Reply to Dougherty: On Measuring Content Diversity in the Experimental Analysis of Human Behavior

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Dougherty (this issue) has thoughtfully examined our contention (Hyten & Reilly, 1992) that the experimental analysis of human behavior (EAHB) is healthy and growing rapidly. However, his data on the number of papers in nine content areas suggest that the recent growth has been in only selected areas. We agree that some content areas (e.g., stimulus equivalence) have dominated recent EAHB work, but we feel compelled to comment on the analysis of content diversity in EAHB.

Dougherty used data from a topical bibliography (Dougherty, Nedelmann, & Alfred, 1993) that classified articles into the nine content areas that were originally outlined by Buskist and Miller (1982a, 1982b) in their topical bibliography. Data compiled from these bibliographies show what appears to be a wide gap between the most investigated topic areas and the least (Dougherty's Figure 3), and that growth in the last decade has occurred in only three of the nine content areas (his Figure 4). However, we believe that the classification scheme itself may not accurately reflect the content diversity within EAHB.

For example, the classification scheme mixes narrow content areas such as "continuously programmed environments" with broader categories such as "reinforcement." The top three areas represented in Dougherty's Figure 3 (reinforcement, stimulus control, and general schedule performance) are all more generic than the three lowest content areas, which are more restricted in their content (programmed environments, coopera-

tive behavior, verbal behavior). In fact, because articles were placed into more than one content area if they contained the relevant elements, the lower "specialty" areas contribute to the more generic areas at the top because they often include some generic element such as reinforcement schedules. Fully 95% (20 of 21) of the *Journal of the Experimental Analysis of Behavior* (*JEAB*) articles in the "instructions" content area of the Dougherty et al. (1993) bibliography are duplicated in at least one of the top three areas, and some are duplicated in more than one of the areas. Even the "choice and preference" area contributed 39% (7 of 18) of its articles to the totals of at least one of the top three areas.

There is also duplication of articles within these three top areas; some of the same behavioral pharmacology articles are listed in both the "reinforcement" area and the "general schedule performance" area. This duplication means that the runaway growth in the top three areas (and hence the gap between them and the less researched topics) is exaggerated, because some of that growth is comprised of the articles from the other areas. Counting articles in more than one content area is useful in a topical bibliography (it provides cross-referencing capability), but it creates interpretation problems when used to quantify content diversity. A classification scheme that used mutually exclusive content categories would prevent this problem, although classifying articles in this way would be a very difficult process.

Is it appropriate to continue the use of Buskist and Miller's nine content areas as descriptors of EAHB research? These areas may have been useful a decade ago in a bibliography, but should they be used forever after? We think not. Some of these

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content areas are questionable as areas, especially after 10 years have passed. Do "continuously programmed environments" really deserve a category by itself (and a decreasing one at that) on a par with "stimulus control"? Other areas need definitional refinement. The "cooperative behavior" area includes certain social phenomena (such as competition and trust) but excludes others (such as aggression). If the category were broadened to be called "social behavior," it would include articles on aggression (there were several of these listed by Dougherty et al., 1993, under the category "aversive control of behavior"). It would still be a small area, no doubt because this area lost a major contributor when Don Hake died in 1982.

The classification scheme also masks some diversity in EAHB. For example, the top three areas contain more subcategories than the other areas do. The "reinforcement" category, for instance, includes 16 subcategories in Dougherty et al. (1993). Embedded (and obscured, we feel) in that content area is the growing topic of human behavioral pharmacology. In Dougherty et al.'s bibliography, human behavioral pharmacology accounts for more total articles in the last decade than the areas of "continuously programmed environments" and "cooperative behavior" combined. Subtle but significant shifts within a category are also not revealed. Over half of the articles in the "choice and preference" category in the last 10 years have been about the kind of choice called self-control; in Buskist and Miller's (1982b) bibliography, almost all of the choice articles were about behavior allocation in standard concurrent choice situations.

And what of the "verbal behavior" area? This area (which shows up as a no-growth area in Dougherty's Figure 4) now has its own dedicated journal, The Analysis of Verbal Behavior, which has been publishing EAHB articles at a healthy rate in the last few years. The appearance of this journal simply highlights the fact that using JEAB as the sole indicator of the state of EAHB underestimates the amount and range of EAHB work cur-

rently being done. We also used only JEAB articles in Hyten and Reilly (1992), but this insured that our optimistic assessment of the state of EAHB was deliberately conservative as well.

Has the scope of EAHB narrowed? We think that the use of Buskist and Miller's (1982a, 1982b) content classification scheme makes the scope seem narrower than it is. A classification scheme with different categories might show relatively more diversity and thus "health." Whether a field's scope has narrowed is debatable, but no one could deny that in any given span of time, certain research areas are more popular than others. Should we be concerned by the fact that stimulus equivalence is currently receiving more EAHB attention than other areas? Yes, it is worth some degree of concern; the ideal situation would be one in which many content areas are equally represented, but scientists are no less inclined than the general public to jump on a bandwagon. What is popular now may be replaced by another area in the next decade.

Perhaps there are other issues worthy of more concern. Dougherty provides some very interesting data showing that EAHB has been attracting new authors into the JEAB publication stream. That is good news, but do we have enough people entering and staying in the field to keep it healthy and growing? That is an issue that may determine both the diversity of topics studied in EAHB as well as the survival of the discipline.

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