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# EXAMINING TOLERANCE FOR AMBIGUITY IN THE DOMAIN OF EDUCATIONAL LEADERSHIP

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## ABSTRACT

*The tolerance for ambiguity (or intolerance for ambiguity) construct relates to a person's disposition or tendency in addressing uncertain situations. Research literature has pointed out that tolerance for ambiguity (TFA) or intolerance for ambiguity (INTFA) influences an individual's behavior, which in turn affects leadership style and decision making process. While studies in multiple fields (e.g., business, medicine) have addressed the value of understanding a person's level of TFA, little information can be found in its application to school administrators, e.g., principals. This research advances the study of the TFA construct in the domain of educational leadership through the development of a scale for use with prospective and practicing school administrators. A sample of 326 early career principals and principal trainees was surveyed in this study. Through the use of a factor analysis and reliability examination (Cronbach's alpha), an instrument was developed that shows promise in evaluating TFA levels.*

## INTRODUCTION

The principal, who is the instructional leader of a school, is central to the effectiveness of students' academic outcomes (Barth, 2001; Lunenburg & Ornstein, 2004). Moreover, the campus leader directs the infusion of a moral order in the school community, embracing values and beliefs that drive the purpose and meaning of the organization (Sergiovanni, 2000). Administratively, the principal is expected to multitask, handling unexpected diverse situations that require either quick reaction or long term planning. For example, what is the school leader's response to a group of disgruntled parents who suddenly appear at school end, accompanied by a local news station reporter and cameraman, as elementary students are being directed to their assigned school buses, while other parents are waiting to pick up their children? The principal's timely decision making process encompasses student safety, community responsiveness, school district policy, and professional etiquette. Having an understanding how a school leader will respond in ambiguous or uncertain situations, especially in times of adversity, is critical since the leader's actions can greatly impact the lives of hundreds or possibly thousands of students, including campus staff.

With the growing occurrence of uncertainty in today's society (Visser, 2003), school leaders need to exercise a high tolerance for ambiguity (TFA). Research literature has noted that tolerance for ambiguity (TFA) and intolerance for ambiguity (INTFA) have been found to influence people's behavior, be linked to interpersonal skills, leadership styles, and performance levels (DeRoma et al., 2003; Owen & Sweeney, 2002). In a study of the Bridgeport School District, TFA was identified as a key personal trait for the effectiveness of school leadership teams (*The Bridgeport Study*, 2002). Thus, principal preparation programs

need to develop curriculums and pedagogies that foster the development of knowledge, skills, and dispositions so school leaders effectively respond to the complexity and ambiguity of school environments that include human, cultural, and political elements. While the literature refers to the value of TFA for school leaders (e.g., Patterson, 2001), little empirical research exists on the topic of TFA as applied to a school principal's disposition (and consequential behavior). This paper advances the study of the tolerance for ambiguity construct in the context of school leadership by providing (1) a literature review on TFA, (2) instructional strategies to better prepare school leaders in handling ambiguous situations, (3) an empirical study in developing a TFA scale for school leaders, and (4) implications for future research on TFA.

## LITERATURE REVIEW ON TOLERANCE FOR AMBIGUITY

### Definition of Ambiguity

Research on ambiguity and its psychological elements has occurred since the 1950s (Sweeney & Owens, 2002). In general, the term ambiguity is referenced as vagueness of words and uncertainty of conditions or situations where multiple interpretations or views, although at times contradictory, can be present (Visser, 2003). In everyday life, ambiguity can occur when one routinely interacts with numerous meanings, uncertainty, incompleteness, vagueness, contradictions, probability; as well as lack of clarity, structure, information, and consistency (Norton, 1975). Situational ambiguity results from three major sources: (a) novelty, i.e., new situation where no familiar signs exist; (b) complexity, i.e., large number of cues need to be taken into consideration; and (c) insolubility, i.e., situation that is contradictory in nature where different cues purport differing arrangements (Budner, 1962).

### Definition of Tolerance and Intolerance for Ambiguity

How one interacts with ambiguity in knowledge and nature reflects a person's cognitive and affective style (Stoycheva, 2003). Ambiguity tolerance has been described as "the way people perceive, interpret, and react to ambiguous situations" (Stoycheva, 2002, p. 35). The way a person perceives, construes, and responds to uncertain situations determines one's level of tolerance for ambiguity (Stoycheva, 2002). The ambiguity tolerance construct is rather complex because of the multiplicity of variables, including various types of situations, perceptions, and other factors, e.g., predictability (Benjamin et al., 1996).

One who is characterized as intolerant of ambiguity tends to view and construe ambiguous situations as a cause of psychological uneasiness or anxiety, or possibly a threat; thus, the ambiguity is viewed as confusing and something to avoid (Stoycheva, 2003). For instance, if a person views a situation as threatening instead of promising, then intolerance for ambiguity probably exists (Budner, 1962). It was found that people who demonstrate intolerance for ambiguity prefer the realm of stereotypes and concrete notions, instead of the sphere of probability and uncertainty (Geller et al., 1993). While much of the literature equates intolerance of ambiguity (IA) and intolerance of uncertainty (IU), researchers have pointed out that a distinction can be made between the two concepts; that being, IA refers to the present circumstances as a cause of threat and IU relates to the future prospect of a negative result (Grenier, Barrette, & Ladouceur, 2005).

One who is characterized as tolerant of ambiguity tends to have the capacity to recognize and analyze an ambiguous condition in a practical manner without disallowing or distorting elements of its complexity

(Stoyvecha, 2003). This type of disposition enables a person to be more adaptive, and endure the anxiety and discomfort of an uncertain situation, allowing more time to generate alternative responses to the situation (Visser, 2003). An individual with a higher tolerance for ambiguity has the propensity to seek feedback less often than one with a lower tolerance (Bennett et al., 1990). The TFA disposition tends to display a risk taking approach as well as resiliency in adversity (DeRoma et al., 2003; Patterson, 2001), and views uncertain situations as desirable (Budner, 1962). Beitel et al. (2004) found a positive relationship between TFA and psychological mindedness, which is associated with a cognitive profile that includes tendencies for realistic thinking, flexibility, and personal agency.

### Research on Tolerance and Intolerance for Ambiguity

Research on tolerance for ambiguity (TFA) and intolerance for ambiguity (INTFA) can be found in organizational, social behavioral, and leadership studies (e.g., Bennett et al., 1990; Budner, 1962; Clampitt & Williams, 2000), as well as in the professions of business (e.g., Bakalis & Joiner, 2004; Lamberton et al., 2005; Lane & Klenke, 2004), and medicine (e.g., Geller et al., 1993; Schor et al., 2000; Sherrill, 2005). The following chart lists many of the characteristics displayed by people who tend to be TFA or INTFA, based on the literature.

Tolerance for Ambiguity Characteristics	Intolerance for Ambiguity Characteristics
<ul style="list-style-type: none"> <li>• Collaborative as well as receptive to working in cross-cultural environments (Bakalis, 2004)</li> <li>• Psychological mindedness (Beitel et al., 2004)</li> <li>• Tend to not seek feedback, except in context of job advancement (Bennett et al., 1990)</li> <li>• Associated with suspending closure, having a tolerance for failure, taking risks, and monitoring self (Blau, 2003)</li> <li>• View an uncertain situation as desirable (Budner, 1962)</li> <li>• TFA as a predisposition to critical thinking; open-mindedness; flexibility, independent and integrative thinking; positive approach to risk taking (DeRoma et al., 2003)</li> <li>• Flexibility, discovery, creativity, reflectiveness, action research, lifelong learning, and leadership are intertwined (Huber, 2003)</li> <li>• Entrepreneurship, adaptability, creativity, and innovation (Lane &amp; Klenke, 2004)</li> <li>• Favor motivational methods and interpersonal relations over professional behaviors and class structure in teaching, in context of instructor</li> </ul>	<ul style="list-style-type: none"> <li>• Dogmatism, authoritarianism, conformity, rigidity, and ethnocentricity (See Bakalis &amp; Joiner, 2004; Geller et al., 1993)</li> <li>• Stress and anxiety to uncertainty; tend to seek feedback, except when job-specific (Bennett et al., 1990)</li> <li>• View an uncertain situation as threatening (Budner, 1962)</li> <li>• Uncomfortable with unstructured courses and grading criteria, and tasks with multiple answers/options (DeRoma et al., 2003)</li> <li>• Attraction to structured elements in learning, finding only one solution and bring closure to the process, instead of multiple alternative solutions; rigidity (Furnham, 1994) (See (DeRoma et al., 2003)</li> <li>• Stereotyping favored over probability thinking (Geller et al., 1993)</li> <li>• Successful with repetitive activities; mechanical, rule-driven (Lamberton et al., 2005)</li> <li>• Tendency to refuse to identify and admit uncertainty in contexts (Sallot &amp; Lyon, 2003)</li> </ul>

**Table 1. Tolerance and Intolerance for Ambiguity Characteristics**

Tolerance for Ambiguity Characteristics	Intolerance for Ambiguity Characteristics
<ul style="list-style-type: none"> <li>• evaluations (Norr &amp; Crittenden, 1975)</li> <li>• Resilient and flexible (Patterson, 2001)</li> <li>• Believe they can solve complex problems; enjoy instruction that helps to explore new perspectives (Sallot &amp; Lyon, 2003)</li> <li>• Risk taker, low anxiety, self-confident, creative, e.g., open to new ideas, explore options (cognitive complexity), and abstract thinking (Stoycheva, 2003)</li> <li>• Thrive on challenges (Taylor, 2000)</li> <li>• Conceptual and analytical decision making style method (alternative solutions) to address situations (Williams, 2006)</li> <li>• Tendency for developer style of management, having a interpersonal relationship approach (Yaffa, 2003)</li> </ul>	<ul style="list-style-type: none"> <li>• Tendency for insecurity and anxiety; poor self-evaluation regarding humanistic orientation and idealism (Stoycheva, 2002)</li> <li>• Overwhelmed by challenges (Taylor, 2000)</li> <li>• Tendency for benevolent and/or autocratic style of management, having a task-orientation (Yaffa, 2003)</li> <li>• Tendency to distort information (Yurtsever, 2001) (See DeRoma et al., 2003)</li> </ul>

## Business

Many research studies address tolerance for ambiguity (TFA) in the context of business (e.g., Bakalis & Joiner, 2004; Gupta & Govindarajan, 1984; Hallinger & Snidvongs, 2008). Major workplace consequences connected to TFA have been found in the areas of (a) employee interests/ability versus job responsibilities, (b) worker turnover, and (c) company commitment to employees (Lamberton et al., 2005). Bennett et al. (1990) found that one's level of TFA influences a person's decision to ask for feedback. In general, those characterized as INTFA seek more feedback more often than those described as TFA. However, exceptions to this general rule were found. Those depicted as INTFA tended to lack motivation in asking for feedback on job-specific matters, while those with TFA orientations were likely to request feedback on job advancement issues (Bennett et al., 1990).

In a study by Lamberton et al. (2005), outcomes suggested that accountants who have high interests in information technology (IT) are more at ease with ambiguous problem-solving circumstances, especially those situations requiring a high degree of creativity. Elias (1999) found that nontraditional accounting students had a higher TFA than traditional ones, suggesting that nontraditional students may have more of the attributes (e.g., less apprehensive or fearful in oral and written communications) in handling uncertain situations (e.g., audits).

Huber (2003) points out that TFA's attributes of flexibility and creativity are becoming increasingly valuable as businesses address the unpredictability and change process of globalization. For organizations to survive in a complex world with varying demands from different constituents, leaders must be able to embrace uncertainty to be effective, demonstrating characteristics of entrepreneurship, adaptability, and innovation (Hallinger & Snidvongs, 2008; Lane & Klenke, 2004). TFA is a key disposition in the

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development of a successful entrepreneur (Michigan Ross School of Business News & Media, 2004), since innovation and creativity necessitate a certain level of tolerance for ambiguity (Lumpkin 2004). To address the diversity of workforce in a global business environment, two personality attributes are critical: tolerance for ambiguity and openness; this latter characteristic is associated with risk taking, open-mindedness, collaboration, as well as receptivity to work in cross-cultural environments (Bakalis & Joiner, 2004). Thus, a person's tolerance for ambiguity should be viewed as a valued trait in the hiring process.

### **Medicine**

Tolerance for ambiguity (TFA) has been researched in the field of medicine (e.g., Budner, 1962; Geller et al., 1993; Schor et al., 2000; Sherrill, 2005). Budner (1962) found that medical students with a tolerance for ambiguity tend to select fields of medicine that are relatively unstructured, e.g., psychiatry, while those students with an intolerance for ambiguity are inclined to choose fields that are more structured, e.g., surgery. In their study, Geller et al. (1993) noted that physicians with an INTFA disposition tend to act paternalistic in their practice of medicine, displaying characteristics of being rigid, authoritarian, and dogmatic; apt to neither discuss the uncertainty of a situation nor respect the autonomy of patients in medical decisions. Schor et al. (2000) call for research to determine whether a relationship exists between the attitudes of medical students to clinical uncertainties and medical schools' institutional environment; since sociological literature has reported that medical school training promotes resistance to criticism and denial of ambiguity. Sherrill (2005) found that TFA can serve as a promising indicator of leadership capability in the selection of physicians who desire to undertake managerial study for future executive assignments. Taylor (2000) suggests that nurse educators need to recognize the existence of a continuum of TFA among care providers in clinical settings, and the value of developing pedagogical techniques to effectively facilitate the administration of uncertain situations.

### **School Leadership**

Limited empirical research exists regarding the impact of tolerance for ambiguity (TFA) and intolerance for ambiguity (INTFA) on school leadership behavior and consequential managerial approaches. Sample studies on school leadership and TFA include a correlation between TFA/INTFA and administrative styles (e.g., autocratic, democratic) of high school principals (Yaffa, 2003). Yaffa (2003) found that principals who practice benevolent and/or autocratic managerial style (task orientation) tend to have low TFA, while school leaders who engage in a developer approach (i.e., people orientation) in leadership tend to have high TFA. Anfara et al. (2000) found high TFA to be a key characteristic of effective middle school principals. Patterson (2001) notes that superintendents who can effectively handle unfamiliar situations and unpredictable setbacks can strengthen their resiliency as a school leader. School principals who practice a combination of conceptual and analytical decision-making approaches tend to develop multiple alternatives in addressing issues (Williams, 2006). This use of cognitive complexity demonstrates a propensity to possess a high degree of tolerance for ambiguity; a major indicator for successfully maintaining and sustaining schools (Williams, 2006).

## **Instructional Strategies in Preparing for Ambiguity Tolerance**

Visser (2003) indicates that the culture of the educational system needs to reflect the culture of society. Since the occurrence of uncertainty is increasing in society, curricular and pedagogical approaches in schools need to prepare learners with knowledge, skills, and dispositions, as well as experiences in multiple contexts to better interact with a highly ambiguous societal milieu (Visser, 2003). The research literature outlines various types of instructional/learning processes beneficial to promote TFA among students (e.g., Banning, 2003; Bennett et al., 1990; Norr & Crittenden, 1975). In studying TFA in the context of five aspects of teaching (i.e., interpersonal relations, motivation, professional behavior, structure, and assignments/evaluations), Norr and Crittenden (1975) found that students high in TFA favor interpersonal relations and motivation over structure and professional conduct in the educational process.

The learning process should address students' tolerance for ambiguity with critical thinking strategies to better prepare for the unstructured components and complexities of life, using pedagogical strategies that include cooperative group learning, process-oriented techniques, and creative thinking methods (DeRoma et al., 2003). Huber (2003) recommends that instruction includes scientific inquiry (i.e., deductive methodology), hands-on assignments, and applications of alternative solutions development, reflection, and non-linear thinking processes. This latter point (i.e., non-linear methodology) is supported by Oblinger and Verville (1998) who note the value of a systems/flexible thinking approach and by Rowland (2003) who points out that systems thinking should be incorporated into authentic activities and situations that are complex, nonlinear, and unpredictable (Lamberton et al., 2005). Torp and Sage (2002) indicate that problem-based learning provides an organized, structured process where a hypothesis-driven reasoning is used to adjust to ambiguities (Visser, 2003).

Tolerance for ambiguity can be improved by using the case study method (Banning, 2003; Sallot & Lyon, 2003) as well as simulations and reflective writing tasks linking theory and practice, explaining the rationale for decisions. Reflective experiences can help students realize they have common concerns and anxieties with regard to ambiguous situations (Levitt & Jacques, 2005). The elaboration theory (English & Reigeluth, 1996) can provide a structural process through a sequence of elaborations (e.g., heuristic task analysis) in addressing a complex situation (Reigeluth et al., 2003; Visser, 2003). Suzawa (2003) suggests the use of the "thinking aloud" process (Bloom & Broder, 1950) as a teaching strategy to promote active learning, especially in large class settings; a technique that allows the exchange of ideas to arrive at a solution to a problem.

Study results of Sallot and Lyon (2003) suggest that while portfolio assessment is a viable instructional strategy to assist students in becoming more effective public relations writers, students with low TFA tend to view portfolio grading as insufficient because it does not adequately reflect their in-class work. Bennett et al. (1990) point out that in general those who tend to be intolerant of ambiguity request more feedback than those who are TFA. Thus, guidance needs to be provided to those low in TFA during ambiguous situations, responding to their reactions of stress and anxiety; while giving feedback to those high in TFA in correcting identified performance errors (Bennett et al., 1990).

Huber (2003) indicates that instruction for developing TFA should be viewed as a lifelong learning process, with an emphasis on action research, using investigative methodology, focused on creating knowledge; instead of simply replicating and verifying existing information. Homework assignments should be designed to address open and closed-ended problems with opinion questions about human affairs issues,

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with opportunities to work in small groups (Suzawa, 2003). In the context of a novel experience, in this case a study abroad program, Bakalis & Joiner (2004) conclude a block approach to teaching may be more effective for students with low TFA. In describing the characteristics of those who become competent in performance literacy (reading), Blau (2003) associates tolerance for ambiguity with risk taking, suspending closure, forbearance with failure, and the ability to self-monitor.

### **PURPOSE OF PRESENT RESEARCH**

This paper advances the study of the tolerance for ambiguity construct in the context of school leadership by providing empirical results. The purpose of the present research is to identify the validity and reliability of a new scale designed to measure TFA and INTFA in the domain of educational leadership. A viable tolerance for ambiguity scale for measuring prospective and current administrators (e.g., assistant principals, principals) can serve as a useful assessment tool by (1) school districts in the hiring procedures of campus administrators, (2) college and university preparation programs in strengthening candidates' dispositions in future leadership careers, and (3) principal candidates and practicing campus leaders to self assess and choose professional development activities to strengthen their knowledge, skills, and dispositions.

Various scales, based on cognitive constructs, have been developed to quantify a person's tolerance and intolerance for ambiguity including Budner (1962); Rydell and Rosen (1966); McDonald (1970); Norton (1975); Bhushan and Amal (1986); McLain (1993); and Furnham (1994) (see Benjamin et al., 1996; Grenier et al., 2005; Owen & Sweeney, 2002). Grenier et al. (2005) indicates that Budner's scale (1962) is the most cited, as well as used for the evaluation of intolerance of ambiguity levels.

Instead of creating an instrument with statements addressing the issues surrounding ambiguity in the domain of educational leadership to conduct a factor analysis, two scales previously used to measure tolerance/intolerance for ambiguity in other domains were administered. The two instruments were Budner's (1962) Scale of Tolerance-Intolerance of Ambiguity and McClain's (1993) MSTAT-I (Multiple Stimulus Type Tolerance for Ambiguity Test). Budner's instrument has sixteen (16) items using a Likert 1-7 response approach. The MSTAT-I instrument, which is an updated version of previous cognitive construct scales, lists twenty-two (22) items using a Likert 1-7 response mechanism.

These two scales were used since both have been found to be reliable and use a Likert 1-7 response method. Budner's scale has been reported as reliable with Cronbach's alpha outcomes ranging from .39 to .62, along with an alpha of .85 on test-retest (Budner, 1962; MacDonald, 1970; Sallot & Lyon, 2003). Although studies have found reliability to be low (Benjamin et al., 1996; Sallot & Lyon, 2003), Budner's work is viewed as seminal research in the area of tolerance and intolerance for ambiguity (Owen & Sweeney, 2002; Sallot & Lyon, 2003). McLain's instrument is reported as having an alpha of .86, and a "significant positive correlations with the Budner and MacDonald scales" (Owen & Sweeney, 2002, p. 2) and noted in the TFA literature as more reliable in comparison to other instruments (Sallot & Lyon, 2003). Similar response mechanisms of both instruments provided consistency of delivery to ascertain the interconnectedness of scales.

This exploratory study will determine the number of factors derived from the two scales with regard to the domain of educational leadership. This factor analytic evidence will provide an initial foundation for the study of the instruments in the context of educational leadership. Furthermore, Cronbach's alpha for each of the subscales derived will be calculated and reported.

## METHOD

### Participants

The sample consisted of 326 graduate students in an educational leadership program in a mid-sized university, situated in the southwestern part of the United States. These graduate students, who are typically classroom teachers, have chosen to take advanced coursework to acquire principal certification, required for school administration positions, e.g., assistant principals. Two-hundred forty-four (244) of the participants were females, and 82 were males; having a mean age of 34.8 years ( $SD = 7.5$ ). The mean experience teaching of the sample was found to be 8.2 years ( $SD = 5.41$ ); while the mean administrative experience resulted in 1.7 years ( $SD = 7.2$ ). The mean GPA of the students in the sample was 3.83 ( $SD = 1.2$ ) on a 4-point scale. One-hundred fifty-two (152) of the participants were Caucasian, 91 were Hispanic, 67 were African-American, eight (8) were Asian, three (3) were Native American, and five (5) were self-described as “other.”

### Instruments

Instruments used in this study consisted of two previously created instruments to measure tolerance/intolerance for ambiguity. The two instruments were Budner's (1962) Scale of Tolerance-Intolerance of Ambiguity and McClain's (1993) MSTAT-I. Past psychometric properties of these instruments include reliability, convergent, and discriminant validity evidence for the MSTAT-I (see McClain, 1993). Although weak reliability evidence for Budner's Scale has been reported, it is cited most and applied for evaluating INTFA levels (Grenier et al., 2005; Sallot & Lyon, 2003). In both instruments, participants scored items using a summated rating scale with a range from 1 indicating the statement is “not at all true of me,” to 7 denoting “completely true of me.” In Table 2, statements in Budner's Scale are listed with the letter B and McClain's Scale with M.

### Procedures

The two instruments with a total of 38 brief statements were administered to the sample, in clusters of approximately 30 graduate students. Participants first gave their informed consent, and then completed both instruments through a paper and pencil administration.

## RESULTS

Using a principal axis factoring method based on an eigenvalue greater than 1 criterion, six factors were extracted and rotated using a varimax technique. The five remaining factors accounted for 55.1 percent of the variance in the data. The first factor, which accounted for 15.1 percent of the variance, is best labeled “general intolerance of ambiguity.” The second factor reflected a “general tolerance of ambiguity” and accounted for 11.9 percent of the variance. The third factor, a “desire for familiarity,” accounted for 10.9 percent of the variance. The fourth factor, accounting for 9.4 percent of the variance, was a “desire for new perspective.” The fifth factor was a “desire for change” and accounted for 4.9 percent of the overall variance. The sixth factor, which accounted for 2.9 percent of the overall variance, was extracted and rotated but was



not interpretable; therefore was considered error and dropped. Six of the statements from the two scales (i.e., M 8., M 22., B 1., B 2., B11., and B 14.) were excluded (and not found in Table 2) because they did not load strongly enough on any factor, based on a factor loading of at least .4 for purposes of statistical significance (see Hair, Anderson, & Tatham, 1987).

Items		Factor Loadings					
		1	2	3	4	5	6
M 1.	I don't tolerate ambiguous situations well.	.68					
M 2.	I find it difficult to respond when faced with an unexpected event.	.53					
M 5.	I would rather avoid solving a problem that must be viewed from several different perspectives.	.52					
M 6.	I try to avoid situations which are ambiguous.	.76					
M 9.	Problems which cannot be considered from just one point of view are a little threatening.	.57					
M 10.	I avoid situations which are too complicated for me to easily understand.	.55					
M 11.	I am tolerant of ambiguous situations. (-)	-.55					
M 13.	I try to avoid problems which don't seem to have only one "best" solution.	.46					
M 16.	I dislike ambiguous situations.	.66					
M 3.	I don't think new situations are any more threatening than familiar situations.		.48				
M 4.	I'm drawn to situations which can be interpreted in more than one way.		.50				
M 7.	I am good at managing unpredictable situations.		.65				
M 12.	I enjoy tackling problems which are complex enough to be ambiguous.		.53				
M 17.	Some problems are so complex that just trying to understand them is fun.		.59				
M 18.	I have little trouble coping with unexpected events.		.48				
M 19.	I pursue problem situations which are so complex some people call them "mind boggling."		.57				
M 21.	I enjoy an occasional surprise.		.55				
B 3.	A good job is one where what is to be done and how it is to be done are always clear.			.61			
B 4.	In the long run it is possible to get more done by tackling			.65			

Items		Factor Loadings					
		1	2	3	4	5	6
	small, simple problems rather than large and complicated ones.						
B 5.	What we are used to is always preferable to what is unfamiliar.			.58			
B 6.	A person who leads an even, regular life, in which few surprises or unexpected happenings arise, really has a lot to be grateful for.			.47			
B 8.	The sooner we all acquire similar values and ideals the better.			.66			
B 9.	I would like to live in a foreign country for a while.				.54		
B 10.	People who fit their lives to a schedule probably miss most of the joy of living.				.43		
B 12.	Often the most interesting and stimulating people are those who don't mind being different and original.				.71		
B 13.	People who insist upon a yes or no answer just don't know how complicated things really are.				.44		
B 16.	A good teacher is one who makes you wonder about your way of looking at things.				.53		
M 14.	I often find myself looking for something new, rather than trying to hold things constant in my life.					.72	
M 15.	I generally prefer novelty over familiarity.					.73	
M 20.	I find it hard to make a choice when the outcome is uncertain.						.43
B 7.	I like parties where I know most of the people more than ones where all or most of the people are complete strangers. (-)						-.42
B 15.	Teachers or supervisors who hand out vague assignments give a chance for one to show initiative and originality.						.59

The reliability coefficients (Cronbach's Alpha) were in the .60 to .80 range for four of the five factors. Given that only two items remained for factor 5, reliability was not computed since the reliability coefficient is negligible (more items were needed).

**Table 3. Subscale Correlations (and Reliabilities)**

Subscale	1	2	3	4	5
1. GiToA	(.80)	-	-	-	-
2. GToA	-.48	(.74)	-	-	-
3. DfF	.38	-.46	(.66)	-	-
4. DfNP	-.22	.57	-.27	(.62)	-
5. DfC	-.21	.35	-.27	.63	(NC)

Note: GiToA = General Intolerance of Ambiguity; GToA = General Tolerance of Ambiguity; DfF = Desire for Familiarity; DfNP = Desire for New Perspective; DfC = Desire for Change

## DISCUSSION

### Current Research Study

The results offer factorial and discriminant validity (subscales are separate), as well as reliability evidence. These results suggest that the combination of statements from these two scales (Budner, 1962; McClain, 1993) into one instrument can serve as a viable tool in identifying and gauging future or current school leaders' levels of tolerance or intolerance for ambiguity. Consequently, it can be an instrument with both formative and summative assessment qualities to (1) diagnose/gauge the development of aspiring school principals enrolled in university preparatory programs to determine the types of professional development for students, so they can be better prepared to handle ambiguous or uncertain situations; (2) assist in the hiring process of school leaders to better understand/predict applicants' dispositions in working in a campus environment that tends to have situations of ambiguity/uncertainty; and (3) allow current school administrators to self-assess their levels of TFA to better design their own professional development needs to strengthen their capability as school leaders.

With regard to the use of the TFA instrument in school administrator preparation programs, graduate students could be administered the scale as a pre, mid, and post assessments to gauge their dispositions (e.g., collaborative, empathetic, fair) toward meeting the expectations of school leadership, encompassed in national administrator standards, e.g., Educational Leadership Constituent Council (ELCC). Researchers have addressed the association between these national standards and the effectiveness of school leadership in promoting student success (Kaplan, Owings, and Nunnery, 2005).

In the process of hiring school administrators, school districts' Office of Human Resources could use the TFA instrument as a mechanism to better determine applicants' levels of tolerance for addressing ambiguous situations that often occur in school environments. This is critical since an individual who is intolerant of ambiguity will likely react to uncertain situations with anxiety and stress (Bennett et al., 1990). This scale along with other assessment tools (e.g., resume, letters of recommendation) could provide a more comprehensive portrayal of candidates' dispositions as well as capabilities and understanding toward implementing sound leadership practices, e.g., collaboration.

In the practice of self-assessing their dispositions, school administrators could apply the TFA instrument as a formative and summative tool to determine their tolerance or intolerance for ambiguity; thus, helping them select professional development (e.g., interpersonal communication techniques) to strengthen their abilities to successfully lead and manage a school community. "Self-directed professional development involves the administrator engaging in self-assessment, setting personal/professional improvement goals, planning learning activities designed to meet the stated goal, implementing the plan, assessing progress, and then entering into a new cycle of action planning" (Gordon, 2004, p. 149). The cognitive process of self-regulated learning where the school leader self-assesses needs; self-selects and plans relevant professional development to meet needs, seeking outside help if needed; self-monitors procedures; and self-evaluates learning outcomes can facilitate the progress in becoming an accomplished self-learner and successful school leader (McCullum et al., 2006b; Ormrod, 2006).

### **Further Research Study**

Further development of the TFA instrument could occur with a confirmatory factor analytic study. Moreover, additional TFA scales, e.g., the Measure of Ambiguity Tolerance (MAT-50) instrument (Norton, 1975), could be applied. The MAT-50, with 61 statements, has been found to possess content validity (adequate level), construct validity (good), and criteria-related validity (strong), as well as high internal reliability ( $r = .88$ ) and test-retest reliability ( $r = .86$ ) (Norton, 1975). Furman (1994) notes an alpha of .89 for the MAT-50 (Benjamin et al., 1996).

Moreover, correlational research could take place between the TFA instrument and self-efficacy scales, e.g., School Administrator Efficacy Scale (McCullum et al., 2006a; 2006b) to determine the association between school leaders' TFA and self-efficacy. This would be especially important since effective campus administrators, e.g., principals, tend to be highly efficacious (e.g., McCullum et al., 2006a; 2006b). Prior research in the development of effective counselors provides insight and direction toward the connection between TFA and self-efficacy. Levitt & Jacques (2005) point out that self-efficacy and trust are key elements in the formation of successful counselors, since uncertainty is an element of the counseling process. Because of the complexity of the counseling process (e.g., addressing the unknown), counselors need to be assured of their capabilities, especially where anxieties occur about the correctness of the counseling direction (Levitt & Jacques, 2005). More research needs to occur in studying the connection of individual traits and preferences for coursework and careers (Lamberton et al., 2005) to better attract educators to the field of school administration.

Additionally, correlational research could be conducted between campus leaders' TFA and school climate because of the major impact campus climate (and culture) can have on a school community. To understand the work climate of an organization, there is a need to study how employees handle uncertainty and how employees perceive the organization as managing uncertain or ambiguous situations (Clampitt & Williams, 2001). There are various climate surveys that could be used in this type of study (e.g., National Association of Secondary School Principals School Climate Survey, CFK, Ltd School Climate Profile). Because of the limited TFA research directed to educational leadership and the multiple implications that TFA can have on school organizations and because of the value of TFA for effective campus leadership (Anfara et al., 2000), further research on the topic of TFA and school leadership should be conducted.

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