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Gerace A, Day A. The short anger measure: development of a measure to assess anger in forensic populations. *Journal of Forensic Nursing*. 2014 Jan-Mar;10(1):44-9. doi: 10.1097/JFN.0000000000000010.

which has been published in final form at

DOI:

<http://dx.doi.org/10.1097/JFN.0000000000000010>

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RUNNING HEAD: Development of a brief anger measure

The Short Anger Measure (SAM): Development of a measure to assess anger in forensic  
populations

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Conflicts of interest: None.

## **Abstract**

In this brief report we describe the development of a measure of anger that may be used by nurses and other professionals to assess anger and changes in anger with male offenders. The Short Anger Measure (SAM), a 12-item self-report measure of angry feelings and aggressive impulses, was administered to 73 male offenders. The measure demonstrated sound psychometric properties (internal consistency reliability, test-retest reliability), and concurrent validity with an established measure of anger. The potential use of the measure by nurses working in forensic settings is discussed.

**KEYWORDS:** aggression, anger, evaluation, forensic nursing, forensic patients, measurement, offenders

## **Introduction**

Given that nurses are more frequently the target of aggression and assault than other health professionals and patients (Daffern & Howells 2002; Cornaggia, Beghi, Pavone, & Barale 2011; Gudjonsson, Rabe-Hesketh, & Wilson, 2000; Nicholls, Brink, Greaves, Lussier, & Verdun-Jones, 2009), the ability to assess risk and formulate appropriate interventions may be considered a core nursing skill (Norman & Parrish 1999). Although anger need not be a contributing factor in all acts of aggression (Howells, 2004), its association with violence provides a strong rationale for its assessment (Doyle & Dolan, 2006). Indeed, anger management is a common component of violence reduction programs, with one evaluation by Dowden and Andrews (2000) reporting that violence programs which targeted negative affect/anger were more effective in reducing re-offending. Accordingly, it is relatively common for nurses who work in forensic settings to deliver anger management programs (Kettles & Woods 2006; Peternelj-Taylor & Johnson, 1995; Schafer & Peternelj-Taylor, 2003).

There have been relatively few evaluations of the effectiveness of anger management programs with forensic populations (see Heseltine, Howells, & Day, 2010), with one obstacle to evaluation being a lack of available measures. There are particular challenges in measuring anger in forensic populations. Existing measures of anger are often too lengthy or costly to routinely use, require a level of literacy considered too high, and have not been well validated. In addition, some measures (e.g., of trait anger) are unlikely to be sensitive to changes over short periods of time or have been developed for use with particular anger incidents and, therefore, are of limited use in assessing reductions in anger as a result of treatment (Daffern, Howells, Ogloff, & Lee, 2005). There are also restrictions on who can administer or interpret some tests. In short, there is a need for a brief measure of

anger for use in forensic populations that is in the public domain and which can be used both for screening purposes before treatment is offered and to measure change over time in angry emotion. In this paper we describe the development of one such measure, the Short Anger Measure (SAM).

### **Original Development with Youth At-Risk**

The SAM differs from trait measures of anger in that it asks respondents to rate their anger over the last week. The SAM was originally developed for use as a brief (12 item) measure of anger for use with adolescents identified as 'at risk' (Mohr, Heseltine, Howells, Badenoch, Williamson, & Parker, 2001). Items were selected to address the frequency of the experience and of the expression of anger, and respondents are asked to answer on a five point scale from 'never' to 'very often'. This development work with a sample of 95 participants (average age of 14 years) suggested that the scale had a sound factorial structure, with two separate subscales identified (labelled 'angry feelings' and 'aggressive impulses'). Both subscales were found to have high levels of internal consistency (alpha .87 and .92 respectively), with a total scale alpha of .92. Scores on the aggressive impulses subscale also correlated significantly with staff ratings of negative behavioural incidents ( $r = .31, p < .05$ ), giving some indication of convergent validity. Scores on the angry feelings subscale were unrelated to staff ratings of negative behaviours ( $r = .09, p > .05$ ), offering some support for the two factor model of anger. The measure also showed some sensitivity to change over the course of an intervention, with a sample of participants identified as high in need showing significant changes in the angry feelings subscale in comparison to a matched control group. The aim of the current study was to assess its suitability for use in an adult forensic population.

## **Method**

### **Participants**

A sample of 73 adult male offenders in both community and prison settings in South Australia participated. Of these 49 were resident in prison and 24 were reporting to a probation and parole (community corrections) centre. The average age of participants was 30.38 years ( $SD = 8.55$ ;  $Range = 19-60$  years) and the average level of education completed was year 10. The majority (63, 86.3%) described themselves as Australian.

### **Materials and procedure**

Correctional clients referred for anger management programs in both custodial and community settings were invited to participate in the study prior to beginning the program. Participation was voluntary and the decision to complete the measures had no bearing on subsequent treatment or services received. Participants completed the SAM and the State-Trait Anger Expression Inventory-2 (STAXI-2: Spielberger, 1999), which has well-established psychometric properties and is one of the most widely-used measures of anger expression and control. The STAXI measures how angry the respondent is feeling at the time (State Anger scale), their general propensity to experience and express anger (Trait Anger scale), and their characteristic response to anger experience (measured as outwardly-expressed behavior or Anger Expression-Out; suppression of experience or Anger Expression-In; control of outward expression, Anger Control-Out; and the use of calming techniques, Anger Control-In).

A subgroup of participants ( $n = 64$ ) completed the SAM on two occasions, 14 days apart to assess test-retest reliability.

## Results

### Factor structure of the SAM

Exploratory factor analysis using Principal Axis Factoring with an oblimin rotation (Kaiser normalization) was used to assess the factor structure of the measure. Bartlett's test of sphericity was significant (543.01  $p < .001$ ), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .83 indicating the suitability of the data for factor analysis. The anti-image correlation matrix revealed that all KMO values for scale items were above .60 (the smallest being .77), as recommended by Tabachnick and Fidell (2001).

Factor analysis identified two factors which corresponded to the original factor structure identified by Mohr et al. (2001). The factor loadings for each of the 12 items of the SAM are shown in Table 1, along with the loadings obtained in the study by Mohr et al. and the difference between scores from both studies. The first factor explained 49.23% of the total variance in scores, with an additional second factor only adding a further 7.30%.

< Table 1 about here >

In contrast with the results of the original study (Mohr et al., 2001) and with the exception of items 5 and 7, the items show either a better fit or an equally good fit with the proposed two-factor structure. Items 5 ("I felt like smashing things") and 7 ("I felt like hitting someone"), which were expected to load onto the aggressive impulses factor, loaded moderately highly on the angry feelings factor and had noticeably lower factor loadings on the aggressive impulses factor. The correlation between factors found in the present study was very high ( $r = .67$ ,  $r^2 = .47$ ), and substantially higher than that found in the original validation study ( $r = .54$ ,  $r^2 = .29$ ).

## **Reliability of the SAM**

Total scores on the SAM ranged from 12 to 58, with a mean score of 23.56 ( $SD = 9.31$ ). Table 2 presents the means, standard deviations, ranges, quartiles and deciles for the SAM total scale, the two existing subscales (Angry Feelings and Aggressive Impulses), and two subscales based on the factor analysis (Angry Affect, consisting of the Angry Feelings items as well as items 5 and 7; and Angry Behavior consisting of all Aggressive Impulses items with the exception of items 5 and 7).

< Table 2 about here >

The internal consistency of the item scores was established using Cronbach's alpha coefficient. The full scale score showed high reliability with an alpha coefficient of .91. This was almost identical to the alpha coefficient obtained in the original validation study. The addition of two items (5 and 7) to the Angry Feelings subscale based on factor analysis results in a small (.03) increase in alpha for that subscale, with the removal of these items from the Aggressive Impulses subscale leading to decrease in alpha of .01. Table 2 presents the Cronbach's alphas for the total scale and existing subscales, as well as modified subscales based on factor analysis. Examination of Cronbach's alphas statistics if particular items were removed from the total scale, two original subscales or the two potential subscales revealed no large changes in alpha.

Test-retest reliability was assessed with the subgroup of participants who completed the measure twice. The correlation between scores obtained on the two occasions ( $r = .74$ ) showed that the scores were relatively stable, but not too fixed to be unamenable to change.

The magnitude of the correlation is to be expected from a variable that is relatively stable (at least in the short-term), but not a relatively fixed characteristic, such as a personality trait.

### **Concurrent validity of the SAM**

Correlations between the total SAM score and the scales of the State-Trait Anger Expression Inventory-2 (STAXI-2) were used to assess concurrent validity. Scores on the total SAM score were moderately associated with those obtained from the Trait Anger scale of the STAXI ( $r = .54, p < .001$ ), indicating that the SAM measures a construct that is related to trait anger. Scores were also moderately correlated with the Anger Expression-Out ( $r = .58, p = .001$ ), Anger Control-Out ( $r = -.52, p = .001$ ), and Anger Control-In ( $r = -.44, p < .001$ ) scales of the STAXI-2, with weaker correlations between the measure and State Anger ( $r = .39, p = .001$ ) and Anger Expression-In ( $r = .31, p = .01$ ). The scale did not correlate with the responses to a general question participants completed, “How much is anger a problem for you?” ( $r = -.01, p = .96$ ). These findings support those obtained in regard to test-retest reliability which show that while the SAM measures anger that is relatively stable it is not reflective of a fixed trait. On the other hand, it is not a strong indicator of anger at a single point in time, as is typically assessed by measures of state anger.

### **Discussion**

This paper reports preliminary data concerning the development of a short scale that aims to measure anger and problems with anger regulation and expression. While based on a small sample and reporting findings that require further validation with different populations (e.g., forensic inpatients), the psychometric properties of the SAM demonstrated in this study are nonetheless promising. Reliability measures suggest that the items are measuring

meaningful and internally-consistent components of anger, scores can change over time, and are associated with established measures of how individuals express and control their angry feelings. That the measure was not related to a general question about anger problems suggests that it may probe deeper into specific feelings and behaviors. The measure is efficient to administer and is likely to be meaningful to the client.

The variation between results obtained from the two samples (“at risk” youth and male adult offenders) requires explanation. It may simply be the result of utilizing a small sample size and speak to the need for replication with larger samples. However, measures of sampling adequacy suggested suitability for factor analysis, and the item factor loadings, number of factors extracted and number of variables per factor suggest reliable results have been obtained (de Winter, Dodou, & Wieringa, 2009). Further examination of the items suggested that participants in this study are responding according to angry affect or inclinations to anger (items from the Angry Feelings subscale as well as Items 5 and 7) and actual behaviors (items from the Aggressive Impulses scale with the exception of Items 5 and 7). It is suggested, therefore, that those administering the test should use either the total scale score (since the reliability for this is high), or a modified version of the scale that delineates between affect and behavior. It is also the case that these data relate to a sample of correctional clients who had already been referred for anger management, whereas the original scale construction study involved adolescents who had not necessarily been identified with anger problems.

The data reported here provide a reference point for those who are seeking to use the SAM as a screening measure to identify the need for anger management. Notwithstanding the difficulties associated with determining cut off points for clinically significant anger problems generally (see Cornell, Peterson, & Richards, 1999), and the fact that the population recruited for this study (correctional clients referred for treatment) are likely to

have a high level of need for treatment in relation to aggressive and violent behavior, it is suggested that scores above the means for the total scale would be broadly indicative of a need for anger management.

While other measures of anger and aggression are available (see for example, Irritability subscale of the NOSIE (Honigfeld & Klett, 1965), the START (Webster, Martin, Brink, Nicholls, & Middleton, 2004), the DASA (Ogloff & Daffern, 2006), and the Violence Scale (Morrison, 1993)), a simple self-report scale such as the SAM has some advantages over those such as the Overt Aggression Scale (Yudofsky, Silver, Jackson, Endicott, & Williams, 1986) that rely on behavioural observation in so far as the base rate for observed instances of aggression may be too low to be used to monitor change over time (see, for example, prison data reported by Howells et al., 2005). The test-retest reliability of the SAM further suggests that it may be also suitable for use as a measure of change over time. In addition, the SAM does explicitly assess angry feelings, which are particularly relevant in a nursing context given robust evidence that such emotional cues are lacking in staff reports of antecedents to aggression and violence on the ward (Papadopoulos, Ross, Stewart, Dack, James, & Bowers, 2012).

### **Implications for clinical forensic nursing practice**

Given the high reported rates of aggression in mental health settings, management of anger is an integral component of interventions to decrease aggression in in-patient settings (Daffern, Howells, & Ogloff, 2007; Doyle, 1999). Nurses and other health care professionals who work with offenders have a unique role to play in both their treatment and rehabilitation (Peternelj-Taylor & Johnson, 1995). The measure may play a part in nursing risk assessments and observations, as well as being able to be used in program evaluations or to demonstrate therapeutic changes in individual patients as a result of treatment. For example, there is some evidence to suggest that whilst historical risk factors may be more

predictive of long-term risk, it is the clinical risk factors that have greater value in the prediction of acute risk. The assessment of anger can contribute to an understanding of impulsivity, which is identified as a risk factor in instruments such as the Historical-Clinical-Risk Management-20 assessment protocol (Douglas, Hart, Webster, Belfrage, & Eaves, 2008). Doyle and Dolan (2006) suggest that measures such as the HCR-20 “might not be best suited to routine clinical use in acute settings, where assessments need to be made quickly with little or no background information” (p. 784). In their study, they found that staff-rated patient anger over the previous week was higher for patients who were subsequently (over the 12-week study period) physically violent or who threatened violence, and that the measure they used to assess anger was predictive of patients who were violent/threatened violence controlling for factors such as gender, age, and presence of major mental disorder. The researchers stressed the importance of risk management measures addressing anger regulation problems in reducing aggression and violence. While the SAM is unlikely to be useful to predict imminent violence, it is likely to play a part in nurse interventions to address patient risk factors for violence.

Nurses can also use the SAM clinically; to discuss with patients the cognitive processes and triggers for their reported angry feelings and behaviors, accompanying physiological experiences, and the interpersonal and environmental precipitants to their reported anger (Lewis, 2002; Robins & Novaco, 1999). Collaboration with the client in this way is likely to help them to feel heard, that they have been provided with feedback, and that they share treatment objectives with the nurse (see Schafer & Peternelj-Taylor, 2003). The SAM measure also appears promising for use as a measure of change for participants in anger management programs, as well as having a broader role to play in evaluating treatment outcomes for forensic populations.

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Table 1

Factor loading of SAM items

	Factor 1			Factor 2		
	(Angry Feelings)			(Aggressive Impulses)		
	Present study	Mohr et al.	Diff.	Present study	Mohr et al.	Diff.
<b>Angry Feelings</b>						
Item 1 I felt angry	0.77	0.74	0.03	-0.05	0.14	-0.19
Item 2 Something annoyed me and I couldn't get it out of my mind	0.83	0.83	0.00	-0.12	-0.09	-0.03
Item 3 I felt like I was ready to explode	0.82	0.76	0.06	-0.01	0.04	-0.05
Item 6 Other people or things got on my nerves	0.64	0.56	0.08	-0.02	0.23	-0.25
Item 9 I felt like going berserk	0.74	0.48	0.26	0.11	0.38	-0.27
Item 12 I felt like people were having a go at me	0.46	0.58	-0.12	0.13	0.24	-0.11
<b>Aggressive Impulses</b>						
Item 4 I yelled at someone	0.15	0.41	-0.26	0.62	0.42	0.20
Item 5 I felt like smashing things	<b>0.59</b>	<b>0.37</b>	<b>0.22</b>	<b>0.18</b>	<b>0.48</b>	<b>-0.30</b>
Item 7 I felt like hitting someone	<b>0.53</b>	<b>0.32</b>	<b>0.21</b>	<b>0.31</b>	<b>0.58</b>	<b>-0.27</b>
Item 8 I abused someone	-0.04	-0.08	0.04	0.79	0.91	-0.12
Item 10 I threatened someone	-0.04	-0.11	0.07	0.87	0.94	-0.07
Item 11 I blew my top	0.08	0.35	-0.27	0.77	0.41	0.36

Note: Diff. = difference.

Table 2

*Means, standard deviations, and quartiles for SAM Total score, Angry Feelings and Aggressive Impulses subscales, and Angry Affect and Angry Behavior subscales*

	SAM Total	Angry Feelings <sup>a</sup>	Aggressive Impulses <sup>b</sup>	Angry Affect <sup>c</sup>	Angry Behavior <sup>d</sup>
Mean (SD)	23.56 (9.31)	13.41 (5.25)	10.10 (4.75)	17.04 (6.92)	6.49 (3.15)
Range	12-58	6-30	6-30	8-39	4-20
Quartiles					
Lower quartile	16	9	6	11	4
Median (second quartile)	22	13	8	15	5
Upper quartile	28	17	13	22	8
Deciles					
1	13	7	6	9	4
2	16	8	6	10.40	4
3	17	10	6	12	4
4	19	12	7	14	5
5	22	13	8	15	5
6	26	14	11	18.20	6.80
7	28	16	12	21	7.10
8	30.60	18	13.40	22.60	9
9	35.00	19	16	25	10.70
Cronbach's alpha	.91	.86	.87	.89	.86

*Note:* <sup>a</sup> Items 1, 2, 3, 6, 9, and 12 <sup>b</sup> Items 4, 5, 7, 8, 10, and 11 <sup>c</sup> Items 1, 2, 3, 6, 9, 12, 5, and 7 <sup>d</sup> Items 4, 8, 10, and 11.