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AN INVESTIGATION INTO THE STRUCTURE OF EPISTEMOLOGICAL STYLE*

JAMES E. MARTIN,[1]† DIANE G. SILVA,[2] JOHN H. NEWMAN[3] and JULIAN F. THAYER[4]

[1]Department of Psychology, The Pennsylvania State University, University Park, PA 16802,
[2]College of Education, The University of Maryland, MD, [3]Mount Saint Mary's College,
Emmitsburg, MD 21727 and [4]University of Missouri–Columbia, Columbia,
MO 65211, U.S.A.

Summary—The development of post-formal operational thought has been widely studied using interview procedures. Perry (1970; *Forms of intellectual and ethical development in the college years: A scheme.* New York: Holt, Rinehart and Winston) proposed 9 observable developmental positions construed as resulting from the interaction of 4 underlying and overlapping stages. In contrast, Kitchener and King (1981; *Journal of Applied Developmental Psychology*, 2, 89–116) have argued for 7 discrete and non-overlapping stages which correspond directly to 7 observable positions. This paper investigates whether models invoking overlapping or non-overlapping stages are more appropriate to the data. Taking Kitchener and King's Reflective Judgment theory as a point of departure, a paper and pencil instrument for assessing epistemic style was assembled. Factor analysis of items derived from King's (1977; unpublished doctoral dissertation, University of Minnesota) descriptions of interviews revealed 3 factors, interpreted as representing 3 underlying and overlapping developmentally related epistemic strategies. A 44-item Scale of Adult Intellectual Development (SAID-44) was constructed. The replicability and reliability of the SAID-44 were established. Convergent validity was explored by examining correlations between the SAID-44 and Dogmatism, Locus of Control, Desirability of Control, Need for Cognition, and the Scale of Intellectual Development. The results are discussed in light of their relation to some current issues in the epistemological literature.

This study focuses on the construct of epistemological style. The research addresses fundamental epistemological orientations which constitute the context within which knowledge claims are evaluated and seen as more or less warranted. These orientations represent differing dimensions of epistemological value. As such, they constitute presumptive standpoints from which differential evaluations of knowledge claims and their related arguments are possible.

In his seminal research on the development of adult intellect, Perry (1970) presented an account of intellectual and ethical development during the college years which illuminated the question of epistemological style. Working from interview data, Perry argued for a developmental sequence of 4 underlying and partially overlapping stages. These stages include Dualism (the view that knowledge claims can be made in a strictly *either/or* framework), Multiplicity (the view that with respect to a current state of uncertain knowledge *anything goes*), Relativism (the view that the validity of knowledge is *entirely relative to the individual making them*), and Commitment (the view that knowledge is evaluated within a *pragmatic context* of necessity for committed action). These 4 developmental stages were said to be manifested as a sequence of 9 observable developmental positions.

In order to refine Perry's findings, Kitchener and King (1981) focused on the differing patterns of epistemic justification that are manifested during the interval from high-school through graduate school. In contrast to Perry's scheme of 4 underlying stages and 9 surface positions, Kitchener and King made no systematic distinction between underlying and surface stages of development. Instead, they identified a sequence of 7 non-overlapping developmental positions. Although their original research was cross-sectional, later longitudinal studies (King, Kitchener, Davison, Parker & Wood,

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1983; Kitchener, King, Wood & Davison, 1989) confirmed the developmental character of those stages. Like Perry, Kitchener and King utilized interview procedures exclusively.

Currently, the Reflective Judgment program of research is attempting to demonstrate the independent "hard stage", character of the 7 positions (Kitchener, Lynch & Fischer, 1989; Kohlberg, 1990). They do not claim that the Reflective Judgment model is based on simple stages where only one stage can be observed at any given point of development. Rather, Reflective Judgment is a complex stage model in which more than one stage can be represented at a given time, but in an independent, distinct, and non-interactive way. In this context, the question arises whether the fundamental developmental categories of epistemological style should be modelled as distinct and non-interacting (Kitchener & King), or as overlapping and interactive (Perry). Further, from a psychometric point of view, which kind of model holds up better when procedures involving oral interviews and trained interpretations are avoided? Which model is more robust?

Using Kitchener and King's descriptions of their 7 stages, a paper and pencil test was constructed to shed light on these questions. After obtaining preliminary answers, we attempted to deepen our understanding of epistemological style by correlating the measure to several conceptually related measures of cognitive style and personality. This assessment generally supported an interpretation which is consistent with an epistemology proposed by Kleindorfer and Martin (1983), Martin, Kleindorfer and Buchanan (1986), Martin, Kleindorfer and Brashers (1987) and Martin and Kleindorfer (1991).

STUDY 1

Method

Subjects

Two hundred and fifty-four undergraduate students ranging from 17 to 27 years in age were recruited from introductory psychology and education courses at a university in the US.

Instruments

Three assessment instruments were utilized in this investigation: the 65-item Scale of Adult Intellectual Development (SAID-65), the Scale of Intellectual Development (SID) (Erwin, 1983), and the Marlowe–Crowne Social Desirability Scale (M–C) (Crowne & Marlowe, 1960, 1964).

SAID construction. The SAID-65 items were constructed by extracting statements from the 7 Reflective Judgment (RJ) positions outlined by King (1977) and Kitchener (1978). Kitchener and King distinguish their 7 positions with the use of 10 concepts or dimensions: role of authority in personal decisions (ROA), view of knowledge (VOK), use of evidence (UOE), understanding of decision making (DM), use of right vs wrong dichotomy (RVW), willingness to accept responsibility for views (RES), complexity vs simplicity of world view (CVS), nature of judgment process (NOJ), attitude toward differences in views (DIV), open vs closed to alternative views (OVC). Some items were not developed for certain positions; positions 1 through 3 are relevant to only 9 as they exclude "responsibility". According to Kitchener and King (1981), the question of responsibility does not arise until Ss attain the fourth position. Further, only 1 item was constructed for both positions 6 and 7 on the dimension pertaining to "differences in views" since these 2 positions are not distinguishable on that concept. This resulted in 65 items (SAID-65).

The 65 items were constructed from the original description of the positions, given by Kitchener and King, altered in order to simplify vocabulary and personalize the statements so that the readers could relate the content to themselves. Items were created as a cluster of statements, with each item composed of 3 or 4 separate, but related, sentences. It was intended that the related sentences in a cluster would reduce the ambiguity of any one sentence, and thus increase reliability in the representation of each position.

Two judges independently identified the RJ position described by each item. The validity coefficients, obtained by correlating the judges' ratings with the RJ positions the items were constructed to represent, were $r = 0.78$ and 0.85. Discrepant items were revised to express more

accurately the position descriptions given by Kitchener and King. A validity coefficient of $r = 0.89$ was obtained from a third judge for the revised instrument.

The items were randomized and displayed for the response of research participants on a 7-point Likert scale. All items were anchored for self-rating in the same direction with a "1" meaning "least like me" and a "7" meaning "most like me". The instrument was *not* counterbalanced with items keyed in reverse direction. Counterbalancing was rejected because the RJ model is not a binary, polar, reasoning system. Items reconstructed with negative wording would not necessarily relate to the same position in a negative way. More probably, they would tap some alternative construct.

Other measures

The SID (Erwin, 1983) includes 101 items based on Perry's scheme of intellectual and ethical development (Perry, 1970). The 4 subscales of the SID represent the factors Dualism, Relativism, Commitment, and Empathy.

The M–C scale, a measure of incentive, or motivation, based on social approval developed by Crowne and Marlowe (1960, 1964) identifies those individuals who engage in behavior they perceive to be socially desirable.

Procedure

Participants completed the 3 scales in an auditorium environment. They were given as much time as they needed to complete all 3 instruments. The time required ranged from 35 to 85 min. The mean testing time was 46 min. At the conclusion of the study, the participants were debriefed and given a description of the theoretical nature of the study.

Results

The items of the SAID-65 were factor analyzed using a principal factors technique with list-wise deletion of missing values ($N = 228$). In the first factor analysis, 6 factors were generated with eigenvalues > 1. A scree test (Cattell, 1956) indicated that a 3-factor solution was optimal. Reanalysis for 2-, 3- and 4-factor models confirmed the choice of the scree test. The 3 factors accounted for 57% of the variance. The factors were then rotated to an oblique solution by direct quartimin rotation.

The resulting factors were interpreted as representing 3 underlying and overlapping epistemological styles: Absolutism, Relativism, and Evaluativism (Newman, 1984), respectively. Factor correlations (ψ) between Absolutism/Evaluativism, Absolutism/Relativism, and Relativism/Evaluativism were $\psi = -0.09$, -0.03, and 0.40, respectively.

Subscales were developed from these 3 factors retaining items that loaded above 0.30 on a single factor. Items which showed significant loadings on more than 1 factor and items with a communality under 0.20 were dropped from the instrument. Three items which did not meet these criteria were retained in the instrument because of their theoretical interest. Forty-four items remained on the final form of this instrument (SAID-44), (see Table 1). The intercorrelations of the subscale scores (the unit weighted sum of the responses to the retained items) were $r = -0.13$ ($P < 0.05$), -0.10, and 0.67 ($P < 0.01$) for Absolutism/Evaluativism, Absolutism/Relativism, and Relativism/Evaluativism, respectively.

Table 1. Items and factor structure of SAID-44

Items	Study 1 ($N = 228$)		
	Evaluativism	Relativism	Absolutism
CVS1 The world is absolute, exact, and black and white. The answers are real, tangible, and exact. Every question can be answered by someone. The world is big but pretty simple.	-0.366		0.500
OVC1 Many times I'm surprised to find how differently people can feel about straightforward issues.			

Table 1—*continued*

Items	Study 1 ($N = 228$)		
	Evaluativism	Relativism	Absolutism
Most people naturally feel the same way.			
When it gets right down to it, there is really only one right view.			0.511
VOK2			
There are often at least two points of view.			
I usually see the different views as wrong or misguided.			
If I don't know the answer, authorities will.			
Science is one type of authority and therefore one can know for sure in the sciences.			0.587
ROA2			
There are two types of authority: good, truthful, and right; or bad, misinformed, and wrong.			
Poor authorities introduce diversity and complexity.			
I'm sure experts generally disagree due to misinformation.			0.542
DM2			
There is a right way to decide so there is little true conflict.			
If there are differences in views, the differences can be simply resolved.			
Most of my views have come from my parents' and teachers' views.			0.572
RVW2			
There is only one right answer.			
I may not know what the right answer is at this time, but I know there is a right answer known by somone now.			
The terms right and wrong are more useful than better and worse.			0.448
ROA1			
Authorities are the source of true facts.			
Authorities have the true facts.			
Some experts claim to be authorities even though they disagree with the real authority.			0.556
OVC2			
I make factual, absolute, or clear-cut decisions based on my background (for example: liberal or conservative positions.)			
There are many different viewpoints but they are misguided.			
Much of what I believe has been learned from an influential person in my life.			0.513
NOJ1			
A fact is one of the few things in the world you can know for sure.			
The facts don't lead to different points of view.			
Facts are not subject to interpretation.			
My viewpoint is usually the same as the facts.	0.279		0.517
DM1			
A fact is one of the few things in this world that is exact.			
Little true conflict exists.			
There are not real problems in making choices.			
It's often best to follow tradition or social convention.			0.477
UOE1			
Beliefs can't really be disproved by facts.			
The authorities do have the evidence.			
Even if evidence supports a view, it's probably not enough to disprove what we already know.			
One of the few things in this world that is black and white is evidence.			0.473
CVS2			
There may be many different views but the differences can be easily resolved.			
Differences do not actually exist.			
I think simple solutions will usually develop.			
Everything will turn out OK if you give it enough time.		0.262	0.373
VOK1			
A fact is one of the few things that is black and white.			
Usually, different views don't seem legitimate.			
I sometimes find myself wondering, "Why would anyone say something like that?"			
Personal belief is as important as factual evidence in making a decision.		0.471	
VOK6			
I will never know most things for sure.			
One view is probably more correct than others.			
At this point I feel more comfortable assuming an authority's view I can personally accept.		0.326	
DM6			
Many times I feel it is better not to take a firm stand.			
If I'm not ready to take a stand, I'll use an expert's opinion who I respect.			
There is a huge responsibility in taking a stand.		0.422	

Table 1—*continued*

Items	Study 1 ($N = 228$)		
	Evaluativism	Relativism	Absolutism
CVS3 There are many views on every issue. There are many possible choices and not enough information to be sure of making the right one. Things aren't as simple as they once seemed, but I wish they were.		0.482	
OVC4 People would describe me as someone that is very open and willing to consider all views. Sometimes I can't be as objective with my point of view as I can with the viewpoints of others. Sometimes I have wishy-washy opinions and I feel overly open to new input.		0.516	
DIV3 Since some things are not known for sure by anybody, everybody's point of view is equally correct. Differences in views are usually due to upbringing.		0.438	
ROA4 You really can't expect too much from authorities. No one really knows the answer. You should look at each expert's opinion equally. Some authorities try to impose their interpretations on people.		0.411	
DM4 Many times I have chosen a temporary view but I can be swayed. I use both beliefs and reasoning in my arguments. There is a difference between beliefs and reasoning. If you feel strongly about something, you can't be objective.		0.373	
DM3 It is difficult to depend on authority for the right answers. Usually I can feel what is right for me. Interpretations are bias. Decisions should be flexible.		0.402	
NOJ3 Usually I can decide which view to hold by what feels right. Logical arguments, evidence, and scientific procedures are useful but not always essential in decision making. Sometimes, I don't choose the view supported by the facts and authority.		0.450	
DIV4 Differences in views are due to differences in personalities which may lead people to understand things differently; this is not just due to upbringing. Differences in view exist clearly.		0.328	
OVC6 My first priority is to be open to a variety of views before making a decision. It is important to see the difference between being closed to other points of view and holding a view. Sometimes it is hard for me to choose a view since I don't want to become too narrow.	0.257	0.314	
RVW5 The terms right and wrong are not as useful for complex problems. You can't say for sure that one way is right and the other is wrong. I'd rather say one view is more acceptable.	0.264	0.366	− 0.287
VOK5 We can never know for sure, since uncertainty is part of our understanding of the world. Understanding the situation is important to my point of view.	0.315	0.355	
UOE3 Evidence exists for different views. Facts and opinions should be used differently. I can usually feel what is right for me.	0.365	0.370	
CVS6 You must see all of the issue to really understand. I have a more complex view of some issues than of others. There is complexity within issues. I evaluate different parts of an issue in different ways. Sometimes I wish the world was less complex.	0.484	0.281	
UOE5 There are different types of evidence. I have a particular way I look at evidence. Evidence is usually available for many different answers. All evidence is not equal.	0.427	0.294	− 0.250

Table 1—*continued*

Items	Study 1 ($N = 228$)		
	Evaluativism	Relativism	Absolutism
DIV6 Experts disagree because they look at the evidence differently. People's interpretations develop out of their own views of the world, what they know, and what their interests are. Differences in people's views are a result of differences in culture, education, personality, and information.	0.351	0.283	− 0.288
RVW7 Frequently I say better or worse are more appropriate than right or wrong. I look at the evidence as suggesting a view as a better representation of the issue than another view. I feel it is important to explain the situation in which something may be right.	0.388		
RVW4 I know what is right for me. I don't make judgments about others' behavior or ideas. Everyone has a right to their own opinion.	0.416		
DIV5 Differences in views occur because people see the world differently. It's best to have detached understanding of the problem at hand, including other's views. It's important to distinguish between the evidence which supports a view and the person who holds it.	0.451		
ROA6 Authorities are experts whose opinions can and should be evaluated. Experts may have investigated the issue more than other people. Experts differ in opinions.	0.517		
CVS7 The world is basically complicated. It is too easy to search for black and white answers to complicated problems. It's important to break problems into their parts and look at the parts in different ways. It's best to put the parts together into a view based on the facts.	0.486		
ROA7 I respect the expert's view but I don't always accept the view. Experts offer interpretations. After I've read a variety of opinions, I rely on people who seem to be reputable or who are aware of the facts.	0.584		
DM7 I have firm conclusions. Some of my views are more firm than others. I use evidence, personal experiences, and values in decision making. My judgments are more probable and in that sense better.	0.536		
UOE6 I argue using the evidence. Evidence requires a conclusion. I look at the strength of the evidence for many views.	0.676		
NOJ6 Some evidence is better than other evidence. I will not make a good judgment unless I have an overall picture of the whole situation. I must understand how all the pieces of evidence fit together before I will make a decision. I judge evidence qualitatively.	0.578		
NOJ5 My primary way of making a decision is to use logic. It is crucial to use evidence to support various views. When I use evidence to support various views, one view can conflict with others.	0.616		
NOJ7 I am told I always use facts and logic. I always come to a final decision but the decision may only be temporary. I always defend and use the view that I've chosen.	0.558		0.258
UOE7 The source largely influences the evidence. The process of getting evidence influences my judgment. Some types of evidence are better than others.	0.545		
VOK7 Knowing is probable but can't be for certain. I am always willing to stand behind my point of view but I will look at it again if there is new evidence. The "most probable" true point of view is the most in keeping with the facts.	0.553		

Table 1—*continued*

Items	Study 1 ($N = 228$)		
	Evaluativism	Relativism	Absolutism
RES7			
Because I have made a judgment and looked at the problem from all sides, I am willing to stand behind my views.			
I always take the responsibility of sharing my views with others, despite conflict.			
I feel a responsibility to share the facts but not to change others' opinions.	0.341		

Scale reliabilities

Cronbach's (1951) alpha was calculated for the SAID-44 subscales of Absolutism ($\alpha = 0.79$), Relativism ($\alpha = 0.82$), and Evaluativism ($\alpha = 0.87$).

Sex differences

Statistically significant sex differences were found in this study. Men scored higher than women on both Absolutism and Evaluativism. Multivariate Analysis of Variance using Wilks' criterion gave an $F(3, 206) = 5.43$, $P < 0.01$. Subsequent univariate analysis as indicated for Absolutism and Evaluativism resulted in an $F(1, 208) = 6.13$, $P < 0.05$ and $F(1, 208) = 6.39$, $P < 0.05$, respectively.

Table 2. Means for men and women on the SAID-44[a]

SAID-44	Men	Women	Total
Absolutism	3.80	3.50	3.60
Relativism	5.00	4.91	4.94
Evaluativism	5.20	4.89	5.00

[a]Scores on SAID-44 subscales range from 1, not like me to 7, like me.

Continuity between SAID factor structure and RJ taxonomy

Despite the overlapping character of the derived factors, the factor analysis grouped items in approximate correspondence to the RJ hierarchy. In the SAID-44, all 12 of the Absolutism items were derived from RJ positions 1 and 2. Of the 15 Relativism items on the SAID-44, 9 were from RJ positions 3 and 4; 1 was from RJ position 1 (although study 3 has shown this item to load on the Absolutism factor); 5 were from RJ positions 5, 6 and 7. Of the 17 Evaluativism items on the SAID-44, 16 were from the RJ positions 5, 6 and 7; 1 item came from RJ position 4.

Relation to other scales

Correlations between the SAID-44 and the SID are presented in Table 3. There were significant positive correlations between Dualism and Absolutism, and between the two Relativism scales. Evaluativism on the SAID-44 did not show a strong relationship with the SID.

Table 3. Correlations between the subscales of the SAID-44 and SID

SID subscales	SAID-44 subscales		
	Absolutism	Relativism	Evaluativism
Dualism	0.40*	0.08	0.10
Relativism	0.11	0.22*	0.07
Commitment	− 0.07	0.08	0.12
Empathy	− 0.03	0.16	0.15

*$P < 0.01$.

There were no significant correlations between any of the subscales of the SAID-44 and the M–C.

STUDY 2

The purpose of this study was to engage in an initial evaluation of the reliability of the previously derived subscales of the SAID-44 and to explore the meaning of the SAID-44 through further

assessment of its convergent validity. In many respects, it seems possible that Absolutism may be related to characteristics of the close-mindedness studied by Rokeach and his colleagues. The relationship between Absolutism and close-mindedness was assessed by correlating the SAID-44 and Rokeach's (1956) Dogmatism Scale. Also of interest was what, if any, the relationship might be between open-mindedness as measured by Rokeach's scale and the dimensions of Relativism and Evaluativism.

Method

Subjects

Two hundred and seventy-two undergraduate students were recruited from an introductory psychology class. No sex or age information was obtained. Some missing data existed for individual scale items throughout the data set, however for all correlations the lowest N was 243.

Procedure

The participants were asked to complete two instruments, the SAID-44 and the 66 item (Form D) Dogmatism Scale (Rokeach, 1956). Participants were given enough time to complete both instruments. At the conclusion of the study, participants were debriefed.

Results

Correlations between the dimensions of the SAID-44 and Dogmatism were significant only for the predicted correlation between Dogmatism and the Absolutism factor ($r = 0.49$, $P < 0.01$). The significant intercorrelations among the SAID-44 subscales were between Absolutism and Evaluativism ($r = -0.16$, $P < 0.05$) and between Relativism and Evaluativism ($r = 0.65$, $P < 0.01$). This replicates the correlation pattern in the previous study.

STUDY 3

The first purpose of this investigation was to further assess the reliability of the SAID-44. This was accomplished by replicating the derivation of the factor structure and by assessing test–retest and split-half reliabilities for the SAID-44. Secondly, relationships among the SAID-44 and several published scales, which assess aspects of cognitive style and personality, were explored. It was hypothesized that the 3 subscales of the SAID-44 would be related to intellectual orientations addressed by locus of control and cognitive style. However, it was expected that the concept of epistemological style as represented by the SAID-44 would not be fully determined by either personality and/or cognitive style.

Methods

Subjects

Participants for this study were recruited from four sections of introductory psychology. Two hundred and thirty-nine participated in the test phase of this study (102 male, 136 female, and 1 uncoded), and 224 (96 male and 128 female) returned to participate in the retest phase.

Procedure

Test and retest sessions were held 3 weeks apart in the same small auditorium.

Materials

The testing materials of both sessions began with an augmented form of the SAID. This form included the 44 items of the SAID-44 and 12 additional items randomly inserted as distracters. The 12 distracter items were generated from the descriptions of Israel's (1983) stages in his recapitulation theory of intellectual/moral development, and from Basseches' (1980, 1984) dialectical schemata framework. The testing materials for both sessions also included two additional psychometric measures in each testing session.

In the first session, the SAID was followed by the Need for Cognition Scale (NFC, Cacioppo & Petty, 1982) and the Desirability of Control Scale (DOC, Burger & Cooper, 1979). In the second session, the SAID was followed by the M–C (Crowne & Marlowe, 1960, 1964) and the Levenson (1974) Locus of Control Scales (LOC). The order of the scales presented in the test booklets was invariant; no attempt was made to counterbalance for presentation sequence.

Results

Reliability

The reliability of the SAID was assessed by looking at test–retest and split-half correlations for the subscale scores from the SAID-44 items. Test–retest correlations were obtained for Absolutism ($r = 0.75$), Relativism ($r = 0.63$), and Evaluativism ($r = 0.63$), split-half correlations were $r = 0.57$, 0.53, and 0.55, respectively.

Correlations with other scales

Correlations with measures of locus of control, desirability of control, need for cognition and social desirability are presented in Table 4. Evaluativism is correlated more highly with internal locus of control than Absolutism or Relativism. On the other hand, Absolutism is more highly correlated with the view that powerful others and chance are the primary locus of control. The DOC indicates Absolutists' desire not to have control, and Evaluativists do desire control. The cognitive style, as measured by the NFC, follows a similar pattern, with Absolutists showing mild aversion to cognition and Evaluativists demonstrating a moderate need for cognition. Finally, in contrast with study 1, the M–C did show significant correlation with the SAID-44, in the Evaluativism subscale.

Table 4. Correlations between SAID-44 and Desirability of Control, Need for Cognition, Social Desirability and Levinson's Locus of Control[a]

	Absolutism	Relativism	Evaluativism
Need for Cognition (Cacioppo & Petty)	− 0.35***	− 0.06	0.27***
Social Desirability (Crowne & Marlowe)	0.13	0.05	0.18**
Desirability of Control (Burger & Cooper)	− 0.17*	0.04	0.27***
Locus of Control (Levenson)			
Powerful others	0.40***	0.13	− 0.03
Chance	0.30***	0.13	− 0.11
Internal	0.17	0.28***	0.49***

[a]Correlations are between scales from the same testing session.
*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

Factor structure

Factor analysis of the SAID responses demonstrated that the distracter items failed to load consistently on the SAID-44 factors across the two testing sessions. On the other hand, Absolutism, Relativism, and Evaluativism factors were reliably replicated. As mentioned previously, the stray Absolutism item from (VOK, RJ position 1) study 1 returned to the appropriate factor in both sessions of study 3 (Table 5). Factor correlations between Absolutism/Relativism, Absolutism/Evaluativism, and Relativism/Evaluativism are $\psi = 0.05$, 0.07, 0.35, and 0.09, 0.07, 0.34, respectively for the two sessions. Further, the replications showed factor stability from study 1 to 3 (with a different S sample), and showed the reliability of the factor structure within the study 3 sessions. Comparing observations from studies 1 and 3, coefficients of congruence (c) (Gorsuch, 1983, p. 285) for the factors of Absolutism, Relativism, and Evaluativism on the SAID-44 items are respectively $c = 0.86$, 0.84, and 0.80; the congruence coefficients for SAID-44 items between factors from the test and retest sessions of study 3 are $c = 0.96$, 0.90, and 0.85, respectively.

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Table 5. Testing and retesting session factor structures of the augmented SAID

Conceptual position	SAID scale	Test (N = 213)			Retest (N = 202)		
		Eval.	Rela.	Abso.	Eval.	Rela.	Abso.
DM7	Eval.	0.460		0.287	0.600		
NOJ7	Eval.	0.278			0.473		
UOE6	Eval.	0.485			0.397		
NOJ6	Eval.	0.470			0.397		
RESP7	Eval.	0.325			0.467		
NOJ5	Eval.	0.288			0.398		
VOK7	Eval.				0.461		
UOE3	Rela.	0.322			0.340	0.290	
UOE7	Eval.	0.489			0.357		
ROA7	Eval.		0.285		0.409		
DIV6	Rela.	0.586				0.352	
UOE5	Eval.	0.384				0.357	
CVS7	Eval.		0.291		0.377		
CVS6	Eval.	0.272				0.506	
VOK5	Rela.	0.364	0.255			0.358	
DIV4	Rela.	0.256				0.318	
RVW7	Eval.		0.305	− 0.270		0.435	
OVC6	Eval.		0.404			0.433	
ROA6	Eval.					0.254	
DIV5	Eval.					0.397	
RVW4	Eval.					0.302	
VOK6	Rela.		0.556	0.322		0.298	0.286
DIV3	Rela.		0.468			0.382	
CVS3	Reia.		0.433			0.408	
OVC4	Rela.		0.467			0.334	
RVW5	Rela.		0.373	− 0.280	0.259	0.310	− 0.274
ROA4	Rela.		0.290			0.366	
DM4	Rela.					0.436	
DM3	Rela.					0.287	
DM6	Rela.		0.255			0.267	0.288
NOJ3	Rela.						
VOK1	Rela.			0.349			0.371
OVC1	Abso.			0.573			0.617
CVS1	Abso.			0.420			0.693
RVW2	Abso.			0.515	0.280		0.571
ROA2	Abso.			0.509			0.545
VOK2	Abso.			0.490			0.578
OVC2	Abso.			0.526			0.483
NOJ1	Abso.			0.484			0.524
DM2	Abso.			0.431			0.566
DM1	Abso.			0.420			0.540
ROA1	Abso.			0.413			0.542
UOE1	Abso.			0.350			0.467
CVS2	Abso.			0.262			0.386
—	Dist.		0.348			0.537	
—	Dist.	0.327	0.260			0.559	
—	Dist.	0.420					0.432
—	Dist.	0.468				0.313	0.338
—	Dist.	0.406				0.296	
—	Dist.					0.367	
—	Dist.		0.335				
—	Dist.					0.331	
—	Dist.	0.404				0.510	
—	Dist.	0.430				0.377	
—	Dist.	0.361				0.352	− 0.253
—	Dist.						
Variance accounted		0.28	0.08	0.16 = 0.52	0.08	0.29	0.18 = 0.55

GENERAL DISCUSSION

We begin by considering the results of the factor analyses and interpreting the underlying character of the 3 factors that consistently emerged from them. Second, we move to discussion of the correlations between the SAID-44 subscales and the selection of other psychometric measures. Finally, we conclude with an interpretation of the overall results of this investigation from the point of view of a responsibilist epistemology of the sort proposed by Code (1984).

The reported exploratory analyses repeatedly produced a continuous and overlapping factorial alternative to Kitchener and King's discrete and non-overlapping stage model. The 3 factors resulting from exploratory analysis did show some correspondence with the stages of the RJ model when the

RJ stages represented in the 3 factors were examined. However, that correspondence may be interpreted as indicating continuous incremental changes in the relative salience of the underlying factors at different points in development, not a sequence of stages.

The 3 factors of epistemological style that emerged from this investigation can be interpreted as grounded in values which determine the choice of underlying epistemological assumptions. For example, Absolutism appears to involve valuing the assumption of an unqualified epistemic access to the world. The world is assumed to be composed of facts which may be apprehended either through one's senses, through algorithmic calculation, or (if one lacks the relevant empirical experience or calculative skills) through the experts who possess them. The guiding assumption represented by the Absolutism factor implies that one really has no choice about how one sees reality. It is for this reason that persons who are predominantly Absolutist find it difficult to believe that those who claim to differ from them are sincere. From the Absolutist point of view, one is epistemically connected with the world so that one is required to see it as it is. For this reason, the question of responsibility is irrelevant to an Absolutist conception of the process of knowing.

In contrast, from the Relativist point of view, the valued assumption appears to be that the knower is epistemically disconnected from the world. Accordingly, from this perspective, it follows that how one sees the world is entirely a matter of one's own arbitrary choice. The world is not taken to constrain the knower to see it as it is. As in Absolutism (but for reasons precisely opposite to those of the Absolutist), persons who are predominantly Relativist in orientation do not recognize the dimension of agentive responsibility as having any relevance to the process of knowing. The assumed epistemological disconnection of the knower from the world precludes the possibility that he or she might have a responsibility to see things as they are.

The Evaluative epistemological style, on the other hand, appears to eschew both the Absolutist assumption of necessary epistemic connection and the Relativist assumption of epistemic disconnection. The alternate assumptions which underlie Absolutism and Relativism are *both* denied. However there is a sense in which the tacit core of what they each affirm is retained. The knower is assumed to be an agent who has access to the world, but not a fully determined or explicit access. The knower's responsible judgment in a context of good reasons is assumed to make possible qualified but real advances in knowledge. Responsible decisions made for good reasons are, at ground, value judgments (see Martin & Kleindorfer, 1991, for more discussion).

We now turn to consideration of the correlations between the SAID-44 and other scales. Rokeach's Dogmatism Scale is intended to index a bi-polar open–closed dimension of mind, a dimension that is in major aspects epistemic in character—for example, the degree of connectedness of beliefs and non-beliefs, and the importance of authority. The significant correlation between the Dogmatism scale and the Absolutism subscale of the SAID-44 was as predicted. Absolutist pre-suppositions do not appear in a vacuum. The Dogmatism scale provides a set of categories which may facilitate our understanding of at least some aspects of Absolutism.

The lack of significant negative correlations between Dogmatism and either Relativism or Evaluativism raises some interesting questions. Since Relativism and Evaluativism seem to be more "open" than Absolutism, and since neither of these correlate negatively with Dogmatism, one is led to ask whether Rokeach's bi-polar analysis is an adequate model of the difference between "open" and "closed" minds. We suggest that "openness" may not be the inverse of Dogmatism, but entirely orthogonal to it—in the direction of Evaluativism. We are currently exploring this possibility.

In a related vein, the reported results suggest the need to rethink the originally proffered interpretations of investigations of epistemological style which have construed Dualism and Relativism to be the opposite ends of a single, bi-polar dimension. For example Ryan (1984a, b), Schwartz and Wilkinson (1988), and Wilkinson and Schwartz (1990, 1991) have measured the relationships between performance on a variety of cognitive tasks and epistemological style as assessed by the Adherence Scale (Perry, 1968). The difficulty with the Adherence Scale as used by these investigators is that it assumes an inverse correlation between Dualism and Relativism. But, the present investigation has demonstrated that this assumption is false. Under these circumstances it is difficult to know what to make of the results of studies utilizing the Adherence Scale. The latter part of our investigation may be viewed as an initial attempt to explore the relationship between a more adequate measure of epistemological style and some other aspects of cognition.

A primary advantage of the SAID-44 over interview assessments of epistemic strategies is that it makes the broad exploration of convergent relationships economically practical. Such convergences may reveal conditions for adopting a particular epistemological style. For example, consider the pattern of correlations between the SAID and the NFC (Table 4). We interpret those correlations as follows. The 3 epistemological styles require differential cognitive complexity for their expression. The differences among Absolutism, Relativism and Evaluativism would require corresponding increases in one's desire for effortful thought and a corresponding willingness and capacity to see the world in cognitively complex terms. Such a willingness and capacity is indexed by the NFC. The reported pattern of correlations is consistent with this requirement.

The related but distinct issue of the link between epistemological style and the desire and capacity for accepting responsibility for one's judgments is indicated by the correlations between the SAID-44 and the measures of LOC and DOC. The latter appear to measure, in part, the degree to which persons perceive themselves to be, or desire to be, agents, in control of their destinies. Lefcourt (1986) has argued for such an interpretation of Potter's locus of control measure and that perceptions of self-efficacy indicate a low degree of Dogmatism on the Rokeach scale.

Interestingly enough, a significance of the self as an agent who is responsible for his or her epistemic process appears to be an important discovery that emerges in the course of epistemic development (Perry, 1970; Kitchener & King, 1981). As noted by Kitchener & King (1981), recognition that the act of taking an intellectual position is a matter of choice for which one is responsible only emerges in the later developmental stages. They have since (Kitchener & King, 1985) dropped responsibility from the RJ model. We surmise that as Evaluativism becomes salient, one is faced with the responsibility to think without Absolutist guarantees or Relativist excuses.

We believe that the epistemological style we have called Evaluativism is illuminated by the 'responsibilist' epistemology suggested by Code (1984). Code argues that rather than limiting themselves to looking for epistemological foundations, epistemologists should examine the dimensions of epistemic responsibility that constitute the personal/communal context of epistemic activity. Similarly, Johnstone (1956), Bernstein (1983), and Martin and Kleindorfer (1991) have held that both of the assumptions discussed above—that persons have direct and explicit epistemic access to the world, and that they have no access—must be denied if knowledge is to develop in a responsible way. The epistemological position they envision is thus similar to what we have documented here as Evaluativism. Accordingly, we suggest that the epistemic position favored by these theorists on philosophical grounds, is a reflective explication of a developmentally related dimension of epistemology. And further, we argue that the developmental dimensions of epistemology are empirically demonstrated in the epistemic styles Absolutism, Relativism, and Evaluativism.

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