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RELATIONSHIP OF INTELLIGENCE WITH COGNITIVE THERAPY OUTCOME*

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Summary—Theorists have speculated that intelligence is positively associated with the capacity to benefit from cognitive-behavioral therapies. We evaluated this notion by relating pre-treatment measures of fluid and crystallized intelligence to self-reported symptom reduction in a naturalistic study ($n = 106$) of cognitive therapy for outpatients with principal diagnoses of major depression, dysthymia, or generalized anxiety disorder. Intelligence measures did not significantly predict outcome, and nonsignificant relationships were in the opposite direction from the theoretical prediction. Discussion centered on possible limitations to the generalizability of these results and on the logical interpretation of prediction studies in psychotherapy research.

It is often proposed that intelligent patients benefit most from psychotherapy (e.g. Coltart, 1986; Curtis, 1985). Empirical evidence pertaining to this hypothesis is mixed, perhaps because most researchers have studied heterogeneous samples of therapies and patients (Garfield, 1986). Some theorists contend that high intelligence may portend favorable response especially in cognitive-behavioral therapies (CBT), which require patients to understand logical arguments, evaluate their own thought processes, and the like (Garfield, 1989; Lane & Schwartz, 1987). The belief that intelligence bears a positive, linear relationship with response to CBT was illustrated by a respondent in a survey of eclectic psychotherapists, who explained her or his strategy for treatment selection as follows:

> "Vary my therapeutic approach depending upon client characteristics and specific issues. . . . For adult depression, I might use a cognitive approach if client is intellectually able to handle material" (Norcross & Prochaska, 1988, p. 171).

Systematic empirical evidence of a relationship between intelligence and response to cognitive-behavioral treatment is sparse, however. Ellis (1983) observed that nonresponders in his own rational-emotive therapy practice appeared to be less bright than responders, but these patients were not administered intelligence tests; more formal RET outcome studies have to date failed to confirm Ellis's observation (Haaga & Davison, 1989).

The present study examines the relationship of patients' intelligence with response to another cognitive-behavioral approach, cognitive therapy (CT; Beck, Rush, Shaw & Emery, 1979), using a sample of outpatients with principal diagnoses of Major Depression, Dysthymia or Generalized Anxiety Disorder. Previous research has provided strong support for the efficacy of CT, particularly in the treatment of depression (for reviews, see Dobson, 1989; Hollon & Najavits, 1988), but published studies have not evaluated the hypothesis that the efficacy of CT would be particularly favorable for highly intelligent patients.

Our study was naturalistic, with both length of treatment and the exact techniques employed left to the judgment of the psychotherapists (staff and postdoctoral trainees of the Center for Cognitive Therapy, University of Pennsylvania). Although this approach sacrifices standardization to some extent, it should enhance the external validity of the results. We measured both crystallized

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intelligence (reflecting acquired knowledge; Horn, 1976) and fluid intelligence (abstract reasoning capabilities). The latter seemed more likely to relate to treatment response, though theoretical statements predicting an advantage for highly intelligent patients often fail to specify the facet of intelligence being considered.

METHOD

Subjects

*S*s were 106 adult outpatients who requested treatment at the Center for Cognitive Therapy, University of Pennsylvania Medical School, from January 1986 to December 1988. Patients referred during this period were included in the study if they (a) entered treatment at the clinic and remained in treatment for at least six therapy sessions, (b) completed intelligence measures as part of the standard pretreatment evaluation, (c) completed symptom measures at the first therapy session and the last one, and (d) received as a principal diagnosis either Dysthymia ($n = 19$), Major Depression ($n = 57$), or Generalized Anxiety Disorder ($n = 30$). Diagnoses were assigned according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association, 1980) by a clinician using the Structured Clinical Interview for DSM-III (SCID; Spitzer & Williams, 1985).

Measures

Depressive symptoms were assessed with the Beck Depression Inventory (BDI; Beck *et al.*, 1979), a 21-item self-report scale with favorable psychometric properties as an index of depression severity (Beck, Steer & Garbin, 1988). Anxiety symptoms were measured with the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown & Steer, 1988), a 21-item self-report measure showing high internal consistency, short-term retest reliability and concurrent validity (Beck *et al.*, 1988).

Crystallized intelligence was indexed by the 40-item, self-administered WAIS-Clarke vocabulary test (WAIS-C; Paitich & Crawford, 1970), which correlates 0.92 with the WAIS Vocabulary subscale. Fluid intelligence was assessed with the Abstractions subscale of the Shipley Institute of Living scale (Shipley, 1940). The 40-item Abstractions subscale indexes logical sequencing abilities and is moderately to highly correlated with WAIS IQ scores (e.g. $r = 0.64$ in a clinical sample; Paulson & Lin, 1970).

Procedure

The WAIS-C, the Shipley, and the SCID were included in the clinic's standard intake evaluation. The BDI and BAI are routinely completed at each therapy session by patients at the Center for Cognitive Therapy. For the purposes of this research, we analyzed scores from the first therapy session (approximately one week after intake evaluation) and from the patient's final session at the clinic.

RESULTS

Descriptive statistics are reported in Table 1.

Patients continued in treatment for an average of about 20 sessions, and treatment response was variable but generally favorable. Little prior research is available on CT for generalized anxiety disorder, and there is only equivocal support for its effectiveness (e.g. Borkovec & Mathews, 1988; for a review, see Wilson, 1990). Moreover, the recency of publication of the BAI makes it difficult to compare our findings in absolute terms to those of other investigators.

The descriptive results pertaining to depression are more readily interpretable. Sample means at the first session suggest moderate depression in the dysthymia and major depression subgroups, and the average depressed patient could be considered nearly remitted by the last session (Kendall, Hollon, Beck, Hammen & Ingram, 1987). The pretreatment and posttreatment mean BDI scores in the Major Depression subsample are strikingly similar to values reported in controlled outcome studies of psychotherapy for depression. A recent quantitative review of published studies, based mainly on cognitive and behavioral therapies, reported a pretreatment BDI mean of 21.8 and a posttreatment mean of 11.8 (Robinson, Berman & Neimeyer, 1990, Table 10). Thus, our results

Table 1. Descriptive statistics for intelligence measures, depression and anxiety symptoms and length of treatment

Diagnostic group	Descriptive statistics Means (SD) BDI (pre)	BDI (post)	*n* of Sessions	Shipley	WAIS-C
Dysthymia ($n = 19$)	20.2 (11.0)	13.5 (10.4)	19.3 (12.7)	33.8 (5.8)	34.7 (3.1)
Major depression ($n = 57$)	22.2 (10.2)	11.7 (10.0)	23.0 (14.5)	33.3 (6.3)	32.9 (6.2)
	BAI (pre)	BAI (post)			
GAD ($n = 30$)	15.7 (10.4)	6.6 (6.3)	19.5 (13.6)	32.8 (7.8)	32.5 (5.7)

BDI = Beck Depression Inventory. WAIS-C = WAIS-Clarke Vocabulary Test. BAI = Beck Anxiety Inventory. GAD = Generalized Anxiety Disorder.

complement those of Persons, Burns and Perloff (1988) in suggesting that the efficacy of CT for depression in naturalistic studies is comparable to the efficacy revealed in controlled studies with more stringent inclusion/exclusion criteria.

Intelligence and outcome

The hypothesis that intelligence would predict CT outcome was tested by correlating WAIS-C and Shipley scores with residualized final-session symptom scores (with the influence of first-session symptom scores statistically controlled). The two groups of depressed patients were combined because of the small size of the dysthymia group. Neither intelligence scale correlated significantly with outcome among either depressed or anxious patients. The WAIS-C correlated 0.15 ($P = 0.21$) with residualized post-treatment BDI scores in the depressed sample, 0.17 ($P = 0.38$) with residualized BAI scores in the anxious sample. Likewise, the Shipley correlated 0.07 ($P = 0.57$) with residualized BDI scores among depressed patients, 0.24 ($P = 0.19$) with residualized BAI scores among GAD patients.

Note that superior outcome for more intelligent patients would have been reflected in *negative* correlations between intelligence and post-treatment (residualized) symptoms. Therefore, the (nonsignificant) positive correlations noted here are in the opposite direction to the predicted effect of intelligence on outcome.

DISCUSSION

Contrary to a prediction derived from theory and anecdotal evidence, intelligence did not significantly predict outcome in a naturalistic study of cognitive therapy for outpatients with depression or generalized anxiety disorder. Indeed, nonsignificant correlations of fluid and crystallized intelligence measures (pre-treatment) with symptoms (post-treatment, statistically controlling for pre-treatment symptoms) were positive, meaning that, if anything, more intelligent patients fared worse than average in CT.

Methodological limitations require cautious generalization of these findings. The sample was derived from patients at a private outpatient clinic in a university setting; pre-treatment sample means reflected estimated IQs in the 'high average' range. Thus, restriction of range on the predictor measures may have attentuated a real relationship between intelligence and CT outcome. The findings cannot safely be assumed to generalize to inpatient settings or to samples including numerous very-low-IQ *S*s. Such samples might be more likely to reveal a direct relationship between IQ and beneficial outcomes (cf. Greenwald, Harder, Gift, Strauss, Ritzler & Kokes, 1989). Also, further replication of these findings using a more definitive intelligence measure such as the WAIS-R would be useful. Nevertheless, within these limitations, our results suggest that the capacity to benefit from CT is not, as is sometimes assumed, limited to highly intelligent, verbal patients.

This study is not alone in finding it difficult to predict response to CT for depression on the basis of pre-existing patient characteristics. Results indicating a poorer response on the part of depressed patients with personality disorder diagnoses (Thompson, Gallagher & Czirr, 1988) were not

confirmed when CT subjects were considered separately from other treatment conditions in the NIMH Treatment of Depression Collaborative Research Program (Shea, Pilkonis, Beckham, Collins, Elkin, Sotsky & Docherty, 1990). Likewise, Simons, Lustman, Wetzel and Murphy (1985) found that depressed patients high in learned resourcefulness fared especially well in CT, but two subsequent CT studies have failed to find any predictive value for learned resourcefulness (Beckham, 1989; Kavanagh & Wilson, 1989).

As important as determining what such prediction research shows is appreciating what it does not show. In particular we wish to caution against two plausible, yet in our view inappropriate, interpretations of our own data: (a) that intelligence can play no role in treatment selection, and (b) that intelligence is irrelevant in CT process.

First, intelligence could conceivably fail to predict response yet play a useful role in treatment selection. Conversely, it could predict response but play no useful role in treatment selection. The questions of what patients will respond to a given treatment approach (addressed in our study) and of what treatments are best for a given type of patient are logically independent and call for different types of data (DeRubeis & Beck, 1988; Hollon & Najavits, 1988). To take a hypothetical example, suppose that researchers found that CT is moderately (and equally) effective for high-IQ and low-IQ depressed patients, whereas interpersonal therapy is highly effective for low-IQ depressed patients and ineffective for high-IQ patients. This pattern would suggest that IQ does not predict response to CT, but a therapist skilled in both approaches would do well to administer pretreatment IQ measures and select CT only for those of high intelligence.

Second, intelligence might be relevant to CT process yet not show a *correlation* with clinical outcome (cf. Stiles, 1988). This result could occur, for example, if therapists successfully adapt their methods of presenting CT ideas to the vocabulary and conceptual skills of diverse patients. Outcome differences among patients would then be determined by other factors and would not correlate with intelligence. The design of our study does not permit any conclusion regarding the existence or nature of such an adaptation process. We can conclude, though, that such adaptation, if indeed it is necessary, appears to be effectively achieved by cognitive therapists.

Having tried to clarify what our results do not mean, we close by reiterating what they do suggest: there is still no empirical foundation for the common belief that patients of less-than-superior intelligence are unlikely to profit from CT.

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