Requiem for the Dead Man Test?

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Published online: 21 November 2016

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Abstract A popular measurement heuristic called the “Dead Man Test” predicts that behavior will be absent in vitality-challenged individuals. Unfortunately, the core idea behind the Test lacks empirical support, is hopelessly vague on several counts, and may be at odds with key aspects of behavior theory. This raises serious concerns about whether the Test should continue to be employed as a guide to behavioral measurement.

Keywords Behavioral assessment · Measurement · Experimental design · Dead Man Test · Behavioral thanatology

Quite possibly, the most foundational concept in behavioral measurement involves distinguishing behavior from things that are not behavior. This may not sound like the most pernicious of challenges until it is recognized that, throughout history, people interested in problems of behavior have shown an astonishing capacity to direct their efforts toward things that are *not* behavior¹ (e.g., Boring, 1953; Bruner & Feldman, 1990; Chomsky, 1965; Freud, 1900; Modrak, 2009; Rouleau, Karbowski, & Persinger, 2016; Stephens, 1998; Winett & Winkler, 1972). As a simple heuristic for addressing this problem, Ogden Lindsley (e.g., 1991) developed the now-ubiquitous Dead Man Test (DMT), which asserts that nothing a deceased person can do qualifies as behavior.² Even a generation ago, Lindsley could claim that the DMT “has been used successfully

¹At least not in the sense of Skinner’s (1938) objective definition: “the movement of an organism or of its parts in a frame of reference provided by the organism itself or by various external objects or fields” (p. 6).

²Lindsley (1991) recalled devising the test in 1965 while concerned about the target behaviors that school personnel were selecting for behavior management interventions: “If a dead boy could do it, it wasn’t behavior; we should not spend valuable school funds teaching children to play dead” (p. 457).

Portions of this article are based on the following non-copyrighted report: Critchfield, T.S., & Shue, E.Z.H. (in press). The Dead Man Test: A preliminary experimental analysis. *Experimental Analysis of Human Behavior Bulletin*.

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by a large number of applied practitioners. So many, in fact, that... credit for its origins are no longer cited” (p. 457). Today, the DMT is described in popular applied behavior analysis textbooks (e.g., Cooper, Heron, & Heward, 2007; Malott & Trojan Suarez, 2004) and is even employed by people who do not embrace other contributions of behavior analysis. For example, at my university, a cognitive developmental colleague relies on the DMT every semester to teach hundreds of pre-service teachers how to pinpoint behaviors and a recent Google Books search (September 24, 2016) revealed over two dozen volumes, representing a broad spectrum of human service professions, that describe and endorse the DMT.

Science cannot advance without periodically subjecting cherished concepts to critical inspection (Critchfield, 2014), and in view of the popularity of the DMT, it is disturbing that the peer reviewed literature apparently contains no empirical evaluation of its central claim that only living organisms may emit behavior (though see Critchfield & Shue, *in press*). There could be two reasons for this grave oversight. First, the DMT is discussed mostly in conjunction with *applied* behavior analysis, which was intended to address “socially important” problems (Baer, Wolf, & Risley, 1968, p. 91, 92, 96). For better or worse, “importance” tends to be defined by the interests of living persons who create the social order (e.g., see Kazdin, 1999, Skinner, 1987; Wolf, 1978), so it is not surprising to find little research that focuses on other kinds of individuals.

Second, as originally conceived, the DMT is an untestable tautology.³ It equates *behavior* with *being alive* and therefore precludes the labeling of anything a deceased person might do as *behavior*. Scholarly interpretations of the DMT have attempted to circumvent this tautology by providing face-valid examples of actions that are performed frequently by at least some living persons and, presumably, can be generally agreed upon as *behaviors*—for instance, “Bobbie’s crossing his legs” (Malott & Trojan Suarez, 2004, p. 9); “yelling Whoa!” (Cooper et al., 2007, p. 26); and “smoking” [cigarettes] (Forsyth & Sheppard, 2008, p. 262). This suggests that the DMT could be evaluated partly by assessing the frequency with which deceased individuals perform such face-valid actions. Although studies have detected operant behavior in persons who lack consciousness (e.g., Fuller, 1949) and even in neurons that have been separated from a living body (Stein & Beluzzi, 1988), apparently no published study has undertaken the required analysis.

Affirming the Null Hypothesis

Contexts of Observation

Such an analysis would be no simple undertaking because the DMT is also a Null Hypothesis. It predicts that behaviors seen in living individuals will not be seen in deceased ones, and Null Hypotheses are notoriously difficult to affirm (e.g., Blackwelder, 1982; Sedlmeier & Gigerenzer, 1989; Streiner, 2003; Susser, 1986). A key reason is that predicted negative results can be an artifact of how observations are

³ This is an extremely serious matter given that unfalsifiable claims are one of the hallmarks of pseudoscience (Normand, 2008).

structured. A thorough discussion of this problem is beyond the scope of the present article but several illustrative issues are mentioned briefly below.

To begin with, there is never a guarantee that observations have been scheduled when and where a phenomenon of interest might occur. Should observations of deceased individuals fail to reveal behaviors expected of living individuals, this does not necessarily mean that behavior is absent in such individuals. Consider, for example, that living persons, in several different recurring conditions (e.g., *sleeping*, *daydreaming*, and *binge watching*) may remain motionless for lengthy periods, only to emit considerable amounts of behavior afterward. If something similar holds for the deceased, then brief studies are inadequate and very extended observations may be needed to detect behavior. Similarly, living and deceased individuals tend to be encountered under very different circumstances, making it is impossible to rule out situational artifacts as the cause of any observed behavioral differences. Imagine, for instance, that observations of deceased persons are undertaken in a convenient field location, perhaps a public institution (like a museum) where deceased individuals are displayed (e.g., in glass cases) for educational purposes (see Critchfield & Shue, [in press](#)). An absence of behavior, though consistent with the DMT, would be uninformative without a demonstration that living individuals emit the behaviors of interest under the same conditions (e.g., Fig. 1). To my knowledge, relevant data are unavailable and significant practical challenges can be imagined to arranging the needed observations.

This suggests that the DMT might be better evaluated in laboratory studies. Unfortunately, current best practices for volunteer recruitment in the experimental analysis of human behavior do not include provisions for soliciting the type of participant that the present topic demands (e.g., Pilgrim, 1998) and scientists in other fields report difficulties in finding enough such individuals to study (Agthong & Wiwanitkit, 2002). The financial resources required to line up participants (Becker & Elias, 2007) may be considerably larger than behavioral researchers are accustomed to providing and, unlike in behavioral research with living participants, may run afoul of various legal statutes (<http://hbswk.hbs.edu/item/a-market-for-human-cadavers-in-all-but-name>). Non-monetary means of securing participants (e.g., Fig. 2), though long practiced, have not gained wide social acceptance (Dickey, 2010).

Participant Considerations

To whom, exactly, is the central tenet of the DMT predicted to apply? Because the phrase “Dead *Man*” implies relevance only to adult males, Lindsley (1991) suggested the more inclusive Dead *Person* Test, although this terminological revision implies a level of inter-gender generality that has not yet been empirically demonstrated. One assumes, but cannot be certain, that Lindsley did not intend the Test to be specific to *homo sapiens*, in which case inter-species generality might be telegraphed through a label like Dead *Organism* Test. Yet this could be too broad if behavior dynamics prove to vary across deceased species.⁴ At the risk of appearing to minimize the importance of

⁴ Consider, for instance, the proverbial chicken running around with its head cut off, or scientific data on the continued activity of decapitated cockroaches (Choi, 2007).

Fig. 1 Standardized conditions of observation. Living and deceased participants occupy identical spaces modeled after those in which deceased individuals often are displayed by educational institutions. Shown for illustrative purposes is an intervention described by Critchfield and Shue ([in press](#)) in which, to prompt behavior, the experimenter periodically knocks thrice on the display case and calls the participant's name. Mummy image used by permission of Florida Center for Instructional Technology

Fig. 2 An effective but questionable technique for procuring participants. Public domain image of Viktor Vasnetsov's *Grave Digger* (1871). Original in Moscow's Tretyakov Gallery

these uncertainties, for economy of expression, I shall continue to use Lindsley's (1991) original label for the Test.

Even within a species, not all deceased individuals will be physically identical and this could influence behavior potentialities. For instance, in conjunction with dying, some individuals experience the loss or incapacitation of selected body parts (e.g., McFarlane, 2014). Thus, for the same reason that pigs, even with intensive instruction, do not fly, some deceased individuals may be unable to perform behaviors of experimental interest, though not because they are deceased per se. A less obvious possible constraint is created by the fact that many deceased individuals are available for observation because they have been chemically preserved. Embalming techniques (e.g., Arriaza, 1995) have varied considerably across eras and locales, and it is known that various chemicals exert highly complex effects on the central nervous system (Byrne & Poling, 2000; Weiss, 2012). For this reason, it is currently impossible to predict how any particular preservation process might interact with behavior dynamics. Therefore, in evaluating the DMT, it may be useful to focus on individuals who are deceased but not chemically preserved, although this could place severe limits on study duration, which I have already identified as a concern. Cryogenic methods (<http://www.cbsnews.com/news/ted-williams-frozen-in-two-pieces/>) are not a viable alternative because hypothermia is known to inhibit behavior (e.g., Andjus, Knöpfelmacher, Russell, & Smith, 1956). More promising, perhaps, is the natural process of desiccation that created the early Chinchorro mummies of South America (Arriaza, 1995). The overall point, however, is that based on the current state of knowledge, negative findings with one deceased individual are not necessarily generalizable to others.

Unwrapping the Dead Man: Conceptual Uncertainties

All research requires precise definition of variables, so in order to informatively compare repertoires of the living and the deceased, a clear definition is needed of the factor that supposedly demarcates these two categories of individuals. In medical terms, *death* is operationalized as a cessation of either brain or cardiopulmonary functions, though medical professionals vary considerably in terms of which standard they apply and of how consistently they apply a given standard (Pelegrino, 2008).⁵ Thus, there would seem to be no guarantee that any two individuals who have been categorized as *deceased* will exhibit precisely the same characteristics.

And some individuals appear to defy categorization. For example, persons who have been declared dead in terms of either brain or cardiopulmonary function may be kept “alive” with machine assistance (Gorvett, 2016); just how they would be treated for purposes of evaluating the DMT is unclear. Then there is the complication of legal definitions of *death*, which do not always invoke physical symptoms. For example, an individual who has been missing for a length of time can be pronounced legally dead without medical examination. A formidable philosophical question thus arises about whether, according to Lindsley's guideline, such a person, if located, would be expected

⁵ This poor reliability may be illustrated by the detection, through functional magnetic resonance imaging technology, of apparent neural activity in an Atlantic salmon that had been diagnosed as *deceased* (Bennett, Baird, Miller, & Wolford, 2011).

to emit behavior. Even less certain is the status of “undead” individuals who are “not quite dead but not fully alive” (Oxford English Dictionary; <http://www.oed.com>)—or, in terms more palatable to the behavior analyst,— “are deceased but behave as if alive” (<https://en.wikipedia.org/wiki/Undead>).⁶ These individuals have been speculated to possess nervous system functions at least partially similar to those of living humans (e.g., Verstynen & Voytek, 2014) and, perhaps not surprisingly, anecdotal reports suggest that they may emit a considerable amount of behavior (e.g., Brooks, 2003). The take-home message should be clear: Until medical science can reliably determine who is *deceased*, behavior scientists have little hope of unambiguously ascertaining whether unique behavior dynamics may exist for this category of individuals.

Earlier, I suggested that evaluating the DMT requires not only studying behavior in deceased individuals but also parallel observations in living ones. Thus, a proper evaluation of the DMT would appear to demand two groups of participants, some living (who are expected to emit certain behaviors) and some deceased (who are not expected to emit the same behaviors). Experts on behavioral research methodology have pointed out that the group-comparison research strategy implies a belief in fixed behavioral characteristics (“traits;” e.g., Galton, 1894) that differ across types of individuals (see Johnston & Pennypacker, 1981; Sidman, 1960). By contrast, behavior analysts normally start by assuming that variability in behavior is imposed by historical and current experiences (e.g., Skinner, 1966) rather than intrinsic. Thus, the most troubling revelation of the present discussion is that the DMT, at its core, may be an expression of trait psychology.

As Sidman (1960) has so cogently explained, “individual differences” can *seem* dispositional because of limitations of the very group-comparison designs that are used to study them. One problem involves cursory measurement. Repeated observations, which can be impractical with a large *N*, are useful because the effects of pre-experimental histories (which can differ across individuals but do not constitute “traits”) may persist after an experiment has begun. Steady-state, single-subject methods permit observations to continue until historical influences dissipate. It should be mentioned, however, that the persistence of history effects may correlate with the duration of the history (e.g., Tatham & Wanchisen, 1998), and the histories of some deceased individuals are far longer than what is normally encountered in living subjects. This makes it difficult to predict the generality of the behavioral history literature to deceased individuals.

Another problem with group-comparison experiments is that they discourage within-experiment modification of design. Sidman (1960) identified nonresponders (participants who fail to show an expected effect) as an occasion for using this strategy. Specifically, although nonresponders might be thought to provide evidence of qualitatively different functional relations (e.g., some individuals are affected by a given variable, while others are not), careful investigation may reveal that they differ only quantitatively. Figure 3 shows a hypothetical example in which, for both of two types of individuals (living versus deceased), behavior frequency relates positively to the magnitude of an independent variable, though at different scales of effect. An experiment employing only Level 1 of the independent variable would indicate that living

⁶ Hypothesized categories include but are not limited to zombies, ghosts, golems, vampires, and psychological theories whose popularity is not attenuated by contrary evidence (Ferguson & Heene, 2012).

Fig. 3 Hypothetical case of quantitative differences in similarly—shaped dose—response functions. *Triangles* labeled 1 and 2 represent experimental conditions defined by different magnitudes of an independent variable. Based on Sidman (1960, Fig. 15)

individuals emit behavior but deceased ones do not. At Level 2 of the independent variable, however, deceased individuals would exhibit behavior, albeit at a lower frequency than living ones. Fortunately, when negative results are encountered, single-subject designs can readily accommodate new conditions in which the independent variable is strengthened. By contrast, in large-*N* experiments, any design modifications must be applied to all participants, functionally precluding the inductive search for order that is the hallmark of single-subject research (Skinner, 1956).

Based on the preceding, it seems essential to step outside of a group-comparison framework to conduct single-subject evaluations of the DMT. Specifically, experiments in which a single individual toggles between states of being *alive* and *deceased* would overcome many of the methodological problems that have been discussed. Technologies that transition an individual from *living* to *deceased* (e.g., McFarlane, 2014) are more numerous and reliable, than those for transitioning in the opposite direction (Eisenberg, 2005), but nevertheless rigorous experiments can be imagined that compare behavior rates for the same individual in different states (e.g., Fig. 4). Though such experiments would raise particular ethical concerns, this is often true of

Fig. 4 Model for an ABAB single—subject investigation of the dead man test. Pictorial condition labels represent EKG readings for *living* and *deceased*. Using technology described by Shelley (1818), it might be possible to reverse the order of conditions

innovative research (e.g., Lanphier, Urnov, Haecker, Werner, & Smolenski, 2015) and progress demands achieving a balance between the quest for knowledge and basic standards of decency.

Conclusions

To summarize, Lindsley's (1991) DMT implies that no evidence will be found, in individuals who give every indication of being *deceased*, of actions that reasonably can be called *behaviors* and that are performed by living persons under identical circumstances. Unfortunately, despite (or perhaps because of) its popularity, the DMT has gone unquestioned for more than 50 years since Lindsley first developed it. I have argued elsewhere (Critchfield, 2014) that one of the most important exercises in science is to subject consensus "truths" to skeptical analysis because, in the words of essayist G.K. Chesterton (1923), "There are only two kinds of people, those who accept dogmas and know it, and those who accept dogmas and don't know it" (p. 86). Recognizing and questioning dogmas allow a field to gain clarity about what it believes and why.

The present discussion focused on how the DMT might be empirically validated and, toward this end, on parsing out what it actually claims. This in turn exposed the DMT as hopelessly vague in several respects and, far worse, as a likely instance of trait psychology—with the latter rendering the DMT inconsistent with many core philosophical and methodological precepts of behavior analysis. Difficult questions follow about whether a practice that violates so many of our field's defining ideas can possibly be useful, no matter what Lindsley (1991) and others say about its value to "a large number of... practitioners" (p. 457).⁷ Indeed, whatever the DMT contributes by lending precision to the process of pinpointing target behaviors may be outweighed by the malignant ideas that it spreads about the control of behavior. Sidman (1960) explained how the tautology of trait-based accounts provides a false sense of understanding that dampens curiosity about situational controlling variables and, therefore, is at odds with the inquisitive spirit that historically has guided the analysis of behavior (e.g., Skinner, 1956). Evidence of this may be seen in the five full decades that have elapsed, since the DMT was first devised, without any empirical examination of its claims. The present essay does not quite sound the DMT's death knell, because I have noted that yet-to-be conducted single-subject research might resurrect the DMT by grounding it more firmly in behavior theory. But until the specter of trait psychology is exorcized from the DMT I see no alternative to a moratorium on its use, because there can be no defense of a practice that, in its current form, is a grim perversion of much that is good about behavior analysis.

Compliance with Ethical Standards

Ethical Considerations Ethical oversight: The work does not describe primary research by the author involving either human participants or vertebrate animal subjects and therefore is not subject to oversight by a research ethics committee.

⁷ A common feature of pseudoscience is presenting as "evidence" an idea's endorsement by a famous "expert" (Hines, 1993). Lindsley certainly qualifies as an expert on applied behavioral measurement but his endorsement of the DMT does not make it valid.

Conflict of Interest The author declares that he has no conflict of interest.

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