State-Trait Anger Expression Inventory

The State-Trait Anger Expression Inventory (STAXI; Spielberger, 1988) involves an integration of two previously developed inventories, the State-Trait Anger scale and the Anger Expression (AX) Scale. Five independent subscales comprise the STAXI, including State Anger, Trait Anger, Anger-in, Anger-out, and Anger Control. A sixth scale involves an arithmetic combination of the Anger-in, Anger-out, and Anger Control subscales to provide a general index of the frequency with which anger is expressed.

- 44-items, Four-point frequency scale (e.g., from “almost never” to “almost always”)

- *Primary Reference:*
  Spielberger CD: Manual for the State-Trait Anger Expression Inventory (STAXI). Odessa, FL: Psychological Assessment Resources, 1988.

- Strengths:
  - All of the STAXI subscales have been extensively characterized on large normative samples, and their internal factor structure has been well described.
  - There is some information about the association between these measures and other self-report scales.
  - Accumulating evidence links these measures with cardiovascular risk; findings with the Trait Anger scale tend to be more consistent than those involving Anger Expression measures.

- Weaknesses:
  - Only a few studies have assessed the test-retest reliability of the STAXI scales (although these data suggest that the scales are reasonably stable over time; Bishop & Quah, 1998; Jacobs, Latham, & Brown, 1988).
  - There is little available information on the retest reliability of these scales, especially over longer periods. This would appear to be critical as a test of the assumption that some of these characteristics (for example, the propensity to hold anger in) are stable traits.
  - There is little information available on the construct validity of the STAXI using behavioral or observational measures of anger expression or aggressive responding, and some of the existing data on these questions are inconsistent.

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State-Trait Anger Scale Psychometrics

Two ten-item subscales, the State Anger and Trait Anger scales, were originally designed using a rational-empirical approach in a manner similar to that which had

guided the development of the state-trait anxiety inventory (Spielberger et al., 1983). Items were selected to characterize the current experience of angry feelings or, in the case of trait anger, assess the frequency with which anger is typically experienced over a range of situations.

Internal Reliability and Factor Analysis
Internal consistency (alpha coefficients) of each of these two scales has been shown to be quite high (.93, .86 for State Anger, Trait Anger, respectively, (Spielberger, 1988), although factor analyses of the Trait Anger scale suggest that it may consist of two subscales, one involving the tendency to experience anger in general ("Angry Temperament") and the other involving the tendency to experience anger when provoked ("Angry Reaction"). Several factor analyses have shown that the State Anger scale may also be divided into two coherent subscales, one describing angry feelings (e.g., "feel angry") and another involving descriptions of verbal or motor responses (e.g., "feel like hitting someone," "feel like yelling") (Forgays, Forgays, & Spielberger, 1997).

Construct Validity
In each of two samples, Trait Anger was found to be highly correlated with the Buss-Durkee total score (.66 - .73) and the Cook-Medley scale (.43 - .59). As suggested by the overlap between anger and anxiety, moderately high correlations were reported between Trait Anger and Neuroticism in both men and women (.49 - .50) (Speilberger et al., 1983). State anger scores have been shown to change reliably in the expected direction in response to acute behavioral challenges (Kamarck, Manuck, & Jennings, 1990).

Anger Expression Scale Psychometrics

The Anger Expression (AX) scales were subsequently developed by the same group to assess differences in the manner in which individuals typically respond to anger.

Internal Reliability and Factor Analysis
Preliminary analyses suggested that two orthogonal factors could be used to describe responses to the item pool, involving measures of anger-in (8 items, e.g., "pout or sulk") and anger-out (8 items, e.g., "say nasty things"), respectively. Internal consistency was reasonably high for each of the two subscales (.73 - .84).

Construct Validity
Scores on these two scales were shown to be associated in the expected direction with written responses to hypothetical anger scenarios in initial pilot testing (Spielberger, 1988). Others have reported that Anger-In scores are more strongly associated with anxiety (.25 with Beck Anxiety scale) and depression (.29 with BDI) than are scores on Anger-Out (.10, .04, respectively), suggesting a stronger loading of neuroticism associated with Anger-In (Frasure-Smith, Lesperance, & Talajic, 1995).

Anger-Out scores are moderately correlated with Trait Anger (.52 - .58) and more highly so than the Anger-In subscale (.24 - .29), as might be expected. Such associations are accounted for by the Angry Temperament subscale, suggesting that those scoring high on Anger-In and Anger-Out may not be distinguished as clearly in terms of their

responses to situations that involve blatantly unfair treatment or frustration, i.e., the Angry Reactions subscale, the other half of the Trait Anger scale (Speilberger, 1988).

Because such person-by-situation interaction effects may be anticipated, it is hard to interpret the fact that Anger-in and Anger-out scores have not always been associated with verbal or behavioral measures of anger expression in a straightforward manner (Suchday & Larkin, 2001). An Anger Control scale, assessing the use of a restrained approach in the face of anger, such as "I control my temper" is also included in the STAXI. To our knowledge, there are few data addressing the construct validity of this scale at this time.

Relationship to Health Outcomes

The STAXI and its subscales have been used in a number of prospective studies assessing cardiovascular disease. In two studies involving initially healthy populations, Trait Anger has been shown to be associated with single measures of carotid atherosclerosis (Bleil, McCaffery, Muldoon, Sutton-Tyrrell, & Manuck, 2004; Matthews, Owens, Kuller, Sutton-Tyrrell, & Jansen-McWilliams, 1998), and one prospective study showed that this scale predicted 4-1/2 year incidence of CHD events (Williams et al., 2000) and 6-year incidence of stroke as well (Williams, Neito, Sanford, Couper, & Tyroler, 2002). In 2 small samples with CHD, measures of Trait Anger were significantly associated with recurrent events (Denollet & Brutsaert, 1998; Mendes de Leon, Kop, de Swart, Bar & Appels, 1996), although in the latter case, such associations were significant among men only.

With respect to the STAXI measures of anger expression, Anger-in scores were significantly associated with carotid atherosclerosis by ultrasound 10 years later in a sample of women (Matthews et al., 1998), although anger-in was not related to carotid atherosclerosis (Bleil et al., 2004) or atherosclerotic progression (Julkunen, Salonen, Kaplan, Chesney, & Salonen, 1994) in two studies involving male samples. Anger-out scores were related to carotid IMT assessments among one of these samples (Bleil et al., 2004) and anger-control scores were associated with IMT progression in the other (Julkunen et al., 1994).

In two prospective studies examining clinical outcomes in male community samples, one showed that anger-out scores were related to an increased 8-year risk of stroke (Everson et al., 1999) and one showed inverse associations with 2-year stroke incidence (Eng, Fitzmaurice, Kubzansky, Rimm, & Kawachi, 2003). Anger expression variables were unrelated to cardiovascular outcomes in 3/5 samples of CHD patients (Suls & Bunde, 2005), and were related in the opposite direction to risk in two other reports (Angerer et al., 2000; Thomas, Friedmann, Wimbush, & Schron, 1997).

State-Trait Anger Expression Inventory References

Angerer P, Siebert U, Kothny W, Muhlbauer D, Mudra H, von Schacky C: Impact of social support, cynical hostility and anger expression on progression of coronary atherosclerosis. J Am Coll Cardiol 36: 1781-1788, 2000.

Bishop GD, Quah SH: Reliability and validity of measures of anger/hostility in Singapore: Cook & Medley Ho Scale, STAXI and Buss-Durkee Hostility Inventory. Pers Indiv Diff 24: 867-878, 1988.
Bleil ME, McCaffery JM, Muldoon MF, Sutton-Tyrrell K, Manuck SB: Anger-related personality traits and carotid artery atherosclerosis in untreated hypertensive men. Psychosom Med 66: 633-639, 2004.
Denollet J, Brutsaert DL: Personality, disease severity, and the risk of long-term cardiac events in patients with a decreased ejection fraction after myocardial infarction.[see comment]. Circulation 97: 167-173, 1998.
Eng PM, Fitzmaurice G, Kubzansky LD, Rimm EB, Kawachi I: Anger expression and risk of stroke and coronary heart disease among male health professionals. Psychosom Med 65: 100-110, 2003.
Everson SA, Kaplan GA, Goldberg DE, Lakka TA, Sivenius J, Salonen JT: Anger expression and incident stroke: Prospective evidence from the Kuopio ischemic heart disease study. Stroke 30: 523-528, 1999.
Forgays DG, Forgays DK, Spielberger CD: Factor structure of the State-Trait Anger Expression Inventory. J Pers Assess 69: 497-507, 1997.
Frasure-Smith N, Lesperance F, Talajic M: The impact of negative emotions on prognosis following myocardial infarction: Is it more than depression? Health Psychol 14: 388-398, 1995.
Jacobs GA, Latham LE, Brown MS: Test-retest reliability of the State-Trait Personality Inventory and the Anger Expression Scale. Anxiety Res 1: 263-265, 1988.
Julkunen J, Salonen R, Kaplan GA, Chesney MA, Salonen JT: Hostility and the progression of carotid atherosclerosis. Psychosom Med 56: 519-525, 1994.
Kamarck TW, Manuck SB, Jennings JR: Social support reduces cardiovascular reactivity to psychological challenge: A laboratory model. Psychosom Med 52: 42-58, 1990.
Matthews KA, Owens JF, Kuller LH, Sutton-Tyrrell K, Jansen-McWilliams L: Are hostility and anxiety associated with carotid atherosclerosis in healthy postmenopausal women? Psychosom Med 60: 633-638. 1998.
Mendes de Leon CF, Kop WJ, de Swart HB, Bar FW, Appels AP: Psychosocial characteristics and recurrent events after percutaneous transluminal coronary angioplasty. Am J Cardiol 77: 252-255, 1996.
Spielberger CD: Manual for the State-Trait Anger Expression Inventory (STAXI). Odessa, FL: Psychological Assessment Resources, 1988.
Spielberger CD, Jacobs GA, Russell S, Crane RS: Assessment of anger: The state-trait anger scale. In: JN Butcher, CD Spielberger, eds. Advances in Personality Assessment, vol 2. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc., 1983.
Suchday S, Larkin KT: Biobehavioral responses to interpersonal conflict during anger expression among anger-in and anger-out men. Ann Behav Med 23: 282-290, 2001.
Suls J, Bunde J: Anger, anxiety, and depression as risk factors for cardiovascular disease: The problems and implications of overlapping affective dispositions. Psychol Bull 131: 260-300, 2005.
Thomas SA, Friedmann E, Wimbush F, Schron E: Psychological factors and survival in the cardiac arrhythmia suppression trial (CAST): A reexamination. Am J Critical Care 6: 116-126, 1997.
Williams JE, Nieto FJ, Sanford CP, Couper DJ, Tyroler HA: The association between trait anger and incident stroke risk: The Atherosclerosis Risk in Communities (ARIC) Study. Stroke 33: 13-19, 2002.
Williams JE, Paton CC, Siegler IC, Eigenbrodt ML, Nieto FJ, Tyroler HA: Anger proneness predicts coronary heart disease risk: prospective analysis from the atherosclerosis risk in communities (ARIC) study. Circulation 101: 2034-2039, 2000.