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Assessing the Factor Structure of the Anger Expression Inventory (ML-STAXI) in a Mexican Sample

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ABSTRACT

Although the State Trait Anger Expression and Control Inventory (ML-STAXI) was validated with Latin American samples, it is unknown whether its factor structure remains in a Mexican only sample. Therefore, the goal was to assess the stability of the ML-STAXI factor structure, and additionally to test a new Questionnaire about Anger Expression with Physical Aggression (QAEPa). Participants were 503 university students ($M_{age} = 21.67$, $SD = 1.96$), 221 men and 282 women. Results from confirmatory factor analyses indicated that current data did not replicate the ML-STAXI factor structure. An exploratory factor analysis yielded nine factors, three of which were identical to previous ML-STAXI: trait anger temperament, trait anger reaction, and anger control-in. The other factors had some similarity to previous ML-STAXI samples. The QAEPa was useful to measure physical aggression toward: others (e.g., pushing someone), objects (e.g., hitting the table), and one self (e.g., cutting). Gender anger differences were small.

Key words: anger, measurement, validity, culture.

RESUMEN

Aunque el Inventario Estado Rasgo de Expresión y Control de la Ira (ML-STAXI) fue validado con muestras latinoamericanas, se desconoce si la estructura factorial se mantiene en una muestra formada únicamente por mexicanos. En consecuencia, el objetivo fue evaluar la estabilidad de la estructura factorial del ML-STAXI, además de probar un nuevo Cuestionario sobre Expresión de la Ira con Agresión Física (CEIAF). Los participantes fueron 503 estudiantes universitarios ($M_{edad} = 21,67$, $DT = 1,96$), 221 varones y 282 mujeres. Como resultado del análisis factorial confirmatorio, no se replicó la estructura factorial del ML-STAXI. Un análisis factorial exploratorio arrojó nueve factores, tres de los cuales fueron idénticos a los obtenidos previamente con el ML-STAXI: temperamento de ira rasgo, reacción de ira rasgo y control interno de la ira. Los otros factores fueron algo semejantes a los encontrados previamente con el ML-STAXI. El CEIAF fue útil para medir agresión hacia: los demás (e.g., empujar a alguien), los objetos (e.g., golpear la mesa) y uno mismo (e.g. cortarse). Las diferencias por género fueron pequeñas.

Palabras clave: ira, medición, validez, cultura.

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Anger is a frequent emotional experience, typically experienced one or more times per week and in response to people the person knows well (Averill, 1983; Kassinove, Sukhodolsky, Tsytsarev, & Solovyova, 1997). When anger is mild to moderate and expressed appropriately, it may lead to positive outcomes such as problem-solving, reducing injustice, behaving assertively, communicating effectively, and improving relationships (e.g., Averill, 1983; Berkowitz, 1994; Novaco, 1976; Rothenberg, 1971). When anger is intense or expressed inappropriately, it may eventuate in undesired outcomes, affecting not only the person, but those around him/her. For example, anger is correlated with negative psychological conditions such as depression, general anxiety, social anxiety, lowered optimism, and reduced positive and problem-oriented coping (Conger, Conger, Edmondson, Tescher, & Smolin, 2003; Deffenbacher, Oetting, Thwaites, *et al.*, 1996; Martin & Dahlen, 2005; Trew & Alden, 2009).

In terms of physical health, anger is associated with sleep difficulties, poor health habits such as increased consumption of fatty foods and alcohol and decreased exercise, and cardiovascular disease (e.g., Kline, 2005; Narita, Murata, Takahashi, *et al.*, 2007; Williams, Paton, Siegler, Eigenbrodt, Nieto, & Tyroler, 2000). Anger is also associated with psycho-social adaptation. For example, anger is associated with increased marital communication and relational difficulties (e.g., Baron, Smith, Butner, Nealey-Moore, Hawkins, & Uchino, 2007) generally and in more extreme cases of intimate partner violence (e.g., Barbour, Eckhardt, Davison, & Kassinove, 1998), with work-place issues such as job performance, job satisfaction, and intentions to quit (e.g., Bruk-Lee, Khoury, Nixon, Goh, & Spector, 2009; Douglas & Martinko, 2001), and with verbal and physical aggression (Deffenbacher, Beeby, Lewis, & Ho, *in press*; Jacobson, Gottman, Waltz, Rushe, Babcock, & Holtzworth-Munroe, 1994).

Issues like these necessitate the development and validation of measures of anger and anger expression. However, measurement of anger constructs must be done in a linguistically and culturally sensitive manner. It cannot be assumed that a translated measure will necessarily have the same structure and pattern of relationships in another cultural context.

Since the current research focused on the experience and expression of anger in Mexico, authors identified two Spanish language measures -Spanish State-Trait Anger Expression Inventory-2 (Spanish STAXI-2; Miguel Tobal, Casado, Cano, & Spielberger, 2006) and the Multicultural Latin American Anger Expression Inventory (ML-STAXI; Moscoso, 2000; Moscoso & Spielberger, 1999). The STAXI-2 includes items consistent with Spanish speakers from Spain, but not fully with Spanish as spoken in Mexico. Actually, Oliva and Calleja (2010) gave the Spanish STAXI-2 to 15 Mexican adults and asked them to “think in loud voice” while answering the inventory. As a result they found phrases (e.g., *estoy cabreado, estoy quemado, me caliente, decir tacos, me enfado, rehuyo encararme*) which are not of common use in Mexico for anger. The ML-STAXI was developed for Latin American populations and seemed closer in Spanish expressions from Mexico. It was, therefore, employed in the current research. However, even the ML-STAXI included phrases not often used in Mexico to describe anger and anger expression (e.g., *Expreso mi cólera, or Me siento enfadado*). For example, Mexican participants completing the ML-STAXI often asked for a definition of *cólera*.

The factor structure and validity of the ML-STAXI in Mexico, therefore, could not be assumed and had to be established empirically.

Additionally, expressing anger via physically aggressive behavior receives little attention in the ML-STAXI. Items in the Feel-like-expressing-anger portion of the State Anger Scale (see method section description) do refer to the person's desire to engage in physically aggressive behavior. However, they refer only to desires and only to those desires at the moment of completing the measure, not the person's general tendencies to express anger through physically aggressive behavior generally. Moreover, the Anger-out scale does not have items addressing physically aggressive expression of anger, such that it may adequately address this form of anger expression. The present research, therefore, included six items asking the person how often he/she expressed anger by pushing, hitting, and throwing things at someone, hitting objects, damaging or breaking things, and doing something to hurt one's self physically.

In summary, the goals of this research were threefold. First, it sought to assess the stability of the factor structure of the ML-STAXI in a sample consisting entirely of Mexican participants. Second, it attempted to more fully address the extent to which the person expresses his/her anger through physically aggressive behavior. Third, although research shows few consistent gender differences in anger and aggression (Archer, 2004; Bartz, Blume, & Rose, 1996), this research explored potential gender differences in anger and anger expression in Mexicans.

METHOD

Participants

Participants were 503 (221 male, 282 female) undergraduate students from 20 different majors at a private, Mexican university ($M_{age} = 21.67$, $SD = 1.96$, range = 18-30). Most (98.0%) were single. Religious affiliation was 83.5% catholic, 5.0% other religion, and 11.5% no religious preference. Average family income ranged from 30,000 to 35,000 Mexican pesos per month (approximately \$2308 to \$2692 monthly income USD). Students completed instruments in class and received no compensation or class credit for participation. One percent ($n = 5$) declined participation, indicating that participation took too much time (approximately 20 minutes).

Instruments

Demographic Questionnaire. This questionnaire requested student age, gender, marital status, religious preference (e.g., Catholic, Jehovah's Witness, Mormon, and no religious preference), and family income (choices in units of 5000 from \$5000-10,000 to More than 60,001).

Multicultural Latin American Inventory of Anger Expression and Hostility (ML-STAXI). The 44-item ML-STAXI yields eight factors or scales with α reliabilities ranging from .61 to .99 and with appropriate correlations with other measures of anger and anger expression (Moscoso, 2000). Items are rated on 4-point scales (1= almost never, 4= almost always) with regard to how often the person feels or does the content of the

item. Higher scores reflect more of the emotional or expressive characteristic assessed. The 10-item State Anger Scale (current $\alpha = .82$) assesses what the person feels and desires to do at the moment and includes a 6-item Feeling-anger scale (e.g., feeling angry or furious) assessing current angry feelings (current $\alpha = .76$) and a 4-item Feeling-like-expressing-anger scale measuring the person's desires to express anger physically (e.g., feeling like hitting someone or breaking things) (current $\alpha = .83$). The 10-item Trait Anger Scale (current $\alpha = .83$) measures the general propensity to experience anger across time and situations and includes a 5-item factor referring to being angry generally or Angry-temperament (e.g., being bad tempered and angered easily) (current $\alpha = .83$) and a 5-item scale assessing anger in reaction to specific frustration situations (e.g., being criticized or making mistakes) (current $\alpha = .78$). The 24-item Anger Expression portion of the ML-STAXI contains four, 6-item scales assessing how anger is expressed: (1) Anger-in or suppressing anger and harboring grudges (e.g., boil on the inside, but not showing it) (current $\alpha = .65$); (2) Anger-out or the outward, generally negative expression of anger towards others (e.g., arguing) (current $\alpha = .71$); (3) Anger-control-in or the person's attempts to maintain emotional control (e.g., trying to relax) (current $\alpha = .86$); and (4) Anger-control-out or instrumental efforts to manage one's behavior when angry (e.g., being patient with others) (current $\alpha = .83$).

Questionnaire about Anger Expression with Physical Aggression (QAEPa). The QAEPa was constructed for this study, because the ML-STAXI does not contain a measure of expressing anger via physical aggression. The QAEPa contained six items regarding physically aggressive anger expression: (1) hit objects, (2) push someone, (3) hit someone, (4) do something to hurt your own body (e.g., cutting or biting oneself, injuring your own body), (5) throw things at someone, and (6) damage or break things. In response to the question, "How often, being angry, do you..." participants rated on a 10-point scale (1= I never do it, 10= I do it more than 10 times per week) how often they engaged in the behavior when angry. Separate principal component analyses with promax rotations for men and women showed that three items (2, 3, and 5) formed a factor with an eigenvalues >1 (eigenvalues = 2.86 and 2.71, variance accounted for = 47% and 35%, and $\alpha = .79$ and $.71$, respectively). This suggested a 3-item factor involving physically aggressive anger expression toward others. Other items failed to form a factor, because they did not reach an eigenvalue >1 . Because items 1 and 6 involved physical aggression toward the physical environment, a reliability analyses were conducted and yielded as of $.62$ and $.73$ for men and women, respectively. They were, therefore, combined into a 2-item measure of aggressive anger expression toward the environment, rather than people. The self-aggression item (#4) was considered alone as a measure of physical anger expression toward self. In summary, the QAEPa measured three forms of physically aggressive anger expression, i.e., towards others (3 items), toward the physical environment (2 items), and towards self (1 item). Higher scores on each measure reflect greater reported use of that form of physically aggressive anger expression.

Procedure

This research was approved by institutional review processes and individual instructors. Research assistants administered questionnaires during class. They informed students that participation was completely voluntary, their responses were anonymous and confidential, and questionnaires would take approximately 20 minutes. Students

completed, in order, the Demographic Questionnaire, ML-STAXI, and QAEPA. When students turned in questionnaires, they were thanked for participation.

RESULTS

We conducted confirmatory factor analyses (CFAs) using EQS (Bentler, 1995) to determine if our data replicated the ML-STAXI factor structure reported by Moscoso and Spielberger (1999). Following best practices in evaluating the quality of fit (see Hu & Bentler, 1999) CFAs were evaluated in terms of four statistics. First, a non-significant chi square (χ^2) indicates a good fit. However, this statistic is highly sensitive to sample size such that a good fitting model may have a significant χ^2 (Kline, 2005). Therefore, the following three fit indices and criteria were employed: (1) normed fit index (NFI) where values above .95 are considered good; (2) comparative fit index (CFI) where values above .95 are good; and (3) root mean square error of approximation (RMSEA) where values below .06 are good.

Following Moscoso and Spielberger, we examined the fit for males and females separately.

We conducted an overall CFA in which four scales (Trait Anger, State Anger, Anger Expression, and Anger Control) were included as four independent factors in a single model. Results from the overall CFA for males showed a poor fit, $\chi^2(865)=1670.89$ $p < .05$, NFI= .65, CFI= .79, RMSEA= .07 with 90% confidence interval (CI) for RMSEA of .06 to .07. Results for females were similar. The overall CFA revealed poor fit, $\chi^2(874)=2004.72$, $p < .05$, NFI= .69, CFI= .80, and RMSEA= .07 (90% CI of RMSEA= .06-.07). In summary, results from CFAs for men and women suggested that current data did not replicate the factor structure for the ML-STAXI in a Mexican-only sample.

Because the CFAs suggested a somewhat poor fit of the original ML-STAXI factor structure in a Mexican sample, we undertook an exploratory factor analysis in the combined gender sample. This was done for two reasons. First, we were looking for the most general understanding of anger and anger expression for Mexican samples. Second, employing the largest sample (i.e., both genders) maximized the reliability of factors by having the highest ratio of participants to the number of items in the analyses. We employed a principal component analysis with an oblique (rather than orthogonal) promax rotation. This analytic format was employed because factors were likely correlated and in order to achieve factors which are theoretically relevant (Hair, Anderson, Tathan, & Black, 1998).

Nine factors emerged with eigenvalues >1 and accounted for 58.31% of the variance (Table 1). Two five-item factors (F2 and F6) are state factors or how the person feels right now, involving angry feelings (F6) and the desire to express one's anger physically and verbally (F2). Two other five-item factors (F4 and 5) are trait factors or how one typically or generally reacts in terms of anger. F4 involves the degree of anger the person generally feels in response to specific situations such as being criticized

Table 1. Principal component analysis of the ML-STAXI (including men and women).

Items	F1	F2	F3	F4	F5	F6	F7	F8	F9
36. I control my angry feelings	.80				.12				
44. I keep control	.77								
21. I control my angry mood	.76								
27. I control the way I react	.72								.13
25. I stay calm	.69								
30. I can control myself before being in bad mood	.51	.11			-.17		.12		
34. I lose control	-.39	.15	.13		.19	-.10	.19		
7. I feel like hitting somebody		.83							
8. I feel like beating somebody	.11	.82							
10. I feel like destroying something		.81							
6. I feel like insulting someone		.80							
5. I feel like breaking things		.75							
39. I try something relaxing to calm down		.91							
37. I try something comfortable to calm down	-.13	.86							
38. I try to relax		.80							
42. I breath deeply to relax	.13	.62					.13		.13
41. I try to calm down as soon as possible	.29	.57							
40. I reduce my anger as soon as possible	.35	.52				-.10			
18. It makes me furious when I do a good job and people do not give value to it				.90				-.10	
14. I get angry when I do something well and it is not appreciated				.84					-.11
16. It makes me furious when I am criticized in front of other people				.65				.10	
17. It makes me furious when I do stupid mistakes	.11		.61				.11		.12
19. I get mad when someone screws up my plans			.55	.20				.10	
12. I have an irritable character				.89					
15. I get angry very easily		-.11		.83					
11. I am a very temperamental person				-.13	.81				
20. I have an angry mood	-.12	.10	.14	.14	.58				
13. I am a hotheaded person	-.14	.16			.54				
2. I am angry						.89			
1. I feel I am angry						.86			
9. I am annoyed		.13				.66			
3. I feel irritated						.59			.18
4. I am furious	-.13	.19			-.11	.51		.11	-.20
43. I express my angry feelings	-.17				-.18		.79		
35. If somebody bothers me, I tell him/her how I feel	.13	.10					.70	-.22	
22. I express my anger	-.13						.64		
26. I show my anger to other people			-.10				.63		
28. I argue with others	.12	-.23		.20	-.11	.43		.16	
32. I am more angry than I generally admit								.92	
33. I get more angry than people knows								.79	.13
31. I get secretly very critical of others			.31	-.21			.22	.38	
24. I stay apart from people							.10		.75
23. I suppress my anger many hours	.19								.72
29. I harbor grudges that I do not say to anyone	-.25	.11	.14				-.24	.10	.46
Eigenvalues	8.96	3.98	2.90	2.65	2.11	1.61	1.24	1.13	1.03
Percentage of variance	20.4	9.06	6.60	6.02	4.81	3.67	2.83	2.57	2.35

Note. All the .00 values were omitted in the table. ML-STAXI= State trait anger expression and control inventory.

in front of others, whereas F5 includes a self-perception as an angry person (e.g., being hotheaded). The other five factors involve how one typically expresses or deals with his/her anger. The five-item F7 could be described as anger-out or the outward expression of angry emotions to others. The 3-item F8 and F9 involved suppression of angry feelings and being secretly critical and withdrawing from others and harboring grudges, respectively. The final two factors involve positive or controlled aspect of anger expression. The seven-item F1 involves controlling one's self and behavior (anger

control-out), whereas the six-item F3 involves controlling or reducing one's angry feelings particularly through relaxing (anger control-in).

Reliability coefficients suggest good reliabilities (.86 and .77) for the two state scales (F2 and 6). These two measures can be combined into an overall State Anger Scale with α reliability of .82. The two trait indices (F4 and 5) also have solid reliability coefficients of .78 and .83, respectively. These two trait measures can also be combined into an overall Trait Anger Scale ($\alpha = .83$). Anger-out (F7), anger control-out (F1), and anger control-in (F3) have acceptable reliability coefficients of .70, .72, and .86. Measures involving anger suppression, being secretly critical, withdrawing, and harboring grudges (F8 and 9) have lower reliabilities of .61 and .50, with the latter being arguably too low to be accepted as a reliable factor. Because items in F8 and F9 previously combined into a single anger-in factor, their combination resulted in α of .65, suggesting a degree of correlation between these items.

Correlations of the factors derived from the ML-STAXI and the three forms of physically aggressive anger expression are presented in Table 2. As expected, the State Anger Scale and Trait Anger Scales were highly correlated with the two factors added to make their scores. State measures, i.e., feeling like expressing anger physically (F2), angry feelings (F6), and their combination (State Anger Scale), correlated positively with each other and formed small to moderate positive correlations with trait anger measures, anger-out, anger-in, and measures of physically aggressive anger expression (physically aggressive expression toward people, objects, and self) and small negative correlations with controlled anger expression (anger control-in and anger control-out). Trait anger measures, i.e., anger reaction (F4), anger temperament (F5), and their summation (Trait Anger Scale), yielded small to moderate positive correlations with state anger measures, anger-out, anger-in, and forms of physically aggressive anger expression and small negative correlations with forms of controlled anger expression. The exception to this pattern was a large negative correlation of anger temperament and anger control-out. Anger-in (F8 and F9 combined) and anger-out (F7) were uncorrelated, but tended to form

Table 2. Pearson correlations among ML-STAXI factors and other measures.

Factors and other measures	F1	F2	F3	F4	F5	F6	F7	F8&F9	State	Trait	Personal	Objects
F1 Control-out	--											
F2 Desire	-.18											
F3 Control-in	.57	-.12										
F4 Reaction	-.26	.15	-.23									
F5 Temperament	-.54	.36	-.29	.42								
F6 Feeling anger	-.13	.33	-.10	.20	.22							
F7 Anger-out	-.38	.15	-.16	.19	.39	.09						
F8&F9 Anger-in	-.13	.21	-.10	.44	.27	.19	-.06					
State anger scale	-.20	.82	-.14	.22	.36	.81	.15	.24				
Trait anger scale	-.47	.30	-.10	.86	.82	.25	.34	.43	.34			
Personal aggression	-.25	.28	-.31	.13	.25	.10	.18	.04	.23	.22		
Objects aggression	-.24	.33	-.13	.19	.28	.11	.18	.13	.27	.28	.47	
Self-aggression	-.16	.17	-.10	.20	.17	.16	.08	.26	.20	.22	.22	.31

$r > .09, p < .05; r > .13, p < .01$.

Note. Desire= desire to express anger physically and verbally, Reaction= trait anger reaction, Temperament= trait anger temperament. ML-STAXI= State trait anger expression and control inventory.

a similar pattern of relationships with other variables. They formed small to moderate positive correlations with state and trait anger measures and forms of aggressive anger expression and negative correlations with controlled anger expression. Two exceptions were that anger-out did not correlate with self-directed physical anger expression and anger-in did not correlate with physically aggressive anger expression towards others. Measures of physically aggressive anger expression (i.e., toward other people, objects, and self) formed small to moderate correlations with each other and generally small positive correlations with state and trait anger measures, anger-out, and anger-in and small negative correlations with anger control-in and anger control-out.

A one-way (Gender) MANOVA on all measures (Table 3) yielded a significant, moderate multivariate gender effect, $\lambda = 0.88$, $F_{11,491} = 5.59$, $p < .001$, $\eta^2 = 0.111$. Univariate ANOVAs (Table 3) revealed gender effects on the state measure of desire to express

Table 3. Gender comparisons in anger and aggression

Measure	Gender				Univariate Gender <i>F</i> (1,501)	Gender Effect Size (η^2)
	Men		Women			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
State Anger Scale	11.58	2.64	11.44	2.50	0.36	.001
Desire	5.75	1.82	5.39	1.36	6.19*	.012
Feeling anger	5.83	1.34	6.05	1.68	2.39	.005
Trait Anger Scale	19.59	5.44	19.33	5.35	0.29	.001
Trait anger reaction	10.74	3.47	10.28	3.27	2.37	.005
Temperament	8.85	3.05	9.05	3.00	0.56	.001
Anger-out	10.62	2.83	11.31	3.03	6.94**	.014
Anger-in	11.84	3.40	11.89	3.54	0.02	.000
Control-out	20.44	4.44	19.64	4.72	3.72	.007
Control-in	17.21	4.46	16.88	4.50	0.68	.001
Personal aggression	6.62	4.60	5.44	3.84	9.76**	.019
Objects aggression	6.17	3.83	4.60	3.46	23.12***	.044
Self-aggression	1.50	1.46	1.35	1.08	1.86	.004

* $p < .05$, ** $p < .01$, *** $p < .001$.

Note. Desire= desire to express anger physically and verbally, Temperament= trait anger temperament.

anger physically, anger-out, and expressing anger physically toward other people and objects. Gender effect sizes were small, except for the moderate gender effect on physically aggressive anger expression toward objects. Men reported more desire to express anger physically and physically aggressive anger expression toward people and objects than women, whereas women reported more anger-out than men.

DISCUSSION

The present study examined the ML-STAXI in a sample of Mexican participants. In eight of the nine current factors reliabilities ranged from .61 to .86, which is similar to previous studies (Moscoso, 2000; Moscoso & Spielberger, 1999) where reliabilities ranged from .61 to .99. The ninth factor involving ruminating and remaining apart from others had a value of .50, which is too low for a reliable factor. When the three items from F9 and F8 (anger-in involving suppressing angry feelings) were combined, the

reliability was .65. Overall, ML-STAXI reliabilities in the current sample were similar to those in Latin American Samples (Moscoso, 2000; Moscoso & Spielberger, 1999).

Factors correlated in logical and expected directions. For example, anger control measures correlated negatively with all other anger measures. The state anger scale and its factors (feeling anger and desire to express anger) were strongly related, just as the trait anger scale was strongly correlated with its factors (trait anger reaction and trait temperament). Nevertheless, state and trait anger were moderately correlated, indicating that scales measure different constructs. Anger control scales correlated positively, whereas anger expression scales (anger-in and anger-out) did not correlate, indicating that anger-in and anger-out are orthogonal, not related constructs.

In summary, the current factors formed logical positive and negative correlations that are similar to others found in the literature (Moscoso, 2000). Correlations were small enough to suggest that measures are tapping related, but they are independent enough that they can be used separately to assess different aspects of anger and anger expression.

Three aggressive forms of anger expression were measured with the QAEPA: aggression toward other people, aggression toward objects, and self-aggression. Correlations among them were small to moderate, but they generally had low correlations with the ML-STAXI subscales. These findings suggest that the QAEPA captures aggressive forms of anger expression which other measures do not. Since aggressive anger expression is both personally and interpersonally important, future research should develop a larger item set and assess whether reliable measures of these forms of anger expression can be constructed.

Regarding gender, there were no differences on trait anger measures, one state (angry feelings) measure, anger-in, anger control-in and anger-control-out. Differences emerged on state desire to express anger physically and two physically aggressive forms of anger expression (towards others and objects), with men reporting more of these. This may suggest a tendency for men to want to and typically express their anger in a more physically aggressive manner. However, women reported more anger-out, which is somewhat counter to this notion. Moreover, when gender differences were found at all, effect sizes tended to be small with the largest accounting for only 4.4% of the variance, corresponding to the literature (e.g., Archer, 2004; Bartz *et al.*, 1996).

Unlike the original ML-STAXI factor structure which included seven (Moscoso, 2000) and eight factors (Moscoso & Spielberger, 1999) in Latin American populations, the current Mexican sample yielded nine factors. However, it should be noted that the ninth factor has α reliability of .50. If this factor were deleted because of low reliability, this would result in an eight-factor final solution. If the ninth factor is retained, then the current analyses found two three-item factors for anger-in, rather than a single six-item scale. Three items involved suppressing anger more than others know and three items involving ruminating and remaining apart from others. If the ninth factor is dropped because of low reliability, then the anger-in scale would include three, rather than six items as in the original ML-STAXI.

On the other hand, if the both anger-in factors are conceived as a single six items scale, then its reliability increases, suggesting the items are correlated. This result is

consistent with Moscoso and Spielberger (1999) where these six items formed a single factor. However, in the current study these items did not form a single clear factor. This suggests two possibilities. First, anger-in is not a clear construct in the Mexican sample. Second, it may be that two or more correlated constructs are being forced together because there are insufficient items tapping each construct to allow them to form clear factors. For example, suppressing, stuffing angry feelings, boiling but not showing it, etc. may form a kind of suppression factor, whereas harboring grudges, being critical, ruminating, etc. might form a cognitively oriented factor. Future research, therefore, needs to identify and include more items to see if different factors might be identified.

The other seven factors in the current sample were conceptually similar to the original factor structure (Moscoso, 2000; Moscoso & Spielberger, 1999). Nevertheless, the number of items in each factor and the type of factor were not always the same as the original ML-STAXI. Three factors were identical to the original ML-STAXI, specifically (a) trait anger reaction (5 items) reflecting a tendency to react with anger to specific frustrating situations (e.g., being criticized in front of others), (b) trait anger temperament (5 items) reflecting a self-conceptualization as an angry person (e.g., being hotheaded); and (c) anger control-in (6 items) describing efforts to lower angry emotional arousal (e.g., relaxing).

Four other factors included different numbers of items and/or type of loading. For example, anger control-out, reflecting behavioral self-control of anger (e.g., controlling the way I act), included seven items rather than six in the original ML-STAXI, and the seventh item (i.e., I lose control) had a negative loading on the anger control-out factor. The state scale of feeling like expressing anger physically and verbally included five items rather than four in the original ML-STAXI. The fifth item (I feel like insulting someone) suggests that in Mexican samples the desire to express anger physically such as hitting someone is also associated with a desire for a highly verbally aggressive expression of insulting somebody. The state scale of feeling anger, i.e., indicating current intensity of angry feelings (e.g., being annoyed), contained five items in the current sample and six in the original samples. Finally, anger-out reflecting whether the individual expresses anger to others (e.g., arguing) contained five items in the current sample, but six in the original sample.

In summary, exploratory factor analysis in a Mexican sample yielded nine factors, seven of which are similar to those obtained in Latin American samples (Moscoso, 2000; Moscoso & Spielberger, 1999). Although the factors were similar, the number of items and in one case the loading of the item differed for Mexican and Latin American samples, suggesting some differences in the structure of the experience and expression of anger in Mexican versus other Latin American countries and which may account for the lack of replication of factor structures outlined in the CFAs.

Cultural and linguistic differences may account for the lack of stability of the ML-STAXI in the current Mexican sample. Since the ML-STAXI was constructed and validated with people from 18 (Moscoso & Spielberger, 1999) and seven (Moscoso, 2000) different Latin American countries, items may capture general aspects of anger across cultures, but may not be as sensitive to the specific Mexican context (see introduction for possible linguistic issues). Although most Latin American countries share Spanish as

a common language, cultural and linguistic differences must be considered in developing tests sensitive to specific cultural contexts. For example, strategies like “reading in loud voice” (Oliva & Calleja, 2010), focus groups, and use of culturally specific language experts could be helpful in adapting measures and developing new items to assess anger and its expression in a culturally sensitive manner.

REFERENCES

- Archer J (2004). Sex differences in aggression in real-world settings: A meta-analytic review. *Review of General Psychology*, 8, 291-322.
- Averill JR (1983). Studies on anger and aggression: Implications for theories of emotion. *American Psychologist*, 38, 1145-1160.
- Barbour KA, Eckhardt C, Davison GC, & Kassino H (1998). The experience and expression of anger in martially violent and martially discordant-nonviolent men. *Behavior Therapy*, 29, 173-191.
- Baron KG, Smith TW, Butner J, Nealey-Moore J, Hawkins MW, & Uchino B (2007). Hostility, anger, and marital adjustment: Concurrent and prospective associations with psychological vulnerability. *Journal of Behavioral Medicine*, 30, 1-10.
- Bartz AE, Blume NE, & Rose J (1996). Gender differences in self-report measures of anger: The role of social desirability and negative affect. *Journal of Social Behavior and Personality*, 11, 241-253.
- Bentler PM (1995). *EQS for Windows 6.1*. Encino, CA: Multivariate Software Inc.
- Berkowitz L (1993). *Aggression: its causes, consequences, and control*. New York; McGraw Hill.
- Brook-Lee V, Khoury HA, Nixon AE, Goh A & Spector PE (2009). Replicating and extending past personality/job satisfaction meta-analyses. *Human Performance*, 22, 156-189.
- Conger JC, Conger AJ, Edmondson C, Tescher B, & Smolin J (2003). The relationship of anger and social skills to psychological symptoms. *Assessment*, 10, 248-258.
- Deffenbacher JL, Beeby AC, Lewis JE, & Ho TN (in press). Prediction of the frequency of anger consequences. In JP Welty (Ed.), *Psychology of Anger: Symptoms, Causes and Coping*. Haupauge, NY: Nova Science Publishers.
- Deffenbacher JL, Oetting ER, Thwaites GA, Lynch RS, Baker DA, Stark RS, et al. (1996). State-trait anger theory and the utility of the trait anger scale. *Journal of Counseling Psychology*, 43, 131-148.
- Douglas SC & Martinko MJ (2001). Exploring the role of individual differences in the prediction of workplace aggression. *Journal of Applied Psychology*, 86, 547-559.
- Hair JF, Anderson RE, Tatham RL, & Black WC (1998). *Multivariate Data Analysis (5th ed.)*. New Jersey: Prentice Hall.
- Hu L & Bentler PM (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- Jacobson NS, Gottman JM, Waltz J, Rushe R, Babcock J, & Holtzworth-Munroe A (1994). Affect, verbal content, and psychophysiology in the arguments of couples with a violent husband. *Journal of Consulting and Clinical Psychology*, 62, 982-988.
- Kassinove H, Sukhodolsky D, Tsytsarev S, & Solovyova S (1997). Self-reported anger episodes in Russia and America. *Journal of Social Behavior and Personality*, 12, 301-324.
- Kline RB (2005). *Principles and practice of structural equation modeling (2nd edition)*. New York: Guilford Press.
- Martin RC & Dahlen ER (2005). Cognitive emotion regulation in the prediction of depression, anxiety, stress and anger. *Personality and Individual Differences*, 39, 1249-1260.
- Miguel Tobal JJ, Casado MI, Cano A, & Spielberger CD (2006). *STAXI-2: Inventario de expresión de ira estado-rasgo*. Madrid: Tea.

- Moscoso MS (2000). Estructura factorial del Inventario Multicultural Latinoamericano de la Expresión de la Cólera y la Hostilidad. *Revista Latinoamericana de Psicología*, 32, 321-343.
- Moscoso MS & Spielberger CD (1999). Evaluación de la experiencia, expresión y control de la cólera en Latinoamérica. *Revista Psicología Contemporánea*, 6, 4-13.
- Narita K, Murata T, Takahashi T, Hamada T, Kosaka H, Yoshida H, *et al* (2007). The association between anger-related personality trait and cardiac autonomic response abnormalities in elderly subjects. *European Archives of Psychiatry and clinical Neuroscience*, 257, 325-329.
- Novaco RW (1976). The functions and regulation of the arousal of anger. *American Journal of Psychiatry*, 133, 1124-1128.
- Oliva FJ & Calleja N (2010). Medición de la ira en el deporte de combate: Validación del STAXI-2 en deportistas mexicanos. *LIBERABIT: Revista de Psicología*, 16, 51-62.
- Rothenberg A (1971). On anger. *American Journal of Psychiatry*, 128, 454-460.
- Trew JL & Alden LE (2009). Predicting anger in social anxiety: The mediating role of rumination. *Behavior Research and Therapy*, 47, 1079-1084.
- Williams JE, Paton CC, Siegler IC, Eigenbrodt ML, Nieto FJ, & Tyroler HA (2000). Anger proneness predicts coronary heart disease risk: Prospective analysis from the atherosclerosis risk in communities (ARIC) study. *Circulation*, 2, 2034-2039.

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