



# Are depression and suicidality evolved signals? Evidently, no.

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## ABSTRACT

We offer a commentary on Gaffney, Adams, Syme, and Hagen (2022; Depression and suicidality as evolved credible signals of need in social conflicts. *Evolution and Human Behavior*, 43, 242–256). Gaffney et al. argue that suicidality and other depressive behaviors evolved as mechanisms by which otherwise powerless individuals obtain concessions from others, and these authors present experimental data to support their argument. While applauding their goals and their study's strengths, we present reservations and counter-arguments: that the target behaviors to be explained are inadequately defined; that there is insufficient evidence of ancestral fitness benefits arising from them; and that both depression and suicidality lack the evidence of special design required to support an adaptationist explanation. In the light of anomalies noted in Gaffney et al.'s "signaling" stance, we propose a new theoretical project—toward a comprehensive theory of human mental health and wellbeing.

## 1. Introduction

Gaffney et al. (2022; henceforth also "the authors") are to be commended for an important advance in the debate concerning the proximate and ultimate causation of suicidality and depression. They argue that these phenomena function as evolved credible signals by which subdominant individuals can elicit fitness-enhancing concessions from dominant others. In pursuance of this theory, the authors investigated how Mechanical Turk (online) subjects in the US and India responded to fictional vignettes of women's depressive and suicidal behaviors. As the authors predicted, subjects were swayed by these behaviors, becoming more inclined to help the hypothetical victims.

We agree with Gaffney et al.'s strategic aims, inasmuch as the connection between depression and suicide must be explained. A coherent explanation must be both "grounded in evolutionary theory" (p. 242) and recognize that these behaviors arise not from supposed brain dysfunction but from the necessity of dealing with life adversities, which are frequently social.

However, as this commentary will explain, we find the authors' proposed solution unpersuasive and unsupported by the evidence. While applauding their work, we disagree with their conclusions. We do not dispute that suicidal and depressive behaviors sometimes have a communicative agenda and may have social utility as signals. But the authors provide no reason to believe that suicidality or depression evolved for this purpose. By our reading, after a decades-long effort to

develop this line of adaptationist theorizing (e.g., Hagen, 1999; Hagen, Watson, & Hammerstein, 2008), an enduring evidential void indicates that the time may have come to lay the hypothesis to rest. Gaffney et al.'s article looks to us strong enough to stand as a last word: if not even these researchers, among the sharpest minds in evolutionary science, are able to convincingly demonstrate the case, then we doubt anyone can.

Three problems stand out. First is a conceptual haziness concerning the phenomena being explained, circularity in the definitions of "suicidality" and "depression". Second is weak evidence that fitness-serving payoffs are reliably to be won from either behavior, whether now or in the ancestral past, at least not in the way the authors suggest. Third, whatever signaling utility these behaviors might have, there is scant evidence of special design, the criterion by which a behavior or biological feature must be judged for its hypothesized evolved functionality (Williams, 1966).

We address these points first with regard to suicide, and then for depression. We conclude by commending an alternative, "pain-brain", model, which may be a better solution to the mysteries that Gaffney et al. identify.

## 2. Suicide

### 2.1. What is "suicidality"?

Gaffney et al. (2022) do not define their explanandum, "suicidality",

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although their use of the term suggests they see it as a homogenous, unidimensional phenomenon. We dispute such a conception. “Suicidality” is an umbrella for many diverse and complex behaviors, some of which may be communicative, but others surely not.

### 2.1.1. Heterogeneity of “suicidality”

To briefly review some aspects of the term’s heterogeneity, much hinges on the actor’s intentions. The conceptual root of “suicidality” is suicide, and suicide is by definition purposeful. Whether the act is considered, planned, attempted, or accomplished, suicide is “intentional self-inflicted death” (Farias & Plutarco, 2019). Sometimes death is not intended, acts of “parasuicide” often being more cries for help than attempts at willful self-extinction (Shneidman & Farberow, 1961). Suicidality may take the form of suicidal ideas, which are importantly distinct from suicidal actions (Klonsky, Saffer, & Bryan, 2018); ideation is much more common, rarely leads to suicide, and for some people can even be reassuring—it can be soothing to have that emergency exit in mind should things become unbearable (Brand, Gibson, & Benson, 2015).

For sure, ambivalent motives, shared correlates, and other ambiguities exist in all these, and other, dimensions of suicidality—much scope, then, for confusion. Hence, scholars in this field take special care with terminology, particularly when they are discussing suicide’s various hues (Silverman, 2013). It is not clear that, as Gaffney et al. (2022) allege, “[c]ommon to almost all theoretical and empirical investigations of suicide in anthropology and other disciplines is a focus on completed suicides, i.e., suicide deaths” (p. 244). Some argue the opposite (McKean, Pabbati, Geske, & Bostwick, 2018). It is problematic for Gaffney et al. that the literature is not more supportive of their focus on survived attempts, but the research is wide-ranging, as is evident from any handbook or review in this domain (e.g., Nock, 2014; Staples & Widger, 2012). We suggest the pertinent commonality of work elsewhere is an effort to be clear about the behavior under discussion, which Gaffney et al. are not.

### 2.1.2. Problems with the authors’ conceptualization of “suicidality”

“Suicidality” being a mixed bag, the term invites cross-purposes. For example, based on a graph titled “US Suicidality” (p. 245), Gaffney et al. suggest that “there are hundreds of attempts for every death” (p. 244)—but attempts at what? The data source for these supposed “attempts” includes uncounted self-injuries wherein death was not intended (C.D.C., 2021; Nock et al., 2012). This mass of *non-suicidal* self-injury, the most common form of deliberate self-harm, is done for the purpose of neither suicide (by definition) nor primarily communication—thus, one might imagine, it is a weak candidate for a “suicidality-as-communication” interpretation. *Non-suicidal* self-injury is predominantly a private act, aimed mainly at self-regulating intolerable emotional distress (Klonsky, Victor, & Saffer, 2014). Indeed, usually hiding the resulting wounds (Martorana, 2015), people sometimes measuredly cut, burn, or otherwise hurt themselves, as a way to *avoid* acting on suicidal thoughts (Kuehn et al., 2022; Miller, Redley, & Wilkinson, 2021). Thus, *non-suicidal* self-injury, with this secretive *anti-suicide* aspect, is implicated in Gaffney et al.’s notion of communicative “suicidality”:

Suicidality, and perhaps also *non-suicidal* self-injury (Hagen et al., 2008), is conceptualized as putting all future contributions to cooperative endeavors with social partners at risk with some low but non-zero probability, credibly signaling low valuation of current circumstances. (2022, p. 244).

This *a priori* conceptualization of “suicidality”—a declaration, rather than a definition—looks to us perilous, for three reasons.

First, it sets up circularity. Suicidality is defined only in terms of

meeting the authors’ theory of suicidality. Thus, their theory sets out to explain whatever can be found that can be explained by the theory.<sup>1</sup> There would be nothing wrong with such a starting position if it were held tentatively, as a way to begin shaping an evolutionary hypothesis.

However, second, this starting position is not tentative. The authors appear committed to a credo, independently of the evidence. Indeed, the reference cited in their conceptualization (above) contains an uncompromising article of faith:

*We believe* that DSH [deliberate self-harm] and suicidality are *always* attempts to improve the relationship in the here and now. (Hagen et al., 2008, p. 130, italics added).

With this theoretical position fixed, subsequent empirical enquiries will presumably have to flex around it. Such accommodation is indeed what we see. Here are two examples. One is the authors’ cherry-picking from the anthropological and epidemiological literature: ethnographic findings are held up as evidence when they serve the favored explanation—when actors express “protest, revenge, and/or appeal” (Gaffney et al., 2022, p. 244), but the same ethnographies are ignored when actors plainly have other aims in mind. Thus, Gaffney et al. (2022) devote a paragraph to Firth’s (1936, 1961) writings, to highlight that “a sizable subset of the suicide attempts among the Tikopia were not meant to end in death...” (2022, p. 244). But the subset that clearly *were* meant to end in death, about which Firth writes just as graphically—women swimming out to sea at night, for example—are not discussed. Elsewhere, similarly, Hagen et al. (2008) quote approvingly and at length Hezel’s (1984) description of self-harm and suicidality on the Micronesian islands of Chuuk, but only insofar as it “closely resembles the bargaining model” (2008, p. 129). When Hezel recounts a suicidal scenario that is evidently no bargaining gesture, Hagen et al. set aside the first-hand report in favor of their own reconstruction, with the remark, “This is one point where our analysis differs from Hezel’s” (2008, p. 130). Hezel views this selective extracting from his research as an oversimplification:

I noticed the long quote that the authors [Hagen, et al. (2008)] used of my work. Signaling distress is obviously always one component in suicide in the islands. When women ingest some harmful substance in their own home with others around, clearly, they are expecting someone to intervene and to pay serious attention to their complaint, often about family mistreatment. But when a young man wanders off into the woods some distance from his house at night and hangs himself, there is little opportunity for negotiation. Clearly, he intends to end his life, usually because he has given up on any amelioration of the situation. There is a big difference here that an ethnographer ought to take note of. I wish that suicide around the globe could be reduced to such formulae as the authors seem to prefer, but I’m afraid that such is not the case... [With] all due respect to the authors, I’ll hold to my original position on suicide in Chuuk for want of convincing evidence that it is erroneous. (Francis X. Hezel, Personal communication, 29 August 2022, with permission).

Another expediency is the conceptualization’s built-in immunity to counterevidence. Hagen et al. (2008) present two clauses by which anomalous suicidal behaviors may be discounted: either (a) “Many adaptive signals...can be consciously overridden or concealed if desired” (p. 135); or (b) “The bargaining model does not predict that individuals would necessarily have *any* conscious awareness of the interpersonal functions of DSH [deliberate self-harm]” (p. 131, original italics). Caught in this double bind, it is difficult to imagine what a distressed person could do or say that would be accepted by the authors as disconfirmation of their theory. If suicidal actors admit to

<sup>1</sup> This particular circularity is not uncommon in suicide research. As Baechler (1979) observed, definitions of suicide “sometimes involve the entire theory of the author” (p. 9).

manipulation, then they are consciously manipulative; if they do not, then they are either unconsciously manipulative or dissembling.

Third, by thus denying the epistemic validity of conscious intent in suicide—which is by definition an intentional act (Farias & Plutarco, 2019)—the authors gut the term of meaning. No doubt, many human behaviors are underlain by unconscious, evolved motivational systems, but to disregard conscious goals in suicidality is to disavow a, or *the*, primary means by which this facet of human nature can be understood.

There is a further peril, which we find disquieting. Suicide researchers take special care with terminology partly because scholarly loose words, retold in the lay press, can potentially have harmful real-world consequences. For good reason, responsible reporting calls for academics, as well as journalists, to “[a]void simplistic explanations of suicide” (Knipe, Sinyor, Niederkröthaler, & Hawton, 2021, p. 1) in their publications. The depiction of suicide as a supposedly normal or positive way to resolve social difficulties is problematic (Syme & Hagen, 2019b). We see an added danger: the presumption that suicidal behavior is “always” (Hagen et al., 2008, p. 130) a bargaining gambit puts not only the protagonists but also their families in positions of unfalsifiable culpability. Loved ones, however hard they might have tried, are cast by Gaffney et al. (2022, p. 242) as “reluctant others”, from whom necessities must be coerced. As for the bereaved, could they have been so blind to those needs that even the final deadly “signal” came as surprise? One family member relates the torment of implicit blame: “I believed Kim had been stolen from us as our punishment for not having been aware of how deeply she was suffering” (Bialosky, 2011, p. 34).

By our reading of the epidemiological record, this line of survivors’ guilt is groundless. Suicides are almost always “out of the blue” events (Dyregrov, Plyhn, & Dieserud, 2012). They are usually impulsive (Rimkeviciene & De Leo, 2015) and virtually never open to usefully accurate prediction (Belsher et al., 2019; Franklin et al., 2017; Soper, Malo Ocejó, & Large, 2022). People take their own lives for diverse and complex reasons. It seems to us that the authors are claiming otherwise; that suicides are “always” precipitated by some specific, identifiable, condition of social conflict. We would expect such a troubling message to be solidly evidenced, theoretically and empirically. This section finds that theoretically it is not. As the next sections discuss, empirically it is on weak ground too.

## 2.2. What fitness benefit?

The life-or-death “gamble” that Gaffney et al. (2022, p. 244) perceive in suicidality could have evolved only if a commensurately rich and reliable compensation in ancestral reproductive success was secured by the winners. An adaptationist argument requires evidence that ancestral fitness benefits would predictably have accrued. To meet this call, the authors state that “increased social support and beneficial changes to important relationships have been reported to follow suicide attempts” (p. 242), while acknowledging that in this regard there is only “limited literature” (p. 245).

### 2.2.1. Paucity of evidence of fitness benefits

The literature buttressing this statement is certainly limited. Gaffney et al. offer just three citations in support. Two of these, Stengel (1956) and Lukianowicz (1972), draw on follow-ups of patients hospitalized because of suicide attempts. Both reports are aged, idiosyncratic, provide minimal data, and offer only general remarks. Stengel alludes vaguely to “changes vis-a-vis a special person, usually resulting in mutual concessions and in an improvement of crumbling relationships” (1956, p. 118), while Lukianowicz puts “gain” in scare quotes when she writes that “some ‘gain’ was evident” (1972, p. 390) in 75 out of 100 cases where patients had seriously tried to kill themselves. It is not clear whether this “gain” was an objective reality, or perhaps a manifestation of the human tendency for benefit-finding—a silver lining for every cloud (Helgeson, Reynolds, & Tomich, 2006). Even if real, it takes a leap to infer causation. The said “gain” might have been unconnected, and/or

happened despite, not because of, the suicide attempt. Even if it were caused by the suicide attempt, it is doubtful whether a supposed “gain” would have conferred a sufficiently powerful and dependable fitness upside to compensate for the deadly risk taken.

As for the third citation offered by Gaffney et al. (2022) to support their claim that “beneficial changes...have been reported to follow suicide attempts” (p. 242), we read it as *counterevidence*. This study, the authorship group’s own review of suicidal behavior across 474 ethnographies (Syme, Garfield, & Hagen, 2016), found that the great majority (84.6%; p. 184) of suicidal acts were lethal. Of the few that were not lethal, only a minority evinced upsides; just “30 out of 84 examples of [nonlethal] suicidal behavior resulted in positive changes for the survivor” (Gaffney et al., 2022, p. 244)—or, to be more accurate, were *said* to have resulted in “positive changes”, according to ethnographers’ hearsay and folkloric sources. We find these data difficult to reconcile with the authors’ own precis of their research, that “[i]f the victim survived, *far more often than not* he or she received important benefits” (Syme & Hagen, 2019a, p. 105, italics added). As to the value of these rumored rewards, we see little reason to believe that ancestral reproductive fitness would have been reliably enhanced. Some of what Gaffney et al. count as “30...positive changes” (p. 244) have, at best, suggestive fitness relevance (e.g., “Marry a forbidden spouse”)—but others do not, including the ilk of “Get one’s way”, “Remedy unhappy situation”, and “Prevent unwanted ear modification” (Syme et al., 2016, Table S3). In fitness terms, contrary to a repeated assertion by the authors’ team, it is not clear to us that survivors “received *important* benefits” (Hagen & Syme, *In press*; Syme & Hagen, 2019a, p. 105; italics added).

That these are the highlights of Gaffney et al.’s literature search is telling. Suicide has been subjected to scientific scrutiny for more than 200 years (Goldney & Schioldann, 2000). Suicidology’s 21st-century research output, growing exponentially and increasingly sophisticated, runs to tens of thousands of studies (Astraud, Bridge, & Jollant, 2020). If ancestral fitness rewards accrued, and of such compelling richness and reliability as to make the life-or-death gamble of a suicide attempt routinely worthwhile on fitness grounds, a pattern would have surfaced by now. That no stronger evidence of such a pattern can be found poses a *prima facie* challenge to Gaffney et al.’s adaptationist hypothesis.

### 2.2.2. Problems with Gaffney et al.’s Mechanical Turk study

This evidential shortfall sets the scene for Gaffney et al.’s (2022) experimental study, which was presumably aimed at closing the gap. As we registered in our introduction, there is much to commend about this work. It is a serious inquiry by a skilled and respected team. However, we raise three concerns.

First, it seems odd to us that Gaffney et al. chose females for the role of the “signaling” victim in all four of their vignettes. As the authors acknowledge, there is no theoretical reason within their conceptualization for signaling to be sex-specific. Their US subjects (Indian subjects, markedly less so) took the (female) victims’ suicidal and depressive behaviors as credible appeals for help; but it is not clear that this response manifests a game-theoretical evolved adaptation, as the authors suggest. More simply, subjects may have been following a gendered script. Particularly in the West (less so in south and west Asia), suicide is characterized by a “gender paradox”: women account for most attempts, but men account for most deaths (Canetto & Sakinofsky, 1998). Men’s attempts are more decisively lethal, probably in large part because help-seeking behavior is deemed incompatible with a male stereotype (Mergl et al., 2015). “Women seek help—men die” (Möller-Leimkühler, 2003, p. 3). As Gaffney et al. note, cultural specificity could undermine their adaptationist hypothesis, but their study may inadvertently have ridden, instead of circumvented, an encultured expectation.

Second, it is unclear to what extent Gaffney et al.’s Mechanical Turk respondents may have been exposed to implicit or explicit cues as to the researchers’ prior conceptualization, which might have influenced the

selection of participants and/or their responses. Game-theoretical experiments are potentially confounded by the way players frame a game's context, as this can radically alter their choices (Hagen & Hammerstein, 2006). Gaffney et al.'s subjects were selected partly for their satisfactory performance in completing previous online surveys, a record that they were presumably keen to maintain. Having read the brief, did they anticipate what the researchers might have wanted to hear, and duly oblige?

Third, as Gaffney et al. acknowledge, their subjects' expressions of support for the vignettes' victims were not "real-world observations" (p. 253). This unreality is not trivial. Other researchers stress that a loved one's suicidal act has a special impact: "[t]o experience a partner's, a close relative's or a friend's suicide attempt is a very dramatic and personal event which often involves feelings of guilt, shame and anger" (Magne-Ingvar & Öjehagen, 1999, p. 78). The crisis comes with, and adds to, an intricate backstory. Such a heartfelt ordeal cannot be well simulated by, in Gaffney et al.'s words, "transient, inconsequential relationships" (p. 245)—or, we suggest, a hypothetical vignette. The authors' findings appear to corroborate Staples and Widger's (2012) insight, that fictionalized portrayals of threatened and actual self-harm—a staple of the arts the world over—play on a "common human empathy" (p. 184) for the suicidal victim. But such make-believe encounters may shed little light on the strongly adverse reactions that survivors expect, and clearly do experience, in real life (Mayer et al., 2020).

In sum, notwithstanding this research, we see little reason to believe that people who try to kill themselves would reliably have won ancestral fitness-enhancing rewards sufficient to outweigh the cost and risk taken. Gaffney et al.'s study (accepting its high quality, even Gaffney et al.'s study) does not fill this evidential gap—and to their credit, Gaffney et al. do not claim that it does.

### 2.3. What evidence of special design?

We do not dispute that threatened or attempted suicide might sometimes be an effective way to extract concessions from social partners (Aldridge, 1998). We do dispute that such an effect is sufficient to support an adaptationist case. Gaffney et al. (2022) claim that suicidality "function[s] to help victims of adversity elicit support" (p. 253), but we see no evidence of special design to justify this assertion. The authors may have confused a commonplace psychological sense of "function" with the term's evolutionary biological meaning, whereby "functional hypotheses are supposed to do explanatory work" (Barrett & Kurzban, 2006, p. 638). Many traits have incidental social utility. Blood pouring from an open wound may be taken as a credible sign of need, and induce help from others, but that social response is not evidence that bleeding evolved for a signaling function. The wound may be self-inflicted, perhaps done to elicit help, but such social re-purposing does not constitute evidence of an evolved signal. Likewise, even if it were true that, as some suggest, "suicidal threats...whether carried out successfully or unsuccessfully, pervade our entire social structure" (Siegal & Friedman, 1955, p. 45), this does not speak to evolved functionality. As Williams (1966, p. 261) cautions, "One should never imply that an effect is a function unless he can show that it is produced by design and not by happenstance".

To claim that a trait is an adaptation, the burden of proof lies in demonstrating special design, and the required standard of proof is high. It must be shown that the fit between a trait's form and its hypothesized function is so exceptional that it would be an extraordinary coincidence if natural selection had not shaped the trait to fulfil that function. There are several criteria to consider (Buss, 2019). They include *efficiency*—does the trait effectively contribute to survival or reproduction in the manner proposed? *Reliability*—does it emerge dependably during normal development, to meet the adaptive problem that it is hypothesized to address? *Economy*—does it do so cost-effectively, without imposing a disproportionate fitness burden on the organism? And

*precision*—do all components show precise functionality, working together to deliver a good solution? For all the above questions, with regard to a communication hypothesis of suicide, we think the answer is "No".

#### 2.3.1. Efficiency

As the previous section discussed, whether the act is imagined, planned, attempted, or accomplished, suicide does not appear outstandingly effective in enhancing reproductive fitness, whether by communication or any other route.

#### 2.3.2. Reliability

Suicidality does not reliably emerge among relatively powerless people in times of conflict. Despite an intense search over many decades, no set of social (or any other) conditions has been identified that predicts any measure of suicidal behavior much better than chance (Belsher et al., 2019; Franklin et al., 2017). If Gaffney et al. (2022) had discovered that suicide was specific to a particular social dynamic, it would be an astonishing breakthrough, which almost surely is not the case.

#### 2.3.3. Economy

Whatever ancestral fitness benefits might have been had from trying to kill oneself, if any, these were almost certainly outweighed by the costs (Gunn, Malo, & Soper, 2021), which arise at three levels.

First, costs begin with death, an expectable outcome of a serious suicide attempt, especially in the absence of modern medical interventions. The ancestral ratio of [survived:lethal] attempts would likely be closer to the [19:33] estimated by Poole (1985, p. 179) in Papua New Guinea, or the [84:>400] implicit in Syme and Hagen's (2016, pp. 184, 190) ethnographic review, than the "hundreds of attempts for every death"—or, more to the point, hundreds of self-injuries treated in hospital emergency rooms—reported for 21st century USA by Gaffney et al. (2022, p. 244). Genetically, no doubt "it's very bad to be killed" (Buss, 2006, p. 96); hence, humans are probably protected by adaptations that minimize the risk of being killed, whether by someone else's hand (Daly & Wilson, 1988; Duntley, 2005) or their own (Soper, 2018, discussed further below).

Second, stigmatizing social penalties await the near kin of suicides, magnifying the inclusive fitness harm (Gunn et al., 2021).

Third, severely deleterious ancestral fitness consequences expectably follow even if a suicide attempt is not summarily fatal. If survived, a suicide attempt—almost by definition—sets the actor up for physical injury, which may be disfiguring, and/or disabling, and potentially lead to premature death. Jumping and hanging, for example, frequently cause neurological lesions, up to and including paraplegia (Kennedy, Rogers, Speer, & Frankel, 1999), and people who poison themselves may be left with permanent or degenerative internal injuries (Indira, Rakesh, Hithesh Shankar, Suchithra, & Andrews, 2015). The damage is often psychological too, with suicide attempters often traumatized by their own actions (Stanley, Hom, Boffa, Stage, & Joiner, 2019). And, as Gaffney et al. (2022) acknowledge, a punishing stigma awaits survivors: penalties include social distancing, reduced status, material losses, and sometimes physical abuse (Lester & Walker, 2006; Osafo, Akotia, Andoh-Arthur, & Quarshie, 2015). These evidenced sequelae can be expected to weaken a suicide attempter's ability to compete for mates and directly to impair their reproductive prospects.

These costly consequences suggest that the ancestral fitness downside of attempting suicide would likely swamp any supposed upside.

#### 2.3.4. Precision

Suicide does not appear precisely engineered to address the problem of communicating need—or communicating anything else, for that matter. Modal suicidal behavior is characterized systemic failures of communication. We see at least 9 anomalies, where, from initial thought to final act, whether the act is survived or not, opportunities to send and receive signals are either non-existent or routinely passed over.

(1) Although Gaffney et al. (2022) include “suicidal ideation” in their array of supposed “credible and adaptive signals” (p. 243), ideas in themselves do not entail signaling.

(2) Suicidal ideation is usually not communicated (Obegi, 2021). In one study of 157 patients who killed themselves, two thirds had explicitly denied suicidal thoughts when last asked; half of these were dead within just 48 hours (Berman, 2018). This suggests that suicidal ideas often remain not merely passively undisclosed but actively concealed; and/or they may be so transient—coming and going within minutes (Drum, Brownson, Denmark, & Smith, 2009; Simon, Swann, Powell, Potter, & O’Carroll, 2001)—that they offer little scope for communication

(3) Enactment of suicidal thoughts is usually a private behavior and is rarely preceded by usefully predictive or actionable cues (Franklin et al., 2017; Rimkeviciene & De Leo, 2015; Soper et al., 2022). That suicides usually come unannounced is evidenced by the shock, confusion, and disbelief that typify loved ones’ immediate reaction to the news (Chow, 2006).

(4) Suicides are often marked not just by privacy, but methodical secrecy, to the extent of purposefully ruling out the possibility of the actor being saved (Misson et al., 2010)—as with, for example, Firth’s (1961) account of Tikopia women swimming out to sea after dark, and Hezel’s (1984) account of suicide in Chuuk, noted earlier.

(5) If an attempt is lethal, the deceased’s family is presumably likely to find out, but then no feedback loop exists by which information conveyed by the action could be put to use. If, that is, there is useful information to be had...

...which (6) usually there is not. The bereaved do not normally report enlightenment, a sense of “Aha!”, but the opposite. Unable to make sense of a loved one’s actions, they are typically left bewildered, pitched into a “Canyon of *Why?*” (Campbell, 2001, original italics).

(7) If a suicide attempt is not (immediately) lethal, attempters usually do their best to keep their actions undiscovered. Self-injurers typically avoid seeking help, preferring privately to self-treat their wounds—although, understandably, they may eventually share their overwhelming situation, self-injury and all, with a close friend or other confidante (Martorana, 2015). Parents, however, are usually kept in the dark, both before a suicide attempt and after (Brezo et al., 2007; Walker, Moreau, & Weissman, 1990), despite their “monopoly power” which, according to Gaffney et al. (2022, p. 244), ought to make parents prime targets for a putative “signal”.

(8) Where suicide attempts do come to light, there is rarely an unambiguous message transmitted or received; instead, social meanings are constructed, “folk” explanations projected onto the act (Anderson, Standen, & Noon, 2005; MacDonald & Murphy, 1990). At least in the modern West, these culturally-mediated (mis)interpretations over-attribute attention-seeking or manipulative motives, and correspond poorly with the intentions reported privately by self-harmers themselves (Bancroft et al., 1979; Saunders, Hawton, Fortune, & Farrell, 2012).

At the same time, (9) suicide evidently being a “privilege of fully self-conscious human beings” (Baechler, 1979, p. 38), non-human animals do not signal with suicidality, despite presumably having signaling needs (Soper, 2018).

Of course, none of the above phenomenology of modern-day suicide speaks to ancestral conditions. Perhaps, to speculate, radically different dynamics applied in the relevant environment of evolutionary adaptiveness (EEA). But then again, as “most ontogenetically significant features of the current human environment...probably fall within their historic ranges” (Symons, 1990, p. 432), the burden rests on explaining why the EEA for suicidality would have been so different as to produce reliable communication then, when it does not now. It will not be because “monopoly power” (Gaffney et al., 2022, p. 244) is entirely a phenomenon of the past; extreme oppression occurs in modern times—slavery, for example—but it does not strongly associate with suicide (Lester, 1997), as noted earlier under *Reliability*. Moreover, if a fitness

advantage arose then, but not now, it must be explained why selection has not rapidly pressured this variable, heritable, and highly costly trait toward elimination in any known human population (Soper, 2018, 2021).

To summarize: suicidal behavior is evidently not efficiently, reliably, cost-effectively, and precisely designed to deliver fitness-enhancing communication, a thread that robustly contraindicates Gaffney et al. (2022) adaptationist explanation. On this basis, it would be worth considering whether a more consilient evolutionary theory of suicide is available. There are several proposals on the table, including Aubin, Berlin, and Kornreich (2013); Gunn (2017); Humphrey (2018); Joiner, Hom, Hagan, and Silva (2016); Krippner, Riebel, Ellis, and Paulson (2021); Riordan (2019); Saad (2007); Soper (2018, 2019, 2021); Tanaka and Kinney (2011); Ziker and Snopkowski (2020); and a number by deCatanzaro (1981). However, it is not clear whether Gaffney et al. (2022) have given these alternatives due consideration.

### 3. Depression

Our concerns about Gaffney et al.’s (2022) construal of depression as an evolved signal are similar to those with regard to suicidality: problems with undefined terms; doubtful ancestral fitness gains; and missing evidence of special design.

#### 3.1. What fitness benefit?

The shortfall on the second of these points—a lack of evidence of fitness-salient upsides—is perhaps even starker than was observed above for suicidality. Two decades ago, one of Gaffney et al.’s (2022) authors frankly acknowledged a “lack of objective evidence for long-term benefits” from depression (Hagen, 2003, p. 109). Nearly a decade later, there was still “no evidence that depressive symptoms themselves bring about life improvements” (Hagen, 2011, p. 722), and today the authors continue to view this void as a “primary missing piece” in their adaptationist argument (Hagen & Syme, *In press*).<sup>2</sup>

It is certainly primary: without evidence that depression might have conferred a fitness benefit, the question of whether such a benefit arose due to adapted functionality is otiose. As is the case with suicide, Gaffney et al. (2022) do not claim to fill this enduring evidential vacuum. We suggest below where evidence of ancestral fitness gains from depressive symptoms might be found, although to perceive these would require Gaffney et al.’s hypothesis of both suicide and depression to be reconsidered.

#### 3.2. Problems with conflating “depression” and “suicidality”

We return now to the issue of explanatory wooliness—undefined terms. As with “suicidality”, although “depression” features as one of Gaffney et al.’s (2022) focal explananda, no definition is provided. It is unclear, therefore, what referent the article and its hypothesis are meant to explain: it may be: “depression”, as stated in the title (p. 242) and conclusion (p. 253); or “depressive behaviors” (p. 242)—also not defined; or selected “depression symptoms” (p. 244). We presume the authors do not mean “depression” as a syndrome—the constellation of frequently co-occurring symptoms that psychiatry labels “Major Depressive Disorder” (MDD) or “Major Depressive Episode” (MDE)—although the latter is explicitly referenced (p. 243). MDD and MDE are arbitrary constructs, with no claim to theoretical underpinnings (American Psychiatric Association, 2013), and are unlikely to represent

<sup>2</sup> Fertility estimates suggest that depression associates with long-term reproductive damage; people with affective disorders, of which depression is the most common, produce 30% to 50% fewer children than the general population, probably because of their impaired ability to compete for mates (Keller & Miller, 2006).

a carving of nature at its evolved joints. Instead, Gaffney et al. select two symptoms of depression which, so the authors contend, serve an evolved signaling function: a *loss of interest in virtually all activities* (henceforth, “LIVAA”), which is said to “jeopardize one’s productivity” (2022, p. 244)—akin to “going on strike” (Hagen, 1999, p. 350); and, as already discussed, suicidality.

Problems of non-specificity emerge. In one direction, depression does not associate uniquely with LIVAA and suicidality. The most that can be said is that depression “often” (Gaffney et al., 2022, p. 244) involves these symptoms. More often it does not (Fried & Nesse, 2015). With or without LIVAA or suicidality, depression can present in sleep disturbance, cognitive impairments, weight change, agitation, and thoughts about death generally—that is, not specifically about suicide (American Psychiatric Association, 2013). Presumably, then, unless these other commonplace aspects of depression are also posited to be signals, depression is not just about, or at all about, signaling.

In the other direction, LIVAA is not unique to depression. It is a possible criterion for other diagnoses, notably schizophrenia and bipolar disorder—the latter, anomalously, characterized by episodes of manic activity (American Psychiatric Association, 2013). Presumably, then, LIVAA is not just about, or at all about, “going on strike”.

Suicidality is even less specific. It associates not just with depression but with psychiatric disorders almost across the board (Schechter & Goldblatt, 2020). Although the risk of suicide is elevated with depression, higher risk is reported with bipolar disorder, schizophrenia, and anorexia nervosa (Harris & Barraclough, 1997; Nordentoft, Mortensen, & Pedersen, 2011), and suicidal behavior is a supportive criterion for other diagnoses, such as posttraumatic stress disorder and personality disorders (American Psychiatric Association, 2013). Depression predicts suicidal outcomes only weakly—no more accurately than do hundreds of other risk factors (Franklin et al., 2017)—and most people who take their own lives were not observably depressed (Bertolote, Fleischmann, De Leo, & Wasserman, 2004). Gaffney et al.’s (2022) assertion that depression “sometimes leads to death by suicide” (p. 253) imputes a special causal connection that, although widely presumed, is unsupported (Goldsmith, Pellmar, Kleinman, & Bunney, 2002). There is no evidence that depression—or any other identified or, even in principle, identifiable condition—leads to this outcome (Soper et al., 2022).

These epidemiological disconnects between depression and suicide raise questions as to why Gaffney et al. (2022) conflated them into a single notion of “depressive and suicidal bargaining” (p. 245). Why select depression for examination, in preference to other conditions that also associate with suicide? And why focus on LIVAA and suicidality to the exclusion of other regular symptoms of depression?

In the absence of a better answer, LIVAA and suicidality may have been selected for explanation because they fit most comfortably (or, rather, least uncomfortably) the needs of a preferred “bargaining” conceptualization. However, as we have noted in this section, the theory of “Depression and suicidality as evolved credible signals” rests on a disregarding of concomitant, but anomalous, symptomatology for both phenomena. On this evidence, the theory may be misconceived. It is not a “most parsimonious” or “comprehensive model” (Hagen & Syme, *In press*) if it offers a speculative account of arbitrarily selected aspects of depression and suicidality some of the time, thereby calling for a more parsimonious, more comprehensive, model to explain the full picture the whole of the time.

#### 4. Concluding comments: Signals of a better theory

##### 4.1. Adaptive, or adapted?

Gaffney et al. (2022) make a plausible case that depression and suicidality may serve as “credible and adaptive signals of need” (p. 242, italics added)—adaptive in the sense of being adjusted to proximate conditions. Perhaps it is true that these manifestations of human distress can be put to social use. However, the authors present no grounds for

concluding that such “signals” are evolutionarily *adapted* (Symons, 1990). They quote verbatim (pp. 242–243), and purport to follow, Maynard-Smith and Harper’s (2003) definition of a biological signal—

An act or structure that alters the behaviour of another organism, which evolved because of that effect, and which is effective because the receiver’s response has also evolved. (p. 15).

—but they provide no evidence of the natural history that this definition specifies. Notwithstanding the word “evolved” in Gaffney et al.’s (2022) title, implying a claim of evolved functionality, their article’s text reveals this claim to rest on a logical non-sequitur: that because depression is costly to both the depressed individual and the individual’s kin, “it might therefore be an evolved bargaining strategy” (p. 244, italics added). This “might therefore” conjecture is fallacious. A trait cannot be judged to be an evolved adaptation simply, or at all, on the basis of current utility (Tooby & Cosmides, 1992).

##### 4.2. An alternative proposal

A more powerful theory of depression and suicidality is needed, and two clues indicate where one might be found. The first is that depression predicts suicide only inasmuch as it predicts suicidal ideation—it does not predict the escalation of those ideas into suicidal plans and actions (Klonsky et al., 2018). Indeed, during this “into action” stage of a suicidal trajectory, there is evidence that some depressive symptoms may have a protective, anti-suicide, effect (Rogers, Ringer, & Joiner, 2018; Rufino, Beyene, Poa, Boland, & Patriquin, 2022; Stanley, Yancey, Patrick, & Joiner, 2018). This finding is anomalous from Gaffney et al.’s (2022) perspective, but would come as no surprise to psychiatrists, trained to be wary of “an early increase in suicide risk as depressive symptoms begin to lift” (American Psychiatric Association, 2003, p. 61).

The second signal is that, as Gaffney et al.’s (2022) co-authors have noted (Syme & Hagen, 2019a, 2019b), diverse psychiatric diagnoses, depression included, are connected by a “p-factor” of individual susceptibility (Caspi et al., 2014; “p” references psychopathology), and may be underlain by a single, superordinate, causal driver (Marshall, 2020). Such an implied cross-diagnostic origin may link to the reason why suicide risk, too, cuts across diagnostic labels.

The pain-brain theory of suicide (Soper, 2018, 2021) offers a possible unitary explanation for both of these findings, and for other phenomena that are otherwise difficult to explain. If suicide is understood not as an adaptation, but as a costly by-product of human intellectual sophistication (“brain”), combined with the imperative to escape psychological pain, then we should expect to find cost-reducing anti-suicide adaptations activating in cognitively mature humans in the wake of chronic distress. These evolved mechanisms would be expected to attenuate the human organism’s “pain” (motivational) and “brain” (cognitive) faculties at times of relatively high suicide risk. The former, “pain-type” defenses (Soper, 2018), could be expected tactically to downgrade the power of emotional pain to motivate action. At the extreme, they might precipitate two depressive symptoms that Gaffney et al. (2022) rightly identify as needing explanation: a protective loss of interest in virtually all activities—suicidal activities included; and compulsive, but measured, non-suicidal self-injury—done for the purpose of regulating unbearable negative affect. In other words, certain “mysterious symptoms of depression” (p. 243) do not “lead to death by suicide” (p. 253), but may function instead to block suicidal action among people suffering sufficiently for that exit to appeal.

Diverse other symptoms of commonplace psychopathology might be understood in this way, arising by a common etiology, as a repertoire of anti-suicide responses to protracted psychache. Final psychiatric presentations may depend on individual points of environmental and/or genetic difference. This model would account *inter alia* for the common, underlying causal mechanism of human mental ill-health implied by the existence of a p-factor (Soper, 2018, 2021), and the nonspecific association of apparently disparate psychopathologies with elevated risk of

suicide.

Gaffney et al.'s (2022) laudable ambitions, noted in our introduction, may be better served by the pain-brain framework; it presents both a coherent alternative to the presumption of depression and suicidality as brain dysfunctions, and an account, grounded in evolutionary theory, of how these phenomena connect. More broadly, it could offer the beginnings of a comprehensive, evolution-informed model of human psychopathology and psychological wellbeing (Wong, 2022). If we better understood how the human organism evolved to live with the capacity for willful self-extinction, and how protective adaptations nearly always forestall that outcome, then it may be possible to capitalize on these life-preserving defenses. The signal we take from Gaffney et al. (2022) is of a need for a stronger and more ambitious theory. Depression and suicidality are indeed linked, but in ways that may run much deeper and wider than these authors suggest.

## Declaration of Competing Interest

None.

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