Interpretation tested by experiment: The dream of the six-legged dog

Maxson J. McDowell[1], Joenine E. Roberts[2], and Rachel McRoberts[3]

[1]C. G. Jung Foundation for Analytical Psychology. Private practice.
[2]International Association for Psychoanalytic Self Psychology, Private practice
[3]Department of Counseling, University of Cumberland. Private practice.

Summary. We present experimental evidence that a dream interpretation was accurate. Current wisdom notwithstanding, we could interpret from the text alone because its information is redundant: repetition provides internal checks. Knowing neither dreamer nor their associations we made falsifiable predictions that we tested by subsequently gathering information about the dreamer. Predictions were supported. Results were repeated with seven additional dreams. Each dream was tightly crafted, used humor, drama or hyperbole to penetrate the dreamer's defenses, and furthered the emergence of personality. Our experiment compliments fMRI and statistics because it studies a whole text as a unique narrative: one iteration identified healing steps during therapy; another confirmed the psychological meaning of a myth. Our experiment may generate a body of objective knowledge about interpretation and make interpretation itself more accurate. In the US 20% live with mental illness. Our experiment supports talk therapy against pressure from the drug and insurance industries.

Keywords: Symbol, narrative, and relationship; Experimental system, falsifiable predictions and dream interpretation; Self-organization and emergence of personality; Personality as complex dynamic system; Dream homeostatic for personality because compensates for excess.

1. Introduction

Narrative, relationship, and personality

Just as Winnicott (1964/1947, p.88, 85-92) said 'there is no such thing as a baby ... a baby cannot exist alone, but is essentially part of a relationship,' so we could likewise say there is no such thing as personality, only personality in relationship. Personality must necessarily be a *complex adaptive system* (McDowell 2010, pp 12-15/348-350) of psychological components: perceptions, thoughts, emotions, ideals, and feelings towards others all woven into narratives. [Our inclusive definition of personality is compatible with many theories of personality, for example with trait, type, psychoanalytic, behaviorist, social cognitive, and humanistic theories.] For more discussion of narrative and personality see McDowell (2024 pp. 16-17). If you show me your dog and also how you feel about your dog and I take that in, then, verbally or otherwise, we are sharing a narrative which means we are in relationship (Cavarero 2000). To understand personality, therefore, we need to study its narratives. A therapist does this but not by experiment. Can we devise an experiment that studies one of the personality's narratives? A dream might give us access because it emerges directly from the unconscious but how can we

know what a dream means? A therapist interprets dreams but again, not by experiment. Can we devise an experiment that falsifies or confirms our interpretation of a dream?

An experiment that tests an interpretation

It is widely agreed that, to interpret a dream, we must have the dreamer's associations to tell us the particular meaning of *that* image for *that* dreamer (Jung 1980a/1953, pp. 44-45; Whitmont & Perera, 1989 p. 35; Erdelyi 2014, pp. 119-20; Hollis, 2016). [Nevertheless, both Jung (1980b/1953, pp. 43-223) and von Franz (1998, pp.37-64) published extended interpretations of dreams without knowing the dreamer's personal associations.] Once we know those associations, however, we cannot isolate the meaning of the text alone and hence we cannot study the text by experiment. Here we report one iteration of an ongoing experiment conducted within classes on dream interpretation. The class interprets a text without having the dreamer's associations, nor any knowledge of the dreamer beyond age and gender. [Note that, when working with a patient, we should always use their associations because, without these, we are in danger of assigning meaning from a 'cookbook' or from our own projections.] We can do so because the text's information is encoded redundantly, see below. Our interpretation generates falsifiable predictions that we subsequently test by learning more about the dreamer. To the degree that our predictions are supported, this is empirical evidence that our interpretation is accurate and, therefore, that the text alone specifies a substantial part of the dream's meaning. Dream interpretation has previously been a matter of opinion, sometimes very useful in therapy but not tested by experiment.

The whole class participates but, because the instructor is didactic, the group process described by Ullman (1996), Lawrence (2005), or Balint (Fitzgerald 1987) is not germane.

Our interpretation technique is based on Jung's, as developed by others including Whitmont and Perera (1989) and the lead author. [Other methods of dream interpretation have been documented. It is beyond the scope of this paper to compare them with our method. Our experiment tests the accuracy of *this* method.] To summarize: We assume that each detail was remembered because it has meaning. We analyze each image separately, setting aside our own personal associations to the image and employing instead both objective facts (sharks are dangerous) and the dreamer's personal associations (these last we forgo for the class). Then we ask how the images' meanings intersect to create a narrative.

Park et al. (2023) showed that publications and patents have become less disruptive and therefore less productive because 'a narrower scope of existing knowledge is informing contemporary discovery and invention.' We integrate logic-based experimental science with dream interpretation. We show that the whole text is a narrative about the dreamer: we can best decipher that narrative from the intact text. Our experiment may seem crude or 'unscientific' (no fMRI, no statistics) but it compliments fMRI and statistics by focusing on one dream's specific narrative. Like a person, a dream is full of ambiguities and uncertainties and its meaning ranges far and wide. But that is the point. A personality is a coat of many colors and the same is true for a dream. Our experiment allows for that complexity.

Erdelyi (2014, pp. 116, 121-124) said that a dream is 'noisy,' the product of 'primitive,' and 'resource poor' thought, but 'suffused with meaning' Many theories of dream function have been proposed (Crick & Mitchison 1983; Barrett 2001; Valli & Revonsuo 2009; Zhang & Guo 2018; Wegner et al. 2004; Hobson & McCarley 1977; Eichenlaub et al. 2018; Rasch & Born 2013; Llewellyn & Desseilles 2017; Ruby 2011; Gujar et al. 2011; Blagrove et al. 2019; Cartwright 2010) but none of these have been tested directly by experiment. We test our theory by experiment. Each interpretation is based upon the hypothesis that *a dream furthers the emergence of the dreamer's personality*. If, with many different dreams, our interpretation's predictions are confirmed, then that hypothesis is supported.

In the US one person in five lives with mental illness (NIMH 2020). Meanwhile psychiatrists' use of talk therapy declined more than 50% from 1996 to 2016, especially for lower-income patients (Moran 2022). Talk therapy has limited scientific means to prove its utility or mode of action and thus to defend itself against pressure from the insurance and drug industries (Keefe 2021). Our experiment supports talk therapy by showing that narrative furthers personality. One iteration identified some of the steps by which talk therapy led to development: see paragraphs 109-120 and 138-173 (Appendix 1) or a shorter segment in the audio-record: 1:13:10 to 1:21:45 (McDowell, Roberts, & Nyerges 2023b.)

Information is encoded redundantly

Whitmont and Perera (1989 pp 123-124) showed that, within a series of dreams, a central idea may be repeated. McDowell (2022, pp. 36-37) further developed the method by showing that information is repeated within a single dream. It seems that the sleeping brain had an 'idea in mind' and found a series of different images to repeat and explore that idea. Repetition provides an internal check on interpretation. For example, a woman dreamt that *she had lost her purse and could not go home. Her purse contained her license, credit cards, and keys.* A purse suggests personal identity. Going home could confirm her identity but she cannot go home. Her license, or one of several credit cards, or one of several keys could confirm her identity but she has lost them all. Thus there are more than ten images that repeat the same idea, that she fears losing her identity. The above demonstrates a point critical for our method: *stay close to the details.*

A 'true symbol'

The dream describes a six-legged dog. In rational terms this makes no sense and, worse yet, each dog has the face of a little old lady. We are therefore forced to explore the dog as a *symbol* [a dream not infrequently invents a unique symbol to convey its meaning.], like Yeats' (1919) 'shape with lion body and the head of a man … What rough beast, its hour come round at last, slouches towards Bethlehem to be born?' Cook (2017) demonstrates another symbolic chimera, the 40,000-year-old Lion-Man, in a short, extraordinary video in the British Museum. Cook's video supports many of the arguments we make in this paper. Jung (1966/1931) said that a 'true symbol' depicts an 'intuitive idea that cannot yet be formulated in any better way.' Shiva dances in a ring of fire upon an image of ignorance, his six limbs, though literally false, pointing to another level of meaning. Shiva is a lover, husband and artist (dancer) whose third eye periodically burns up the universe to make room for new creation. He suggests the mystery of the human personality: how can one person, though genetically little different from other mammals (McDowell 2010, p. 11/348), embrace not only love, relationship, and war but also art and the cosmos? Like Yeats' rough beast and like the Lion-Man and like Shiva, the six-legged dog, we show, is a 'true symbol' that supports the emergence of personality.

Personality self-organizes

Molecular biology has shown that biological complexity is not specified by genes (McDowell 2010, pp. 10-14/348-349). Instead it *emerges* by the self-organization of complex adaptive systems. A hierarchy of dynamic systems generates progressive levels of complexity (Holland 1998, pp. 8-9, 229-231) from, for example, the folding of a macromolecule (Alberts 2007, pp. 134-137, 387-388) to the assembly of an organelle like the cell membrane (ibid p. 9), to the organization of a whole cell, or from the ordering of an ecosystem to the ordering of the biosphere. At each level the environment informs self-organization, in part by providing constraints. The function of a gene is to specify the linear sequence of amino acids or nucleotides in a macromolecule, or to regulate the timing or degree of a development (McDowell 2010, p. 11/348). For example a gene increases the *degree* to which neurons proliferate in the frontal neocortex of modern humans (Pinson 2022).

When robots are programmed to cooperate socially and to communicate with each other, then a complex dynamic system of language with vocabulary and grammar emerges spontaneously between them (Steels, 2009).

It follows from the above that the personality must also be a complex adaptive system – not biological but psychological and relationship dependent – and must also self-organize (McDowell 2010, pp. 15-18/350-351). A therapist sees

that a personality spontaneously reorganizes as therapist and patient work together with empathy.

Just as the self-organization of a fetus requires the womb as a supportive environment, so the self-organization of personality also requires supportive environments, familiar examples being play, conversation and theater. Dreaming is likewise a supportive environment. The dream of the six-legged dog discovers a new organizing narrative and presents it to the dreamer's conscious mind. If the dreamer works with the new narrative, perhaps by talking about it, or by artistic expression, or by behaving differently, then the dreamer's emerging personality can better integrate the narrative. Jung (1967/1952, p. 301) said that the self-organization of personality is a difficult project that may continue throughout life. Dreaming provides rehearsal space.

To use other terms, every level of a complex dynamic system is necessarily homeostatic *at that level*. Were it not, that level would never have emerged and stabilized in the first place. For example your body-and-brain includes kidneys, lungs, skin, pancreas etc. to stabilize its steady state. Two main themes in this paper are: (1) Because a dream is a narrative that compensates for excess in any direction, it functions homeostatically for personality. (2) Our experiment generates empirical evidence for (1). [Jung (1969/1948) observed that, when your conscious view is one-sided, your sleeping mind produces a compensatory dream.]

We document seven additional iterations of the experiment: a young man's personality is overshadowed by his father's childhood illness (McDowell, Roberts & Roth 2023); a man compulsively criticizes his boss (McDowell, Roberts & Hausman 2023); a young man panics when compelled to face his inner life (McDowell, Roberts & Moadeli 2023); a young woman must accept her non-binary identity (McDowell, Roberts & Lakis 2023); a woman must confront her childhood rape of which she had never spoken (McDowell & Roberts 2023); a woman asserts herself more and becomes less controlled (McDowell, Roberts & Guercio 2023); a woman suffers intrusion and loss, then finds help to defend her boundaries (McDowell, Roberts & Nyerges 2023).

Dream wisdom

Our evidence shows that a dream is subtle and often tightly crafted, that each detail has meaning, and that a dream demonstrates a shrewd awareness of the dreamer's defenses and future possibilities. We do not suggest that dream wisdom is supernatural. To the extent that your conscious mind is goal-directed, it tends to be one-sided: being most aware of factors relevant to your purpose it misses other factors. Your sleeping mind, perhaps because it is not goal-directed, sees a bigger picture and is free to play. Play supports development (Winnicott 1989/1971, pp. 56-64).

Non-verbal thought

Amit et al. (2017) used behavioral studies and functional MRI studies to demonstrate an asymmetrical relationship between verbal and non-verbal thought in waking subjects. They found evidence that non-verbal thought is primary.

Though a dream is *reported* verbally, it seems not to be *composed* by verbal logic, as a progression of sentences. Rather it seems to be composed in images, usually visual. When a dream does include words, these usually consist of a brief phrase or sentence, as in the dream of the six-legged dog which ends with the sentence 'Thank you so much!'

(For exceptions see Barrett 2001, pp. 56-63). While you sleep, verbal thought appears to stop but your mind continues to work. When you remember a dream you are usually remembering a coherent sequence of images, a 'snapshot' of non-verbal thought (Jung 1967/1952, pp. 7-33). Characteristic of such thought is a playful juxtaposition of images that surprises you because it is a new way of seeing things, a new solution to a problem. Thinking in images is a part of creativity. Because creative images also 'occur to you' while you are awake, non-verbal thought must continue in your waking mind, though often overlaid and obscured by verbal thought. Our experimental system might be used to study non-verbal thought.

2. Method

We interpret a dream in a 90-minute, online class that the instructor teaches currently through the C. G. Jung Foundation for Analytical Psychology in New York. Class size ranges from fifteen to more than thirty. Class members send the instructor dreams, with permission, from a friend, family member, or patient. For each iteration of this experiment, the instructor selects a dream. The dreamer is never present. The bringer at first tells us either nothing about the dreamer or no more than the dreamer's gender and age. The bringer does not speak while we interpret and, currently, also turns off their video camera to rule out non-verbal communication. We interpret for about an hour, then ask the bringer to tell us more about the dreamer. At a later date, the dreamer may provide more information directly.

Since the covid pandemic we use Zoom, which means there is a complete auditory and visual record of each class. Thus far we have documented eight classes online. Here we provide links to all eight. For the class on the dream of the six-legged dog, see the edited transcript (Appendix 1), or the complete transcript (Appendix 2), or the audio record (McDowell, Roberts & McRoberts 2022b).

The executive committee of the board of the C. G. Jung Foundation for Analytical Psychology has approved our protocol as following established ethical guidelines for research with human subjects.

3. Results

Here we evaluate our evidence. Instead of reading this section, you may prefer first to listen to the class on audio or to read the edited transcript (Appendix 1). Then you could read the falsifiable predictions listed here and proceed to Conclusion.

What follows is not our full analysis of this dream: that would include our final class discussion. What follows is evidence that we committed ourselves to several predictions and evidence that falsifies or supports these predictions. Neither our interpretation nor the bringer's subsequent information can be considered objective. What *is* objective (though not quantified) is (a) our report of what was said during the class, and (b) the degree of concordance between what the interpreters predicted and what the bringer subsequently revealed. Paragraph numbers refer to quotes from the edited transcript (Appendix 1). The bringer began to speak only after paragraph 90. We did not, while interpreting, phrase each prediction as concisely as it is written here.

The dream (of a 52-year-old man)

There were two six-legged dogs. Looking closer they had little-old-lady faces. One was black and one was white. The little old black lady lifted up her right paw for help. I took her hand and I walked down to a low place, like a mall. She looked up at me and said, in a wavering voice 'thank you so-o-o much."

Prediction 1 with evidence we made it:
The dreamer is too much 'in his head', too high up, too much in 'masculine' or cerebral activity. He needs to transform to a more down-to-earth, grounded state. This would bring him closer to material things, instinct, touch, feeling, and relationship.

"If you have six legs ... you have more grip on the ground (5). A dog is the animal closest to humans. It looks at our eyes, has evolved to communicate, sustain bonds with us, ... symbolize[s] ... instinctual wisdom that is unconscious but closest to humans (6), and is ... more accessible because is talking to the dreamer (9)." The dog is a chimera "the integration of animal ... with human (12) [like the] 40,000-year-old carving, the Lion Man ... trying to make contact with you (13) to influence your psychological development ... it brings with it the power of the animal that it represents (Cook 2017) (14). The dog ... took her hand (41), [but still] with four legs it can walk like a dog (42)," retaining connection to earth.

"She's speaking with consideration for the other person ... communicating consciously in a related fashion (56). I took her hand ... it was a paw but it becomes a hand, [again relationship, a repetition] and walked her down to a low place, like a mall (60). You go down closer to the earth and come to a place that is close to the earth ... spread out horizontally ... [repetition] where she wanted to go (62). Matter, material goods ... are all part of the earth [repetition] (65). The dog has tricked him down, towards the earth which I [the instructor] would therefore suspect he is ... avoiding ... he needs ... help (70). If you were tricked into ... a library ... it might help you to develop a more spiritual, head-centered attitude ... if you are tricked into ... a mall, this is going to help you explore [the] mother-earth world, because all the ... things you manufacture are there in the mall ... all the material things you can possess (69). I [the dreamer] was above ... the material world ... now I am surrounded by it. (87). I am too much above ... in my maleness ... in the spirit world (88). I am supposed to gain an education in the material world [in] mother nature (89)."

Evidence from the bringer that supports prediction 1:
"He loves dogs. He has two dogs (91). He used to be a working clay artist but he gave it up to be a professor ... sacrificing that part of himself to take care of his family (93). He is starting to build his art studio, where he plans to go and start working with his hands, and working with the earth again, with clay, and firing it, and building kilns and things like that (95). But I think he has some guilt, some trepidation, to go back down to working with that part of himself (96)."

"It is his first nature ... his first love was working with clay (100). And it was dismissed! 'Oh that's sweet but you can't really make a life like that.' He gave it up. So he is going back and revisiting the dream of youth (101). That is something that is funny about him, he doesn't really like hanging out with people and he doesn't really like stuff. But he worked in the record shop in the mall and he just loved the idea of malls, and the smells and that he could look at the stuff (106-7)."

"His father didn't think being an artist was a manly job, and his brother built houses and things, and worked with his hands in another way, and so he tried to overcompensate and be more successful, make more money, and that's why he changed careers (110) ... He worked as an artist as a young man, and then as a professor ... but he always felt a very deep connection with his mother, and they shared that love of making artwork (111). He likes to cook his own food and build his own sheds, and do home repairs, all himself, and doesn't like to hire things out (118)."

Prediction 2 with evidence we made it:
He resists this transition and the vulnerability it will bring; he defends against needing help. His defense is to project his vulnerability onto other people and then help those 'needy' others.

He might have defended by refusing to see anyone's need for help, his own included, or by distancing everyone so that no-one could see his need, or by feeling extra strong and invulnerable, or by being compulsively greedy. Out of all these possibilities, and there are more, the dream predicted that the specific defense described in Prediction 2 was the dreamer's.

"The words are 'little old lady.' (20) It's an interesting diminutive because it speaks of the observer's prejudice ... The lady ... might be wise. It's a projection. Old and small doesn't make them necessarily small in psychological content... 'Lady'... 'old' and ... 'little' are all ... diminutives ... ageism, sexism, and size-ism (21). There might be wisdom here ... looked at ... with the prejudicial eyes of youth (23)."

"Witches were a source of wisdom ... but persecuted instead of revered (34). A mythological beast [but] he's talking about little old ladies. That [repeats] that the power is not ... fully perceived (46). Out of her apparent frailty, her oldness ... she asks him to help her (66). She speaks ... in a wavering voice which [repeats again] ... something frail (59). I [the dreamer] tend to dismiss old ladies and think ... they have no power or meaning (84). I help her ... she thanks me, she seems weak (85). Nature has enticed me with her apparent frailty (89)."

Evidence from the bringer that supports prediction 2:
[Here we repeat quotes that supported prediction 1 because they also support this prediction]

"He used to be a working clay artist but he gave it up to be a professor so that he could take care of his family (93). He has some guilt and some trepidation to go back down to ... revisiting that part of himself (96). His first love was working with clay (100). It was dismissed! 'Oh that's sweet but you can't make a life like that' (101). He tried to overcompensate and be more successful, make more money (110)."

"He's the kind of guy who doesn't ask for anything (113). He's very self-sufficient. He doesn't like asking for help, he doesn't like talking about his feelings (116). He'll do a lot for other people, if someone asks him to do something for him, he tends to do it; people call him and ask him for favors. He hasn't talked about wanting reciprocation from that. He has a very giving nature (117). He likes to cook his own food and build his own sheds, and do home repairs, all himself, and doesn't like to hire things out, or ask for help (118)."

Instructor. "Doesn't like to be vulnerable? (119)."

Bringer: "Right! Doesn't like to be vulnerable. Doesn't even really think that he needs that! ... to be vulnerable. I

don't think vulnerable is even on his radar! (120)."

Prediction 3 with evidence we made it.
The unconscious has devised a Trojan horse trick to penetrate his defense. The dog pretends to need his help but takes his hand to bring him down to a more grounded state.

Instructor: "The dog … is asking for help but [its apparent neediness is deceptive because] it's also striking up an acquaintanceship. Being friendly, a talking dog (9). There's an extra *repetition* of legs, and ... a *repetition* of dogs, so it might be emphasizing the vigor of this instinctual energy which 'has legs', a lot of legs to carry [it] forward into the dreamer's life (10)."

"A chimera ... [like] the Minotaur. There [are] 40,000-year-old rock paintings ... of men with deer's heads, who were hunting (12). There is a 40,000-year-old carving, the Lion Man, a lion's head on a human body. The wear on the carving [shows] that it was handed around the campfire many times. One person after another held it and looked at it. And when you hold it the lion is staring at you (13)."

"There are no chimeras in reality. It ... forces you to understand it symbolically. It's looking at you (and the same is true in this dream) so it's ... approaching you, trying to speak to you ... to influence your psychological development. It brings ... enormous power and strength … a cave lion was bigger than regular African lions ... to the human beings that it already resembles by having a human body. These dogs are doing something similar [again the image contradicts the old lady's apparent neediness] (14)."

Instructor: "[S]he's got two legs to spare (44)."

Class Member: "That's why I'm seeing the middle legs as arms, like a deity, with power, and he's dismissing this powerful creature (45)."

Instructor: "And she lifted up her right paw ... Why does it have to be the right paw? The left paw would be the sinister side, the unconscious side, the right paw is the sword hand, the conscious side (55). She's making a conscious approach, and sure enough she speaks, which is also a conscious communication [repetition], and she speaks in a related way, 'thank you so much' … with consideration for the other person [another repetition; again her relatedness is a source of power, though it is cloaked as neediness] (56)."

"It's like a Trojan Horse! The dog tricks him into going down ... and she speaks in a wavering voice, she's tricked him [again, a repetition]! She seems frail and insubstantial, but she's controlled the action and brought him to a place which is maybe foreign to him, closer to the earth. I [the instructor] think that is the secret of the 'little old lady' phrase. The unconscious is tricking this man, to introduce him, I think, to the maternal [world] (67). Which I would therefore suspect he is somehow avoiding. He needs to be tricked into this, he needs to be helped (70). It seems as though the man is being a strong, helpful male, but ... they're the ones who are doing the moving and the shaking ... the feminine tricking the masculine (79). The material world ... I [the dreamer] was above that, now I am surrounded by it (87). Nature, with her apparent frailty, has enticed me into that world, where I am supposed to gain an education in the material world, in mother nature (89)."

Evidence from the bringer that supports prediction 3:

[Here we repeat quotes that supported prediction 2 because they also support this prediction]

"He's the kind of guy who doesn't ask for anything (113). He's very self-sufficient. He doesn't like asking for help, he doesn't like talking about his feelings (116). He'll do a lot for other people, if someone asks, he tends to do it; people call him and ask him for favors. He hasn't talked about wanting reciprocation from that. He has a very giving nature (117). He likes to cook his own food and build his own sheds, and do home repairs, all himself, and doesn't like to hire things out, or ask for help (118)."

Instructor: "Doesn't like to be vulnerable? (119)"

Bringer: "Right! Doesn't like to be vulnerable. Doesn't even really think that he needs that! … to be vulnerable. I don't think vulnerable is even on his radar! (120)."

[What follows now is not part of the independent evidence as to the accuracy of prediction 3, because this subsequent discussion is necessarily influenced by the instructor's statement in paragraph 121. We quote it nevertheless because it further explains to the reader why we see the old lady as a 'trojan horse' trick tailored to penetrate this dreamer's defenses.]

When the bringer spoke about vulnerability (120) and we finally got the joke in its entirety, we all laughed. A class member gestured in amazement (dramatic on the video-record). We were startled to see how accurately the dream mocked the dreamer. The whole dream revolves around this joke and our laughter showed that the joke succeeds.

Instructor: "There's the trickery, I think! Because the little old lady is vulnerable and asks for help … and there's the 'little old lady,' there's the diminishing of her power in his mind, because he's a tough man who doesn't ask anybody for help (121)."

Class member: "What you said about him being so altruistic, in giving he is really receiving (123)."

Another class member: "But he doesn't know it. Hence the trick…If you want this very altruistic guy to go down the hill, you can't tell him to go down the hill. You say 'Oh, I need help going down the hill, can you help me? Oh thank you so-o-o-o much' (124)!"

Not only is the little old lady a Trojan horse, but also the joke itself is a Trojan horse. If the dreamer can see the joke then he will be laughing at himself, taking the joke on board inside his own personality, and thus making his own defense more flexible and hence more adaptive.

Prediction 4 with evidence that we made it:
The dreamer feels sweetness and love in this 'very odd' transition.

Class member: "Holding hands together and walking down … is very sweet … like marriage ceremony ... the father will hold hands with the bride and walking down the aisle … something very odd at the beginning … good intention in disguise, like something good if you trust the process, or you give it a try (76)."

Evidence from the bringer that supports prediction 4:
"He is very nurturing to his family ... He loves dogs (91). His mother is also an artist, and he has recently gotten reunited with her after a big emotional distance (94). He always felt a very deep connection with his mother, and they shared that love of making artwork (111). He has a very giving nature (117). And the paw turning into a hand. Artists use their hands, and it's this instinctive nature to create, you can't

create with a paw but you can with a hand, And I didn't even notice that when I wrote it down, because I wrote it down as he was telling it to me (128)."

The sweetness appears in his being reunited with his childhood love of art and with his own mother, an artist, from whom he had been estranged for many years. The little-old-lady-faced dog suggests both the Great Mother and his actual mother, whose hand he now holds.

Prediction 5 with evidence that we made it:
The dreamer needs encouragement to take action, to engage other people and help them:

Class member: "They seem to be encouraging him into taking action ... He looked closer, and then he provides altruistic support. They are maternal, but they also seem to be eliciting in him his humanity, his engagement with help (80)."

Evidence from the bringer that falsifies prediction 5:
"He's very nurturing (91). Sacrificing … to take care of his family (93). He has a very giving nature (117)." The dreamer had always been actively altruistic. He did not need encouragement in this. The dream encouraged him rather to use his hands, to reconnect with his mother, to do his own creative work.

4.   Discussion

Predictions 1-4 were supported. Prediction 5 was falsified. We should have rejected prediction 5 as soon as we made it because the dream itself showed the dreamer was already altruistic: for him, this was a defense he needed to understand.

A review of the complete transcript (Appendix 2) shows that no other predictions were made and accepted during this interpretation. There were two ideas the instructor acknowledged but did not discuss because he did not believe they were relevant (see edited transcript 58, 63, Appendix 1). Three other ideas the instructor immediately rejected because the dream text itself contradicted them (47-9, 68-9, 71-2, Appendix 1). The above shows that we did not cherry-pick predictions that, having heard what the bringer said, we already knew would be confirmed.

5.   Conclusion

Possible objections to this experimental design

1. The phenomena predicted in this experiment (vulnerability, projection, relationship, connection to earth, humor, sweetness) are subjective or ill-defined. Therefore this experiment cannot generate objective results.

Experimentalists in the hard sciences may make this objection because they do not themselves work with subjective phenomena but we apprehend much of the human personality subjectively, through empathy. This does not make the personality less real. The burden is on us to devise an experiment that studies the personality as it is.

Meanwhile our experiment addresses four *objective* questions: (a) Is there a strong correlation between a prediction made from the dream text and information subsequently provided by the bringer or the dreamer? (b) If so, is this repeated with other predictions made from the same text? (c) Are correlations reliably repeated in different iterations using

different dreams? (d) Does each iteration support the hypothesis that a dream furthers the emergence of personality?

2. Our predictions are so general that they would be true for many people and thus resemble the "cold readings" that fake psychics employ.

Many of our predictions are quite specific. Though we cannot quantify the probability, it is extremely unlikely that the observed concordance between prediction and subsequent evidence could be due to chance or to our professionally informed guesswork. More to the point, the only source we have is the dream text (plus the dreamer's age and gender). Our predictions are based upon the text .

3. Our sample size is small and the dreams were selected, not randomly chosen. Our data is not quantitative, nor evaluated statistically. Therefor our results cannot be generalized.

Plat (1964) argued that logic-based, qualitative research is more productive than quantitative research.

It is true that the instructor selects a dream that he guesses will make for an interesting class. However, more than 100 iterations (eight documented here) have yielded similar results and hence these results appear to be somewhat general. We show that the eight dreams we analyze all support personality development. We do not claim to show that all dreams serve this function.

4. While our interpretation was blind, the testing of our predictions was not blind because the bringer had heard our interpretation before she described the dreamer to us. This explains the correlations between prediction and subsequent information.

The bringer has known the dreamer for years. Her loyalty is to him and to her years of knowing him rather than to us or our 60-minute interpretation. This is made clear by her words and tone of voice (McDowell, Roberts & McRoberts 2022b, beginning at 57:59 minutes). See, for example, paragraphs 116-118, either in the edited transcript (Appendix 1) or in this paper in Results section 8. Or listen to paragraphs 116-120 at 1:09:54 to 1:11:00 on the audio record (McDowell, Roberts & McRoberts 2022b).

In another iteration the bringer did not enter our class until we had completed our interpretation (McDowell, & Roberts 2023). In three iterations, most information was provided later by the dreamer (McDowell, Roberts & Lakis 2023; McDowell & Roberts 2023; McDowell, Roberts & Guercio 2023). In each case the correlations were just as strong.

5. While interpreting the dream, the bringer was present on camera and sent non-verbal signals that guided our interpretation.

This bringer was expressive, nodding or smiling often until the instructor asked her not to. However, a review of the complete transcript (Appendix 2) or of the video-recording, shows that her non-verbal expressions were not directive and did not change our interpretation's content. [If a researcher needs to view a video-recording then, to protect confidentiality, we will consider your request on a case-by-case basis. Please contact the corresponding author.]

Earlier iterations were performed with audio only. In other current iterations on Zoom video, bringers were much less non-verbally expressive (McDowell, Roberts & Lakis 2023).

In five of the eight iterations documented here the bringer was not present or not visible during the interpretation (McDowell, & Roberts 2023; McDowell, Roberts, & Roth 2023; McDowell, Roberts & Guercio 2023; McDowell, Roberts, & Nyerges 2023a; McDowell, Roberts & Moadeli 2023). In each case the correlations remained as strong. This is not a 'Clever Hans' effect (Samhita & Gross 2013).

6. Because we identified and listed predictions 1 to 5 only after the class was over, we cherry-picked predictions that we already knew had been confirmed. This created a false degree of concordance.

Our results eliminate this objection. All predictions that were consistent with the dream's details were subsequently supported by the bringer's information (see Results 13 above)

7. We could not exclude the clinical experience of the instructor and class members, many of whom were therapists. Our interpretation is the product of that experience: the dream is only a jumble of images.

Many features of the dream eliminate this objection. This dream is not a random assortment of clues but a tight, elegantly constructed narrative with a beginning, middle and end. The same is true for the dreams in all other iterations referenced in this paper. In 63 words this dream conveys complex, subtle meaning, like one of Shakespeare's sonnets. At first the images seemed outlandish but, once interpreted, they tell a coherent narrative with frequent repetitions. All eight of the dreams discussed here offer a clear narrative and, in each case, our interpretation depends upon the complete narrative, not upon a random collection of images. There are many parallels between the dream of the 6-legged dog and the Bushman myth of *!Ko-g!nung-tara* which also concerns a female shaman (Bleek & Lloyd 1911/2007, pp. 57-62; McDowell 2022, pp. 127-188; Whitmont 1991/69, p.76).

In addition, this 63-word dream tells several successful jokes that gently mock the dreamer. The unconscious takes an ironic view of the tough man with his arrogance and his defenses. He thinks he is helping the old lady when the opposite is true. Two other jokes are entirely non-verbal, like an illustration from *Alice in Wonderland* or the antics of Charlie Chaplin. The two faces, one black, one white, suggest the integration of opposites, while the six legs, three on each side, would require complex integration of another kind. Taken together, these two images make a joke about psychological integration which (integration) is central to the dream's meaning (noticed by a class member in paragraphs 51-2, Appendix 1). The second visual joke is that the six-legged dog takes the dreamer's hand in her 'hand' but still has four, or possibly five paws on the ground (paragraphs 41-44). This repeats that the dreamer needs to be more connected to mother earth. He 'gets a hand' from her.

The dreamer's face-to-face meeting with a chimera suggests increasing consciousness and the dream's multiple jokes repeat this suggestion because consciousness requires humor. Without humor we do not fully grasp what is going on: our understanding is too linear or legalistic. To be conscious is to see paradox, to embrace the strange otherness of things and of other people. We laugh when things fit together unexpectedly and, when we laugh at ourselves, neurosis and even narcissistic injury loses its grip. Our personality breaths, expands, and reorganizes a little.

8. Our evidence is untidy, laborious to read, and not clear enough to be taken seriously.

Our results are not ambiguous. Testing dream interpretation by experiment is new. When the first recordings were played from a wax cylinder, the sound was rough but the experiment was important.

Is this science?

This experiment requires skill in interpreting dreams. Beyond that, it can easily be repeated. It does not require a class, though a conversation between several interpreters would help. Since those skilled in interpreting dreams are not likely to be skilled in experimental science, nor vice versa, collaboration between people from both fields would also help.

Our approach comes from experimental biology, where an experimental system is key. The geneticist Francois Jacob said that an experimental system is a 'machine for creating the future' because it enables us to formulate questions that can be answered and because it is itself a vehicle that materializes questions (Rheinberger 2006, p. 4). Our system does what Jacob described. Perhaps our experiment was not discovered sooner because the disciplines of experimental science and psychotherapy seem incompatible. It is unlikely that a researcher would have both skills. In addition, we did not use the class-members' own dreams because dreams are too revealing. This meant, fortuitously, that we had to interpret without associations and this, in turn, made our experiment possible. Our experimental approach suggests new research (below) on dream language, the mechanism of talk therapy, and the interpretation of myth. From all of the above we conclude that this is experimental science.

A language of dreams?

Our results raise further questions. Is it accurate to say that dreams are composed in a distinct language? What properties of this 'language' can we observe? How universal is it? How far back in prehistory is there evidence for it? How does it relate to the evolution of verbal language (Botha and Knight, 2009)? Our experiment might help to pursue these questions further.

Further discussion

If I am exclusively a clinician, then my knowledge of dreams is clinically based. A patient tells me if they feel the truth of an interpretation, or their body confirms the interpretation with an autonomic response, a flush, or tears, or a relaxation of tension. I can observe whether or not an interpretation helps our work and I can also interpret my own dreams and observe how that affects me. But all this evidence is anecdotal: another interpreter may contradict me and neither of us can disprove the other. Like therapy itself, dream interpretation has always been subjective and tricky. Fashions come and go and a body of generally accepted knowledge does not accumulate.

Neuroscience can correlate a dream's neuronal activation in a system of the brain (for example the limbic system), the functions mediated by that system (general pleasure, sex, fear, and aggression) and the emotions most commonly reported in dreams (fear, aggression, sex, joy), but neuroscience cannot address the specific meaning of one dream. Statistical studies have led to the 'continuity hypothesis,'

that the content of dreams correlates with the content of waking mental life: dreams are therefore a continuation of waking life (Domhoff 2017). But Freud's 'day residue' might also explain these statistics. Schredl (2010) noted that a limitation of statistical studies is that they cannot address the dream text as an integral whole, nor can they address the meaning of one dream to the individual who had it. Thus our approach serves to compliment both neuroscience and statistical studies.

The meaning of dreams has been endlessly debated. If we have experimental evidence for an interpretation then we can better use the interpretation as a window into self-organization. We discover a new narrative in a dream. If we interrogate that narrative (in art, or conversation, or in our actions) then we can assimilate it. When we interpret a dream we can watch the narrative integrate itself within the personality as though we were watching a live embryo develop under a microscope. How does the narrative work? What goes where? We can see it with our own eyes.

Our experiment confirms a very old idea, that a dream offers guidance and wisdom. If generative AI creates narrative without human values, a dream helps to integrate personality. Dreams are related to myth. How a myth supports personality has been extensively studied (Edinger 1983/72 pp. 131-156) but, lacking experimental evidence, these studies are inaccessible to science. We provide evidence. For example, we show that the myth of Saturn (McDowell, Roberts, & Roth 2023) portrays a father who devours his son's personality because of his own childhood injuries, an interpretation that may seem obvious but has not previously been supported by experiment.

Science has not previously had an experimental system to study an individual dream. This experiment may contribute to the understanding of consciousness (McDowell 2024), in part because the dreaming personality proves better informed than consciousness itself. Our experiment might also influence how therapists work with dreams: not only may the quality of interpretation increase because it can be tested, but also interpreters might build upon a body of knowledge that is generally accepted.

We combine dream interpretation with experimental research. Our results are not ambiguous but it will take work to assimilate them into current thinking. We hope that this paper will stimulate discussion.

Authors' Notes

Acknowledgements

Supplemental materials

Appendix 1 and Appendix 2 are available in the online version of the paper.

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