

The Metacognitive Anger Processing (MAP) Scale: Preliminary Testing

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Background: Few studies have explored the metacognitive components of anger, and at present there is no metacognitive framework on anger incorporating both positive and negative beliefs about anger and distinct maladaptive processing routines, such as rumination. **Aims:** The aim of the present preliminary studies was to apply a metacognitive framework to anger and put forward a new anger self-report scale, the Metacognitive Anger Processing (MAP) scale, intended as a supplement to existing measures of anger disposition and to enhance anger treatment targets. **Method:** The new measure was tested in a nonclinical and a clinical sample together with measures of anger and metacognition to establish factor structure, reliability, concurrent, and convergent validity. **Results:** The MAP showed a reliable factor structure with three factors - Positive Beliefs about anger, Negative Beliefs about anger, and Rumination; good internal reliability, and test-retest reliability. The subscales showed positive correlations with anger and the pattern of correlation with the general metacognitive measure supported the idea that the MAP represents dimensions of metacognition as it relates to anger. **Conclusions:** The present data indicate that positive as well as negative beliefs are involved in the tendency to ruminate about angry emotions. Clinical interventions may benefit from an exploration of the patient's experience of anger, as structured by the MAP's factors and their interrelationships. The psychometric properties of the MAP should be further investigated in clinical samples using larger test batteries and objective measures of aggression.

Keywords: Anger, metacognitive beliefs, rumination, assessment tool.

Introduction

Anger has functional value, but presents itself as a clinical problem when it is triggered too frequently, too intensely, is prolonged in duration, or triggers excessive aggression. Anger has a duality in its associations. On the one hand, it is associated with eruptive and destructive feelings linked to madness, while on the other hand, anger is associated with energizing and empowering experiences linked to survival systems (Novaco, 2010).

Beliefs about anger/aggression as a strategy to achieve a desired goal and the process of rumination have been associated with high anger and aggression, but no metacognitive framework on anger incorporates both positive and negative beliefs related to distinct

maladaptive processing routines, such as rumination. Therefore, to improve understanding of problem anger, the present study attends to ruminative cognitions and higher level cognitive beliefs (metacognitive beliefs), including the duality of the anger experience. In doing so, it puts forward a new anger self-report scale concerning these factors, intended as a supplement to existing measures of anger disposition and to enhance anger treatment targets.

In the metacognitive framework by Wells (2000), the central motor in emotional disorder is the maintenance of negative and biased thinking styles, which are guided by specific positive and negative metacognitive beliefs. Whether the framework of Wells and his colleagues that has proved well-suited for “worry” might also apply to anger was the starting point for the present studies. The literature on anger and metacognition is sparse, and in the clinical area there is only the interview study by Simpson and Papageorgiou (2003) with 10 patients referred for anger problems, all of them ruminated, all held negative metacognitive beliefs about angry rumination, and eight held positive beliefs about rumination. The Metacognitive Anger Processing (MAP) scale that was developed in the present studies assesses angry rumination separately from negative/positive beliefs about anger.

Pilot testing with hospitalized forensic patients determined that four domains of the Wells (2000) framework (positive beliefs about worry, beliefs about uncontrollability and danger related to worry, general negative beliefs about mental control, and evaluations of one’s own awareness of cognition) were deemed relevant for anger, and these guided the creation of the initial pool of MAP items. Their psychometric properties were tested with non-clinical and clinical samples.

Method: Study 1

Participants

A convenience sample of 192 Danish police students with an average age of 28 (range 19–35, $SD = 2.6$) was recruited; 44 (23%) were male and 148 (77%) were female. To evaluate test-retest reliability, 39 participants were retested after 3-weeks.

Measures

Metacognitive Anger Processing scale (MAP). The initial pool was comprised of 57 items assessing metacognition in relation to anger on four domains: (1) General positive beliefs about the functions of anger (e.g. “Anger helps me solve problems”); (2) Uncontrollability of the experience of anger and anger-related thoughts (e.g. “I cannot let go of angry thoughts”); (3) Negative conceptions related to anger, particularly those focused on danger, harm and madness in association with anger (e.g. “Anger could make me go mad”); (4) General evaluations of one’s own cognitive awareness and monitoring processes (e.g. “I am constantly aware of my thinking”). MAP items were worded solely to assess anger, avoiding overlap with aggression. The items are rated on a 4-point scale (1 = never true; 2 = sometimes true; 3 = often true; 4 = always true).

The Provocation Inventory (PI; Novaco, 2003): The PI is a 25-item, self-report instrument with good psychometric qualities measuring anger intensity. The items sum to a total score.

Results

A Principal Axis Factoring (PAF) with an oblique rotation using the Promax technique fixing a 4-factor solution accounted for 33.3 % of the variance, with 34 of the 57 items loading above .41 and only on the expected factor. The first factor was Positive Beliefs about anger (9 items, $\alpha = .85$), the second was Negative Beliefs about anger (14 items, $\alpha = .84$), the third was Rumination (7 items $\alpha = .79$), and the fourth was Cognitive Consciousness (4 items $\alpha = .61$). Internal reliability analysis yielded an alpha of .85 and test-retest reliability was .78 for the 34 MAP items, indicating very good stability for the new measure.

The MAP showed significant positive inter-correlations between the subscales, ranging from $r = .21$ to $.35$, except for $r = .02$ between Negative Beliefs and Positive Beliefs. All MAP subscales were highly correlated with the MAP Total. The MAP correlation with the PI score was $r = .38$, indicating a moderate relationship. Three of the four subscales had significant correlations with PI anger level, ranging from $r = .21$ to $.38$, whereas the correlation for the Cognitive Consciousness subscale was non-significant ($r = .14$).

The mean PI score was 51.1 ($SD = 8.6$). Compared to the Danish norms for the PI with nonclinical participants ($N = 477$, $M = 53.5$, $SD = 10.3$) (Moeller, Novaco, Heinola-Nielsen and Hougaard, 2015) the present sample of police students had a significantly lower mean PI ($t(667) = 2.90$, $p < .004$).

Method: Study 2

The next step was to test the psychometric properties of the MAP involving a sample with a higher level of anger. To more fully address convergent validity, a general metacognitive measure was included.

Prior to study 2, the MAP was revised based on Study 1. The Cognitive Consciousness subscale was eliminated because its correlation with the anger criterion was non-significant. The remaining 30 items extracted from the factor analysis in Study 1 entailed positive beliefs, negative beliefs, and rumination. As there were comparatively few rumination items, five new items were constructed for that subscale. The final measure thus had a total of 35 items.

MAP subscales were expected to show moderate positive correlations with the general Meta Cognitive Questionnaire (MCQ-30). Consistent with the metacognitive approach to emotional disorders, the inter-subscale correlations of the MAP were expected to be moderately positive, and all subscales of the MAP were expected to be positively correlated with anger.

Participants

A sample of 167 male prisoners with an average age of 30.8 (range: 18–62, $SD = 9.7$); an average length of sentence of 3.1 years (range 1–13 years, $SD = 3.1$); an average length of scholarly education of 9.2 years ($SD = 2.2$) was recruited from five different prisons in Denmark (three closed and two open). Sixty-one percent had no education other than compulsory schooling and 61% were serving a sentence for a violent crime. Evaluating test-retest reliability, 17 participants were retested after 1–3 weeks.

Table 1. Correlations (Pearson) between the MAP subscales and measures of metacognition and anger level for prisoners, $N = 167$

| | MAP | | | MCQ-30 | | | | | Total | PI total |
|-----------|------|------|------|--------|------|------|------|------|-------|----------|
| | Rum | NB | PB | 4 | 5 | 6 | 7 | 8 | | |
| PI total | | | | ns | .26* | .20* | .22* | ns | .22* | |
| MAP total | .87* | .79* | .72* | ns | .51* | .33* | .44* | ns | .46* | .61* |
| Rum | | .55* | .57* | ns | .48* | .31* | .33* | ns | .37* | .63* |
| NB | | | .22* | .21* | .45* | .27* | .47* | .33* | .49* | .34* |
| PB | | | | ns | .26* | .21* | .23* | ns | .20* | .53* |

Notes: $p < .01$. PI = Provocation Inventory; MAP: Rum = Rumination, NB = Negative Beliefs, PB = Positive Beliefs. MCQ-30: 4 = Positive Beliefs, 5 = Uncontrollability/Danger, 6 = Cognitive Confidence, 7 = Need to Control thoughts, 8 = Cognitive Self-Consciousness, 9 = MCQ-30 total

Measures

The MAP revised (35 items) as described above, the Provocation Inventory (PI) from Study 1, and the 30-item Meta Cognitive Questionnaire (MCQ-30) (Wells and Cartwright-Hatton, 2004) were used. The MCQ-30 measures general components of metacognition on five subscales, and psychometric properties were addressed satisfactorily.

Results

Before assessing reliability, factor analyses were conducted to further hone the instrument. A Principal Axis Factoring (PAF) using Promax rotation was conducted with three factors fixed, resulted in a solution accounting for 44.2 % of the variance with 31 items loading above .40 and only on the expected factor. The first factor was Rumination (9 items, $\alpha = .88$), the second factor was Negative Beliefs (12 items, $\alpha = .86$), and the third factor was Positive Beliefs (10 items, $\alpha = .85$). Internal reliability analyses for the remaining 31 items yielded an alpha of .91. The test-retest (Pearson) correlation was .67, indicating good stability for the MAP.

The Pearson inter-correlations among the subscales of the MAP and between the metacognitive and the anger criterion measure are available in Table 1. All subscales of the MAP were highly correlated with the MAP total. Supporting the MAP as a metacognitive measure, each of the MAP subscales had significant correlations with the MCQ-30. Moreover, the MAP was more strongly correlated with anger level (PI) than was the MCQ-30.

Discussion

The aim of the present studies was to develop a new anger measure including metacognitive components of anger to guide clinical case conceptualization and improve the outcome of treatment for problematic anger. A metacognitive perspective on anger highlights metacognitive beliefs and specific strategies for processing information in relation to anger. Rumination is a form of processing anger experiences. The high inter-correlations between

the MAP subscales are evidence for the coherence of the instrument, and their relevance for anger was supported by the strong correlations of the MAP subscales with anger (PI). The correlations of the Rumination subscale with the Negative Beliefs and the Positive Beliefs subscales are in accord with Simpson and Papageorgiou (2003), indicating that positive as well as negative beliefs are involved in the tendency to ruminate about anger.

The studies presented have several limitations. First, sample size was small, second, the studies are cross-sectional and rely on correlational statistics, and finally, anger was measured with only the PI. Also missing was a rumination criterion measure.

Clinical interventions may benefit from an exploration of the patient's experience of anger, as structured by the MAP's factors and their interrelationships. The Positive Beliefs subscale represents cognitive networks that increase the risk of an anger-related response because anger is conceived as a problem solving strategy. In this proposal, positive beliefs are associated with anger through their activation of rumination, which in turn maintains negative affect and strengthen negative beliefs. Negative beliefs possibly motivate the individual to control anger arousal by suppression; however that may back-fire and paradoxically result in increased anger processing. In conclusion, the MAP is a promising new measure to assess and formulate metacognitive anger processing. The psychometric properties need further testing in clinical settings with a larger assessment battery and objective measures of aggression.

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Conflict of interest

None.

Ethical standards

The author asserts that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. The author also asserts that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guides on the care and use of laboratory animals.

Supplementary materials

To view supplementary material for this article, please visit <http://dx.doi.org/10.1017/S1352465815000272>

References

- Moeller, S. B., Novaco, R. W., Heinola-Nielsen, V. and Hougaard, H.** (2015). Validation of the Novaco Anger Scale - Provocation Inventory (Danish) with non-clinical, clinical, and offender samples. *Assessment*, *May*, 1–13.
- Novaco, R. W.** (2003). *The Novaco Anger Scale and Provocation Inventory*. Los Angeles: Western Psychological Services.
- Novaco, R. W.** (2010). Anger and psychopathology. In M. Potegal, G. Stemmler and C. Spielberger (Eds.), *International Handbook of Anger* (pp.465-497). New York: Springer.
- Simpson, C. and Papageorgiou, C.** (2003). Metacognitive beliefs about rumination in anger. *Cognitive and Behavioral Practice*, *10*, 91–94.
- Wells, A.** (2000). *Emotional Disorders and Metacognition: innovative cognitive therapy*. Chichester: John Wiley & Sons.
- Wells, A. and Cartwright-Hatton, S.** (2004). A short form of the metacognitions questionnaire: properties of the MCQ-30. *Behaviour Research and Therapy*, *42*, 385–396.