IS RELIGIOUSNESS
A CORRELATE OF
ABSORPTION?:
IMPLICATIONS FOR
PSYCHOPHYSIOLOGY,
COPING, AND MORBIDITY

Jeffrey S. Levin, PhD, MPH, Jan E. Wickramasekera, PhD, and
Caryle Hirshberg

Jeffrey S. Levin is a senior research fellow at the National Institute for
Healthcare Research in Rockville, Md. Jan E. Wickramasekera is a
professor at Saybrook Institute and the Stanford University Medical School, San
Francisco, Calif. Caryle Hirshberg is a scientist and writer in Ben Lomond, Calif.

Context • Evidence synthesized from social epidemiology, psychophysics,
and behavioral medicine suggests that religiousness may represent a significant
correlate of absorption, a construct for which few if any psychosocial
determinants have been identified.

Objective • To examine the association between absorption and
intrinsic and extrinsic religiousness.

Participants • 83 respondents of a self-administered survey of adult
survivors of cancer or other life-threatening diseases, recruited from
participants in a pilot study of psychosocial factors related to recovery
from illness.

Main Measures • Tellegen Absorption Scale and Religious
Orientation Scale.

Results • Absorption, as assessed by the Tellegen Absorption Scale,
was positively and significantly associated with intrinsic religiousness,
as measured by the Religious Orientation Scale. Predominantly
intrinsic subjects had absorption scores at least 20% higher than did
predominantly extrinsic, prereligious, or nonreligious subjects.

Discussion • Prior research has found that absorption and hypnotizability
have psychophysiologic correlates, and that religiousness shows
protective effects against morbidity and mortality. In light of this
work, the present findings suggest that certain religious cognitions,
emotions, or experiences may generate an internally focused state
that enhances health and attenuates disease through self-soothing
psychophysiologic mechanisms. (Altern Ther Health Med.

Absorption has been defined as "a characteristic of
the individual that involves an openness to experience emotional and cognitive alterations across a
variety of situations." It is a personality trait that is
normally distributed, stable (30-day retest r = .91),
and appears to have a partly genetic basis in monozygotic twins
reared apart—a conclusion based on studies comparing correla-
tions between monozygotic and dizygotic twins. Several
investigators have reported a moderate to strong correlation
between absorption and belief in or verbal reports of mystical or
paranormal experiences. Other studies report that absorption
is related to verbal reports of altered subjective states of
consciousness. Absorption also appears to have psychophysi-
ologic correlates, and has been associated with changes in
heart rate, blood pressure, electromyography (EMG),
and peripheral skin temperature through hypnosis, imagery,
and biofeedback procedures. Some studies indicate that absorption
is a component of hypnotic ability.

Absorption has been empirically shown to be a risk factor for
several stress-related disorders (e.g., nonorganic chest
pain, morbid obesity, nightmares, anticipatory nausea, vomiting,
and somatic complaints). Wickramasekera theorizes that
absorption is one of the mechanisms of psychophysiological
self-regulation and dysfunction. He argues that absorption is a
risk factor for stress-related disease, and that learning to reverse
this mechanism of risk with "self-soothing" coping skills such as
self-hypnosis, imagery, or biofeedback may promote health.

The High Risk Model of Threat Perception (HRMTP) hypo-
thesizes that highly focused attention ("hypersensitivity"), as
perhaps assessed by absorption, is a risk factor for stress-related
disease, and that coping skills such as self-hypnosis or prayer
that recruit and refocus this ability can reduce the impact of
stress-related disease.

Levin and colleagues propose that religious behaviors,
attitudes, and beliefs serve as powerful coping skills that have
been empirically shown to attenuate morbidity and mortality in
epidemiologic research on stress-related diseases such as hyperten-
sion, heart disease, and cancer. He suggests that the cognitive,
emotional, and experiential components of religious involve-
ment may function to engender psychophysiological or psy-
choneuroimmunologic states that bolster host resistance and
thus promote salutogenesis and influence physical health.

Using a large, national probability sample, he found strong and
significant positive associations between private (i.e., noninsti-
tutional) and subjective religiousness and lifetime prevalence of
self-reports of mystical experiences.

Published research and reviews have demonstrated or
strongly suggested the presence of significant associations
between (1) reports of mystical or paranormal experiences and
absorption, (2) hypnotic ability and absorption, (3) absorption
and psychophysiologic changes, (4) absorption and stress-
related somatic symptoms, (5) health status and religiosity.
and (6) religiousness and reports of mystical or paranormal experiences. These associations suggest a meaningful connection linking absorption to religiousness, possibly through perceptions of inner, mystical experiences. By identifying overlooked psychophysiological pathways, such an association may be clinically significant for enhancing coping skills, reducing morbidity and mortality, and improving health.

The religious belief that our lives have intrinsic meaning and significance extending beyond death may enable people to buffer the impact of stressors that heighten risk for morbidity and mortality with a tranquility that enhances perceived well-being or quality of life—a state that is protective against morbidity and mortality. Belief in and experience of mystical or paranormal events, phenomena associated with religiousness, may operate as a self-soothing buffer against chronic activation of the hypothalamic-pituitary-adrenal axis by the “slings and arrows of outrageous fortune.” Perhaps the trait of high absorption, hypothesized to subjectively validate mystical or paranormal beliefs or experiences, is one of the mechanisms through which the coping skill of private, subjective religiousness is recruited.

It is predicted that the interplay of trait absorption and what Allport referred to as “interiorized” (as opposed to “institutionalized”) religiousness generates a type of internally focused psychophysiological self-regulation that can enhance health and/or attenuate disease, in a sense objectively validating mystical or paranormal beliefs or experiences through self-soothing mechanisms. Through high absorption, interiorized religiousness may operate as a psychophysiological mechanism that prevents morbidity and promotes healing.

The first task in establishing this possibility empirically is to demonstrate a significant connection between religiousness and absorption. It is hypothesized that interiorized religiousness, operationalized as the construct of intrinsic religiousness, will be positively and significantly associated with high levels of absorption. It is also hypothesized that subjects who are predominantly intrinsic in their religious orientation will have higher absorption scores than will subjects who are predominantly extrinsic (an operational construct for institutionlized religiousness). Intrinsic more than extrinsic religiousness has been associated with various behaviors, attitudes, and sociodemographic characteristics. There are relatively fewer published associations, however, with psychological constructs (a couple of exceptions are low trait anxiety and internal locus of control). Likewise, few if any psychological beliefs or attitudes (along the lines of religiousness) have been found to predict absorption.

METHODS

Participants

The study sample consisted of 83 adult respondents who participated in a pilot study of psychosocial factors related to recovery from cancer and other life-threatening diseases. The group was composed of 52 cancer survivors, 7 of their spouses, 15 long-term survivors of HIV/AIDS, 8 trauma survivors, and 1 cancer survivor from multiple sclerosis. Respondents were aged 30 to 82 years (46 females, 37 males) and were recruited from a larger sample of patients who had experienced remission from cancer or other chronic diseases. Respondents who agreed to participate were sent a packet of self-administered paper-and-pencil instruments, including standardized, validated measures of absorption and religiousness. Questionnaires were returned to the pilot study director and forwarded for data analysis with all personal identifiers removed.

Measures

Absorption. Absorption is measured by the Tellegen Absorption Scale (TAS), one of the 11 component scales of the larger Multidimensional Personality Questionnaire. The TAS is a paper-and-pencil test containing 34 true/false verbal report items. TAS items assess “involvement in internal and external events,” and absorption ability is captured by the sum of “true” responses. Empirical evidence supports the presence of 6 nonoverlapping factors measuring responsiveness to engaging stimuli, synthesis, enhanced cognition, enhanced awareness, vivid reminiscence, and oblivious/dissociative involvement. Tellegen reported high levels of both internal ($r = .88$) and test-retest ($r = .91$) reliability, the latter replicated elsewhere ($r = .88$). The TAS score is orthogonal to a variety of other measures of personality and behavior, such as neuroticism, loss of control, introversion-extroversion, and social desirability, and related to measures of trance-like experiences, dissociative experiences, and hypnotic ability, independent of context effects.

Religiousness. Intrinsic and extrinsic religiousness are measured by the Religious Orientation Scale (ROS), based on the work of Allport and developed further by Allport and Ross and Feagin. These constructs respectively operationalize Allport’s concepts of interiorized and institutionalized religiousness. According to Allport, interiorized and institutionalized religiousness “have opposite effects in the personality,” with institutionalized religiousness associated with attitudes such as prejudice and dogmatism and interiorized religiousness associated with tolerance and openness. The ROS and its subsequent variations and revisions provide “the dominant conceptual and measurement paradigm for the psychology of religion,” and “in so far as the empirical psychology of religion has any consistent theoretical integration, it is from Allport’s typology.” A review and meta-analysis published more than a decade ago reported nearly 70 published empirical studies using the ROS, making it “one of the most frequently used measures of religiousness.”

The ROS consists of 9 items measuring intrinsic (I) religiousness and 11 or 12 items measuring extrinsic (E) religiousness (Feagin’s 1/E scale included 12 items). In this study, all 12 items are used. Scale items are simple statements with which
respondents report agreement or disagreement according to 1 of several 4-category, Likert scale responses (e.g., "I definitely disagree," "I tend to disagree," "I tend to agree," "I definitely agree") coded from 1 to 5 (with scores of 3 reserved for nonresponse). Specific items are coded in this study such that a high score on the I subscale represents a high level of intrinsic religiousness and a high score on the E subscale represents a high level of extrinsic religiousness.

Subscale scores are simply the sum of individual item scores, with I scores ranging from 9 to 45 and E scores from 12 to 60. Published alpha reliabilities range from .81 to .93 for I and .69 to .82 for E. In this sample, the I and E subscales have alpha reliabilities of .85 and .65, respectively. Factor analysis results have shown that I and E represent orthogonal factors, and the interfactor correlation across about two dozen studies averages .20. In this sample, the interfactor correlation is -.25 (P < .05).

In describing results of an early study, Allport and Ross noted that subjects tended to cluster into 1 of 4 groups. Purely intrinsic types were those who tended to agree with intrinsically worded items on the I subscale and tended to disagree with extrinsically worded items on the E subscale, whereas purely extrinsic types were just the opposite. The indiscriminately pror eligious (P) were those who tended to agree with items on both scales, whereas the indiscriminately nonreligious (N) were those who tended to disagree with items on both scales. As with the original subscales, considerable empirical research and theoretical writing has explored the relation of the 4-fold typology to various psychosocial constructs.

Data Analysis

First, descriptive statistics and Pearson product moment correlations were calculated for I and E religiousness and absorption score. Second, through analysis of variance, mean absorption score was compared across categories of the 4-fold religious typology. Purely I subjects and purely E subjects can be differentiated by splitting subjects at the median subscale scores, which tend to vary across studies (30 for I, 23 for E in this sample), or at the theoretical midpoints (27 for I, 36 for E).

Each approach has specific advantages and limitations. Median splits produce more balanced cell sizes between pure intrinsics and pure extrinsics, but this approach is conditioned by a particular sample's distribution and resultant findings. Accordingly, despite the possibility of relatively small cell sizes, theoretical midpoints splits are preferred as the best way to address this issue, because this approach differentiates theoretically high and low scores on each subscale. In this study, both approaches were used for the sake of comparison. Analyses were conducted using the UNIVARIATE, CORR, and GLM procedures in the PC version of SAS 6.10.

RESULTS

The average absorption score among subjects was 21.9 (SD = 8.0). Subjects had an average I score of 29.3 (SD = 8.3) and an average E score of 30.4 (SD = 7.3), which represent scores above the theoretical midpoint (27) for the I subscale and below the theoretical midpoint (36) of the E scale. The Pearson product moment correlation of absorption with intrinsic religiousness was .24 (P < .05) and with extrinsic religiousness was .15 (NS). The more intrinsically religious the subject, the higher the absorption score; and—although not statistically significant in this small sample—the less extrinsically religious, the higher the absorption.

When absorption score was stratified by religious category according to the 4-fold typology using the method of median splits, intrinsics and the pror eligious reported absorption scores more than 20% higher than did extrinsics and the nonreligious (F = 3.23, P < .05) (see Table). When using the preferred method of theoretical midpoint splits, the results were even more striking: intrinsics reported absorption scores more than 20% higher than any other type (F = 3.84, P < .05) (see Figure). Multiple comparisons using the Scheffé test in SAS GLM confirm this result (P < .05). The findings of this study suggest that respondents who are purely intrinsically religious or who report high intrinsic religiousness may have greater self-hypnotic ability and greater capability of recruiting other self-soothing coping skills than other subjects.

DISCUSSION

Research suggests that absorption may represent a risk factor for stress-related disease. Absorption is theorized to be a risk factor specifically when it interacts with high negative affectivity or neuroticism. In other situations, absorption is theorized to be a protective factor. It is a direct prediction from the HRMTT that if absorption is focused on intrinsic religiousness and is recruited as a self-soothing coping skill (e.g., through prayer or self-hypnotic states), it may buffer chronic threat perception and activation of the hypothalamic pituitary adrenal axis, contributing to remission of disease through psychoneuroimmunologic mechanisms. According to Wickramasekera, "a religious faith that is subjectively credible but that need not be subject to any determination of objective truth can be the best buffer of major life stress."

Absorption has been related modestly, but reliably, to hypnotic ability independent of context effects. Context effects pertain to the sequence in which absorption and other tests (e.g., tests of hypnotic ability to be correlated with absorption) are administered. The relationship (a modest association) between hypnotic ability and trait absorption has been shown to hold even when the effect of the order of administration has been controlled. High hypnotic ability, measured with standardized scales, is also related to belief in and verbally reported experiences of paranormal phenomena. Because hypnotic ability, like absorption, is a stable, partly genetically based trait associated with the capacity for self-soothing and verbal reports
of altered states of consciousness, it may also subjectively validate paranormal beliefs. Alternatively, Lynn and Rhue suggest that fantasy proneness (which is moderately positively associated with absorption) may be associated with psychopathology under other unknown conditions.

Another useful direction for further investigation into psychophysiological correlates of a religion-absorption linkage might involve the close relationship between absorption and "openness." The construct of openness is one of the superfactors in the 5-factor approach to personality, yet has been largely overlooked in empirical research in health psychology. If openness has psychophysiological correlates, as do absorption and hypnotic ability, its mobilization as an internal religious coping skill may have therapeutic as well as preventive implications for behavioral medicine.

Schwartz states that psychobiological and psychological research has demonstrated that "psychosocial factors play an important role in all diseases," and that self-attentiveness in general and biofeedback in particular are keys to reversing pathological processes and promoting health. A common thread in these statements is recognition that empirical evidence linking "hard" psychophysiological and neurophysiological outcomes to "softer" mental and emotional states or traits is central to efforts seeking to prevent, treat, and reverse chronic disease.

The results of the present study suggest that epidemiological findings implicating a protective effect of religiousness may be due in part to an effect of religious motivations on absorption—a construct for which psychophysiological but not religious correlates have been found. One’s understanding of religious outlook or worldview thus may serve as a Rosetta stone for psychophysiologists, helping to suggest pathways for health-related research and intervention.

The present results are a preliminary effort in the direction of specifying some psychophysiological mechanisms to prevent morbidity and possibly promote healing. These mechanisms are consistent with cultural beliefs about prayer and healing throughout recorded human history, and with recent literature on the placebo effect in pharmacology and healing. The results of this study underscore the potential value of religious assessment for clinicians and behavioral medicine researchers interested in psychophysiology, treatment utilization, and coping and recovery.

Acknowledgments
The work of Dr. Levin was supported by the National Institute on Aging under NIH Research Grant AG10115. The authors thank Bob Howes for his help entering data and Christine Boothroyd for her assistance in preparing this manuscript.

References
2. Tellegut A, Lykken DT, Boechard T, Wilcox KJ. Rich S. Personality similarity in

References
2. Tellegut A, Lykken DT, Boechard T, Wilcox KJ. Rich S. Personality similarity in