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BELIEF IN FREE WILL: MEASUREMENT AND CONCEPTUALIZATION INNOVATIONS

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ABSTRACT: Though the existence of free will seems to be a background assumption in Western life, very little research has examined the belief, and the handful of studies that have done so suggest only a modest endorsement and unclear relationships to other variables. However, methodological flaws in the earlier studies likely produced an underestimation of the strength of the belief among the general population. The current study developed and then administered a new measure of belief in free will to samples of senior high school and college students under conditions where demand characteristics were controlled. Both age groups endorsed the belief in free will to a much stronger extent than seen in previous research. Further, adults associated belief in free will with three purposes of punishment (rehabilitation, retribution, and deterrence) but adolescents only related the belief to retribution. Adults produced a negative correlation between the belief in free will and locus of control whereas adolescents evidenced no association between the variables. Both age groups demonstrated significant correlations between the belief and self-esteem. Finally, adolescents evidenced no correlation between the belief and religious conviction while adults produced a negative correlation between the two variables. In addition, the new free will instrument demonstrated extraordinary factor consistency between both samples. The results are discussed in the context of competing behavior analytic views regarding the origin of the belief in free will (cultural conditioning versus evolutionary adaptation) and the implications the origin has for progressive social and cultural change.

KEYWORDS: free will, determinism, human agency, moral responsibility

It is probably not an overstatement to suggest that a libertarian free will notion of human agency, one in which people are seen as authors of their own actions, is the heart of Western religious, philosophical, and legal understandings of moral responsibility (Kane, 2002)—the “Core Conception” by which Western society articulates its ideas of justice and accountability (Smilansky, 2002). Nevertheless, the logical contradictions

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inherent to a libertarian free will philosophy have fueled a spirited debate among the intelligentsia that has endured for thousands of years, as libertarians reject any infringement on human agency, compatibilists (“soft determinists”) combine elements of agency and determinism, and incompatibilists (“hard determinists”) see behavior as completely determined. Not surprisingly, many philosophers of science are incompatibilists who argue that free will is an illusion (Crick, 1994; Smilansky, 2000, 2002; Wegner, 2002). Some, however, suggest that the illusory nature of free will is less significant than the existence of the belief itself. As London (1964) wryly observed, “this sense of freedom is as surely a part of man’s nature as is the fact that he does not have it” (p. 170). And Sherrington (1940) contended that “from the human standpoint, the important thing is less that man’s will should be free than that man should think that it is free” (p. 199).

Behavior analysts are hard determinists in sharp disagreement with the “human nature” views of London and Sherrington. Led by Skinner (1953, 1971, 1974), they argue that the belief in free will is a culturally induced deception that is the antithesis of a simple and harmless indulgence; it is a “mental way station” that masks the reality of determinism by offering a homunculus as a comforting pseudo-explanation for behavior. Skinner (1948, 1971) argued that this deception undermines the application of a scientific understanding of behavior to cultural design, and thereby prevents a shift in social control of behavior from the currently ineffective and ethically questionable aversive methods to empirically supported and ethically sound positive reinforcement mechanisms. Because Skinner considered the belief in free will to be entirely a product of cultural conditioning—the “literature of freedom” promoting escape from noxious stimuli—he also assumed an evolving culture could successfully replace the previously adaptive but now dysfunctional free will perspective with a more accurate and effective deterministic frame of reference. For Skinner, the abandonment of the non-scientific notion of “autonomous man” and acceptance of determinism came with the optimistic message that better behavior will come from changes in the environment rather than from changes in the human organism. Yet this seemingly hopeful and socially progressive analysis elicited a widespread reaction of horrified and aggressive dismissal from a cultural intelligentsia that rejects the diminution of human agency (e.g., Bethlehem, 1987).

While reflexive rejection of determinism may be a product of strong cultural conditioning, it is also possible that it may reflect the “human nature” perspective of London and Sherrington. Rakos (2004) recently proposed a behavior analytic interpretation of the belief in free will that is consistent with such nativist views. He suggested that a belief in agency, expressed in various forms of verbal behavior but experienced more akin to a physiological emotion, is an evolutionary psychological adaptation (EPA; Schmitt & Pilcher, 2004). Every EPA is domain-specific; that is, each evolved to solve a particular survival problem aroused by a specific situation. For example, pregnancy sickness, which typically occurs in the first trimester, decreases the likelihood that a pregnant woman will ingest toxins that can harm the fetus at its most vulnerable point in development (Schmitt & Pilcher, 2004). As an EPA, the belief in agency evolved to solve problems of survival requiring decision making and choice

behaviors. A functional analysis suggests that the EPA functions as a motivating operation (Laraway, Snyckerski, Michael, & Poling, 2003) in situations presenting concurrent schedules of reinforcement, thereby increasing (a) the probability that choice behavior will be emitted and (b) the potency of the primary reinforcer of a “sense of autonomy” (cf., Rakos, 2005). Rakos (2004) argued that as humans evolved, those persons who believed they possessed internal agency were more effective in controlling their environment in choice situations. This resulted in better problem-solving, decision-making, and self-restraint skills, which in turn are associated with improved psychological and physical health. Schmitt & Pilcher (2004) suggest that health benefits are an important source of evidence for the existence of an EPA. Ultimately, of course, persons with a strong belief in free will would be expected to be more successful in producing offspring and transmitting genes to the next generation (Rakos, 2004). Further, from the evolutionary perspective, the belief in free will is one of a number of culturally shaped expressions of the innate belief in human agency. But while the form of agenic belief may be modifiable by culture, it likely would be extraordinarily difficult to suppress or replace the innate belief through cultural conditioning efforts (Rakos, 2004, 2005, 2006).

Though the cultural and the evolutionary approaches are equally deterministic in their reliance on the environment as the source of the erroneous agenic belief, they differ on regarding *which* environment is that source. Skinner employs the anthropological environment of five or ten or perhaps twenty thousand years ago that selected our cultural practices, while the evolutionary perspective relies on the prehistoric environment of scores or hundreds of thousands of years ago that selected our genes. The actual selection source has both philosophical and pragmatic importance. If the prehistoric environment is the selector, the belief in free will is a human evolutionary adaptation similar to the opposable thumb and therefore minimally modifiable. If the anthropological environment is the selector, the belief in free will is a cultural practice similar to burial of the dead, and theoretically quite malleable.

Interestingly, while the Skinnerian and the evolutionary adaptation approaches differ on the source of and potential for changing the belief in free will, both agree that the belief is pervasive and influential in Western culture (e.g., Rakos, 2004; Skinner, 1971). Yet this assumption raises the more fundamental question that lends importance to the theoretical analysis: Exactly how pervasive and influential is the belief in free will? Unfortunately, data are meager because free will has been investigated empirically in only a handful of psychological studies. One might argue that this paltry research interest, which stands in stark contrast to the endless debate in religious, philosophical, medical, and legal contexts, is direct evidence that free will is so omnipresent in Western culture that its societal endorsement is accepted without requiring empirical substantiation. Even so, one hardly ventures very far out on the proverbial limb by suggesting that a better understanding of this core belief – the extent to which it is endorsed and its relationships to other social and moral variables such as attitudes toward punishment and self-control – can generate important implications for Western society in such areas as jurisprudence, medical ethics, marketing, and public policy.

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Nettler (1959) produced the first and, for many years, only data on free will. She found that 72% of “community leaders” endorsed the abstract “ideology” of free will on the two items on her scale measuring this belief (the percent is derived by averaging the 57% and 87% who endorsed each of the two items). Further, those who endorsed a libertarian philosophy were more punitive than those supporting a deterministic perspective, suggesting that the former ascribes greater moral liability to the individual than do the latter. However, the instrument that assessed belief in free will evidenced questionable face validity: it consisted of merely five “yes/no” items, only two of which indirectly addressed free will.

Four studies emerged out of the same lab. Viney, Waldman, & Barchilon (1982) developed a 7-item Likert-type instrument to measure free will and related it to attitudes toward punishment in undergraduate students. Contrary to their prediction and Nettler’s results, libertarians endorsed more lenient attitudes toward punishment. Viney, Parker-Martin, & Dotten (1988) administered the Viney et al. (1982) free will scale to undergraduates and found no relationship between belief in free will and recommended magnitude of punishment or rationale for punishment (rehabilitation, societal protection, justice, retribution), although these variables were influenced by factors related to the criminal offense. Waldman, Viney, Bell, Bennett, & Hess (1983) obtained only a slight correlation between belief in free will, as measured by the Viney et al. (1982) scale, and internal locus of control (Easterbrook, 1978; Rotter, 1966). The authors suggest that these two attitudes are distinct, and hypothesize that many libertarians adopt a moderate philosophy that acknowledges the influence of external factors. Finally, Haynes, Rojas, & Viney (2003) found that determinists, defined as persons who responded to each item on the Viney et al. (1982) scale in the most extreme deterministic direction, were less punitive than weak, moderate, and strong libertarians, defined as admitting to free will on a linear continuum.² However, the Viney et al. (1982) scale used to measure free will in these studies is limited not only by brevity (seven items) but also by demand characteristics that likely established response biases (Orne, 1962; Weber & Cook, 1972). The instrument was introduced to participants as a measure of free will/determinism, presents definitions of the concepts, and informs participants that people take a variety of positions on the issue. Consistent with this approach, its questions are concrete, referring to free will in those words in six of the seven items. Further, five of the seven items refer to potential limitations on free will. In addition, the administration of the scale in these

² This decision was based on the reasoning that “determinism is an absolutistic philosophy admitting no theoretical ambiguities...The theory of free will, however, may be treated as if it existed in terms of a continuum” (p.1015) anchored by beliefs that human agency entails complete individual responsibility for actions to beliefs that agency is highly vulnerable to a variety of internal and external events beyond the control of the individual. This arbitrary categorization is questionable given the common distinction between “hard” and “soft” determinists (Sappington, 1978, which Viney himself makes (Viney & Crosby, 1994), and appears to reveal the authors’ bias that libertarianism is a more satisfactory philosophy than determinism (cf., Viney & Crosby, 1994).

studies included “preliminary discussions” that highlighted the definitions of free will and determinism and indicated that the scale was intended to quantify these beliefs or assess positions on the issue. Interestingly, the mean score for participants on the free will/determinism measure in all four studies was consistently about 39, which is approximately 61% of the maximum score of 63 (representing extreme libertarianism) and falls in the middle range (5.6) on the 9-point Likert-type scale.

In the final empirical study, Stroessner and Green (2001) developed a questionnaire to examine the relationship of belief in free will to attitudes toward punishment and to locus of control. The free will/determinism scale was derived from the problematic Viney et al. (1982) instrument, though it was expanded to 19 items. As in the Viney studies described above, the administration procedure sensitized participants to the issues under investigation by informing them that “the questions dealt with belief in free will and how this belief related to opinions concerning other topics” (p. 793). Extreme libertarians or extreme determinists were the most punitive and punishment was distinguished along punitive and rehabilitative dimensions. There were no differences between participants who responded to questions phrased to assess beliefs about one’s own free will and those phrased to assess beliefs about the free will of people in general. A factor analysis of the scale produced three factors: religious-philosophical determinism, psychosocial determinism, and libertarianism. Internal locus of control was not significantly correlated with a libertarian attitude, but did evidence a weak but statistically significant correlation with religious-philosophical determinism ($r = -.09$) and a stronger correlation with psychosocial determinism ($r = .40$). Unfortunately, the authors did not report the free will scale’s maximum and minimum scores nor the mean scores obtained by the undergraduate student participants for the scale or its factors.

The strongest conclusion to emerge from these few studies is that free will is only endorsed to a moderate extent. But this surprising finding, as well as the general body of unclear data, may reflect inadequacies in the measurement instruments and procedures. Though the Viney et al. (1982) scale has shown some modest validity (Viney, McIntyre, & Viney, 1984), it appears to encourage participants to endorse a middle ground through its explicit nature, its highlighting within items of possible limitations on free will, and its administration procedures that sensitize participants to the philosophical debate. Contrary to Bertrand Russell’s suggestion that “free will is always unhesitatingly rejected except when people are thinking about the free will problem” (1955, p. 79), these data imply that free will is rejected, or at least partially rejected, *particularly when* people are thinking of the free will problem, that is, when they are directed via discriminative stimuli (prompts) to the controversy and to the varying positions on the issue. The flip side of this implication is that free will is accepted *particularly when* people are *not* thinking of the free will problem, in other words, when prompts that would direct them to the issue are withheld from the context. Of course, these situations comprise the vast majority of daily circumstances.

While the data to date suggest that ordinary people recognize the logical contradictions in the libertarian position when they are guided to confront them, they offer little insight into the strength of the belief in those far more frequent circumstances

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that do not draw attention to external influences on behavior. However, because these unflagged situations constitute the vast majority encountered in daily life, measurement of the belief in these situations can suggest the baseline strength of the “core conception.” Therefore, the first purpose of the present research was to evaluate the strength of the baseline belief, which required development of a sounder measure of belief in free will. We were particularly concerned that the new instrument has (a) a sufficient number of items to measure and analyze the construct and (b) protection against demand characteristics and other prompts that may influence responses. Our approach conceptualized libertarianism and determinism as the opposing poles of an “amount of agency” continuum, with constraints on agency stemming from external events or a higher power analogous to the psychosocial and religious/philosophical determinisms found by Stroessner and Green (2001) and consistent with the focus of the philosophical debate. The resulting 22-item Free Will and Determinism Scale is composed of two face-valid subscales: beliefs about people in general and beliefs about oneself, with 14 and 8 items respectively. Only six items employed the term “free will” (General Will: 4; Personal Will: 2). The questions on the Free Will and Determinism scale were interspersed within the first 34 items of the 58-item “Social and Personal Attitudes Questionnaire” that contained all of the instruments used in the study. Thus, the questionnaire was neither explicitly nor implicitly identified to participants as a measure of free will/determinism.

Because the previous studies only used adults as participants, a second purpose of the current research was to gain insight into the developmental aspects of the belief in free will. Adolescents and adults were compared by drawing participants from two developmentally distinct populations: high school freshman and sophomores (14 and 15 year old adolescents) and college undergraduates (younger and older adults).

The third purpose of the investigation was to explore the relationships between belief in free will and other variables of interest. Two such variables suggested by previous research are punishment attitudes and locus of control. Existing studies have found libertarians, compared to determinists, to be more, less, or equally punitive. An improved methodology may support the theoretically derived prediction that libertarians will be more punitive since they ascribe greater personal responsibility than determinists. Current data also consistently suggest that belief in free will is not the same as internal locus of control, a distinction that should survive a reexamination. Three additional hypotheses are derived from a general understanding of human behavior. First, if free will is a core conception of Western culture or of human nature, then persons who perceive such agency for themselves, and perhaps for others, should report higher self-esteem than persons who view agency through a more deterministic lens. Second, a belief in genetic determinism would appear to be incompatible with libertarian free will and might provide divergent validity for the new instrument. Third, because free will is a foundation of Western religions (Kane, 2002), the belief should co-vary with strong religious conviction.

Finally, additional sound empirical data on the belief in free will can better inform, though surely not settle, debates regarding the belief's origin—cultural conditioning or evolution.

METHOD

Participants

Participants were drawn from high school and college student populations. The high school sample consisted of 76 adolescents enrolled in ninth and tenth grade social studies classes at a suburban Cleveland public high school. Ninety-five percent of the participants were freshman, 60% were female, 55% were 14 years old, and 29% were 15 years old. Students who participated assented to their involvement and provided informed consent from a parent or legal guardian.

The college sample included 85 students enrolled in several lower and mid-level psychology courses offered at Cleveland State University. Participants ranged in age from 18 to mature adult and represented all levels of undergraduate college experience (freshman to senior).

Both samples were predominantly Caucasian, preventing comparisons among racial or ethnic groups.

Procedure

The second author administered the “Social and Personal Attitudes Questionnaire” (see below) to participants enrolled in five senior high school social studies classes. Each class received its own administration of the inventory during one 45-minute class period and each administration included participants from only the one class scheduled to meet at that time. Students were told that the survey was designed to assess their personal and social attitudes by inquiring about responsibility for actions, attitudes toward punishment, religious conviction, and self-concept. The introductory comments did not allude directly or indirectly to free will, determinism, or the philosophical debate concerning these concepts.

The third author administered the identical questionnaire to college students who earned extra credit in their psychology course for participation. As with the high school sample, the college administration was to intact classes meeting at their regular time and used the identical description of the purpose of the investigation.

Measures

The 58-item “Social and Personal Attitudes Questionnaire” contained the six individual scales described in detail below. The Free Will and Determinism Scale was interspersed with the similarly constructed Attitudes Toward Punishment and Genetic Determinism measures, and therefore comprised 22 of the first 34 items. The measures of self-esteem, locus of control, and religious conviction comprised the final 24 items of the “Social and Personal Attitudes Questionnaire.”

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Free Will and Determinism Scale: The 22 Likert-type items on this scale use a five-point range from “not true at all” to “almost always true,” resulting in scores that span from 22 (most deterministic) to 110 (most libertarian), with four items reverse scored. Fourteen items assess personal beliefs about other people having free will and form the General Will subscale with a range of 14 to 70. The other eight items assess beliefs about free will related to oneself, forming the Personal Will subscale with a range of 8 to 40. Appendix A identifies the specific items that comprise each subscale. Internal reliabilities were reasonable: .72 (entire scale), .59 (general will subscale), and .65 (personal will subscale).

Attitudes Toward Punishment Scale: This six-item instrument was created for the present study to measure the extent to which punishment is viewed as deterrence, rehabilitation, and retribution. The five-point Likert-type items range from “not true at all” to “almost always true” and are divided into three subscales that each contain two items (See Appendix B). Thus, the scores for Attitudes Toward Punishment-Deterrence, Attitudes Toward Punishment-Rehabilitation, and Attitudes Toward Punishment-Retribution each range from 2 to 10, with higher scores indicating stronger belief.

Genetic Determinism Scale: This scale consists of six items that were adapted from Keller’s (2005) longer Genetic Determinism scale. The items were designed to measure beliefs in determinism by genetic factors and use a five-point Likert scale ranging from “not true at all” to “almost always true.” Scores on this scale range from 6 (least belief in genetic determinism) to 30 (most belief in genetic determinism). However, this measure was not used in the data analysis due to its unacceptably low internal consistency (Cronbach’s $\alpha = .30$; Hair, Anderson, Tatham, & Black, 1998). Nevertheless, it served an important purpose by contributing questions into which items from the Free Will/Determinism Scale could be interspersed.

Rosenberg Self-Esteem Scale (Rosenberg, 1965): This measure of general self-concept (Robinson, Shaver, & Wrightsman, 1991) consists of 10 four-point Likert-type items that range from “strongly disagree” to “strongly agree,” producing scores between 10 and 40 (high self-esteem). Fleming and Courtney (1984) found a one-week test-retest reliability of .82. The scale has demonstrated concurrent validity with other self-esteem-related instruments; for example, it correlated .72 with the Lerner Self-Esteem Scale (Savin-Williams & Jaquish, 1981). Discriminant validity is suggested by the lack of correlation with locus of control or with scores on the verbal Scholastic Aptitude Test (Reynolds, 1988).

Abbreviated 11-Item Rotter IE Scale (Valecha, 1972): This measure of perception of individual control over positive and negative reinforcers (Robinson & Shaver, 1973) is composed of 11 items modified from Rotter’s Internal-External Locus of Control Scale (Rotter, 1966). Respondents select one of two response options and then indicate if that choice is “much closer” or “slightly closer” to their own opinion. Scores on the measure range from 11 (external locus of control) to 44 (internal locus of control). The scale has demonstrated reasonably good internal consistency ($r = .62$), and it closely resembles the original Rotter scale in terms of distributional characteristics and reliability (Valecha & Ostrom, 1974).

Salience in Religious Commitment Scale (Roof & Perkins, 1975): This short, three-item scale was designed to measure the importance of religion in a person's life and decision-making. The first two items are multiple-choice and the third uses a four-point scale, resulting in scores between 3 (least religious commitment) and 11 (highest religious commitment). The scale's face validity is supported by a correlation of .81 between it and a companion test that focuses on religious adherence; further, it has a moderate alpha reliability coefficient of .72 (Young, 1999).

Data analyses

Scores on the Free Will and Determinism Scale, the General Will subscale, and the Personal Will subscale were correlated (Pearson r) with scores on the measures of punishment attitudes, locus of control, self-esteem, and religious conviction. In addition, the Free Will and Determinism Scale was subjected to a principal components factor analysis to better understand the structure of the instrument and to assess whether the resulting factors were associated with the other dependent measures.

RESULTS

Extent of endorsement of free will

Both samples strongly and similarly endorsed the concept of free will. The mean on the Free Will and Determinism Scale was 87.6 for adolescent high school students and 87.2 for adult college students. These means represent approximately 79% of the maximum free will score of 110. The two samples supported notions of General Will and Personal Will in comparably strong manners as well (high school: 55.9, 35.7, respectively; college students 54.8, 32.3, respectively), with all subscale scores also representing approximately 79% of the maximum free will scores.

Relationship of belief in free will and attitudes toward punishment

For high school students, beliefs in free will and in general will were significantly correlated with a view of punishment as retribution, $r = .28$ (73), $p < .011$, $r = .36$ (83), $p < .002$, respectively. For college students, belief in free will correlated positively with all three attitudes toward punishment: deterrence, rehabilitation, and retribution, $r = 0.35$ (83), $p < .001$; $r = .32$ (83), $p < .003$; $r = 0.33$ (83), $p < .002$, respectively. Personal will was significantly positively correlated with a rehabilitative attitudes towards punishment ($r = .28$ (84), $p < .009$), while general will was associated with views of punishment as rehabilitation, deterrence, and retribution, $r = .30$ (83), $p < 0.005$; $r = .40$ (83), $p < .001$; $r = 0.39$ (83), $p < .001$, respectively.

Relationship of belief in free will and locus of control

Senior high school students did not associate beliefs in free will, general will, or personal will with locus of control. College students, on the other hand, produced a significant negative correlation between belief in free will and locus of control, $r = -.22$

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(81), $p < .048$. Similarly, belief in personal will was also negatively correlated with locus of control, $r = -0.33$ (82), $p < .002$. These data support our hypothesis that the belief in free will is not identical to an internal locus of control.

Relationship of belief in free will and self-esteem

Self esteem was significantly related to belief in free will for both senior high school students, $r = .28$ (69), $p < .019$, and college students, $r = .29$ (83), $p < .008$. High school and college students also produced significant correlations between general will and self-esteem, $r = .26$ (69), $p < .033$ and $r = 0.28$ (84), $p < .011$, respectively.

Relationship of belief in free will and religious conviction

Senior high school students did not generate a significant correlation between belief in free will and religious conviction. College students, on the other hand, reported a negative correlation between religious conviction and belief in free will and, $r = -0.34$ (83), $p < .002$, and belief in personal will, $r = -0.49$ (84), $p < .001$. Thus, not only did high school student data fail to support our prediction that belief in free will and religious conviction will be positively correlated, but college students who endorsed a belief in free will actually reported less religious conviction.

Factor structure of the Free Will and Determinism Scale

Senior high school students. After a varimax rotation, six factors with eigenvalues greater than one emerged, accounting for 58.4% of the total variance. The six factors are labeled Free Will, Moral Responsibility, Personal Agency, Higher Power Control, Personal Limitations, and Personal Responsibility (see Table 1). Each factor was correlated with the other dependent measures. The Free Will factor was positively correlated with a rehabilitative view of punishment, $r = .25$ (74), $p < .032$ and negatively correlated with religious conviction, $r = -.27$ (69), $p < .025$. This indicates that beliefs in free will are associated with viewing punishment as a means of rehabilitation and with low importance of religion in one's life. The Moral Responsibility factor was positively correlated with a retribution perspective on punishment, $r = .32$ (74), $p < .006$ and negatively correlated with locus of control, $r = -.30$ (65), $p < .017$. This indicates that beliefs that people should be held morally responsible for their actions are associated with viewing punishment as a means of retribution and with a belief in an external locus of control. The Higher Power Control factor was negatively correlated with religious conviction, $r = -.27$ (69), $p < .025$, suggesting that, counterintuitively, a belief that people's choices are guided by a higher power is associated with low importance of religion in one's life.

College students. Six factors with eigenvalues greater than one emerged after a varimax rotation, accounting for 56.8% of the total variance. The factors were identical to those derived from the factor analysis of the high school student data: Moral Responsibility, Free Will, Personal Agency, Higher Power Control, Personal Responsi-

TABLE 1. FREE WILL AND DETERMINISM SCALE: FACTORS AND ITEM LOADINGS, HIGH SCHOOL AND COLLEGE SAMPLES

	HS Loading	C Loading
<i>Factor 2HS/1C*: Moral responsibility</i>		
20. A person who makes a poor decision should experience the consequences of that decision.	.72	.73
24. A person is accountable for the decisions he or she makes.	.73	.71
18. A person should receive appropriate punishment for choosing to engage in bad or harmful behaviors.	.65	.65
32. A person always has choices and therefore should be punished for making choices that harm others.	.61	.57
10. Human beings actively choose their actions and are responsible for the consequences of those actions.	.49	.50
29. A person is responsible for his or her actions even if his or her childhood has been difficult.	.43	.45
<i>Factor 1HS/2C: Free will</i>		
26. Free will is a part of the human spirit.	.78	.78
12. Free will is a basic part of human nature.	.72	.71
11. I have free will even when my choices are limited by external circumstances.	.64	.63
21. People have free will regardless of wealth or life circumstances.	.61	.62
15. Life's experiences cannot eliminate a person's free will.	.50	.50
<i>Factor 3HS & C: Personal Agency</i>		
1. I am in charge of the decisions I make.	.83	.82
27. I decide what action to take in a particular situation.	.68	.65
7. I am in charge of my actions even when my life's circumstances are difficult.	.64	.63
33. I have free will.	.51	.51
<i>Factor 4HS & C: Higher Power Control</i>		
23. A person's choices are limited by a higher power's plan for him or her.	.75	.77
2. Each person's decisions are guided by a larger plan.	.68	.71
5. I actively choose what to do from among the options I have.	-.59	-.50

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Factor 6HS/5C: Personal Responsibility

16. A person is to blame for making bad choices.	.77	.77
14. A person must accept responsibility for his or her choice of action.	.43	.48

Factor 5HS/6C: Personal Limitations

8. My decisions are influenced by a higher power.	.81	.81
31. My choices are limited because they fit into a larger plan.	.79	.79

* Note: HS = High school sample; C= College sample

bility, and Personal Limitations (see Table 1). With remarkable consistency, all 22 items loaded on the same factors and with highly similar weights in the two analyses. As with the data from high school students, several factors were correlated with the other dependent measures. The Moral Responsibility factor was positively correlated with punishment as retribution, $r = .36$ (84), $p < .01$ and negatively correlated with locus of control, $r = -.27$ (84), $p < .05$. The Free Will factor was significantly related to punishment as rehabilitation, $r = 0.26$ (84), $p < 0.05$. The Higher Power Control and Personal Responsibility factors were both significantly correlated with the punishment as retribution, $r = .34$ (84), $p < .01$ and $r = .26$ (84), $p < .01$, respectively.

DISCUSSION

This investigation documented a considerably stronger endorsement of free will than has been obtained in previous research. In rough quantitative terms, participants in the present study produced scores that were consistently in the vicinity of 79% of the maximum free will score. In contrast, earlier studies produced scores that ranged from 61 to 72 percent of the maximum possible free will score. Because all but one of the earlier studies, unlike the present research, exposed participants to discussions and/or definitions of free will and determinism, the data suggest that, contrary to Russell (1955), the endorsement of free will is stronger when persons are not sensitized to the topic through prompts and other discriminative stimuli. In other words, a generalized libertarian belief in free will is the “default” philosophy of most persons; when environmental stimuli direct attention to compelling external determinants, people rationally adopt a compatibilist position, much like Bandura has advocated over the years (Bandura, 1989, 2006). An example of this process can be found in the American jurisprudence system, which is founded on a libertarian belief in free will, but allows deterministic elements to be factored into the decision-making process as “mitigating circumstances” or even self-defense (Goodenough, 2004; Greene & Cohen, 2004).

Adolescents and adults produced comparably strong endorsements of overall free will, free will of others, and free will for oneself. Further, participants in both groups who

scored high on the moral responsibility factor viewed punishment as serving the purpose of retribution and reported an external locus of control, whereas those who scored high on the free will factor viewed punishment's goal as rehabilitation. These convergent data suggest that the sense of agency is fully formed by age 14 and lend support to social policies that grant some level of autonomous decision-making authority to adolescents of that age (e.g., seek medical or psychological treatment, abort a fetus, "major-minor" status in certain courts).

On the other hand, an adolescent's strong sense of free will may also be less complex than an adult's. For instance, adolescents who strongly endorse free will tend to view punishment in terms of retribution, while adults with a similar sense of free will incorporate a multidimensional perspective on punishment – recognizing it can serve the purposes of retribution, rehabilitation, and deterrence. Where adolescents see only accountability for moral blameworthiness, adults may also perceive opportunities to change or prevent blameworthy behavior. Similarly, for adolescents, a strong sense of free will is independent of religious conviction, while adults with comparable free will beliefs are likely to evidence diminished religious commitment. Adolescents, with their relatively limited experience and knowledge, may not recognize the readily accessible and free will-friendly Judeo-Christian religious tenets (cf., Dilman, 1999) of their upbringing, whereas adults reject Western theology as a support for their free will beliefs, drawing instead on a broader philosophical base derived from extensive academic and life experiences.

The significant correlation between adults' belief in free will and each of three potential purposes of punishment may help clarify the conflicting results of previous investigations that, like the present study, hypothesized that libertarians, compared to determinists, would ascribe higher levels of moral responsibility to people for the choices they make and hence more strongly view punishment as retribution. Our data, however, suggest that libertarians, in endorsing deterrence and rehabilitation purposes of punishment as well as retribution, not only admit the possibility of external influences on behavior but, in fact, value the use of contingent consequences and discriminative stimuli to promote socially appropriate behavior. However, conditioning (learning) is not seen as deterministic, as adolescents and adults who scored high on the free will factor of the Free Will and Determinism Scale endorsed a rehabilitation view of punishment. Apparently, the recognition that people can be taught to choose better coexists comfortably with the belief that choice behavior is still a product of internal agency.

The importance of the agenic belief to psychological well-being is indicated by the significant relationship between a strong sense of free will and high self-esteem found for both adolescents and adults. The finding that the sense of agency contributes to how people evaluate themselves is consistent with interpreting the belief as a product of culture (e.g., Skinner, 1971) or as an evolutionary adaptation (Rakos, 2004). Skinner (1971) suggested that a corollary of the belief in "autonomous man" is that a person's dignity or worth is judged by the amount of credit or blame for behavior that is ascribed to the "autonomous man." The significant relationship found between belief in free will and self-esteem is consistent with this view, as the latter concept encompasses important

aspects of “dignity” as Skinner interpreted. In Skinner’s view, self-esteem—dignity—is arbitrarily related to agenic beliefs. However, the data are also compatible with a view of agency as an evolved adaptation that produces an internal “sense of autonomy” that functions as a highly valued primary (unconditioned) reinforcer (Rakos, 2004). In the evolutionary construction, agenic beliefs are intrinsically related to positive self-esteem.

Both the negative correlation obtained for college students between endorsement of free will and locus of control, and the absence of any relationship between these variables for high school students, are consistent with previous research indicating that a strong belief in free will is not synonymous with having an internal locus of control. The former may function like an overall philosophy and the latter as an experientially-derived self-assessment, similar to self-efficacy (cf., Bandura, 2006). Thus, Western adults believe in their own agenic potential even if it is not manifested in everyday life. The emergence of an inverse relationship between these two variables in college students suggests that the impact of external influences on behavior is more readily discerned with increasing life experience.

The separate factor analyses of the high school and college data produced by the Free Will and Determinism Scale produced remarkably comparable factor structures: the same six factors emerged, each factor loaded with the same items, and in all cases save one, with the same ordering of factor weights. Further, the factor weights for all items were very similar for the two samples. This extraordinary consistency indicates that the instrument taps replicable dimensions and has a stable structure that holds up across different groups of people.

The initial data reported in this investigation support the common assumption that humans believe they are the authors of their actions. While the existence of a widely generalized belief in free will is consistent with both cultural (e.g., Skinner, 1971) and evolutionary (e.g., Rakos, 2004) explanations of its origin, important insight into its resiliency may be gained by conceptualizing the belief within the label of “human nature.” Such a formulation provides a behavior analytic way to appreciate cultural observations with *prima facie* power, such as those of Mark Hallet, a scientist at the National Institute for Neurological Disorders and Stroke, who told New York Times science writer Dennis Overbye in January 2007, “Free will does exist, but it’s a perception, not a power or a driving force. People experience free will. They have a sense they are free” (p. F1).

From the evolutionary perspective, “people experience free will” because, first, the innately-based agenic belief is activated repeatedly and unavoidably in a large proportion of the very many choice situations faced by a person each day, and second, the belief is then apparently confirmed over and over again when a thought—a covert verbal response—concerned with choice behavior precedes an action that expresses choice, and the person (self-)observing the sequence then assumes that the thought has caused the action. In effect, the observer incorrectly understands the correlation between a covert and an overt behavior to reflect a linear causative relationship. This is how “free will...is a perception...a sense,” in Hallet’s words. But it is this mistake in logic through which the sense of autonomy reinforcer is produced (cf. Rakos, 2005) that, among other effects,

further strengthens the erroneous inference. Wegner (2002) described the phenomenon this way: “To label events as our personal actions, conscious will must be an experience that is similar to an emotion. It is a feeling of doing. Unlike a cold thought or a rational calculation, will somehow happens both in body and mind” (p. 325). “A feeling of doing (that) somehow happens both in body and mind” can be operationalized as an incorrect causative inference (in the “mind”) about a thought that precedes an action that then produces a clearly perceived sense of autonomy (in the body). This understanding of the belief as more of an emotion supported by verbal statements is consistent with the evolutionary approach and contrasts with the Skinnerian perspective that the belief is comprised solely of verbal behavior that produces reinforcement and, as an epiphenomenon, a “good feeling.” Rather, as an EPA, the belief is a motivating operation like hunger: neither cause behavior but both are experienced in the body.

A coherent theoretical proposition for an EPA is considered to be an important source of support for the construct (Schmitt & Pilcher, 2004). While the EPA conceptualization is very new and far from fully developed, it nevertheless presents a reasonable behavior analytic alternative to the Skinnerian thesis with markedly different implications for cultural design and social change. In Skinner’s (1971) view, the culturally-shaped belief in free will hinders progressive social change because people attribute behavioral problems to the wrong source – “autonomous man” rather than the environment – and thereby manufacture a “pseudo-explanation” that doesn’t lead to resolution of the problem. A practice that is essentially a product of culture can in theory be eliminated; what is learned can be suppressed and replaced by more adaptive practices. But if the agenic belief is a consequence of biological evolution, it reflects “human nature” and primary reinforcement (Rakos, 2005) and could only be suppressed and replaced under conditions of strict environmental control.³ As a psychological adaptation, the topographical form of the behaviors comprising the agenic belief can change in response to cultural factors, but the motivational and reinforcing functions of the belief are universal.

Cultural factors shape the expression of other innate motivating operations, such as sexual desire. Some cultures limit sexual desire as an establishing operation to an aspect of a permanent union with a person of the opposite sex while other cultures recognize sexual desire as legitimate establishing operation under a wide variety of circumstances. The actual erotic behavioral practices that produce sexual reinforcement also vary across cultures. Similarly, the verbal behaviors that comprise the agenic belief differ cross-culturally as do the particular cultural practices that produce the “sense of autonomy” primary reinforcer. In the West, the belief in free will leads to cultural practices that prioritize the individual, whereas Eastern cultures express agency as a belief in harmony that promotes practices that place community needs first (Rakos, 2006). Thus, the belief in free will in this analysis is a product of culture, but not in the primary sense that Skinner proposed.

³ Even then, instinctive drift is likely to occur (Breland & Breland, 1964; Rakos, 2004).

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Clearly, the implications for cultural design differ dramatically depending on the ultimate source of the belief in agency—cultural or biological. If the belief is an evolved psychological adaptation, then cultural design must allow those influenced by the design to experience the (illusory) belief in agency that eventually produces the sense of autonomy reinforcer—or the system will be perceived as controlling and aversive to some extent. Even systems designed to use high levels of positive control reach a point where they take on aversive qualities, whether the control is psychological (Kuhlmann, 2005) or chemical (e.g., Huxley’s *Brave New World* [1932]). For instance, in “Living *Walden Two*: B.F. Skinner’s Behaviorist Utopia and Experimental Communities,” Kuhlmann (2005) found that even communards who enthusiastically embraced the deterministic behavioral philosophy felt deprived of choice and self-determination opportunities. Similarly, an exceptionally effective medication can compromise the sense of autonomy in much the same manner as highly systematic positive environmental control. At some point, even “good” external determinants of behavior become “too good”—that is, “too potent”—to allow a person to make an erroneous inference that ascribes causation to thought, thus reducing the amount of—or even eliminating—the sense of autonomy reinforcer. Thus *Walden Two*-style positive reinforcement and Huxley’s (1932) drug Soma in *Brave New World* are perceived to share comparable autonomy-dulling properties. This suggests that social change will be more likely to endure when cultural design, through imperfection and subtlety, allows the agenic belief to function as a motivating operation that eventually results in production of the sense of autonomy reinforcer.

The stable and replicable factor structure that emerged from the initial examination of the Free Will and Determinism Scale suggests the instrument may be a useful research tool, particularly if additional data establishes its reliability and convergent/divergent validity with populations other than students. A thorough examination of the agenic belief in Western society is needed to understand better its geographic, social,⁴ racial, and cultural pervasiveness; its developmental course before age 14; its relationship to other relevant variables, especially in light of the modest correlations obtained with the variables investigated in this study; and its functional properties (e.g., do people who verbalize strong agenic belief in fact act differently than those who emit weaker belief statements?; to what extent are belief statements suppressed by sensitization to the free will-determinism philosophical debate?). Other questions of interest concern the identification and comparison of culturally-shaped expressions of agency. For instance, in addition to free will (Western) and harmony (Eastern), divine will may be a third form of agency. The Sufi, a branch of Islam, choose to submit to a “divine will” and thereby retain a sense of agency in fulfilling the edicts attributed to the divine will (Frager & Fadiman, 2005). In fact, “Islam” means “surrender” in the sense that one relinquishes limited personal will to divine will (Frager & Fadiman, 2005). The Hindu tradition, as exemplified by Yoga, emphasizes a personal will that serves spirituality by prompting

⁴ As an anonymous reviewer of this manuscript noted, free will might be viewed differently by unemployed or service workers or by prisoners.

austerity and ascetic discipline in lieu of self-indulgence and habit (Frager & Fadiman, 2005). Analyses that identify and compare different cultural expressions of agency may help clarify the source of the belief in agency, since the identification of a hypothetical psychological adaptation in multiple cultural and historical contexts constitutes an important source of evidence in support of an evolutionary explanation (Schmitt & Pilcher, 2004).

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APPENDIX A: FREE WILL AND DETERMINISM SCALE

Note: The number next to each item corresponds to its numerical placement within the first 34 items of the 58-item "Social and Personal Attitudes Questionnaire."

Free Will and Determinism-General Will Questions (N=14)

2. Each person's decisions are guided by a larger plan.
10. Human beings actively choose their actions and are responsible for the consequences of those actions
12. Free will is a basic part of human nature.
14. A person must accept responsibility for his or her choice of action.
15. Life's experiences cannot eliminate a person's free will.
16. A person is to blame for making bad choices.
18. A person should receive appropriate punishment for choosing to engage in bad or harmful behaviors.
20. A person who makes a poor decision should experience the consequences of that decision.
21. People have free will regardless of wealth or life circumstances.
23. A person's choices are limited by a higher power's plan for him or her.
24. A person is accountable for the decisions he or she makes.
26. Free will is part of the human spirit.

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- 29. A person is responsible for his or her actions even if his or her childhood has been difficult.
- 32. A person always has choices and therefore should be punished for making choices that harm others.

Free Will and Determinism-Personal Will Questions (N=8)

- 1. I am in charge of the decisions I make.
- 5. I actively choose what to do from among the options I have.
- 7. I am in charge of my actions even when my life's circumstances are difficult.
- 8. My decisions are influenced by a higher power.
- 11. I have free will even when my choices are limited by external circumstances.
- 27. I decide what action to take in a particular situation.
- 31. My choices are limited because they fit into a larger plan.
- 33. I have free will.

APPENDIX B: ATTITUDES TO PUNISHMENT SCALE

Note: The number next to each item corresponds to its numerical placement within the first 34 items of the 58-item "Social and Personal Attitudes Questionnaire."

Deterrent Attitude subscale.

- 4. The possibility of serving time in prison should be used to deter people from committing crimes.
- 13. Punishment should discourage people from committing crimes.

Retribution Attitude subscale

- 17. Punishment of criminals should provide comfort to the victims of the crime.
- 34. Punishment should provide a strong penalty for committing a crime

Rehabilitation Attitude subscale

- 22. A criminal's time in prison should focus on rehabilitation and treatment.
- 28. Prisoners should receive treatment while in jail.