Schrödinger's Nap: A Field Experiment in Superposition

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Abstract. We present experimental evidence that a napping cat exists in a genuine quantum superposition of *awake* and *asleep* states, collapsing to a definite eigenstate only upon measurement (i.e., being looked at, addressed by name, or having a treat bag opened near the kitchen). We formalise this as the *Nap State Superposition Hypothesis*, construct the *Sleep–Wake Hamiltonian*, and derive collapse probabilities as a function of disturbance type. Dr. Shadow McVoidface's extensive experience with ambiguous states of existence made him the ideal co-investigator. All 481 nap trials confirm the central thesis. Nobody disturbed the lead author during data collection and lived to write about it comfortably.

Keywords: quantum superposition, nap mechanics, wavefunction collapse, sleep–wake duality, decoherence, treat-bag measurement

1. Introduction

In 1935, Schrödinger proposed a thought experiment in which a cat inside a sealed box exists in a superposition of alive and dead states until observed [1]. The proposal was intended as a *reductio ad absurdum* of quantum superposition at macroscopic scales. It was not, to Schrödinger's knowledge, taken literally by the cat.

The present paper takes it literally. Specifically, we argue that the alive/dead superposition is a special case of a far more common and observable phenomenon: the *nap superposition*, in which a cat simultaneously occupies the $|\text{awake}\rangle$ and $|\text{asleep}\rangle$ states in a stable, long-lived superposition that is only collapsed by external disturbance.

This is not merely metaphor. Any person who has ever tried to determine whether a napping cat is asleep or just ignoring them will appreciate the operational indistinguishability of the two states, which is the precise condition quantum mechanics requires.

Dr. Shadow McVoidface joined this project on the grounds that ambiguous ontological status is his area of specialisation. Dr. Mittens von Fluffenberg provided theoretical framework development and fell asleep twice during the writing of Section 2, which is considered a conflict of interest but also excellent supporting data.

2. Theoretical Framework

2.1. The Nap State Hilbert Space

The nap-state Hilbert space $\mathcal{H}_{\text{nap}}$ is spanned by:

$$|\text{awake}\rangle, \quad |\text{asleep}\rangle, \quad \left|\tfrac{1}{2}\text{-asleep}\right\rangle, \quad |\text{loaf}\rangle \tag{1}$$

where $|\text{loaf}\rangle$ is the fully-tucked configuration that appears asleep but from which the cat will unaccountably teleport to the kitchen the moment a tin of tuna is opened. $|\text{loaf}\rangle$ is formally orthogonal to both $|\text{awake}\rangle$ and $|\text{asleep}\rangle$.

A general nap state is:

$$|\Psi_{\text{nap}}\rangle = \alpha\ |\text{asleep}\rangle + \beta\ |\text{awake}\rangle + \gamma\ |\text{loaf}\rangle, \quad |\alpha|^2+|\beta|^2+|\gamma|^2 = 1 \tag{2}$$

For the lead author in standard lab conditions (mid-afternoon, sunbeam present): $|\alpha|^2 \approx 0.72$, $|\beta|^2 \approx 0.11$, $|\gamma|^2 \approx 0.17$.

2.2. The Sleep–Wake Hamiltonian

The nap dynamics are governed by:

$$\hat{H}_{\text{nap}} = \epsilon_s\ |\text{asleep}\rangle\langle\text{asleep}| + \epsilon_w\ |\text{awake}\rangle\langle\text{awake}| - \Delta_{\text{nap}}\big(|\text{asleep}\rangle\langle\text{awake}| - \tag{3}$$

where $\epsilon_s < \epsilon_w$ (sleep is energetically favoured), and Δ_{nap} is the sleep–wake tunnelling amplitude. For the lead author, Δ_{nap} is very small between the hours of 13:00 and 16:00, and essentially zero between 14:47 and 15:22 (cf. the Golden Nap Interval [2]).

2.3. Collapse and Measurement

Definition 1 (Nap Measurement)**.** *A nap measurement is any perturbation $\hat{M}$ applied to the nap-state superposition that causes observable collapse. Measurement operators include:*

1. $\hat{M}_{\text{name}}$*: calling the cat by name;*
2. $\hat{M}_{\text{treat}}$*: opening a treat bag (strong);*
3. $\hat{M}_{\text{tuna}}$*: opening a tin of tuna (collapse probability $p_{\text{tuna}} \approx 1.000$);*
4. $\hat{M}_{\text{look}}$*: sustained eye contact > 2 s;*
5. $\hat{M}_{\text{touch}}$*: physical perturbation (weakest unless applied to belly; see Section 3.2).*

The collapse probability to $|\text{awake}\rangle$ given measurement $\hat{M}_i$ is:

$$p(\text{awake}|\hat{M}_i) = |\langle\text{awake}|\,\hat{M}_i\,|\Psi_{\text{nap}}\rangle|^2, \tag{4}$$

values of which are reported in Table 1.

3. Experimental Design

3.1. Protocol

481 nap trials were conducted across Rooms 104B and 112 of the Physics Building during the period January–September 1996. Each trial began when the lead author entered a stable nap superposition (confirmed by

ear-twitch frequency < 0.2 Hz and tail-tip movement rate < 0.1 Hz). A randomly selected disturbance was then applied from the set $\{\hat{M}_i\}$ by the graduate student on duty (W. Tuxedo for daytime trials; R. Tabby, night shift).

Observation of the collapse outcome was performed by Dr. Shadow McVoidface, who was stationed in the room beforehand in a manner not detectable by the subject. (McVoidface confirms this is one of his core competencies.)

3.2. Belly-Touch Anomaly

A planned belly-touch measurement ($\hat{M}_{\text{belly}}$) was added after a pilot trial in which the outcome was *not* a clean $|\text{awake}\rangle$ or $|\text{asleep}\rangle$ collapse, but rather a third state, tentatively classified as $|\text{offended}\rangle$. This state is characterised by the cat being unambiguously awake but refusing to look at anyone. Dr. Mittens von Fluffenberg proposed formalising it as a distinct eigenstate; after discussion, the authors agreed, and added $|\text{offended}\rangle \in \mathcal{H}_{\text{nap}}$.

4. Results

Table 1: Collapse probabilities by measurement type (n = 481 trials).

Measurement	p(awake)	p(asleep)	p(offended)
Name call	0.43 ± 0.05	0.57 ± 0.05	0.00
Treat bag	0.88 ± 0.03	0.08 ± 0.02	0.04 ± 0.01
Tuna tin	0.999 ± 0.001	0.001	0.000
Eye contact (> 2s)	0.31 ± 0.06	0.48 ± 0.06	0.21 ± 0.04
Gentle touch	0.55 ± 0.05	0.39 ± 0.05	0.06 ± 0.02
Belly touch	0.22 ± 0.04	0.05 ± 0.02	0.73 ± 0.05

Key findings: (i) name-call collapses to $|\text{asleep}\rangle$ more often than $|\text{awake}\rangle$ ($p = 0.57$ vs. 0.43), confirming that the cat has heard you and chosen not to respond, which is a different matter entirely from being asleep; (ii) tuna tin achieves $p(\text{awake}) = 0.999$, establishing it as the most powerful measurement operator known; (iii) belly touch predominantly yields $|\text{offended}\rangle$ (73%), a result Dr. Mittens von Fluffenberg called "personally validating" as it confirmed her own extensive subjective data.

4.1. McVoidface Decoherence Effect

In 38 trials in which Dr. McVoidface's presence in the room was eventually detected by the lead author (through mechanisms not yet understood), spontaneous collapse to $|\text{awake}\rangle$ occurred with $p = 0.91$, *without any formal measurement operator being applied.* This suggests that quantum-mechanical decoherence can be induced by mere awareness of being observed, which is well-established in quantum mechanics and, it turns out, also annoying.

5. Conclusion

We have formalised the Schrödinger Nap as a genuine quantum superposition, characterised six measurement operators and their collapse probabilities, identified the $|\text{offended}\rangle$ eigenstate, and quantified the McVoidface Decoherence Effect. The tuna-tin measurement operator achieves collapse probability indistinguishable from unity and is recommended for all practical applications requiring a definite feline state.

Contributions

Cheeto: theory, nap provision, being measured. Shadow: observation (undetected), decoherence trials. Mittens: Hamiltonian development, belly-touch eigenstate proposal, fell asleep twice (supplementary data).

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References

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