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## Dead Reckoning: A Multiteam System Approach to Commentaries on the Drake-S Equation for Survival

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# Dead Reckoning: A Multiteam System Approach to Commentaries on the *Drake-S* Equation for Survival

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We used a multiteam system approach (MTS) to map the critical and constructive feedback from four invited Commentaries on Rock et al.'s (2023) probabilistic analysis of purported evidence for postmortem survival. The goal was to mine actionable insights to guide future research with the potential for important learnings or breakthroughs about the nature or limits of human consciousness and their relation to transpersonal psychology. The commentators' input identified only a few measurable variables or empirical tactics that conceivably challenge or refine our latest *Drake-S* Equation for survival. However, a review of these suggestions using logical and statistical criteria revealed that none immediately upend our previous conclusion that the published effect sizes for various Known Confounds (including hypothetical "living agent psi") do not fully account for the published prevalence rates of Anomalous Experiences traditionally interpreted as survival. However, the commentators proposed several good recommendations for new studies that could eventually alter this calculus. Accordingly, we outline the architecture of a proposed cross-disciplinary research program that extends the present MTS approach and its collected insights and focuses strictly on empiricism over rhetoric in this domain. The results of this coordinated effort should likewise help to clarify a range of psychological and biomedical phenomena that speak to the nature and limits of human consciousness.

**Keywords:** *anomalous experiences, biological death, consciousness, liminality, multiteam system*

We commend the *International Journal of Transpersonal Studies (IJTS)* for publishing this series of diverse papers on the highly controversial subject of postmortem survival of consciousness: "survival" or "afterlife" for short. Hopefully this collective effort will help more broadly to confront scientism—the excessive belief in the power of scientific knowledge or techniques—by showcasing how a sincere drive for discovery involves a balance of proper skepticism and intellectual humility (Durakiewicz, 2022; Houran & Bauer, 2022; Truzzi, 1987). Indeed, data that favor a particular hypothesis simply increase the odds that it is correct. No body of evidence or single research article ever reaches absolutes. Over time, a body of scientific evidence, in theory, leads us to conclusions that are "more likely

than other alternatives." At the same, we think that the academic literature on the survival hypothesis desperately needs new ideas or approaches to remedy the stagnation of research advancements partly due to the rise of ideological or methodological camps that typically resist engaging in solution-oriented debates or adversarial collaborations (for discussions and notable attempts along these latter lines, see e.g., Augustine, 2022a; Braude et al., 2022; Cunningham, 2012; LeBel et al., 2022; Matlock, 2022; Palmer, 2016).

As such, survival-related studies should never explicitly strive to confirm researchers' *a priori* personal assumptions or religious beliefs about the existence of an afterlife. Efforts must instead focus on exploring the technical nature and limits of human observation and consciousness, as well

as how these influence our attitudes, values, and behaviors. It can thus be argued that the survival premise naturally complements transpersonal psychology's major themes of beyond-ego psychology, integrative/holistic psychology, and the psychology of transformation (Hartelius et al., 2007). Then again, it is reasonable to ask first whether the ontological reality of survival is actually a hypothesis to be tested or just an idea to be entertained. The issue could ultimately be intractable with no conceivable means of definitive affirmation or disconfirmation, much like the Simulation Argument that posits our experienced reality is a simulated or artificial environment created by a more advanced civilization or intelligence (e.g., Bostrom, 2003; Bostrom & Kulczycki, 2011; Chalmers, 2022). In fact, some compelling research undermines the notion of any "local reality," at least at the quantum level (Manning et al., 2015).

But we neither defend nor endorse the reality of survival here; only the legitimacy and utility of the question itself. At the same time, we emphasize that spirituality, theology, or metaphysics might have a place in the discussion though not as substitutes for evidence-based claims. Our view instead is that new and important learnings will chiefly come from comprehensive, empirical studies of the various *Anomalous Effects* (AEs) discussed in this context, e.g., near-death experiences (NDEs), cases of the reincarnation type (CORT), after-death communications, apparitions and haunt-related phenomena, and mental mediumship (or channeling). Causality in these contexts may never be fully resolved (Bauer, 2019), but questions about some aspects of survival-type phenomena might be convincingly answered. That is, testable predictions undoubtedly follow from certain philosophies or explanatory models. The Appendix thus provides interested readers our list of recommended literature for a convenient primer on the survival hypothesis, which will hopefully inspire innovative scientists to pursue new research on this complex and nuanced problem. Further to our aim, this Reply assesses the key feedback from four invited Commentaries (i.e., Friedman, 2023; Maraldi, 2023; Merlin, 2023; Simmonds-Moore, 2023) on our updated *Drake-S* Equation exercise (Rock et al., 2023).

To clarify, Laythe and Houran (2022) presented their original *Drake-S* Equation simply as mathematical evidence that absolutist claims about survival-type evidence are insufficient and unjustified. They specifically found that representative published effect sizes of *Known Confounds* (KCs) — i.e., (a) Environmental Variables, (b) Suggestion-Expectancy (i.e., contagion, memory, and persuasion), (c) Fraud, (d) Measurement Error, (e) Mental Illness, and (f) Susceptibility to Perceptual Aberrations — only explained 61.4% of the variance in the published prevalence rates of certain anomalous experiences or cognitions that are traditionally interpreted as evidence of survival. Rock et al. (2023) subsequently revised that calculation to additionally estimate the contribution of putative Living Agent Psi (LAP) to such reports. We obtained an increase in overall explanatory power that now accounted for 69.7% of the variance, but our projected upper limit of LAP likewise failed to fill the mathematical gap. These findings conceptually agree with Laythe and Houran (2022) and thus reinforce our main conclusion that both the *biomedical* (i.e., extinctionist related) and *parapsychological* (i.e., survivalist related) sciences require more specific or comprehensive models to adequately explain the phenomena in question.

### **Multiteam System Mapping of Key Themes in the Commentaries**

We appreciate the respective authors' time and effort in contemplating and responding cogently to our Rock et al. (2023) paper and its potential implications. These reaction essays are valuable not only for their criticisms of our probabilistic exercise, but because the collective insights and feedback can serve as inputs for a larger, solution-focused analysis (McKergow, 2011) via a fortuitous multiteam system (MTS) approach (Shuffler et al., 2015). MTS is used to accomplish multifaceted tasks in challenging environments, as they comprise interdependent teams that work towards their own proximal goals within and across teams to likewise accomplish a shared superordinate goal. Our parallel aim was to identify constructive ways to advance thinking and research on the survival question. As such, we combed the four Commentaries for (a) important variables or mitigating factors that warrant

a re-analysis of our latest *Drake-S* Equation, and (b) ideas that generally might help to pry the stubborn nature of the core premise and fruitfully galvanize survival researchers with currently opposing views, motivations, or methods.

Table 1 lists 10 key themes that we distilled from the reaction essays using an iterative, team-based review (cf. Bertens et al., 2013), along with our corresponding actions in response. Since criticism is easier to give than approval (Ngo et al., 2015), it is unsurprising that we identified more *objections* (i.e., problem-focused topics,  $n = 7$ ) than *observations* (i.e., solution-focused topics,  $n = 3$ ). The commentators often voiced overlapping themes, albeit some also made idiosyncratic points. Readers might wonder if this collective feedback is sufficiently original, provocative, and actionable to advance current thinking and research. To be sure, new knowledge and innovative ideas in science have become increasingly sparse (Alberts et al., 2014; Bloom et al., 2020; Jones, 2009). As we discuss below, the commentators mainly affirmed our previously stated caveats about the *Drake-S* Equation (Laythe & Houran, 2022; Rock et al., 2023). But some inputs broached interesting angles or nuances that could help to address the conceptual and empirical limitations of our study and its conclusions. The major objections/observations from the four Commentaries thus merit thoughtful deliberation.

### **Assessing the "Objections" from the Commentaries**

Several commentators echoed five limitations of our approach and results that we already addressed to an extent: (a) Dubious application of a Drake-esque formula to the survival question, (b) No study pre-registration, (c) Problems of co-variation among the equation variables, (d) Factoring each equation component separately, and (e) Overlooking potential nuances in putative psi-functioning. Beyond these issues, we were also severely criticized for (f) Neglecting the Multiple Sources of Psi (MSoP) hypothesis. Yet deeper scrutiny indicates that none of these potential confounds would alter, much less nullify, Rock et al.'s (2023) main conclusions. Below we separately evaluate these concerns relative to our updated *Drake-S* Equation.

### **Potentially Dubious Application of the Drake Equation**

Several commentators questioned our adoption of Drake's (1961) probabilistic approach, but none so extensively as Friedman (2023). We certainly expect ardent commentary from someone who has been a notable advocate for quantitative approaches in transpersonal psychology and allied fields, but surprisingly Friedman's critique offered few logical or empirical insights that would have been valuable inputs for our MTS analysis which aimed to improve our modeling and the evaluation of pertinent AEs and KCs. Friedman's (2023) presentation instead reflected many of the limitations that stifle survival research, i.e., arguments grounded in appeals to authority, an emphasis on rhetoric over empiricism and logical argumentation, fundamental misunderstandings of core premises (as with the nature of the Drake equation), and a lack of active engagement with data and evidence. Friedman's essay indeed read to us like a disapproval of Rock et al. (2023), even though his allusions to methodolatry and pseudomathematics in our paper equally apply to the very approaches that he and many social scientists ritually use.

*First*, Friedman (2023) knowingly or unwittingly argues from authority when he implies that his views should be endorsed, at least in part, due to his standing within the transpersonal field. For example, he stated that, "As one of the pioneers and most persistent advocates in the use of scientific methods within transpersonal psychology and other transpersonal sciences (Friedman & Hartelius, 2021), I hope this comment can to some degree ameliorate any potential for harm from the Rock et al. paper by explicitly acknowledging the danger in such mathematical approaches" (Friedman, 2023, p. 76). *Next*, "pseudoscience" is a frequently mis-used term that originally referred to the reasonable concern of claims about using scientific methods when these were not actually used. Rigorous fringe (or frontier/ maverick) science instead consists of applying scientific methods appropriate to the topic and maintaining clarity about any biases that prevent or support a particular interpretation of the results (for a discussion, see Houran & Bauer, 2022). Nowadays

**Table 1. Multiteam System Mapping of Commentators' Feedback and Authors' Immediate Applications.**

<b>Essay</b>	<b>Ideology<sup>a</sup></b>	<b>Objections (<u>problem-focused</u> content)</b>	<b>Observations (<u>solution-focused</u> content)</b>	<b>Authors' Responses &amp; Applications</b>
Friedman (2023)	Neutralist	<i>Drake-S</i> Equation might reflect 'pseudomathematics' so constitutes a shaky outcome.	No logical or statistical insights were offered to advance theory or research in this domain.	Reiterated that the <i>Drake-S</i> Equation analyzed published, peer reviewed data per a standard multiple regression type approach.
Maraldi (2023)	Extinctionist	<i>Drake-S</i> Equation is likely limited by the reference class problem, so need to revise or expand it in the future per new empirical evidence.	Consult the prevalence and impact of other forms of discarnate agency like 'angels or demons.'	Failed attempt to buttress category of 'Veridical Anomalous Experiences' with incidence rates of Marian apparitions.  Adding incidence rates of other entity encounter experiences might help, but current <i>Drake-S</i> Equation already accounts for several types.
Merlin (2023)	Neutralist <sup>b</sup>	<i>Drake-S</i> Equation did not incorporate the 'multiple sources of psi' (MSoP) hypothesis, which was offered as a comprehensive solution to the survival question.  Co-variation among equation variables not corrected.	Proposed a 'corrected' probability estimate whereby he divided the variance explained by Rock et al.'s (2023) ELAP metric by two to address hypothetical 'living agent psi' and 'discarnate psi.'	Failed to extract any testable hypotheses specific to the MSoP hypothesis.  Echoed repeated justification in prior papers about uncorrected co-variation, as main conclusion of <i>Drake-S</i> Equation would not change.  Proposed correction lacks empirical foundation and would not change the main conclusion of the <i>Drake-S</i> Equation.
Simmonds-Moore (2023)	Neutralist	No study pre-registration.  <i>Drake-S</i> Equation is likely limited by the reference class problem, most notably the use of data restricted to 'explicit (conscious) psi.'  Co-variation among equation variables not corrected.  Need more precise probabilities for each category of Anomalous Experiences relative to the Known Confounds.	Suggested that the literature on 'implicit (non-conscious) psi' might help to refine Rock et al.'s (2023) estimate of Living Agent Psi.	Clarified that pre-registration is arguably a moot issue.  Conducted scoping review of studies or meta-analyses on 'implicit psi' – and available data suggest the effect sizes do not improve our current estimate of Living Agent Psi.

a. **Survivalist:** believes that, probabilistically (i.e., based on the most rigorous scientific methodological and philosophical advances), a survival source provides the best explanation of, for example, ostensible mediumship; **Neutralist:** believes that, probabilistically, neither survival or non-survival sources provide the best explanation of, for example, ostensible mediumship; and **Extinctionist:** believes that, probabilistically, a non-survival source or combination of non-survival sources (e.g., living agent psi, the psychic reservoir) provides the best explanation of, for example, ostensible mediumship.  
b. Strictly speaking, Merlin (2020b, 2020c) ascribed equal importance to living agent psi and discarnate psi sources.



this derogatory term seems mostly used to attack a claim on moral or ideological grounds. Critique of method, logic, and operational definitions are worthy pursuits, but the wholesale and preemptive rejection of a claim via fallacious rhetoric is an unscientific practice. Friedman (2023) similarly peppered his essay with strong claims of opinion and a disdain for several areas of "fringe science" or presumed pseudoscience, including the Drake equation itself, astrology, so-called "eternal truths," and methodoltry. It is ironic that Friedman used explanations of preference, but not evidence, to argue that these topics are fallacious (p. 73).

To be sure, research may not always support the validity of such controversies, but this does not mean that they cannot be scientifically studied with quantitative methods (for an example with astrology, see e.g., McRitchie, 2022). In any event, Friedman (2023) subtly links the original Drake equation to *astrology*, thereby undercutting its relevance and, by extension, the legitimacy of Rock et al.'s (2023) core premise and exercise. We must reemphasize that the Drake equation's origin is *astrobiology*, a subtopic within astronomy and cosmology (Drake, 1961; Kreifeldt, 1971; Wallenhorst, 1981), and, over recent decades, the original Drake equation has been revisited in many peer-reviewed publications in both astronomy and philosophy journals using empirically-derived terms versus gross speculations (see e.g., Burchell, 2006; Frank & Sullivan, 2016; Platt, 2021).

*Lastly*, and most importantly, it is curious why a quantitative researcher like Friedman neglected to specifically evaluate any empirical or statistical components of our updated *Drake-S* Equation. Maybe he simply could not find any crippling or fatal flaws with our data selection, analysis, or interpretation. Or perhaps he thought that our research design was too weak or the data too noisy to justify a closer inspection. The latter scenario is somewhat bolstered by Friedman's (2023) discussion of mathematical crankery, i.e., he explained that "Pseudomathematics is a misuse of mathematics that goes beyond simply making errors. It includes misapplications that mimic the appearance of good and bad mathematics but are not-even-wrong" (p. 73). Though he perhaps

absolved us late in his essay, Friedman still implied that our *Drake-S* Equation may be mimicking "the appearance of good" mathematics. Of course, he is correct to suggest that we must always be wary of poor or misguided uses of mathematics, but social science as a whole might be as guilty as pseudoscientists on this charge. For instance, many touted psychometric assessments — including Friedman's (1981, 1983) Self Expansiveness Scale — were developed and validated with Classical Test Theory (CTT) versus Modern Test Theory (MTT). Experts in applied tests and measurements have long advocated for robust MTT methods because it has been repeatedly demonstrated that CTT yields "scores" with little to no inherent meaning (for a discussion, see Lange, 2017).

Factually, and more to the point, our formula is a basic applied probability that essentially matches the qualities of data set up for multiple regression, and variants of it are used frequently in most scientific fields. Ergo, unless Friedman wishes to disavow the role of variance, and subsequently, all methods of correlational analysis in inferential statistics, it is inappropriate to suggest that our exercise was an example of crankery. To reiterate — all the individual variables in the formula derived from peer-reviewed empirical studies, and many of those were meta-analyses of more empirical studies. Equally, all the KCs have been previously studied and put forth as explanations for survival-type experiences. Accordingly, we contend that pseudomathematics did not feature in Rock et al. (2023). We do concede that our *Drake-S* Equation involves "rough estimates," but this is a strawman charge. All scientific observations are "rough estimates" in that they involve some degree of measurement error; it is simply an issue of degree (i.e., some estimates are "rougher" than others). At least we based our estimates on a large body of peer-reviewed empirical data.

Readers can now understand why we determined that Friedman's (2023) feedback held minimal value for assessing our current approach or conclusions, as well as for advancing future research. But it does say something positive that Friedman as Senior Editor permitted our Rock et al. (2023) report to be formally reviewed, published, and now

discussed. Whether on the side of quantitative or qualitative research, surely there is a place for data-derived models that serve as "pilot data, preliminary results, or initial estimates." Without doubt, as Friedman himself discussed, there is a place for a variety of data, conducted within empiricism, which helps to create overall models. Moreover, Friedman (2023) made a broader and valid point—all science is modeled from observation and experience, and error is inherent within that process as a function of our own human nature. In this regard, we agree with him, as we would not want the *Drake-S* Equation to be taken beyond its stated purpose and without continued refinement.

### **No Pre-Registration**

Strict and conceptual replications are more compelling to us than pre-registrations per se (cf. Cohen, 1994). We also submit that pre-registering our study design would not have altered the current results, unless perhaps we invited feedback to inform the data selection or statistical analysis. This point is nonetheless moot because the reaction essays here served this same purpose. In fact, the use of alternative peer review methods like transparent, collaborative, and post publication formats (Horbach & Halfman, 2018) might be equally or more effective ways to advance scientific inquiry on controversial topics like survival. For our part, we certainly would like to see more target articles, data sharing, and evidence-based commentaries devoted to parapsychology and consciousness studies in *IJTS* and other science journals.

### **Unaddressed Co-Variation Among Variables**

Our two earlier reports (Laythe & Houran, 2022; Rock et al., 2023) repeatedly explained why we *strategically* sidestepped the issue of co-variation among the equation variables and metaphorically "placed a finger on the scale" for skepticism. Simply put, we would rather make a Type II vs Type I error when assessing the empirical evidence for survival. It is true that remedying the co-variation would challenge our highly conservative estimate and give a more precise result. Yet, we fully expect this approach to "deepen" the mystery of survival-type experiences and not alter our major finding that KCs (including LAP) do not fully explain the AEs in question. Specifically, Laythe and Houran

(2022) emphasized that corrected covariation would probably reduce the variance explained by KCs by 15% or more. We would be curious to know the exact statistic. However, this is unnecessary for our "skeptically-loaded" version of the formula to show that absolutist claims about survival-type evidence are unwarranted. But we welcome future efforts to empirically refine our current equation with data that measure the interactions among its constituent variables with greater precision.

### **Need for More Precise Probabilities of Individual Anomalous Experiences**

Laythe and Houran (2022, p. 146, Table 7) reported the effect sizes of the individual AEs once "purified" of the effect sizes associated with the KCs. But we clustered findings in some instances to create AE categories, which some researchers could argue deserved their own error calculations. Moreover, Simmonds-Moore (2013) noted that our *Drake-S* equation might be applied in the context of each body of evidence to explore relative contributions of different factors in each of the different forms of categories of evidence (i.e., NDEs, CORT cases, after-death communications, apparitions and haunt-related phenomena, and mental mediumship). While this tactic probably would not alter our main conclusion, it could better guide future research via a refined understanding of specific AEs in relation to the KCs. In other words, a more stringent analysis could reveal that "Veridical Anomalous Experiences" (VAEs; e.g., after death communications) and "Haunt-Poltergeist Episodes" are *not* the most promising topics to foster chance- or challenge-type discoveries as we previously proposed (Laythe & Houran, 2022; Rock et al., 2023). Chance-type discoveries are driven by new observations or evidence and may be in line with or against existing literature, whereas challenge-type discoveries are driven by a new or existing observation or evidence that goes against existing literature (Wuestman et al., 2020).

### **Reference Class Problem**

This refers to the task of identifying the most appropriate information for use in an analysis. We thus agree with Simmonds-Moore (2023) that *quality* of evidence (Tressoldi et al., 2022) is a distinct issue from what constitutes *relevant* evidence for or

against survival. So, it is reasonable to ask how we can be certain that our selection of KCs and AEs was sufficiently relevant to include in our *Drake-S* Equation. The short answer is that we have no scientific way to ensure complete confidence one way or the other, but in our defense neither does anyone else if we are honest about the limits of what we can do with, or infer from, scientific methods.

Simply put, we think our original set of KCs is reasonable though may not fully cover all the complexities or nuances of every conventional explanation. We likewise stipulated that the AEs considered in our analysis have been traditionally interpreted as evidence for "discarnate consciousness," as these experiences often include details that suggest to some percipients or investigators the activity of an incorporeal "presence" with some or all the ostensible faculties of *identity* (personality), *perception* (awareness of stimuli), *sentience* (awareness of feelings/ sensations), and *cognition* (understanding perceptual, sensorial, or emotional stimuli).

It is certainly possible to systematically assess and weigh the different groups of AEs in terms of their relative strengths on these apparent faculties, or even to conduct a massive content analysis of spontaneous case collections that rate individual reports on these faculties across all the AE categories. Considerable procedural challenges must be overcome to accomplish such endeavors, but the practical value of the outcomes is debatable. We contend that our holistic treatment of the available data produces a very good "rough" probability estimate, because it has the advantage of comparing the *collective weight* of diverse AEs that have been interpreted as survival against the *collective influence* of KCs that undermine a survival (or otherwise spiritual or parapsychological) interpretation.

### **Unknowns About Psi-Functioning**

Our previous papers (Laythe & Houran, 2022; Rock et al., 2023) indeed noted some important nuances with putative psi-functioning, but this circumstance is not easily resolved for the purposes of immediately refining our *Drake-S* Equation. In fact, psi as a scientifically valid construct has not been unequivocally established in that parapsychologists

cannot yet explain the process(es) of anomalous cognition or action relative to known scientific mechanisms and thus definitively establish any diagnostic signature(s) (for a discussion, see Houran et al., 2017b). On balance, "indirect measurement" of a phenomenon is not an academic sin. Scientists regularly engage in the practice, as exemplified by the concepts of dark energy and dark matter (Trimble, 1987) or the postulated elemental particle of gravity called a graviton (e.g., Sawyer, 2020). Further, some scientists' discussions of hypotheticals like "multiverse theory" (New Scientist, 2017) are quite popular in both the mainstream consciousness and certain scholarly circles despite having no empirical backing whatsoever.

Yet the list of "unknowns" about psi-functioning frankly begins with the ontological reality of psi itself. It is thus unclear what all factors into our LAP estimate (or any index of putative psi), as well as what environmental or psychological factors might reliably enhance or hinder it. To be fair, researchers have uncovered some relevant variables associated with psi-type anomalies that occur spontaneously or within controlled experimental settings. These most prominently include participants/ percipients with higher levels of paranormal belief (i.e., the so-called sheep-goat effect) and permeable (or thin) mental boundary functioning as operationalized by variables like *transliminality* (Thalbourne & Storm, 2012) or *dissociative tendencies* (Ross & Joshi, 1992). This gives some rationale to characterize psi-functioning akin to other faculties or abilities in living people, which are mediated here by a certain perceptual-personality profile and further amplified by the physical or motivational variables attending the manifestation or expression of that ability. Later we revisit these ideas to flesh out a potential "multiplier" for our ELAP metric as inspired by one commentator's suggestion to examine the psi effects that are "implicit" (or non-consciously registered) rather than "explicit" (or consciously registered).

### **Neglecting the MSoP Hypothesis**

Merlin (2023) largely criticized our analysis for not incorporating MSoP, a framework that he strongly implied originated with him. We should first note in the interests of proper context and attribution that Merlin (2020a, 2020b, 2020c, 2023)



amalgamated pre-existing hypotheses (e.g., LAP, survival, and psychic reservoir), next applied the idea of psi sources that co-function (e.g., Beischel & Rock, 2009; see, for example, p. 54 of Merlin's [2020a] doctoral thesis), and finally professed to offer a "novel hypothesis" (Merlin, 2020b, p. 321) that is a "comprehensive solution" (Merlin, 2020a, p. iv). He subsequently proposed (a) using this MSoP framework to upgrade our probabilistic exercise, and then (b) revised our probability estimate for survival using metrics that he deemed more appropriate. On both accounts, Merlin's (2023) reliance on untenable assumptions undercuts the practical utility of MSoP to modify our current approach or conclusions. Detailed examination of these conceptual and empirical pitfalls is warranted because Merlin (2023) persistently uses theology and unsupported (or not openly identified) assumptions within his commentary, while simultaneously critiquing the empirical accuracy of our data-driven model.

To begin, Merlin (2023) claimed that "studies found that mediums can acquire anomalous information from combined data sources, each associated with survival, LAP, and possibly some other source, which provided a reasonable theoretical foundation for the multiple sources of psi (MSoP) hypothesis, which postulates integration and co-functioning of all existing sources of psi" (p. 44). However, Merlin curiously failed to cite any "studies" that support his assertion. Furthermore, Merlin's statement that, "studies found that mediums can acquire anomalous information from combined data sources, each associated with survival, LAP, and possibly some other source" (p. 44), dictates that at least one of the mediums' sources of psi was plainly identified via systematic testing. One of us [AR] has co-authored numerous empirical studies of ostensible mediumship (e.g., Beischel et al., 2015; Beischel et al., 2021; Rock et al., 2009, 2014), and concludes that *none* of these prior studies successfully identified the source(s) of mediums' readings for an alleged discarnate.

Merlin's (2023) claim further assumes that anomalous information reception by mediums has been scientifically established, whereas LeBel et al. (2022) cautioned that the meta-analytic results (Rock et al., 2021b; Sarraf et al., 2021) are

mixed and surely do not clarify any underlying mechanisms for the observed effects. Finally, the MoSP hypothesis, in fact, so inclusively postulates the "integration and co-functioning of all existing sources of psi" (p. 44) that its validity and usefulness are substantially compromised. Indeed, how does one falsify a hypothesis pertaining to "all existing sources of psi," when there is perhaps no scientific or philosophical method to establish that one has, in the first place, identified "all (or any) existing sources of psi" (discarnate agency notwithstanding)? It also gets more problematic — Merlin could be off the mark by assuming *any* sources of psi, because the Simulation Argument has not been falsified as an explanation for AEs that are interpreted as postmortem survival.

This leads us to Merlin's (2023) other assertion that, "The MSoP hypothesis has demonstrated that LAP and discarnate psi functioning are equally important: their impact on the assessment of the probability of survival should be taken into account accordingly" (p. 60). First, we must point out that hypotheses do not demonstrate anything; rather hypotheses are tentative statements or predictions. Second, on what grounds does Merlin contend that "that LAP and discarnate psi functioning are equally important"? Here Merlin merely makes a value or theological judgment that cannot be scientifically defended. To be sure, Survivalists and Extinctionists, by definition (cf. Table 1), would take issue with his thinking. At any rate, we argue that neither the existence of LAP nor discarnate psi have been scientifically established and thus cannot be accepted as a priori assumptions (see e.g., Augustine 2022a, 2022b; Houran et al., 2017b; Kekecs et al., 2023; LeBel et al., 2022; Rabeyron, 2020).

Merlin's claims about discarnate agency essentially equate to theology or religious faith. With this foundation he likewise proposes the necessity of "discarnate interactionism" and the notion of "perspectival awareness," i.e., "a corporeal perceptual capacity allowing for the localization or spatial orientation of sensory experience is by means of clairvoyance. Without physical bodies, discarnates lack perspectival awareness, and consequently the ability to gain knowledge of what is happening in the physical world" (p. 56). We

appreciate philosophers in the survival literature like Stephen Braude and Michael Sudduth, who openly state their working assumptions up front. But Merlin (2020a, 2020b, 2020c, 2023) presents his claims as being *self-evidentially* true within an empirical framework, while factually, they are without any tangible evidence.

Given Merlin's use of "*discarnate interactionism*" noted above, another of his statements is perplexing, i.e., "No knowledge exists about any of the confounds identified by Laythe and Houran (2022), namely expectancy-suggestion effects, environmental influences, fraud, measurement error, mental illness, and susceptibility factors to be associated with discarnates" (p. 55) and "Consequently, the values of any effective error factors applied to discarnate psi cannot be calculated and therefore, considered null for the calculation of the sum error term" (p. 55). Either Merlin is unfamiliar with interactionist principles or has applied them incorrectly to his own theology. Certainly, all the above confounds pertain to LAP and discarnate agency for two solid reasons. First, at a very basic interactionist layer, discarnate agency is experienced or observed by percipients within our standard perceptual environment. As such, humans will without exception engage in a subjective process of interpretation of the stimuli received. And from this interpretative process, humans are empirically shown to inherently engage with all the above confounding issues (such as the KCs), both from within their own psyche and from the environment around them, including the opinion of other people (Drinkwater et al., 2019; Hill et al., 2018, 2019; Ironside & Wooffitt, 2022).

Conversely, information about putative discarnate agency only comes from human perception and appraisal. This means that what we experience as real or true about a discarnate agent is necessarily filtered through the psychobiology of a target person like a ritualist, medium, or an "everyday person" who has an internally-based experience or perceives an externally-based event. Again, using a living person as a perceptual or communication conduit entails that one's experiences and interpretations are subject to all the standard psychological, sociocultural, and

environmental biases inherent to human cognition and perception. While not dealing in absolutes, no citations are necessary for this statement, as interactionism and its associated biases represent entire fields of vast social science data, from clinical psychology to social psychology, to cognitive psychology, even into sensation and perception (for discussions relevant to survival, see e.g., French & Stone, 2013; Houran & Lange, 2001; Martin & Augustine, 2015). Thus, even if we accept Merlin's (2023) beliefs about discarnate interactionism and perspectival awareness, all the interactions we have with discarnates would still comprise narrative constructions, i.e., humans perceiving certain information that is subsequently interpreted per select influences or norms. Whatever existence alleged discarnates have, they necessarily engage with living humans in the material world. Thus, perceptual biases and interpretational errors are ubiquitous confounds.

Especially problematic, aside from Merlin's insistence that discarnate agency simply *a priori* exists within an empirical framework, is his extensive critique of the potential inaccuracies of the literature or aggregated variance used in our two prior analyses (Laythe & Houran, 2022; Rock et al., 2023). However, following his extensive discussion about appropriate evidence, data, and research, Merlin (2023) fine-tuned our calculus merely by dividing the variance explained in our LAP analysis in two; "Therefore, the effect size of LAP influence calculated by Rock et al. (2023) at 8.3% of the variance of ostensible survival-related phenomena should apply to both LAP and discarnate psi with equal probability" (p. 55). In other words, Merlin was unsatisfied with our choice and application of over 300 research articles for calculating data-driven estimates but has no problem himself "mandating" a specious split of the LAP variance due to personal theology. He indeed offered no evidence to rationalize why this metric aptly represented "discarnate psi."

This arbitrary split of a variance term contradicts Merlin's (2023) own extensive methodological critique of Rock et al. (2023). His approach would have been more beneficial if explicitly rooted in some evidence-based or mathematical reasoning. For instance, Merlin could

have quickly calculated an estimate by selecting mediumship studies or ADC studies with a discarnate agency component and then approximating an average effect size. Alternatively, he could have applied some methodological criteria to the studies used in Rock et al.'s (2023) LAP exercise to derive a "survival-based effect size." The basic math in Rock et al. is certainly simple enough for such calculations, for example:

$$D_{\text{percent}} = (\Sigma D (\sigma^2)/n) - \text{LAP}_{\text{estimate}} \quad (1)$$

Where (in all instances terms are converted to variance squared or percent):

- $D_{\text{percent}}$  = The converted effect size to percent or variance of the sum of discarnate agency studies.
- $D$  = "discarnate agency" studies.
- $\text{LAP}_{\text{estimate}}$  = the existing variance or percentage of Rock et al.'s (2023) estimate of LAP.

Or taking the second approach into account:

$$D_{\text{percent}} = ((\Sigma D + D_{\text{LAP}} (\sigma^2))/n) - (\text{LAP}_{\text{estimate}} - D_{\text{LAP}}) \quad (2)$$

Where: (in all instances terms are converted to variance squared or percent):

- $D_{\text{percent}}$  = The converted effect size to percent or variance of the sum of discarnate agency studies.
- $D$  = "discarnate agency" studies.
- $D_{\text{LAP}}$  = Studies from Rock et al. (2023) methodologically deemed due to discarnate agency.
- $\text{LAP}_{\text{estimate}}$  = the existing variance or percentage of Rock et al.'s (2023) estimate of LAP.

Readers (including Merlin) are welcome to critique these two derivatives, as we ourselves do not necessarily endorse them. Nonetheless, the above mathematic terms nicely illustrate how Merlin could have applied empiricism over rhetoric and thus avoided the kind of pseudomathematics that Friedman (2023) cautioned against. The outcomes of these or similar data-driven terms might possibly alter Rock et al.'s (2023) calculations or conclusions,

so we would challenge Merlin to carefully design and execute a detailed analysis.

As it stands, a MSoP approach to the survival question is less a comprehensive solution and more a theological or metaphysical "patchwork quilt" of four empirically unproven concepts including: (a) reservoir of psychic information, (b) psi ability in living people, (c) reality of discarnate agency, and (d) psi ability in discarnate agents. Combining all these components together neither makes any one of them more convincing, nor makes their confluence more likely or tenable. For these reasons, MSoP fails to elucidate the AEs considered by our *Drake-S* Equation. Despite its inherent flaws, we heartily encourage more research on the MSoP framework and especially efforts to refine its tenets and test related predictions without resorting to theology. Many (if not all) of the present authors would undoubtedly collaborate with any scientists if such a design could be developed and implemented. Indeed, our goal is to help move arguments about the survival question towards empiricism and evidence and away from rhetoric and belief.

### Assessing the "Observations" from the Commentaries

It was encouraging that the commentators endorsed some of our prior interpretations and forward-thinking proposals. Fundamentally, most thought that our probabilistic exercise inspired by Drake's (1961) quantitative approach to astrobiology was a novel way to seek new data-driven insights on the survival question. The commentators likewise agreed that more and better research in this domain was desirable and feasible. Indeed, the literature in this controversial area needs more empirical papers that pursue hypothesis-generation or hypothesis-confirmation.

Relatedly, parapsychology should thus generally benefit from Rock et al.'s (2023) finding that psi outcomes are best fostered or studied in "exceptional subjects" versus "typicals" from the general population. Experimental studies that draw on student or otherwise convenience populations could be counterproductive for advancing our knowledge of psi-related mechanisms, which has direct relevance to LAP interpretations of survival-

type evidence. That said, the reaction essays noted three new research opportunities that our papers (Laythe & Houran, 2022; Rock et al., 2023) did not overtly or fully address.

### **Consider Different Forms of Discarnate Agency**

Some commentators argued that discarnate agency might involve incorporeal beings like angels, demons, elemental spirits, or autonomous thought-forms like tulpas. Many religious and occult traditions certainly sympathize with this view (cf. Marathakis, 2012), but it does not generate obviously testable hypotheses or predictions that are relevant here. The bottom line is that the potential existence of such beings is subject to the same interpretation problems as survival, and more to the point, their existence would not necessarily imply human survival of biological death. Instead, more questions than answers stem from the myriad types of anomalous "entity encounter experiences" that people have reported under spontaneous, ritual, and experimentally-induced conditions (Evans, 1987; Houran, 2000; Hufford, 1982; Winkelman, 2018).

For instance, some studies suggest these experiences are largely narrative constructions that are mediated by thin mental boundary functioning (Drinkwater et al., 2022a; Kumar & Pekala, 2001; Laythe et al., 2018) and involve perceptual contents shaped by normative or sociocultural influences (Evans, 1987; Houran, 2000; Hufford, 1982). This view might imply that we are dealing with the byproducts of standard biopsychosocial processes. But recall that permeable mental boundaries also correlate with putative psi as measured by both survey and experimental outcomes (Thalbourne & Houran, 2003; Thalbourne & Storm, 2012; Ventola et al., 2019). From this perspective, entity encounters can be interpreted as expressions of LAP just as easily as evidence of imagination and cognition, or any form of discarnate agency.

All this presents a quandary about how to properly interpret and apply the prevalence rates of the different entity encounters. Their metrics could either bolster the AE category of "Veridical Anomalous Experiences" (*if attributed to postmortem survival*), or the KC categories of "LAP" (*if attributed to spontaneous or induced psi*), "Mental Illness" (*if attributed to clinical hallucinations or*

*delusions*), or "Perceptual Aberrations" (*if attributed to non-pathological alterations in experience*). Or perhaps entity encounters should be ignored altogether since other types of discarnate agents may not inform the possibility of postmortem survival for humans (*if attributed to angels, demons, elemental spirits, etc.*). And do not forget that the Simulation Argument (*if anomalies are attributed to an advanced computer program or hologram*) still lurks about as a highly viable alternative to these competing interpretations<sup>1</sup>.

Still, our current formulation accounts for limited types of encounter experiences primarily as VAEs by their inclusion in some of the rates for "general paranormal experiences" (cf. Laythe & Houran, 2022, p. 134) that we took from representative studies like Ross and Joshi (1992, p. 358, Table 1). In-depth analysis of other entity experiences or similarly diverse forms of discarnate agency could therefore give more precise estimates of some variables in our *Drake-S* Equation. That is, we think it is likely that various types of VAEs differ in their perceptual contents, sociocultural or religious context, and interpretational meaning. This line of research would inevitably lead to models that more accurately predict "what" is likely to occur with a particular type of VAE, but certainly not provide a proof or core mechanism of any of the anomalous characteristics inherent to these experiences. Of course, the primary benefit from this extra effort is likely to be better guidance on which survival-type experiences to allocate the most research resources in the future. Nonetheless, we anticipate that Rock et al.'s (2023) conclusion will be unscathed in that scientists must still face a sizable amount of survival-type data in need of a comprehensive, scientific explanation that is ostensibly absent.

Yet the broader point is well taken that some phenomena might deserve more attention than we gave. For instance, our estimated effect size of VAEs presumably might be bolstered by including the published incidence rates for Marian apparitions, i.e., individually- or collectively-perceived visions of the Virgin Mary (mother of Christ) (for an overview, see Maunder, 2016). This is a well-investigated and special variety of "veridical" encounter experience that arguably suggests discarnate agency with an



ostensibly once-living historical figure. But the details of the reporting statistics are unlikely to shift our current probability estimate for survival. Specifically, the University of Dayton's "Marian Library" (n.d., para. 8) explained in their online repository that during the twentieth century, there have been 386 cases of Marian apparitions. The Catholic Church has made "no decision" about the supernatural character regarding 299 of the 386 cases. The Church has made a "negative decision" about the supernatural character in seventy-nine of the 386 cases. Out of the 386 apparitions, the Church's critical inquiries that extended beyond a theological lens<sup>2</sup> concluded that "yes" there was a supernatural character only in *eight* cases<sup>3</sup>. However, other spontaneous cases of similarly vetted but varied apparitions, visions, possessions, or entity encounters might be researched, collated, and meta-analyzed to update the effect size for VAEs suggestive of survival. It remains to be determined how much a revised estimate might increase.

### Explore Insights from Measures of Implicit Psi

Simmonds-Moore (2023) suggested that the literature on "implicit (non-conscious) psi" might help to refine our ELAP metric. To reiterate, our *Drake-S* Equation arguably used data that was perhaps mostly limited to "explicit (conscious) psi." We thus used Google Scholar to search for meta-analyses related to "implicit psi" per Simmonds-Moore's (2023) definition. The goal was to determine whether any reported effect sizes in this context exceeded our proposed ELAP metric and so warrant an updated *Drake-S* probability estimate.

We found two relevant meta-analyses on implicit psi that provided the following information: (a) Bem et al. (2016, fast-thinking studies,  $N = 89$  studies), with standardized effect size = 0.11, ( $r^2 = .003$ , approximately) 95% CI = .08 to .14; and (b) Duggan and Tressoldi (2018,  $N = 36$  studies), with standardized effect = .28, ( $r^2 = .02$ , approximately) 95 CI = .18 to .38. Interestingly, these results suggest that "implicit psi" did not outperform "explicit psi," as measured by our original ELAP variance coefficient ( $r^2$ ) of 0.083 (Rock et al., 2023). New research on implicit vs explicit forms of putative psi might eventually yield findings that shift this calculus, but immediately we have no compelling reason to alter our estimate of LAP.

### Carefully "Mind" the Human Dimension

Most essays noted the importance for scientists to support the role of transpersonal psychology in contextualizing survival-type experiences. Understanding the aftereffects of altered-anomalous experiences is a burgeoning area of study (Brett et al., 2014; Kennedy & Kanthamani, 1995; Laythe et al., 2021; Rabeyron, 2022; Roxburgh & Evenden, 2016), so we agree with those commentaries that called for continued explorations of the humanistic, social, and cultural aspects or implications of related beliefs and experiences. Moreover, the subsequent learnings could prove out Kennedy's (2004) idea that the purpose of psi is to draw attention to spiritual matters. This view might therefore predict that survival-type experiences will correlate positively with Friedman's (1981, 1983; cf. Pappas & Friedman, 2007) transpersonal cartography of self-expansiveness, consisting of "levels of expansion of the self-concept, reflecting aspects of temporal and spatial identity" (Rock et al., 2021a, p. 3). This topic could guide new research that encourages scientists, spiritual authorities, and clinical practitioners alike to rethink biological death and help others to productively deal with it.

That said, we would be remiss not to stress the serious ethical considerations that accompany therapeutic applications of these or other research findings pertinent to survival. For example, several methods—including *mirror-gazing* (Moody, 1992), *mental mediumship* (Beischel et al., 2014), and *technology-based immersive experiences* like AI simulations or holograms (Özdemir et al., 2021)—can intentionally induce or facilitate experiences of deceased individuals (and even pets) to comfort grieving families. The purveyors of these practices must be extra cautious about any unproven claims as to the mystical, spiritual, or otherwise parapsychological nature or implications of facilitated "survival" experiences (or even spontaneous cases). It is irresponsible to package theology as science, and further to actively or passively promote or reinforce afterlife beliefs in vulnerable populations by misconstruing empirical studies that, in fact, *do not* affirm the ontological reality of survival or discarnate agency. There certainly have been some troubling signs along these lines (see e.g., Beischel,

2023). Nevertheless, heeding a transpersonal view on survival-type experiences is not a purely humanistic stance and might lead to untapped opportunities for advancing studies of putative LAP.

As an example, one frequently reported consequence of entity encounters is a sense of "enchantment" (Houran et al., 2022). This denotes a complex arousal state involving absorption within a melee of "pleasant" ideations and emotions (e.g., excitement, surprise, awe, and wonder), simultaneously mixed with more "unpleasant" ideations and emotions (e.g., uneasiness, disorientation, tension, and unpredictability). This happens when an individual's normal waking experience is disrupted by a sudden, unexpected, or profound awareness that seeds a transformative feeling of connection to a "transcendent agency or ultimate reality" (Drinkwater et al., 2022b, p. 195). Moreover, evidence suggests that enchantment is a mental state that itself facilitates additional anomalous or exceptional human experiences (Lange & Houran, 2021). Maybe this is why percipients both within (e.g., Sutherland, 1989) and outside (e.g., Ouellet, 2015) survival contexts often report successive anomalous experiences. The idea of an "enchantment-psi" loop has certainly helped to develop experimental designs that (a) ostensibly elicit more reliable psi effects (Lange et al., in press) and (b) underscore the interactionist nature of some anomalous experiences, i.e., they involve "the right people in the right settings" (Laythe et al., 2018, p. 210). Thus, conducting psi tests with "exceptional subjects" who are in a state of enchantment might produce greatly enhanced outcomes that clarify principles related either to implicit vs explicit psi, or psi-functioning in general.

The empirical literature on interactionism and psi also includes findings that hint at *additive*, *compatible*, or *interactive* sources of LAP. Note that this premise might parallel (or redeem) aspects of the MSoP hypothesis. Illustratively, Lange and Houran used the Chinese book of divination known as the *I Ching* in a series of experiments (Houran & Lange, 2012; Lange & Houran, 2013) to study psi outcomes using pairs of experimental participants with High (H) and Low (L) scores on the Revised Transliminality Scale (Lange, Thalbourne

et al., 2000) and the Rasch version of Tobacyk's Revised Paranormal Belief Scale (Lange, Irwin, & Houran, 2000). This segmentation permitted four experimental groups composed of participant-pairs with HH, HL, LH, or LL psychometric profiles. Consistent with the concept of co-functioning psi, the HH group (both members of the participant-pair scored high on Transliminality and Paranormal Belief) showed significant psi effects, whereas the other test groups did not.

This suggests that a potentially successful tactic to amplify or compound LAP effects in future research would be testing "exceptional subjects" in pairs or groups (cf. "sitter-group" psychokinesis, see McClenon, 2019), as well as within psi-conducive ("enchanted") settings. To this point, and motivated by Simmonds-Moore's (2023) suggestion to consider situations or tasks that enhance psi effects, we re-examined our readily available research reports on interactionism in psi (i.e., Houran & Lange, 2012; Lange et al., in press; Lange & Houran, 2013) to infer a statistical "multiple" for our ELAP metric. This approach follows from the premise that our estimated upper bound limit of LAP might increase to some extent under supremely optimal conditions. We eventually concluded that this idea had merit but required more data to do it justice. However, this might be very interesting to pursue once enough studies on interactive (or co-functioning) psi are available for a meta-analysis.

### Conclusions from the MTS Applications

An MTS approach to the commentaries identified beneficial feedback to further contextualize our *Drake-S* Equation, but our attempts to apply the relevant inputs ultimately failed to shift Rock et al.'s (2023) main conclusions, at least in the *short-term* (cf. Table 1, last column). In particular, (a) the MSoP hypothesis did not convincingly equate to empirical operationalizations or observations, and Merlin's (2023) "corrected" probability estimate failed on conceptual and statistical grounds; (b) published meta-analyses on "implicit psi" did not report effect sizes that exceeded our current estimation of LAP; and (c) factoring in the prevalence rates of alternative forms of discarnate agency (like angels or demons) has already been done to some extent and a

quick examination of well-vetted Marian apparitions did not enhance our prior probability estimate of discarnate agency as measured by VAEs.

On the other hand, the mapping exercise provided suggestions that might lead to critical insights in the *longer-term*. For starters, the recommendation to determine the explanatory power of the KCs relative to specific AEs might better pinpoint those topics with the strongest evidential value to parapsychology. Also, the most productive and viable next steps in survival research could, funnily enough, involve the development of innovative methods for testing the "amplifiers" of putative LAP — which remains among the strongest KCs (in terms of relative effect size) that challenges a survivalist interpretation of certain AEs. And finally, the helpful albeit limited outcomes from this MTS analysis give us strong reason to think that a *fresh* and *expert* evaluation exercise of larger scale and scope could bring real advancements or even breakthroughs.

#### Level-Setting for Future Research

Although Rock et al.'s (2023) probabilistic analysis had important caveats, it was arguably an obvious and useful first step to corroborate whether there is even a mystery in need of an explanation. The empirical results we obtained thus compel our conclusion that blanket, superficial, and outright skeptical dismissals of survival-related experiences are uninformed and misguided. That said, we have also seen scientifically problematic claims made online that postmortem survival has been "*established beyond a reasonable doubt*"<sup>4</sup> by a special essay contest on the best evidence sponsored by the Bigelow Institute of Consciousness Studies (BICS) (Kelleher & Bigelow, 2022). We think instead that this contest's outcomes mainly served to highlight the enduring conceptual and methodological challenges which have prevented better scientific conclusions in this domain (cf. Augustine, 2022a, 2022b, 2022c; Braude et al., 2022; Nahm, 2022; Tressoldi et al., 2022). Thus, to reiterate our own position statement for readers—i.e., we contend that (a) the survival literature undeniably documents some empirical anomalies still in need of clear and convincing scientific explanation(s), (b) this circumstance *per se* does not necessarily affirm

the reality of postmortem survival, and thus (c) specific explanatory hypotheses must be identified and comprehensively tested to make meaningful progress on the issue.

Accordingly, we propose the creation of a *solution-focused* (McKergow, 2011) and *cross-disciplinary* (Houran, 2022) work group to critically evaluate the best available information and data in this domain (Tressoldi et al., 2022) against the most current and robust models of consciousness, and by extension, consider whether the ideas of physicalism and trans-physicalism can be reasonably subsumed within a common framework (see e.g., Klauber, 2000; Walker, 2000). The specific goals would be (a) to formulate clear hypotheses, and (b) to develop corresponding pre-registered protocols and innovative assessment methods to test those hypotheses (cf. LeBel et al., 2022). The outputs should include study designs that aim to (a) *confirm* predictions consistent with survivalist models, and (b) *disconfirm* extinctionist explanations for any positive results obtained. Also, a supplementary team of experts on the survival literature could lessen the work group's learning curve on foundational material via an exchange and cooperation effort that informs or clarifies questions, as needed, about existing methods or models.

Sufficient time and funding are obviously essential to implement this plan and conduct any follow-up research. Still, Sturrock et al.'s (1998) workshop on the UFO/UAP phenomenon and LeBel et al.'s (2022) collaboration on a pre-registered design for robustly testing mental mediumship both well illustrate the feasibility and efficacy of a consultative team approach in frontier science. It is vital for any such endeavor to be grounded in genuinely scientific exploration and analysis rather than involve biased aims or evaluations as arguably occurred with the BICS contest (Augustine, 2022a; Mayer, 2021; Tressoldi et al., 2022). We also think that this work group should "move at the speed of science" and thus include leading representatives from the fields of *neurology* (e.g., Zhao et al., 2019), *computer science* and *artificial intelligence* (e.g., Blum & Blum, 2021), *philosophy* (e.g., Sudduth, 2016), *quantum processes* (e.g., Hameroff & Penrose, 2014), and *measurement and data modeling* (e.g., Lange, 2017).

Finally, much available literature provides handy guidance for structuring the approach and activities of this proposed work group, as well as selecting the most suitable contributors (e.g., Coulter et al., 2016).

### General Discussion

So, where do we "go" from here? Existentially speaking, we as scientists cannot confidently say at this point. But intellectually speaking, an MTS approach to the invited Commentaries helped to identify several potentially fruitful lines of new thinking and research on the survival question. Namely, it is clear that more research is needed on (a) implicit vs explicit measures of psi, (b) potentially multiple and co-functioning sources of psi, (c) more precise estimates of the evidentiary strength of each AE category relative to the KCs, (d) meaningful empirical measures of alternative forms of discarnate agency that may have greater evidential value; and (e) the nature and degree of influence of biopsychosocial aftereffects of survival-type experiences, as well as how these might influence subsequent psi-functioning.

Such pursuits are arguably justified on several grounds. Most obviously, there is an important behavioral phenomenon at play with strong transpersonal connotations. Ross and Joshi (1992) even argued that paranormal (including survival-type) experiences "...are so common in the general population that no theory of normal psychology or psychopathology which does not take them into account can be comprehensive" (p. 360). Thus, the broad scientific community should acknowledge and engage with these anomalous phenomena rather than turn a blind eye via apathy or efforts to prematurely rationalize them away.

At the very least, it is worth examining these experiences for their profound influence on well-being, religiosity, meaning-making, and other clinical or sociocultural outcomes. But studies of survival-type anomalies are also likely to inform standard theory and practice across both the psychological and biomedical sciences (see e.g., Cardeña et al., 2014, 2017; Denis, French, & Gregory, 2018; Peters et al., 2016; Ross, Hartig, & McKay, 2017). For instance, altered-anomalous experiences in this context could refine our understanding of neurological

changes or abnormalities or other physiological processes (for an overview, see Martin & Augustine, 2015). Some spontaneous or induced mystical- or survival-type experiences certainly could stem from neurotransmitters or other chemical activities in the brain that influence mood or perception (e.g., Klemenc-Ketis et al., 2010; Martial et al., 2019; Persinger, 1983, 2001; Timmerman et al., 2018). Indeed, it is well known that certain psychedelic substances can induce exceptional human experiences involving perceptions of "expanded consciousness" or "contact with discarnate agents" (Luke, 2022). Other researchers have suggested that altered-anomalous experiences may be related to changes in physiological processes, such as brain waves, heart rate, blood pressure, or other biomarkers. As an example, ecstatic epileptic seizures (including epileptic auras) are often associated with intensified sensory experiences, enhanced self-awareness, and feelings of godly bliss (Gschwind & Picard, 2016).

Two other relevant lines of research and theory to pursue include *autohypnotic phenomena* (Eason & Parris, 2019) or *enhanced capabilities* (Vicente et al., 2022) linked to spontaneous altered states, physical crisis, or end-of-life experiences. Rock et al. (2023) only briefly touched on these ideas, but here we are talking about a range of subjects that include memory functioning at its limits (Wade, 2023), arcane imagery (Tungjitcharoen & Berntsen, 2022), dissociative experience (Wahbeh & Radin, 2017) and other types of "self and identity" aberrations (Cunningham, 2022), syncretic cognitions (Houran et al., 2017a), or the sudden occurrence of "rebounded or expanded" awareness as with terminal lucidity (Nahm et al., 2012). Terminal lucidity is a medical term that refers to a period of increased mental clarity and alertness during the dying process. It can last minutes, hours, and even days. It is commonly thought of as occurring within a week or a day of death but has been documented as occurring within the last month. Beyond these sensation and perception capabilities, all the topics noted above arguably relate to spirituality in the context of biopsychosocial health (e.g., Johnson & Friedman, 2008; Koenig, 2012; Park et al., 2017).

Finally, we suspect that survival-type experiences have important implications for the construct



of self-expansiveness ("expanded consciousness") and its role in parapsychology and broader consciousness studies (Evans et al., 2019; Pappas, 2004; Pappas & Friedman, 2012; Rock & Storm, 2012; Rock et al., 2021a). Continued research in this domain could thus uncover or verify aberrant influences or mechanisms that lead to paradigm shifts in science. Much empirical data suggests the possibility of psi (Cardeña, 2018; Parker & Brusewitz, 2003; Vernon, 2021), but parapsychological aspects to some or all purported survival evidence have yet to be unequivocally established or demonstrated. Therefore, this tantalizing prospect continues to brew heated controversy and debate.

However, the present exchange shows that conversations neither need be contentious nor unscientific. We agree with the commentators who noted that some or all the anomalous experiences considered by our *Drake-S* analyses (Laythe & Houran, 2022; Rock et al., 2023) may not index survival or any form of discarnate agency. In fact, it seems probable to us that the array of survival "evidence" comprises an unresolved constellation of distinct or interrelated biopsychosocial phenomena and some of which could rewrite the idea of consciousness as an emergent property of mere neurological activity (e.g., Wahbeh et al., 2022). These accounts thus certainly shed an important light on the nature or limits of human consciousness. Exactly *what* those learnings are must still be fleshed out, so we strongly encourage new and rigorous pursuits by frontier scientists who reject ideological zeal and instead responsibly follow the empirical evidence wherever it leads.

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### Notes

1. To clarify, Bostrom's (2003) simulation "argument" involves three hypotheses describing

the large-scale structure of reality, with each being mutually exclusive and jointly exhaustive. One of the hypotheses is that we are living in a computer simulation; the other two spell out two non-simulation scenarios. Bostrom is wary about assigning probabilities to these hypotheses, but is willing to acknowledge that at present we should distribute out credence equally between each of them, so roughly afford each a probability of .33, but since two are non-simulation scenarios each have a probability of .33 and are independent of each other, this implies that it is more likely than not that we are "not" living in a simulation; the probability that we are within a simulation would be, given present evidence, about .33 (Bostrom, 2003, p. 255). Of course, new evidence might modify the initial probability distribution. Also, Bostrom is clear about his underlying assumptions, one of which is "substrate independence." Sudduth (personal comm to J. Houran, 3 April 2023) noted that it is precisely this kind of clarity that is missing from most papers on the survival hypothesis. Similarly, Chalmers (2022, p. 101) considered Bostrom's argument and similar ones and ultimately concluded, with a few caveats, that the probability that we are in a simulation is about 25%.

2. The Vatican (2012) most recently published an English translation of its 1978 "Norms regarding the discernment of apparitions." The Congregation for the Doctrine of Faith made these Norms public on December 14, 2011. Until then these were available to Bishops only.
3. These cases are: Fatima (Portugal), Beauraing (Belgium), Banneux (Belgium), Akita (Japan), Syracuse (Italy), Zeitoun (Egypt), Manila (Philippines) (according to some sources), and Betania (Venezuela).
4. For example, the BICS website (<https://bit.ly/3F3JiKr>) boldly states that "After a massive international response judged by a panel of outstanding experts, the 2021 Bigelow Institute for Consciousness Studies (BICS) essay contest ("The Contest") established that there is evidence beyond reasonable doubt for the survival of consciousness after permanent physical death

("life after death," or "the afterlife")" (accessed 01 March 2023). Similarly, Tymn (2023) asserted that "the legal doctrine of Res Judicata, meaning 'it has already been decided,' should be applied to the cumulative [survival] evidence gathered between 1850 and 1900, and therefore should not require another legal action. Case closed!" (para. 1).

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**Appendix. Recommended Reading List for a Balanced Primer on the Survival Hypothesis.**

Reference	Article Type <sup>a</sup>	Discipline	Ideology/ Conclusion <sup>b</sup>
Augustine (2022a)	PA	Philosophy	Extinctionist
Augustine (2022b)	PA	Philosophy	Extinctionist
Beischel & Rock (2009)	NR	Parapsychology	Neutralist
Braude (2003)	PA	Philosophy	Survivalist
Braude (2014)	PA	Philosophy	Survivalist
Braude et al. (2022)	PA	Philosophy/Parapsychology	Survivalist/Neutralist
Fontana (2005)	NR	Parapsychology	Survivalist
Gauld (1982)	NR	Parapsychology	Neutralist
Jamieson & Rock (2014)	EP	Neuroscience	Neutralist
Klauber (2000)	PA	Physics	Survivalist/Neutralist
LeBel et al. (2022)	EP	Parapsychology	Extinctionist/Neutralist
Martin & Augustine (2015)	NR	Neuroscience/Philosophy	Extinctionist/ Neutralist
Merlin (2020b)	PA	Philosophy/Parapsychology	Survivalist/Neutralist
Merlin (2020c)	PA	Philosophy/Parapsychology	Survivalist/Neutralist
Rock (2014)	NR	Philosophy/Parapsychology	Neutralist
Rock et al. (2021b)	MA	Parapsychology	Extinctionist/Neutralist
Rock & Storm (2015)	EP	Parapsychology	Neutralist
Saraff et al. (2021)	MA	Parapsychology	Survivalist/Neutralist
Storm & Thalbourne (2006)	NR	Philosophy/Parapsychology	Survivalist
Sudduth (2009)	PA	Philosophy	Neutralist
Sudduth (2014)	PA	Philosophy	Neutralist
Sudduth (2016)	PA	Philosophy	Neutralist

a. EP = experimental protocol; MA = meta-analysis; NR = non-systematic review; PA - philosophical analysis.

b. **Survivalist:** believes that, probabilistically (i.e., based on the most rigorous scientific methodological and philosophical advances), a survival source provides the best explanation of, for example, ostensible mediumship; **Neutralist:** believes that, probabilistically, neither survival or non-survival sources provide the best explanation of, for example, ostensible mediumship; and **Extinctionist:** believes that, probabilistically, a non-survival source or combination of non-survival sources (e.g., living agent psi, the psychic reservoir) provides the best explanation of, for example, ostensible mediumship.

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