

genic Risk of Chemicals to Humans, Tobacco Smoking, vol. 38 (International Agency for Research on Cancer, Lyon, France, 1986), vol. 38.

3. J. Gillette *et al.*, *Clin. Toxicol.* 23, 1 (1985).
4. J. H. Weisburger and E. K. Weisburger, in *Methods in Cancer Research*, H. Busch, Ed. (Academic Press, New York, 1967), pp. 307-399.
5. R. R. Maronpot *et al.* *Arch. Toxicol.* 10 (suppl. 10) (1987).
6. S. H. Reynolds *et al.* *Science*, 237, 1307 (1987).
7. B. Armstrong, *Int. J. Epidemiol.* 9, 305 (1980).
8. Office of Science and Technology Policy, *Fed. Regist.* (1985), p. 10371.
9. National Toxicology Program. *Fiscal Year 1986 Annual Plan* (Department of Health and Human Services, Public Health Service, Research Triangle Park, NC, 1986).

The Candidates' Budgets

The time has come to reconsider the scientific method for selecting presidents. In response to the editorial by Daniel E. Koshland, Jr. (19 June, p. 1501), I wrote letters to each of the 14 most likely presidential candidates (seven Democrats and seven Republicans) requesting that they consider the preparation of a federal budget to provide voters with a discrete measure of candidates platforms. The experiment had the advantage of sampling the entire population as of July 1987. The letters suggested that the candidates consider the previous year's budget as a control and report only the significant differences between their budget and the control. Embellishments regarding the potential benefits to the presidential campaign process and the appropriateness of these measures were included, and Koshland's editorial was cited.

Today is the bicentennial of our Constitution, and nearly 2 months have passed since the letters were submitted to our presidential candidates. The raw data include responses from two of the 14 candidates, or 14%. These data deliver a crushing blow to the hopes that the majority of presidential candidates are concerned with "we the people." It is also noteworthy that Republican candidates unanimously chose not to take part in the experiment.

The two Democratic candidates who responded were Michael Dukakis and Paul Simon. The letter from Governor Dukakis' staff was concise (two paragraphs); it stated that my request could not be reasonably fulfilled and that such a specific proposal would not accurately reflect an actual Dukakis budget in 1989. In addition, it said that this request would not provide an accurate representation of "underlying program tradeoffs." Finally, it said that Dukakis would prefer to be judged on his past record and on his statements of purpose for the future. The letter from Senator Simon stated that the request would be considered very seriously. He went on to point out his

support for "education, productivity, peace, and justice."

These observations indicate that a number of candidates may proclaim love of mother because it costs nothing, but only a small minority might sell their Porsche to support her in the manner to which she has become accustomed.

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Human Control

Judith Rodin's article, "Aging and health: Effects of the sense of control" (19 Sept. 1986, p. 4770), reviews empirical studies indicating that the psychological construct "sense of control" can have strong effects on biological variables ranging from physiological changes to mortality. Because of the importance of this research for behavioral and natural scientists in the health and human sciences, and because theoretical and empirical work on control is at such a pivotal juncture, we believe it is important to address two substantive areas in Rodin's article that require further clarification.

Although the data Rodin cites are promising, they emanate primarily from laboratory and institutional settings. It is unclear how effectively these techniques can be generalized to less structured and more complex environments. On the basis of research with clinical populations suffering from impairments of control [for example, eating disorders; substance abuse; stress related disorders; Type A behavior (1)], we believe there are limits to the effectiveness of self-control strategies [for example, biofeedback, behavioral self-control, meditation, progressive relaxation (2)] and that relapse and lack of compliance are frequent (3). Future research needs to assess the differences, if any, between control-enhancing interventions offered by the environment and "self-control" strategies generated by the individual as well as the limits of their effectiveness (or adverse effects) in both clinical and normative populations.

Rodin's article highlights the lack of uniform, operational terminology in research on control. The use of different terms, with variable meanings, suggests the critical need to systematically address the construct of control theoretically and conceptually. We believe what is needed is a theory-driven research model, based on clarification of semantics and efforts toward developing a unifying theory of control. Examples of some important clarifications and issues not

addressed in Rodin's article include the following: (i) the relationship between "sense of control" and actual control; (ii) whether "sense of control" is most effectively generated by self-control behaviors, control enhancing interventions, or belief that a benevolent other has things in control (4); and (iii) the negative effects of an "illusory" sense of control caused by unhealthy defenses and denial.

Further, since many major events (such as death) (5) and minor events (for example, daily hassles) (6) cannot be controlled, it is necessary to make the critical distinction between altering what we can directly control (a mastery model) and dealing with what we cannot control and to which we can only hope to respond well (a coping model) (7). Finally, equating control with active efforts to alter or change, or to use restraint to refrain from altering or interfering, may reflect a limiting, culture-bound definition. Other cultures conceptualize control in terms of yielding, acceptance, and letting go (8). More of a "sense of control" may be gained from letting go of active control (acceptance) than continuing efforts to try to change that over which we do not have control.

Without an effort at more clinically rigorous investigation and clarification of terms and constructs, we may be significantly limiting our understanding of and approaches to human control.

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REFERENCES

1. R. W. Jeffery, *Ann. Behav. Med.* 9, 1 (1987); P. Nathan, *ibid.* 8, 2 (1986); D. H. Shapiro, *Psychother. Patient*, in press; M. Friedman *et al.*, *Am. Heart J.* 112, 4 (1986); D. C. Glass, *Behavior Patterns, Stress, and Coronary Disease* (Erlbaum, Hillsdale, NJ, 1977).
2. D. H. Shapiro, *Biofeedback Self Regul.* 8, 1 (1983); in *Encyclopedia of Psychology*, R. Corsini, Ed. (Wiley, New York, 1984), vol. 3, pp. 285-288; _____ and J. Shapiro, *Fam. Pract. Recertif.* 2, 10 (1980); D. H. Shapiro, *Perspect. Biol. Med.* 26, 4 (1983); *Am. J. Psychiatry* 139, 3 (1982); _____ and R. N. Walsh, *Meditation: Classic and Contemporary Perspectives* (Aldine, New York, 1984).
3. K. D. Brownell, G. A. Marlatt, E. Lichtenstein, G. T. Wilson, *Am. Psychol.* 41, 7 (1986); A. J. Stunkard *et al.*, *N. Engl. J. Med.* 314, 193 (1986).
4. S. Taylor, *Am. Psychol.* 38, 1161 (1983); J. Shapiro and D. H. Shapiro, *N. Engl. J. Med.* 301, 211 (1979).