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RESEARCH

Suicide Avoidance as an Integrative Paradigm for the Study of Human Nature

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Abstract

To advance an integrative understanding of human nature, we advocate for a bold shift in focus across behavioral science towards the study of suicide and its avoidance. Suicide is not just another symptom or social issue among many; it profoundly influences human affairs. It is a major cause of death around the world and can leave psychological scars on the bereaved. Its pervasive impact is reflected in the world's literary and artistic heritage. Yet suicide remains marginalized in science education, overlooked by major theoretical frameworks, and under-researched relative to the scale of mortality caused. The unrecognized scientific importance of suicide is, at root, evolutionary: human vulnerability to suicide—a harmful by-product of sapience—exerted a powerful selective pressure in our deep ancestral past. A suite of psychological and cultural defenses evolved to mitigate the danger, protective machinery that we have inherited. It displays in diverse human traits of the kind that behavioral scientists from varied fields are drawn to study: puzzling, species-typical psychological biases and behavioral patterns that are conspicuously costly but bring unclear benefits. Manifestations may include optimism bias, spirituality, arts and sports, prosocial morality, self-serving self-deception, psychoanalytic defenses, diverse psychopathological symptoms, and even human consciousness. With the shared substrate currently obscured by taboo, these phenomena are usually studied in isolation, perpetuating a fragmented understanding of human nature. The reconceptualizing of *Homo sapiens* as a suicide-avoidance specialist points to a new, long-awaited Kuhnian paradigm in behavioral science, one that is directly linked to promoting well-being and saving lives.

Keywords Behavioral science · Integration · Suicide · Paradigm · Pain-brain

Generations of scholars across psychology, sociology, anthropology, and other humanities have grappled with a fundamental problem: the lack of a unifying understanding of what it is to be human. Despite important advances, behavioral science is characterized by many competing theories offering partial explanations, but little overall synthesis. The result is fragmentation in both knowledge and research orientations, with the central question remaining unresolved: What sets us categorically apart from other species?

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There have been many attempts to pin down a core feature that explains humankind's uniqueness (Pasternak, 2007). Pinker (2010) argues that humans evolved a *cognitive niche*, allowing us to manipulate our environment through causal reasoning and cooperative problem-solving. Dunbar's (1998) *Social Brain Hypothesis* proposes that our exceptionally large neocortex evolved to manage complex social relationships. Others emphasize the role of human *cultural evolution*—the cumulative transmission of knowledge, norms, and technologies (Blackmore, 1999; Boyd & Richerson, 1985; Henrich, 2015). Still other theories focus on *cooperative breeding* (Burkart et al., 2009), *self-domestication* (Hare, 2017; Wrangham, 2019), and *mental time travel*—the ability to project ourselves into the past and future (Suddendorf & Corballis, 2007).

All these perspectives, and many others, contain important truths. However, no framework yet provides sufficient explanatory strength to rally even evolutionary scientists around common inquiry, let alone provide broader foundations for behavioral science.

Here, we argue that a fundamental human trait—one with profound implications for our species' evolution, cognition, and social organization—could serve as the basis of an integrating metatheory of human nature. However, shrouded by taboo, this momentous feature is striking by its absence from mainstream scientific discourse. Is there an elephant in the room? Have we overlooked the key to understanding humanness all along?

Before presenting a solution, let us be clear about the problem: progress is long overdue.

Lack of Integrative Theory in Behavioral Science

Behavioral science is in pressing need of coherent, shared theory—a conceptual base capable of connecting and accumulating knowledge across psychology, sociology, anthropology, and related disciplines. The current picture is a morass of vague and overlapping ideas, as a prominent anthropologist notes:

> [P]rofessionals who work in areas unrelated to the social and behavioral sciences often become overwhelmed by the multiplicity of theoretical and conceptual "models" that are found in the behavioral science literature. Many of the frameworks and the constructs they contain appear very similar but go by different names, and the component concepts seem vague, abstract, and difficult to grasp. (Coreil, 2010, p. 69)

This is a longstanding state of affairs. Chronic stasis is well recognized in psychology, where persisting failure to integrate theory has been summed as more than half a century "gone astray" (Toomela & Valsiner, 2010, p. 325). More than two decades ago, Kvale (2003) called out psychology's "puzzling state, somehow empty of radically new insights into the human situation" (p. 598). An analysis by Zagaria et al. (2020) finds that the disarray has *always* prevailed: since its nineteenth-century inception, psychology has never moved beyond a proliferation of competing schools of thought—in contrast with the "hard" sciences, where overarching Kuhnian paradigms guide and co-ordinate inquiry (Kuhn, 1962). That critiques like Zagaria et al.'s (2020) feature in *Integrative Psychological and Behavioral Science*—a journal that, for decades, has sought pathways to theoretical integration, as yet with little success—speaks to the recalcitrance of the problem.

The Tendency to Study What Bears Consideration

We contend that the chief obstacle to establishing a Kuhnian paradigm in behavioral science is—ironically, perhaps—behavioral. Advancement requires the scholarly community to overcome an inclination to examine what feels okay to consider, rather than what matters most. Kaplan (1964) likens behavioral science's impasse to the confusion of someone...

> searching under a street lamp for his house key, which he had dropped some distance away. Asked why he did not look where he had dropped it, he replied, "It's lighter here!". (p. 11).

Extending the metaphor, gaining insight in behavioral science requires attending to the darkness—the place where understanding was lost, rather than where the light shines.

Suicide, "the act of deliberately killing oneself" (W.H.O., 2014, p. 12), is a prime candidate for the hidden key to progress. We suggest it is the leading candidate because a longstanding gulf separates the significance of the phenomenon on one side, and scientists' readiness (usually, *lack* of readiness) to examine it on the other. The next two sections set out the opposite sides of the gap in turn.

The Importance of Suicide in Human Experience

Few human behaviors are as consequential and pervasive as suicide.

The phenomenon is apparently both unique to our species (Bering, 2018; Preti, 2018; Soper & Shackelford, 2018) and a human universal, spanning every geographic region and historical era as far as can be known (van Hooff, 2000; W.H.O., 2019). At least two empirical findings converge on suicide's ancient universality. First, field reports from nineteenth-century anthropologists around the world—the closest we have to a first-hand view before exposure to modern civilization—found suicide was at least as common among recently encountered tribal peoples as in the industrialized West (Steinmetz, 1894). Second, as Durkheim (1897/1952) points out, suicide was evidently a serious problem in the past everywhere since in some form it is apparently now proscribed everywhere: there would be no need to regulate the behavior if it had not historically posed a problem. This ubiquity speaks of deep prehistoric origins because it indicates that the trait was a fixture in ancestral humans even before they began colonizing the globe. As they left Africa and spread around the world, suicide came with them.

Today, suicide accounts for more than 1% of human deaths (>700,000 annually: W.H.O., 2021). It is a prominent cause of human mortality—indeed, the leading cause in parts of the world (Naghavi, 2019). It is an especially major cause of death among adolescents and young adults, accounting for one in six deaths of 15- to 24-year olds in the USA and Canada, one in three in Australia and New Zealand, and more than one in two in Japan and South

Korea (W.H.O., 2024). It is the second leading cause of death in this demographic in the USA, after only accidents (Curtin et al., 2024). More people die by their own hands than by others', the annual worldwide toll exceeding that of wars and homicides combined (W.H.O., 2021). For every suicidal death, it is likely that more than a score of other people—millions, globally—have tried to take their own lives (W.H.O., 2014). One in two Americans have "at some time considered, threatened, or actually attempted suicide" (Lester, 1997, p. 3).

Harmful repercussions run broad and deep. The economic burden is immense, self-injury mortality costing more than $1 trillion per year in the USA alone (Rockett et al., 2023). Socially, suicide is so concerning that all of the world's major religions give specific guidance on the matter (Gearing & Lizardi, 2009). Each suicidal death directly impacts a circle of more than 100 friends, relations, and acquaintances (Cerel et al., 2019), with the bereaved often left with psychological scars that can last a lifetime (Wertheimer, 2014).

Perhaps most perniciously for those left behind, suicide undermines our sense of the value and inviolability of our own lives. To Camus (1955), the fundamental problem of human existence—*Is life worth living?*—is the one truly serious philosophical question. Proclaiming their answer "*No*"—that "the world is discardable" (Papadopoulos & Hsiu-Chuan, 2022, p. 195)—others' suicides are concerning arguably for this reason above all (Maris, 1982). They pose profound psychological challenges for the living, mere exposure to suicide increasing the risk of further suicides (Hill et al., 2020). This risk factor permeates communities: more than half of Americans, for example, report knowing someone who took their own life (Feigelman et al., 2018).

Reflecting suicide's timeless relevance, the topic threads through the world's artistic heritage, from ancient literature of Egypt (Allen, 2011), India (Nrugham, 2017), and China (Hsieh & Spence, 1981) to popular twenty-first-century film (Stack & Lester, 2009). In the theater, where universal human struggles can be explored with a candor that few other forums can match, suicide figures in 23 extant tragedies of ancient Greece (Garrison, 1995); a quarter of Shakespeare's plays (Hanford, 1912); a similar share of those of the father of modern drama, Henrik Ibsen (Lester, 1972a); and, across 400 years of Western opera, a third of operatic storylines (Pridmore et al., 2013). What boils down to the question of suicide—"To be, or not to be," from Shakespeare's *Hamlet*—is one of the most recognizable and widely quoted lines in English literature (Bruster, 2007). Analysing discourse on the issue in the philosophical and literary canon, Bennett (2017) argues that suicide may be understood as "a *defining* human possibility …a limit case with respect to the question of what it means to be human" (pp. 7, 26, original italics).

Clearly, we are discussing a major human concern—indeed, a commonplace matter of life or death. We hazard that few readers of this article have not been touched by suicide in some way.

Neglect of Suicide in Behavioral Science

The importance of suicide in human affairs could not be guessed from the minimal scientific attention it attracts. This is not to doubt the dedication of suicidologists, but to observe that their work is systemically sidelined by a scientific mainstream. Three aspects of the marginalization will be highlighted here: suicide is largely ignored in science education, overlooked by behavioral theory, and deprioritized in research.

Marginalization in Education

Suicide is all but passed over in behavioral science teaching. In psychology, for example, Lester (1988) noted decades ago that suicide is "not considered an acceptable topic for study" (p. 3)—disfavor that, although perhaps lessened somewhat, evidently persists. Illustratively, of more than 4,700 books in the American Psychological Association's (2025b) online "PsycBooks" library—a "fundamental resource for any psychology program" (2025a)—the topic appears in the titles of just 17. Of USA psychology departments responding to a survey, only 3% offer undergraduate courses in suicidology—even fewer (2%) for graduate programs (Jahn et al., 2017). Suicide is not listed in the lengthy subject indexes of some highly regarded introductory psychology textbooks, such as those by Kalat (2017, 11th ed., 608 pp), Stangor (2021, 3.1 ed., 668 pp), and Zimbardo et al. (2017, 8th ed., 722 pp).

These and other introductory psychology texts typically limit discussion of suicide to a few paragraphs under "Major depressive disorder" or similar psychiatric heading (e.g., Bernstein, 2016; Grison & Gazzaniga, 2022; Weiten, 2021). This relegation of the subject to a side-issue of mental illness disregards compelling evidence that, although psychopathology is a prominent risk factor for suicide, they are distinct phenomena (Soper, 2023a). Crucially, the great majority of people with depression do not try to kill themselves, and most suicides happen among individuals who did not appear particularly depressed (Bertolote et al., 2004). Suicide is an important matter in its own right, but is rarely acknowledged as such.

Psychology is not alone in deprioritizing suicide in its teaching agenda. Scholars arriving at behavioral science from a medical education will likely have fared no better. *Davidson's Essentials of Medicine* (Innes, 2020, 3rd ed.), for example, indexes suicide to just one of its 863 pages.

Similarly cursory discussion, if any, can be found in introductory textbooks in sociology (e.g., Conerly et al., 2021), anthropology (e.g., Hasty et al., 2022), and other major fields.

Neglect in Theoretical Frameworks

Scarcity of theory can be taken as a measure of scholars' disinclination to think carefully about the subject. Notwithstanding an ongoing proliferation of mini-theories within suicidology (Gunn & Lester, 2014), these are poorly integrated into broader theoretical frameworks in behavioral science, which touch on the subject only tangentially or overlook it entirely (Rogers, 2001).

For example, suicide is virtually ignored in inter-disciplinary discussions of human universals (Kappeler & Silk, 2010) and human uniqueness (Pasternak, 2007). The same is true of seminal panoptic monographs, such as Geertz's (1973) *The Interpretation of Cultures*, Churchland's (1986) *Neurophilosophy*, and Pinker's (2003) *The Blank Slate*. It is not indexed in primers on theory in major social science disciplines, such as psychology (Koffmann & Walters, 2014, 307 pp), anthropology (Barnard, 2022, 279 pp), or economics (Earl, 2022, 518 pp). A marginal exception is sociology, where limited discourse on suicide remains dominated by the nineteenth-century ideas of Durkheim (1897/1952): for example, the book *Contemporary Sociological Theory and its Classical Roots* (Ritzer & Stepnisky, 2022, 6th ed., 467 pp.) allots the subject a single page, which merely restates Durkheim.

Durkheim and Sigmund Freud have long stood as behavioral science's "two giants of suicidal theorizing" (Shneidman, 2001, p. 6). Even so, the topic was not a primary concern for either of them. Durkheim's agenda was to highlight not suicide, but what he took to be a general societal malaise, of which heightened suicide was just "one of the forms" (1897/1952), p. xxxv). Data being available, Durkheim saw differentials in suicide rates merely as an expedient vehicle for making his case. He did not inquire into why suicide exists in the first place: he simply took it as a given—a "social fact" (p. 25) of human populations. As for Freud, it took another scholar (Litman, 1967), long after Freud's death, to structure his scattered (and ambiguous: Briggs, 2006) references to the subject. Durkheim's and Freud's enduring dominance of suicide theory reflects more the weakness of competition than the strength of their interest (Joiner, 2000).

The neglect of suicide in theories of human nature contrasts with its considerable impact in many theorists' private lives. Freud, for example, threatened on at least one occasion to kill himself (writing to his fiancé that he would do so if he lost her: Litman, 1967), was affected by the suicides of patients and colleagues—deeply so by that of his niece, and himself probably died by physician-assisted suicide (Gay, 1988). Indeed, psychologists in general appear to be at heightened risk of taking their own lives (Kleespies et al., 2011).

Scientists' reluctance to engage with the subject of suicide in their work, despite often being personally affected, is demonstrated by a text on 20 leading *Psychologists and Their Theories* (Krapp, 2005). In an extensive, two-volume work (529 pp.), it records suicidality as a formative issue in the biographies of many theorists: aside from Sigmund and Anna Freud, suicides among family members or their own suicidal thoughts were notable life experiences for Anne Anestasi, Karen Horney, Eric Fromm, William James, Carl Jung, and Melanie Klein. Lawrence Kohlberg, another of the selected psychologists, drowned himself. However, nothing is said on the matter in the context of any theoretical framework. Suicide is not listed in the book's index (though it does reference "suicidology" to one page, on the empirical work of Aaron T. Beck), nor is insight offered into Freud's or Kohlberg's deaths beyond passing remarks that the former "asked his doctor to… ease him out of life" (p. 155) and the latter "had a major depressive episode" (p. 258).

The more recent suicide of another behavioral scientist, Shane Lopez, a prominent researcher of the "positive psychology" movement, is not just left unexplained by his own theorizing; it is put out of sight. As a fellow researcher observes:

> Lopez's suicide remains basically unacknowledged: with an exception of an obscure obituary by his colleague, all other online and printed documents about Lopez refuse to acknowledge that one of the most published and celebrated positive psychologists took his own life (Yakushko, 2019, p. 122).

In short, the theories of behavioral scientists appear inadequate for understanding even their own suicidality.

Underfunding and Lack of Progress in Suicide Research

The downplaying manifests also in a gross underfunding of research. Despite suicide accounting for more than 50% of premature mortality in the direct domain of mental health, suicide and non-lethal self-harm *combined* attract less than 5% of mental health research funding (Woelbert et al., 2020). Research in mental health is, in turn, under-resourced compared to physical health: mental health conditions account globally for 20% of total morbidity burden, but receive only 7.4% of research investment (Woelbert et al., 2020). Suicide research thus shares an inequitably thin slice of an inequitably small cake.

A prominent clinician, Linehan (2008), describes the ensuing scarcity of high-quality research in suicide

prevention as not just inequitable but, in view of the high death rate, "outrageous" (p. 484). By her assessment, "Help from science is apparently not right around the corner" (Linehan, 2011).

Perhaps unsurprisingly given this marginalizing, scientific understanding of suicide and its prevention have advanced at a glacial pace (Fox et al., 2020; Goger et al., 2024). Suicidology has seen an exponential growth in published output (Astraud et al., 2020)—as has scientific publishing generally (Hanson et al., 2024). However, decades of reviews point to few, if any, significant contributions (Kahne, 1966; Lester, 1972b, 1992, 2000, 2019). One recent review asks, almost despairingly, "Has Suicidology Come to an End?" (Lester, 2019, p. 149). Another, an investigation into suicide theory by the psychologist and science writer Bering (2018)—spurred partly by a desire to comprehend his own suicidal thoughts—finds "no satisfying answers" (p. 234).

Slow theoretical progress is evidenced empirically. Although the worldwide suicide rate has fallen in recent decades, it is unclear why (W.H.O., 2019), and variations persist, for reasons that are also yet to be determined (Hawton & Pirkis, 2024). The USA provides the most striking exemplar of the problem: despite being the birthplace of modern suicidology and the largest contributor of its research (Astraud et al., 2020), and despite major strides in reducing other leading causes of death, the USA suicide rate is the same today as it was a century ago, with no scientific consensus either on the reasons for the lack of change or on how to address it (Millner et al., 2020).

The Biological Challenge of Suicide

We suggest that it may be no coincidence that both suicidology and behavioral science as a whole are chronically and simultaneously stuck. If there is a perennially overlooked key to progress in an integrative understanding of human nature, suicide is a probable place to find it, uninviting though it is.

The unrecognized significance of suicide for behavioral science lies in the complex biological problem that the behavior poses for us, a sapient animal. The nature of this challenge is brought to light by recent theoretical advances in understanding suicide's evolutionary origins: in particular, the *Pain-Brain Theory*, which will be outlined here for background (for full accounts: Soper, 2018, 2021). Other theories of suicide are offered in the literature (Soper & Shackelford, 2025); however, by several scholars' assessment, Pain-Brain Theory offers internal coherence, explanatory power, and the best available fit with the empirical evidence (Abed & St John-Smith, 2025; Lester, 2019; Maris, 2022). The framework points to the likelihood that, across our species' evolutionary history, suicide fundamentally shaped human cognition and behavior.

Evolutionary Origins of Suicide

To understand suicide's overarching significance for humankind, we first have to confront its universality. To shy away from this feature of human nature is psychologically understandable, but scientifically obstructive.

Suicide tends to be viewed as something that only happens to others—so-called *Suicidal People* (Leenaars, 2004), i.e., not *us*. This psychological distancing occurs even among those who have tried to take their own lives, their memory of these momentous experiences often put out beyond recall (Brezo et al., 2007). Across the wider community, people who attempt suicide and their families face stigma—an "othering" that seeks to sequester the phenomenon within a deviant minority (Hagström, 2020). The epidemiological reality is that suicide occurs stochastically across human populations, such that none of us is immune (Soper et al., 2022). The "suicidal person" could be almost anyone.

The reason suicide risk is universal is that all cognitively mature humans carry, in principle, both the *motive* and the *means* to end their own lives.

The prime *motive* is the imperative to escape unbearable psychological pain (Mento et al., 2022; Verrocchio et al., 2016). Pain is an evolved necessity for animals, enabling them to navigate their environments. Necessarily unpleasant, pain is designed to induce action to avoid, ease, or end the aversive stimulus. For the same reason, mammals are sensitive to psychological pain—a particularly insufferable variety, probably homologous to physiological pain, that signals relational injury (Bowlby, 1969; Eisenberger & Lieberman, 2005; Panksepp & Watt, 2011). Observing that "[s]uicide is never born out of exaltation or joy" (p. 7), Shneidman (1996) coined the neologism *psychache* as an umbrella for the many intolerably painful mental states that invite suicidal relief:

> [I]t appears that suicide is pushed by pain; suicidal fantasies and acts are efforts to escape or put a stop to the pain that flows through the mind [psychache]. It is a special kind of pain, psychological pain, the pain of the negative emotions—guilt, fear, shame, defeat, humiliation, disgrace, grief, dread, woe, loneliness, hopelessness, frustrated love, fractured needs, rage, hostility, and the perception that the pain is unbearable. (Shneidman 2001, p. 139)

The *means* of suicide start with a brain so promiscuously intelligent that it can mentally represent self-killing as a way to answer pain's demand for relief. This cognition is an extraordinary intellectual feat, requiring an understanding of personal mortality and enough biology to grasp the steps needed to bring that mortality about.

Virtually all humans acquire this intellectual capability, doing so in the normal course of development, usually in the teenage years (Mishara, 1999; Shaffer, 1974). Hence, although ancestrally adaptive overall, human sapience comes at a heavy price, suicide being one of its most costly by-products. For this reason, suicide is probably a uniquely human phenomenon, categorically different from diverse self-harming behaviors observed in other animals (Soper, 2018; Soper & Shackelford, 2018).

In summary, although pain serves an ancestrally adaptive function, humans possess a uniquely effective, but disastrously maladaptive, means of escaping it—self-killing (Murray & Kluckhohn, 1948). Given that motive (escaping pain) and means (intellectual capacity) together constitute sufficient conditions, suicide represents a species-typical survival hazard.

Yet, if all of us in principle could, and would, escape pain by killing ourselves, why do only few of us do so? The reason is that our species evolved solutions to the problem.

We have lived and died alongside suicide ever since an early human-like population encephalized to the extent that suicide became a mentally representable option for the few individuals who, stochastically, happened to fill the extreme forward tail of its bell curve of intelligence. The arrival of our ancestors at that cognitive frontier marked a critical stage of human evolution, because suicide imposed a lethal phylogenetic barrier—a fitness "cliff edge" (Vercken et al., 2012). The suicides of the population's smartest minority resulted the elimination of their germlines, thereby holding the bulk of the next generation a safe distance behind the barrier (Soper, 2019, 2021). The modern developmental pattern of suicide indicates that the impasse was reached when the front tail of the intelligence distribution approached something like the intellect of a modern pubescent child. Further progression of human braininess was blocked at that point while solutions to the suicide problem took shape.

This proto-human, proto-suicidal phase, spanning thousands of generations, constitutes a crucible in which the distinctive psyche of modern humans evolved. By necessity, evolved protections against suicide were, first and foremost, genetically rather than culturally propagated because, paradoxically, they could not initially presuppose an ability to mentally represent the suicide idea. The heritable defenses that made suicidogenic intelligence viable operated initially in a culture where only the most intellectual few could understand what was being defended against. Intense selection fashioned a complex suite of psychological adaptations that monitored and managed the threat, keeping the human organism enjoying life; or, when life was not enjoyable, at least soldiering on; or when the life was so chronically painful that "The Lure of Death" (Humphrey, 2018, p. 1) might beckon, at least alive.

When anti-suicide adaptations advanced as far as to maintain a suicide rate that was demographically sustainable, the path was clear for behaviorally modern *Homo sapiens* to emerge, with sapience as its defining feature—crucially, that is, sapience beyond the threshold of suicidality. Suicide's onset among modern adolescents reiterates ontogenetically the passing of that phylogenetic milestone. We have inherited the adaptations that made that transition to sophisticated intelligence survivable.

Psychological Defenses Against Suicide

By this light, *Homo sapiens* can be understood, primarily and uniquely, as a suicide-avoidance specialist. We are precisely adapted to counter this lethal consequence of our evolutionary cognitive habitat. Suicide is a superordinate, endemic problem for humans in the same way that, say, hypothermia is for Emperor penguins, or falling from sheer rockfaces is for mountain goats. Just as the extreme conditions of Antarctic ice shelves and steep mountainsides demand an array of specialized adaptations in Emperor penguins and mountain goats, so does suicide-capable intelligence necessitate a set of specialized defenses in humans. It is impossible fully to make sense of the distinctive combination of traits that make Emperor penguins, mountain goats, and humans (or any species) unique except in the light of the overarching selection pressures imposed by their evolutionary environments (Dobzhansky, 1973). These specialist adaptations explain how such animals not only survive in their otherwise uninhabitable niches, but thrive: few other species can compete. If humankind ever had competitors in its "suicidal niche" (Soper, 2019, p. 454), we are the sole inhabitants now.

To understand humanness therefore requires recognition both of suicide as a species-typical, species-universal hazard and of the evolved defenses that address the danger. Providing a framework for such an understanding, Pain-Brain Theory views the adult human organism as being subject to an ongoing hail of potentially suicidal trajectories—would-be suicides, virtually all of which are blocked by special-purpose countermeasures. These barriers operate in two (and, logically, only two) possible ways: some (*pain-type*) weaken the motivation for suicide, managing the organism's exposure to potentially suicidogenic psychache, whereas others (*brain-type*) obstruct cognitive access to the means.

The theory envisages blends of pain- and brain-type defenses forming serial lines, illustrated in Fig. 1. When life becomes so protractedly painful that thoughts of suicide could take hold, emergency defenses (the dark bar, furthest right) intervene to stop any such ideas from escalating into lethal actions. As these last-ditch measures are drastic, their extreme costliness drove, in turn, the evolution of front-line defenses (the lighter bars to the

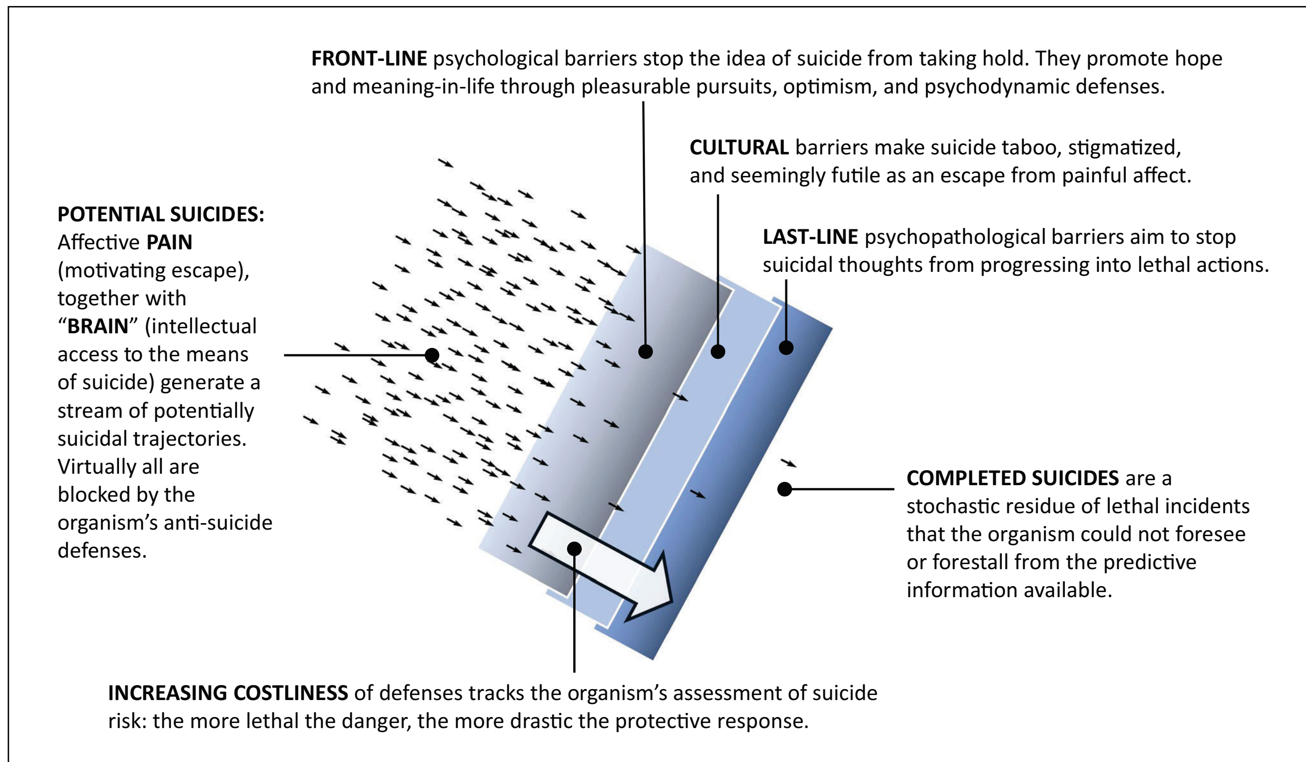

Fig. 1 The Pain-Brain Theory of suicide (adapted from Soper, 2018)

left)—less costly systems that stop the idea of suicide from being seriously entertained in the first place. Thus, we typically find life sufficiently rewarding and promising for the notion of opting out of it to be irrelevant, while encultured stigma and taboo help to keep the suicide idea difficult and unpleasant to think.

The protective system is highly effective, but not failsafe. The need to avert suicide, while extreme, must be balanced against the organism's other fitness demands. Only compromise solutions are available. Hypothetically, a failsafe pain-type defense could keep us perpetually pain-free ("No psychache, no suicide": Shneidman, 1993, p. 147): but no mammal can be permanently immune to psychological pain because, as we noted, sensitive affect is necessary for social functioning (Panksepp, 2011). Just as hypothetically, a failsafe brain-type strategy would maintain cognitive competence below the level needed for the suicide idea to be meaningfully representable or lethally enactable: but to stay in that intellectually disabled state would render the individual unable to compete successfully with more competent conspecifics. Thus, complex trade-offs have to be made. Suicide risk is not eliminated but dynamically managed. Pain- and brain-type measures—tactical attenuations of affective and cognitive faculties—deploy sufficiently usually to block suicide while minimizing the collateral harm caused by the protections.

Human suicide defense is complex, likely with multiple feedback loops. Many compromises are available, the organism selecting the best available at the time according to age, sex, personality, cultural inputs, and other individual and contextual variables. The intensity of defensive measures will vary according to the organism's assessment of the risk. All suicide defenses are costly, but some more so than others. At times of exigent danger, as any price short of death is worth paying to avert completed suicide, the cost may be extreme. As elsewhere in evolved psychology, anti-suicide adaptations are not deterministic or invariant in their outcomes, their current display being open to influence by cultural, personality, and other factors. Their universal outcome, however, is that suicide risk is contained. Suicide rates are never zero, but they do not reach levels that, by themselves, cause demographic instability in any known population. Completed suicides constitute a near-random residue of lethal outcomes that the organism's evolved algorithms—formed by historic correlations between informational inputs and suicidal outcomes—could not practicably have foreseen or forestalled.

Why Suicide Is a Central Issue for Behavioral Science

Evolved defenses against suicide are overarchingly relevant to behavioral science because, as can be inferred from the above discussion, they can be expected to generate precisely the kind of phenomena that behavioral scientists find interesting: behaviors and psychological biases that are universal, costly, and sufficiently puzzling to call for scientific explanation.

Puzzling in at least three important respects. First, suicide-avoidance routines will look irrational, because—without insight into their life-saving payoff—it will be difficult to identify countervailing benefits that justify their expense. Their costs will be conspicuous: tactical modifications of affect and cognition will incur outlays of time, energy, social capital, and other resources—spent in plain sight. By contrast, the compensatory upside of death averted will be more difficult to discern, for at least two reasons. One is that, because evolved suicide defense is a species-typical feature, no *ceteris paribus* group exists that would demonstrate the mortality that would occur if protections did not operate. The other reason is what Cosmides and Tooby (1994) term *instinct blindness*: much of the effectiveness of suicide-avoidance mechanisms may depend on the organism's obliviousness to their functioning. Lack of insight is an expectable feature, helping to keep suicide difficult to mentalize. These epistemological obstacles imply special challenges for behavioral scientists, which we discuss further below.

The second reason suicide defenses will be puzzling is that, superficially diverse, they will lack obvious functional connections. They present researchers with constellations of curious behaviors and cognitions—phenomena that call for simultaneous explanation. However, without recognition of the unifying substrate of suicide avoidance, researchers are left having to explain them piecemeal. The expectable result is a plethora of disjointed and overlapping mini-theories—which, indeed, is the current state of behavioral science.

The third facet of the puzzle is that these apparently irrational and disconnected phenomena will be specific to our species. Because only humans have to manage the suicide problem, only humans will display its evolved solutions. This is not to say that some limited aspects of these displays will not be found in non-humans. Natural selection does not invent anything from scratch, but instead modifies and repurposes existing biological raw material. It is likely, therefore, that homologues of (human) anti-suicide adaptations are visible in other species, especially among other great apes. However, turned to anti-suicide use, such homologues will operate in humans to a categorically different degree of floridity and prevalence, adding to the pressure on behavioral scientists to explain them.

Next, we will sketch the scope of suicide-avoidance as a potential integrative paradigm for behavioral science. In what ways does the management of suicide risk display in human psychology and behavior? What universal, costly, and puzzling phenomena may be explained within this meta-theoretical perspective?

The following examples are intended neither as last words nor as an exhaustive catalogue, but as tentative examples of diverse ways in which suicide avoidance organizes human experience.

Suicide Avoidance and Recreational Pursuits

First, anti-suicide psychological machinery would be expected to, and evidently does, keep most humans, most of the time, enjoying being alive. We tend to be fairly happy, unrealistically optimistic, and thereby positioned to absorb painful life experiences without too much disruption (Diener et al., 2015). This bias is a uniquely human need: no other animal needs to be motivated to enjoy its own life or pleasurably anticipate its future. For humans, however, with suicide as an endemic threat, contentment and hope are vital resources.

To this end, humans fill as much of their lives as they can with affectively rewarding concerns: arts; sports; hobbies; pets; religious and spiritual matters; philosophizing; romance; recreational eating, drinking, and sex; and sundry other loves and passions. Pursued for their intrinsic satisfactions rather than for extrinsic, animalistic fitness payoffs, such diversions appear biologically frivolous—self-harming, indeed, as they expend scarce resources. For any other animal, they would be a waste of time and energy (Pinker, 2003). For humans, however, they are necessities. The sense of meaning and purpose they can engender is not an indulgence or optional extra, icing on the cake of a Maslow-style hierarchy of needs (Maslow, 1943), as Maslow himself came to realize (Thorne, 2012). Instead, having something or someone to love constitutes vital footings of a worthwhile life (Frankl, 1946; von Andics, 1947). The life-or-death value of everyday human pursuits is perhaps unfamiliar outside of suicidology, but is recognized within:

> [N]onsuicidal routine solutions… include love, work, religion, art, money, alcohol and drugs, medical technology, sex, denial, friends and family relations, humor, play and diversion, and many others. Most people deal with the problem of life with nonsuicidal alternatives. (Maris, 1982, p. 6)

Suicide avoidance thereby offers unitary biological explanation for much of the diverse and, seemingly, biologically superfluous business with which humans occupy themselves.

Suicide Avoidance and the Golden Rule

Second, suicide avoidance drives morally oriented behaviors. These are often presumed to be motivated, consciously or not, by strategic interpersonal rather than intrapsychic payoffs. Religiosity (Haidt, 2012), philanthropy (Batson, 1991), politicking (Boehm, 1999), championing good causes, and other prosocial pursuits certainly have social effects, but this does not authorize the conclusion that they stem from a social, adaptive function. Good works can be understood as foremostly personal, life-affirming activities—done for intrinsic reward, independently of extrinsic outcomes to an important degree (Post, 2005).

The reason good works are intrinsically rewarding is that each of us serves as our own test case as to whether the world is a place we want to live in. If we are to believe that the universe and its people offer more than a zero-sum existence, more than merely animalistic transactions, then we are motivated to behave in a way that is consistent with that belief—independently, to a non-trivial extent, of how others behave towards us. By this light, the Golden Rule—treat others as we would want to be treated (irrespective of how they do treat us)—can be understood as a personally life-sustaining principle.

In this way, suicide avoidance helps to explain a recognized gap between traditional economic models of giving—based on reciprocity, game theory, and similar transactional calculus—and the "warm glow" (Andreoni, 1990) or "helper's high" (Dossey, 2018) derived from acting generously where no transactional return is expected, wanted, or practicably possible. Certainly, there are economic constraints on an individual's capacity for altruism: suicide avoidance has to be balanced with the organism's other critical needs. Nonetheless, this nurturing of faith and belief in a benign world—often presumed to float free of objective scientific issues—can be understood as a biologically rooted prerequisite for human willingness even to take part in economic games (Soper, 2023b).

Suicide Avoidance and Psychoanalytic Defenses

Third, suicide-avoidance helps to explain diverse forms of motivated cognition: human propensities such as self-serving self-deception, "my-side" bias (Mercier, 2017), and selective forgetting. These phenomena, again, are often presumed to be driven by extrinsic social rewards: fooling ourselves the better to fool others, for example (Trivers, 2010). However, the primary biological payoff likely resides in a more direct, intrinsic survival advantage: they shield the human organism from potentially suicidogenic psychache. The management of exposure to suicide risk explains why unpleasure, dissonance, and other near-synonyms ("dis-anxiousuncertlibrium": Proulx & Inzlicht, 2012) are worth going to the lengths of denial, self-delusion, and repression to avoid.

This insight offers integrative biological explanation for psychoanalytic defense (Vaillant, 1992) and the so-called *psychological immune system* (Sedikides, 2021), both of which have lacked clarity on the asset defended and what, exactly, it needs defending against (Tice & Baumeister, 2021). Beyond vague, metaphysical notions of ego protection and selfhood, the biological hazard of suicide makes psychological defense a life-or-death matter. The psychological immune system is more than a mere analogy or metaphor (Vaz et al., 2021): it is as life-preserving as its physiological counterpart, because unmitigated psychological pain is potentially as lethal for the human organism as any unchecked infection.

Returning to a theme, the organism's management of its exposure to psychache entails complex trade-offs. Complete insensitivity to psychological pain may be workable as an emergency measure, akin to stress-induced analgesia—but not for long, some realistic perception being necessary for the avoidance of further injury. The best that can be done sustainably is a modifying or titrating of painful experience, balancing suicide risk with other contextual needs.

Suicide Avoidance and Mental Illness

Fourth, regarding emergency measures, diverse symptoms of adult-pattern psychopathology may be understood as the organism's efforts to stop suicidal ideas from progressing into fatal attempts (Soper, 2023a). The loss of motivation, energy, cognitive resources, and other negative symptoms of major depression and other disorders may make suicidal ideas more difficult to put into action, which helps explain why depression associates strongly with suicidal ideation, but only weakly or not at all with the enacting of those ideas (Klonsky et al., 2021). Cross-diagnostic positive symptoms, often experienced at the same time, may render suicide unnecessary. For example, by externalizing the inner threat, psychotic delusions can make the threat easier to resist (Murphy et al., 2022); self-cutting and other acts of non-suicidal self-harm can be understood as costly, but potentially life-saving, forms of pain management (Kuehn et al., 2022); and, in different ways, substance and behavioral addictions and manic states may serve the same protective function (Himmelhoch, 1988). Suicide thereby offers long-awaited and much needed theoretical foundations for clinical psychology and its integration into a wider understanding of human nature (Soper, 2023a).

To be clear, depression, schizophrenia, and other psychiatric syndromes are almost certainly *not* adaptations, whether for preventing suicide or any other biological function. Being categories of convenience, not natural entities, most psychiatric diagnoses are inappropriate targets for evolutionary or any other kind of biological explanation (Casey et al., 2013). Rather, a variety of cross-diagnostic symptoms of adult-pattern psychopathology probably constitute *displays* of underlying anti-suicide adaptations, influenced in complex ways by cultural inputs and individual differences (Soper, 2023a).

Suicide Avoidance and Human Consciousness

Finally, the evolution of suicide avoidance sheds light on the evolutionary origins of human consciousness, because the enjoyment of one's aliveness presumes the ability to construct enjoyable qualia from encounters with environmental stimuli—like the music of birdsong, the fragrance of a flower, and the majesty of a sunrise. Humphrey (2011) argues that the experience of qualia functions to make life vivid, meaningful, and therefore worth living even in the teeth of adversities. He suggests that human consciousness, which he describes as a "magical theater," evolved not just for awareness, but as a motivational system that engages us with life, fosters a shared sense of meaning, and drives a search for spirituality. Safeguarding us against despair in the face of existential threats, this most basic aspect of human experience may thereby also have originated from the need to manage suicide risk.

Suicide Avoidance: Research Opportunities and Challenges

Each of the phenomena discussed above has been explained individually by numerous, plausible, but atomized, mini-theories. There are dozens of explanations for the origins of religious belief, for example (Schloss & Murray, 2009); at least 10 other theories address clinical depression (Nesse, 2023); yet others explain selfless generosity (Batson, 1991), and so on. A detailed review of these would be beyond the scope of this article and extraneous to the argument.

Our point is that suicide-avoidance—a unifying framework—offers the advantage of parsimony: a single, plausible explanation is more likely to be correct than a multitude of disconnected alternatives. Occam's Razor points to suicide defense as an a priori preferable basis for understanding behavioral phenomena that meet the criteria of being uniquely human, universal, and lacking an obvious direct fitness benefit to offset their cost.

Despite its broad applicability, suicide avoidance is not unlimited in its explanatory scope: it is not a "theory of everything"—an elusive ideal. It will not account for non-human behaviors, cross-species neurological processes, or many behaviors humans share with other mammals. Moreover, although suicide avoidance removed a key evolutionary constraint on human encephalization—enabling cognitive expansion—it did not determine every aspect of its subsequent course. Nevertheless, within these bounds, suicide offers a metatheoretical lens for making sense of many important, but seemingly disparate, facets of human cognition and behavior—sociocultural, psychiatric, cognitive, developmental, evolutionary, existential, and others. Without this unifying perspective, behavioral science will remain, as it is now, left to explain these facets on an ad hoc basis.

While offering suicide avoidance as an integrative solution, we do not underestimate the problems that this reorientation poses. Three major obstacles stand out: institutional, methodological, and psychological.

First, institutionalized resistance is expectable. Parsimony and conceptual integration are powerful guiding principles in science, but they come at a cost—the reassessment of many ideas that are less parsimonious, less integrative, but are nonetheless deeply rooted. Many domains within behavioral science are accustomed to operating in disciplinary silos and may not welcome the intrusion. A common response among scholars may be to acknowledge the broad explanatory power of suicide avoidance while reserving their own area of research as a special case, for which a separate, traditional, local mode of explanation suffices (Swanepoel & Soper, 2025). This theoretical inertia is unlikely to wane quickly.

Second, research into suicide defense faces methodological challenges that exceed even those of traditional suicidology (Jerant et al., 2022; O'Connor & Portzky, 2018). As noted earlier, because protection against suicide is a species-typical feature, no control population exists to reveal the unsustainable death rate that would hypothetically occur if *Homo sapiens* lacked such defenses. Some protective mechanisms may be so part-and-parcel of human nature that they appear too mundane to warrant attention. More costly defenses are easier to observe but hard to recognize for what they are, as they may appear more dysfunctional than adaptive. In extreme cases—akin to autoimmune disorders—such responses may even become self-destructive, leading to iatrogenic deaths. Meanwhile, the survival benefits of these defenses remain largely invisible. It is for the same reason that vomiting and fever—regular, healthy responses to pathogen attack—were long mistaken for diseases themselves (Nesse & Williams, 1995).

The absence of direct experimental methods necessitates creative approaches to hypothesis testing. One promising strategy is to track temporal patterns to infer function (Soper, 2023a). For example, if cross-diagnostic symptoms of psychopathology are not simply causes of suicide, as commonly presumed, but rather expressions of the organism's effort to stop suicidal ideas from progressing into lethal actions, then suicidal thoughts should tend to (but not always) precede these symptoms, rather than the reverse.

The third challenge is perhaps the most formidable, touching on the root of the systemic neglect of suicide in behavioral science that this article highlights. Students of human nature, being human, have to deal with a protective blind spot: an inclination to keep personally distanced from the whole idea. The effect of the blind spot is to present suicide as an unpleasant irrelevance—often, indeed, a no-go zone. The taboo and stigma, culturally propagated and readily adopted, usually keep the topic safely unthinkable not just as a personal option, but unappealing as a scholarly option too. This reticence affects scholars not only in the prioritizing and conduct of their own research, but also in their collaborations as course programmers, educators, editors, and peer-reviewers. The aversion extends into the supporting community too: funders, publishers, and other decision-makers that make research possible (Joiner, 2005). Overcoming this socio-psychological resistance will require concerted effort and a willingness to bear a special discomfort.

Conclusion

We urge researchers to confront the taboo. Well described as "the most important topic no one wants to talk about" (Salem Health, 2024), suicide is too important a subject for science to neglect, much as we might prefer to look away. It offers interdisciplinary biological and cultural footings for a unifying explanatory framework, connecting diverse domains of behavioral, psychological, and social research. Viewed from an evolutionary perspective, suicide is not merely one clinical or social issue among many, but instead a critical biological threat that shaped the evolution of human cognition and behavior. For us, a sapient animal, suicide poses a severe fitness hazard—one that the human psyche, by evolved design, monitors, manages, and virtually always avoids. We have argued that the human organism's avoidance of suicide manifests in diverse biases and behaviors that are the stuff of regular scientific inquiry, but their shared substrate is obscured by a collective reluctance to engage with the subject.

This article points to compensation for task: the formulation of the first Kuhnian paradigm in the study of human psychology and behavior. Beyond even the prospect of more effective suicide prevention, it is worth overcoming the taboo to build a coherent scientific understanding of what it is to be human.

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Declarations

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