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Response to: "Are depression and suicidality evolved signals? Evidently, no"

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Because when I was sexually abused nobody seemed to notice. It's like "Hello! It's right in the house and you can't see and can't tell?" And then nobody is listening to me, and so I just started cutting. Power, Brown, and Usher (2013, p.199)

We thank Soper and Shackelford for their thorough reading of Gaffney, Adams, Syme, and Hagen (2022), as well as of our previous publications on the credible signaling hypothesis for depression and suicide. Our hypothesis proposes that over human evolution there were recurring adversities, such as forced marriage, thwarted marriage, physical and other forms of abuse, and sexual assault, where victims needed costly help from others but due to conflicts of interest they might not be believed, thereby not receiving help and suffering a substantial reduction in fitness. These circumstances selected for credible signals (Spence, 1973; Zahavi, 1975) of need, which we identify as depressive and suicidal behaviors. Withholding cooperation through social withdrawal (depression), including the threat to do so permanently (suicidality), would also have imposed costs on social partners in the interdependent groups in which humans evolved, thereby incentivizing social partners to provide more help, a strategy termed bargaining with private information (Kennan & Wilson, 1993). (We will use the terms 'credible signaling' and 'bargaining' interchangeably to refer to our model.) Importantly, we propose that most suicide deaths, especially among young people, are the rare and tragic consequences of costly suicide attempts whose evolved function is to credibly communicate need. Our vignette study found that the depressive and suicidal behaviors of fictional victims of physical and sexual abuse caused a substantial increase in participants' belief that the victims were telling the truth and their willingness to help them.

We address the three major issues raised by Soper and Shackelford: (1) criticisms of the Gaffney et al. study; and claims that our credible signaling model is inconsistent with patterns of suicidality (2) in industrialized societies and (3) in traditional and small-scale societies.

1. Responding to criticisms of Gaffney et al

Soper and Shackelford claim that we do not define our explananda: depression and suicidality. In our vignette study, participants in the depression condition read the following sentence (or similar), which was based on the DSM definition of a Major Depressive Episode:

[The victim] has lost weight and has been putting no effort into her appearance, often wearing dirty clothes and rarely doing her hair. She has also slept more than normal but still seemed tired and inactive. Her demeanor also changed drastically. She has often gotten distressed and has had difficulty maintaining her concentration. She has also missed multiple assignments, and her grades dropped from straight A's to a C average for the first time in her life.

Participants in the suicide attempt condition read the following sentence (or similar):

Then, this past week, you and your daughter went through a traumatic experience when your daughter attempted suicide. You rushed her to the hospital, where she was placed in critical but stable condition.

The depression and suicidal conditions caused a substantial increase in participants' perception that the victim was depressed and suicidal,

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respectively. The behaviors we are trying to explain in Gaffney et al. were clear to our participants, and we think they are clear to readers, too. Soper and Shackelford also find it “odd” that we chose female victims for our vignette study. We agree that this is a limitation of our study, and future studies should test the effects of victim sex on participants’ belief that the victim is telling the truth, and their willingness to help the victim.

Soper and Shackelford then suggest that our study participants “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....Having read the brief, did they anticipate what the researchers might have wanted to hear, and duly oblige?” Our study had a randomized, between-subjects design — participants were randomly assigned to conditions with different signal costs (e.g., crying, depression, suicide attempt). Participants in each signaling condition were unaware of the other signaling conditions. Hence, it was impossible for them to anticipate what we wanted to hear and duly oblige.

Finally, Soper and Shackelford observe that “expressions of support for the vignettes’ victims” are not real-world observations. Yes, of course. We frankly acknowledged this obvious limitation of vignette studies, which is balanced by an important advantage: the ability to randomize participants into different conditions to test causal hypotheses.

2. Do patterns of suicidality and self-harm in industrialized societies contradict our credible signaling model?

Soper and Shackelford draw on research in industrialized societies to make three main criticisms of our larger research program: first, that we suffer from a “conceptual haziness concerning the phenomena being explained”; second, that suicidal behaviors are largely unpredictable, and therefore cannot be explained by our theory (or, it seems, any theory of suicide risk factors); and third, that social partners are usually unaware of an individual’s suicidality, so suicidality cannot be a signal.

2.1. Do we suffer from “conceptual haziness”? Or do we simply reject some mainstream concepts?

Soper and Shackelford, like most mainstream researchers, stress the importance of the presence or absence of “intention” to die, which creates a distinction between suicidal self-injury and non-suicidal self-injury (NSSI). For example, Soper and Shackelford call into question the CDC data we reported for the US that show a high ratio of suicide attempts to deaths (Gaffney et al., 2022, Fig. 1) by suggesting that many of these “supposed ‘attempts’” might not have involved an intention to die. We agree. Our credible signaling hypothesis proposes that the vast majority of self-harming behaviors, including those where victims report an intention to die, have the evolved goal of surviving with improved circumstances.

Our theory, like most evolutionary theories of behavior, is not based on self-reported “intentions” but instead on the concept of an evolved strategy, which applies to all organisms, including those without nervous systems — trees grow tall to compete with other trees for sunlight, for instance, but have no “intention” to grow tall (Hagen & Hammerstein, 2005; Hammerstein, Hagen, & Laubichler, 2006). In humans, self-reported intentions are informative about putative evolved strategies, but not dispositive.

Importantly, reviews and meta-analyses find that NSSI is strongly associated with, and shares risk factors for, suicide attempts (Gillies et al., 2018; Griep & MacKinnon, 2022; Victor & Klonsky, 2014), and more so as the severity of NSSI increases (Jacobson et al., 2023). These patterns indicate that NSSI and suicidality are generated by closely related psychological processes, which we propose are evolved mechanisms to credibly signal need (Hagen, Watson, & Hammerstein, 2008).

Specifically, we propose that to mitigate adverse situations and

favorably resolve conflicts, bargaining strategies evolved that involve withholding cooperation or otherwise putting the benefits one provides to interdependent others at risk. Because there is a broad spectrum of adverse circumstances and conflicts, these bargaining strategies employ a broad spectrum of mutually harmful behaviors ranging from low-cost pouting and avoidance, to running away, to forms of physical self-injury with varying risks of death (Syme & Hagen, 2023). Some forms of self-injury, like scratching and hair pulling, have essentially no risk of death (and therefore cannot plausibly involve an “intention” to die), whereas others have moderate (cutting, burning) and substantial (deep cuts, overdoses) risks. What Soper and Shackelford misconstrue as conceptual haziness is in fact our rejection of the mainstream theoretical emphasis on suicide deaths and self-reported “intentions.” In our credible signaling model, it is not “intention” that is theoretically central, but instead the fitness cost of the self-injury or self-harming behavior (e.g., hair-pulling vs. overdose) compared to the fitness benefit (improved circumstances) for individuals who either are, or are not, in need. Suicide deaths, we propose, are the rare but inevitable consequence of relatively common signals of need that, to be credible, must have a low but non-zero risk of death.

2.2. Is suicidality unpredictable?

Soper and Shackelford claim that “Suicidality does not reliably emerge among relatively powerless people in times of conflict....[N]o set of...conditions has been identified that predicts any measure of suicidal behavior much better than chance....” They assert that “Suicides are almost always ‘out of the blue’ events....They are usually impulsive....and virtually never open to usefully accurate prediction....” (citations in the original omitted). If Soper and Shackelford are right, the outlook for a science of suicidality is grim.

In support of their claims, Soper and Shackelford cite the systematic review of suicide prediction models (SPMs) by Belsher et al. (2019), who actually found that “assessments of global classification accuracy across SPMs were good, with several exceeding 0.80” (p. 644). Classification accuracy involves identifying both those who engaged in suicidal behaviors (rare) and those who did not (common). Positive predictive values (PPVs), on the other hand, are the proportions of true positives (i.e., suicides) among all positives (true and false), which were indeed quite low.

However, the PPV of predictors of any relatively rare behavior, even those for which there are widely accepted evolutionary theories, would also likely be low. Consider the challenge of predicting, based on variables available at the time of interview such as age, sex, and upper body strength, which individuals would get into a physical fight over resources or mates sometime in the next 4.5 months, the median time window considered in the studies reviewed by Belsher et al. There would likely be a few true positives and many false positives, leading to a low PPV. A major reason would be that accurately predicting a physical fight would require the regular collection of information about both the focal individual as well as his or her interactions with numerous other individuals, the nature of their relationships, conflicts, history, and so forth, perhaps on a daily or hourly basis, data not available to the researcher. Under our credible signaling model, the same types of information would be necessary to predict suicidality, information that no one has ever been able to collect.

These and other methodological limitations of current studies are highlighted by Franklin et al. (2017), a meta-analysis of 50 years of research on risk-factors for suicidal thoughts and behaviors. Soper and Shackelford repeatedly cite Franklin et al. (2017) because this meta-analysis also found that “prediction was only slightly better than chance for all outcomes” (p. 1). In contrast to Soper and Shackelford, however, Franklin et al. place the blame on existing methods of studying suicidal thoughts and behaviors (STBs), not on theories of STBs: “most importantly, the overwhelming limitation of this meta-analysis reflects the overwhelming limitation of the existing STB risk factor literature:

the methods of most existing studies have been extremely narrow and homogenous, and have not allowed for tests that approximate how STB risk may work in nature” (p. 31). Franklin et al. conclude that “the present findings indicate a need for more STB risk factor studies, but clarify that these studies must overcome the methodological limitations of the existing literature” (p. 32, emphasis added). We agree, and our vignette methodology is one such approach. Use of smart phones and other mobile sensors for daily information collection from potentially suicidal individuals, control groups, and their social partners is another (Torous et al., 2018).

Despite the limits of existing studies, our evolutionary model of risk factors for suicidal behavior is empirically well-supported. A recent model of risk of a suicide attempt based on a US national survey ($N = 34,653$), for example, found the most important risk factors to be previous suicidal ideation or behavior, feeling downhearted, doing activities less carefully or accomplishing less because of emotional problems, younger age, lower educational achievement, and recent financial crisis (de la Garza, Blanco, Olfson, & Wall, 2021). These map nicely onto our model that recent victims of adversity (financial crisis) who are relatively powerless (young and uneducated) are at risk of depressive symptoms and suicide attempts.

2.3. Are NSSI and suicidality signals?

Soper and Shackelford, like many mainstream researchers, emphasize the (proximate-level) intrapersonal emotion-regulating functions of NSSI, such as alleviating negative affect, asserting that NSSI and other self-injuring behaviors rarely have a communicative function: “That suicides usually come unannounced is evidenced by the shock, confusion, and disbelief that typify loved ones’ immediate reaction to the news”, “Suicides are often marked not just by privacy, but methodical secrecy, to the extent of ruling out the possibility of the actor being saved”, “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....”

The empirical evidence against these claims is overwhelming. A meta-analysis of 36 studies of communication of suicidal intentions by 14,601 individuals who died by suicide (Pompili et al., 2016), for example, found that 44.5% victims communicated intent, and the authors noted that “this figure is likely to be an underestimate given the operational definitions of [suicide communication]” (p. 2239). A systematic review of 30 studies of interpersonal processes in NSSI (Peel-Wainwright et al., 2021) goes further, supporting most elements of our credible signaling hypothesis. Peel-Wainwright et al. remark that the emotion regulation emphasized by Soper and Shackelford and others typically emerges as a *consequence* of an aversive social, relational context where individuals are disempowered, unvalued, and their core needs are unmet, precisely the conditions where we predict credible signaling and bargaining. Peel-Wainwright et al. found that NSSI is indeed used to obtain help and to communicate distress and the need for support in a way that is likely to garner a response when other ways of meeting one’s needs are unavailable or thwarted.

Even sources cited by Soper and Shackelford against our credible signaling model provide clear evidence of signaling. Magne-Ingvar and Öjehagen (1999), for instance, is a study of significant others (SOs) of suicide attempters that notably refers to “suicidal signals”. They found that prior to the attempt >90% of SOs had a clear understanding of the patients’ problems, many providing psychological and practical support; a majority of SOs noticed changes in behavior; and almost half perceived suicidal signals, becoming so alarmed that they urged the patient to seek help. Providing support was often burdensome, however, suggesting that from the patients’ perspective social partners might not be providing enough, necessitating a credible signal of need.

Jill Bialosky’s book about the suicide of her sister, Kim, is another source cited by Soper and Shackelford that reveals credible signaling of

need when other signals apparently went unheeded. Kim was suffering the long-term rejection by her father and recent rejection by her boyfriend. Jill writes, “Each time I spoke of Kim I was reminded of the suffering she must of endured to have arrived at the place where she wanted to die and of the reality that I hadn’t been paying close enough attention....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. 12–13, emphasis added). Jill wonders if Kim’s suicide was a cry for help.

Soper and Shackelford cited those last two sources because they are rightly concerned about the impact of scientific theories of suicide on survivors such as Jill, but they wrongly imply that our credible signaling model characterizes suicidal individuals like Kim as “manipulative.” The word “manipulative” denotes “unscrupulous” or “unfair” control of a situation or person (Merriam-Webster, 2022; Oxford English Dictionary, 2022), which is the opposite of our theory that suicidality is an honest signal of need. In Gaffney et al., we accordingly found that depressive and suicidal behaviors dramatically reduced perceptions of manipulation (see Gaffney et al., 2022, Fig. 6) at the same time as they increased believability and willingness to help. Once social partners are convinced that need is genuine, they often want to help.

3. Have we misrepresented the anthropology of suicidality?

For suicidal behaviors to be evolved cries for help, the ancestral rates of suicide threats and attempts must have far exceeded the rate of deaths, the pattern seen in contemporary national data from CDC and World Health Organization (2014), and there must have been fitness benefits of suicidal behaviors that exceeded the fitness costs. Soper and Shackelford claim there is no evidence for either. They also claim that we ignore ethnographic evidence that is not consistent with our theory.

3.1. Are there more suicide deaths in small-scale societies than threats and attempts?

Soper and Shackelford claim that in small-scale societies, common proxies for ancestral societies, the rate of suicide deaths is greater than that of attempts, with attempt:death ratios that “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....” If true, this would undermine our theory. Syme, Garfield, and Hagen (2016) investigated the number and nature of ethnographic texts mentioning suicide threats, attempts, and deaths in a sample of 53 cultures, however, not the population rates of threats, attempts and deaths. They explicitly warned that such population rates “cannot be accurately determined from our dataset” (p. 181). Syme et al. made no adjustments for population size, length of fieldwork, or any other factors that would be necessary to (somehow) connect the number of discussions of suicide in ethnographic texts to population rates of suicide attempts and deaths.

Soper and Shackelford fail to mention that their other source, Poole (1985), a report on two years of fieldwork among the Bimin-Kuskusmin, recorded a huge number of suicide threats. After Poole explains that “The threats of adult women between about 18 and 35 years of age...are usually taken quite seriously” (p. 171) and that “The attempted suicides of women are virtually always due to one form or another of marital discord” (p. 172), observations that clearly support our credible signaling model, he then reports that “A flurry of suicide threats, which are extremely frequent among women whose demands are not being met, may precede the suicide attempt. Indeed, 93 such threats were recorded among 67 women during the course of field research” (p. 172, emphasis added). These, along with the 18 female attempts, show that for females, non-lethal suicidal behaviors (111) outnumbered deaths (11) by 10:1. Poole also reported numerous suicide threats by children and older adults in this Papua New Guinea group. These patterns strongly support our signaling hypothesis.

Poole goes on to provide the context that might explain the low ratio

of attempts to deaths (1:18) among men during his fieldwork: “Although male suicide is highly stigmatized...even greater stigma attaches to men who attempt suicide and fail. Such men are treated with utter scorn for lacking the forcefulness, strength, and stoic self-control of proper Bimin-Kuskusmin masculinity” (p. 159). Nothing in the credible signaling hypothesis suggests that this strategy would be immune to sociocultural processes that either encourage or discourage its use. Bimin-Kuskusmin do recognize men who are suicidal, however, and assign guardians to watch over them day and night to prevent suicide, suggesting that suicidal signals have been sent and received, and have elicited appropriate responses from social partners.

We agree with Soper and Shackelford, though, that more research is needed on population rates of suicide threats, attempts, and deaths in small-scale societies.

3.2. Are there benefits to suicidal behavior when victims survive (as most do)?

We agree with Soper and Shackelford that we have not yet proven that the fitness benefits of self-harming behaviors outweighed the fitness costs. They note that some benefits of non-lethal suicidal behavior that we documented in our sample of the ethnographic literature (Syme et al., 2016), such as preventing ear modification, do not seem to have significant fitness implications (but, as we reported, that case involved a child’s suicide threat after his father physically assaulted him while he was asleep¹). Here we provide additional analyses of these data.

Syme et al. (2016) found that of 84 ethnographic texts on non-lethal suicidal behavior (many of which only mentioned it in passing), 30 (36%) reported a subsequent benefit to the victim (Table 1). We recoded the remaining 54 texts of non-lethal suicidality with no evidence of a subsequent benefit. Only 10 of those provided any information about the social consequences of suicidal behavior; the other 44 texts simply mentioned an instance of non-lethal suicidal behavior, providing no follow-up information whatsoever. Of the 10 texts with follow-up information, two mentioned a possible benefit, four a cost, one a possible cost, and three neither a clear benefit or cost (Table 2). To be conservative, we did not count possible benefits as benefits. Thus, 30/40 (75%) of non-lethal cases with follow-up information had clear evidence of a benefit, and benefits outnumbered costs by over 7 to 1. In our view, most benefits plausibly represent substantial fitness benefits. See Table 1.

The results of Gaffney et al. provide additional evidence of two important fitness benefits of self-harming behaviors for victims of adversity: increased belief that victims are telling the truth and willingness to help them.

3.3. Do we consider ethnographic evidence against the credible signaling model?

Soper and Shackelford claim that we only cite ethnographic findings when they support our theory “but the same ethnographies are ignored

¹ This is the text of the ear modification case, which was reported to the ethnographers by the person who threatened suicide, Theodore: “However, his father and the chief of Wini (Mike’s father) came into the house one night when Theodore was asleep and, holding him down, cut his ears to make the loops in the lobes which all men and women normally displayed in the past. The next morning they wanted to improve the job a little but Theodore fled to the bush and spent the night with a ‘mother’ of his who was sympathetic. When he returned the next day they again said they were going to cut his ears some more and he again fled. At this they gave up and later when Theodore went to the chief and threatened to commit suicide if his lobes were not repaired the chief complied. After the repair of one ear, however, Theodore could no longer stand the pain; he was ashamed to return again to the chief and later had his other lobe repaired by a relative of his father’s.” (Glandwin and Sarason, 1953, p. 346)

Table 1

Social outcomes from non-lethal suicidal behavior in the ethnographic record. See Syme et al. (2016), Table S3, for the ethnographic texts documenting the original 30 texts with evidence of benefits.

Benefit	Type
mitigate parental abuse	deterred abuse
pressure on abusive mother to treat daughter better	deterred abuse
prevent severe treatment by parents	deterred abuse
forgiven for taboo violation	deterred punishment
prevent punishment for social transgression	deterred punishment
expiate an offense	deterred punishment
mitigate anger over social transgression	deterred punishment
constrain temperamental fathers	deterred punishment
mitigate parental discipline	deterred punishment
prevent unwanted marriage	Improved mating
concubine moved out of house	Improved mating
reconciled with wife	Improved mating
marry a forbidden spouse	Improved mating
allowed to marry over parental objections	Improved mating
allowed to marry	Improved mating
prevent unwanted marriage; allowed to marry	Improved mating
sway parents and other authority figures	improved circumstances
get one’s way	improved circumstances
manipulate parents	improved circumstances
prevent unwanted ear modification	improved circumstances
allowed to resign position	improved circumstances
social compulsion	improved circumstances
action taken to correct an objectionable position	improved circumstances
obtain return of stolen or runaway slaves	improved circumstances
motivate quick action to placate offended party	improved circumstances
obtain repayment of debt or compensation to kin	improved circumstances
release from captivity	improved circumstances
remedy unhappy situation	improved circumstances
avoid captivity	improved circumstances
social support	improved circumstances

Table 2

New analysis of the 10 non-lethal ethnographic cases with follow-up information but no clear benefit. See Syme et al. (2016) for the main study.

Case information	Outcome cost or benefit
Disputes and grievances against kinsmen are frequently settled by suicide or attempted suicide	Benefit?
After a suicide attempt, a ceremony was held and the person recovered	Benefit?
Husband threatens suicide; wife runs for help; husband then kills himself	Cost
Man does not follow through with request for assisted suicide and is forced to relocate	Cost
Attempted suicide by an apprehended murder suspect who was later tried and executed	Cost
Those who attempted suicide must pay those who prevented it	Cost
When fighting breaks out between two groups, a woman from the enemy group is possibly killed after being caught attempting suicide.	Cost?
People avoid those who request assisted suicide (social norm)	Unknown
Those who attempt suicide are not ridiculed or criticized	Unknown
Father of ill son attempts suicide to shame the gods, after which rites are held	Unknown (son recovers, father falls ill)

when actors plainly have other aims in mind.” They also claim “it is not clear whether Gaffney et al. (2022) have given [alternative evolutionary theories of suicidality] due consideration”, including “several by deCatanzaro (1981).”

Both claims are incorrect. In an NSF-funded study, two of us (KLS and EHH) tested deCatanzaro’s inclusive fitness model (deCatanzaro, 1981) against the bargaining model using ethnographic data. We found that 23% of text records had at least partial support for the inclusive fitness model, and concluded that evidence for it “is reasonably well documented among older or infirm individuals, especially those living at high

latitudes” (Syme et al., 2016, p. 13). Syme et al. also quantified ethnographic evidence against the bargaining model, including: no impact of suicidal behavior on social partners, private suicidal behavior, no adversity, highly lethal suicide methods, and victims being worse off (see, e.g., Syme et al., 2016, Fig. 3, whose caption reads “Summary of the evidence for all theoretical variables, grouped by those that refute the bargaining model (top), support the bargaining model (middle), and support the inclusive fitness model (bottom).”). Our disproof of our credible signaling hypothesis for a subset of suicide cases refutes Soper and Shackelford’s various claims that we ignore ethnographic evidence against our theory, that our theory is “circular”, “[immune] to counterevidence”, and “unfalsifiable”, or that we claim that the signaling hypothesis explains all suicides.

Despite the fact that some cases of suicide do not appear to be explained by signaling or bargaining, many anthropologists and sociologists studying suicide have reached nearly the same conclusions we have that most cases involve signaling and bargaining (albeit using different terminology, such as “protest” or “appeal”, e.g., Manning, 2012; for review, see Syme & Hagen, 2023). This includes Hezel, prominently quoted by Soper and Shackelford, whose analysis of suicide in Chuuk (formerly Truk) is almost identical to ours: “Suicide, in the overwhelming majority of Trukese cases, and quite possibly those in other parts of Micronesia as well...means inflicting the ultimate harm upon one-self in order to compel the parents or others to recognize the harm they have done and to repair it” (Hezel, 1984, p. 200–201). It is “employed, in part, to achieve a reconciliation between the victim and his family...” (ibid, p. 201). The only important difference is that Hezel (who does not take an evolutionary approach) proposes that reconciliation occurs “after the death” of the victim (ibid, p. 201). We propose, of course, that the far more common suicide threats and attempts, including the numerous instances of running away into the bush that Chon Chuuk interpret as suicide threats, aim to resolve conflicts without death.

4. Concluding remarks

The specter of survivors’ guilt looms over Soper and Shackelford’s critique. Their mistaken beliefs that suicidal behaviors are usually concealed and that suicides are random lead them to conclude that survivors such as Jill Bialosky need feel no guilt about failing to prevent the deaths of loved ones and patients – “survivors’ guilt is groundless”. As Soper et al. (2022, p. 19) argue elsewhere:

Acceptance of suicide’s essential randomness—as an unforeseeable biological accident—would help to ease the irrational guilt that often besets people bereaved in this way, health workers included.... At a time of trauma, confusion and vulnerability, they need the facts stated unambiguously. There were no signs. There may be lessons to be learnt, but no one could have seen it coming. To insinuate otherwise, as an ethos of risk assessment does, is to add cruel and gratuitous torment to survivors’ grief.

Accepting mistaken beliefs to help ease survivors’ guilt, however, carries the unacceptable cost of failing to prevent future suicides, such as those by sexual abuse victims similar to the person quoted in our epigraph. Our evolutionary approach, in contrast, sets aside blame, guilt, and other normative judgements to frankly assess the consequences of the conflicts of interest that permeate relationships in humans and other organisms. We and the many other researchers seeking to understand the social contexts of suicidal behavior do so not to cast blame or add to the grief of family and friends of suicide victims, of course, but to help avert future such tragedies.

To conclude, we agree with Soper and Shackelford that we have not yet proved that depression and suicidality, in part, are adaptations for credibly signaling need. That is why we have pursued an extensive research program to test this hypothesis. Our results so far are

encouraging.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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