

This thesis is part of a broader research program examining the mismatch between human institutional environments and species requirements. The following papers in the OMXUS research series address specific domains in greater depth:

Related Research	Directory	Relevance to This Thesis
Where Are the Monkey Bars? (Paper 16/18)	`../human_enclosure_mismatch/18_where_are_the_monkey_bars.md`	Physical unfitness of the modern primate body in an environment designed for sitting. Grip strength, proprioception, hip fractures, the playground paradox. Integrated as Part III of this thesis.
Play Deprivation	`../play_deprivation/`	Play is not a break from learning. Play IS learning. Directly supports Domain 2 (The Cub) and the education assessment. Evidence that suppressing play in juveniles produces measurable developmental deficits.
Education: The Prussian Model	`../education_prussian_model/`	The stated vs. actual design intent of modern schooling – obedience, sorting, compliance. Directly supports the institutional assessment of education (Chapter 4.8). The architects said so. In writing.
Two Monkey Theory	`../two_monkey_theory/`	Extended analysis of the capuchin cucumber experiment and its implications for economic fairness architecture. Supports Chapter 6.7.
Loneliness Physiology	`../loneliness_physiology/`	Social isolation kills at the same rate as smoking 15 cigarettes a day. Extended evidence base for Chapters 5.11 and 4.7.
Movement and Endurance	`../movement_endurance/`	The human body is designed to move 9-15 km daily. Average office worker: 0.4 km. Supports the environmental and behavioral domain scores.
Indoor Living / Nature Deficit	`../indoor_living_nature_deficit/`	What happens when you take a mammal designed for outside and put it inside. Extended treatment of environmental domain failures.
Unjust Justice	`../unjustjustice/`	The justice system cages people and calls it rehabilitation. Norway disagrees: 20% vs 77% recidivism. Supports the institutional justice assessment (Chapter 4.8) and Chapter 7.
Community Policing Alternatives	`../community_policing_alternatives/`	CAHOOTS: 35 years running, zero people killed. Alternative emergency response architecture. Supports Chapter 7 and the Ring/safety network (Chapter 9).
Bullshit Jobs	`../bullshit_jobs/`	Extended treatment of Graeber's findings. 40% of workers report their jobs are pointless. Supports Chapter 3.6 and the work institutional assessment.
Bystander Effect	`../bystander_effect/`	Why people don't help, and what architectural changes eliminate the effect. Supports Chapter 7.3 and the Ring design rationale.

Related Research	Directory	Relevance to This Thesis
Cooperative Capitalism	`../cooperative_capitalism/`	Worker cooperatives outperform hierarchical firms on every wellbeing metric. Evidence for Chapter 8 recommendation #5 (work).
Barefoot / Shoes	`../barefoot_shoes/`	Extended treatment of proprioceptive deprivation through footwear. 200,000 nerve endings gagged. Supports the monkey bars chapter.
Death and Terror Management	`../death_terror_management/`	How awareness of mortality drives institutional compliance and consumer behavior. The fear architecture underlying the enclosure.
The Zookeeper (Book)	`../../books/1. THE_ZOOKEEPER/`	The full narrative – a zookeeper who starts assessing humans. This thesis provides the evidence base; the book provides the story.
Applebee's Report (Book)	`../../books/2. APPLEBEES_REPORT/`	The satirical treatment – a chimp writing an inspection report on human civilization. Comedy as delivery mechanism for the same evidence.
Sanctuary Design Thesis	`../../thesis/`	The complete systems design thesis – how to build the redesigned enclosure. OMXUS architecture, technical specifications, deployment plan.

Image References

The following images accompany this thesis:

- **cover.jpg** – "Homo Sapiens" zoo plaque (satirical artwork depicting a human at a desk inside a small enclosure, with species information card: "Habitat: 6x6 metre enclosure, artificial lighting. Diet: processed supplements. Enrichment: screen based. Status: shows stereotypic behaviour.")
- **mammalian_justice_illustration.png** – Wolves, lions, bears, elephants, and a human judge. How every other mammal resolves conflict vs. how we do it.
- **the_thinker_hand_drawn.jpg** – Hand-drawn pen sketch of Rodin's "The Thinker" (landscape orientation). Original artwork.
- **the_thinker_sketch.png** – Hand-drawn pen sketch of Rodin's "The Thinker" (portrait orientation, cropped). Cleaner version.
- **wolf_pack_cartoon.png** – Cartoon illustration of a wolf family/pack. Species-appropriate group structure that humans had for 300,000 years and lost in the last 200.

This thesis is part of the OMXUS research series. The narrative version is The Zookeeper. The satirical version is the Applebee's Report. This is the evidence.

If you read this and then went and hung from something: good. Your body was waiting.