The Thematic Apperception Test: Toward a Standard Measure of the Big Three Motives

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The application of the Thematic Apperception Test to the assessment of motives has been heralded as an important milestone in personality psychology. However, although this approach is well established, there is at present no standard battery of cues for measuring the Big Three motives (achievement, affiliation, power). Furthermore, the extent to which scoring subcategories contribute to overall motive scores has been neglected. Our research with students and managers examined the effectiveness of picture cues in eliciting motive imagery and the prevalence of scoring subcategories within each motive scoring system. Results from 2 data sets comprising 547 men and women suggested that there were 3 cues that should be retained for future research and that motive scoring systems could be refined through removal of redundant subcategories. Further research is needed to systematically investigate the effectiveness of a standard battery of cues and the validity of revised motive scoring systems.

Over the years, there has been substantial advancement in the application of free response measures, especially in the field of personality psychology. In particular, the use of the Thematic Apperception Test (TAT) in assessing motives has been heralded as an important milestone in personality research (Brunstein, Schultheiss, & Grässmann, 1998). Although credit for the development of the TAT is attributed to Murray, it was McClelland and colleagues’ research on the achievement motive, and their development of an empirically justified system of content analysis for associative thought content, that transformed the test into a major tool for scientific personality psychology1 (Winter, 1999).

In our article, we aimed to provide guidelines for improving TAT methodology. Specific aims were to (a) examine the effectiveness of various cues in eliciting motive imagery, (b) outline a set of cues for use in assessing motives, (c) examine the underlying structure of the motive scoring systems, and (d) provide recommendations for the revision of motive scoring systems. Next we briefly describe the assessment of motives with free response measures, the origin of the TAT, and the transition of the test to scientific personality psychology.

Methodological considerations in applying the TAT are then discussed, including cue selection. Finally, we present the results of two studies that used various cues to assess achievement, affiliation, and power motivation in men and women.

THE ORIGIN OF THE TAT

According to Murray (1938), unconscious needs, expressed in thema through storytelling, provide a unique insight into the core of a person’s personality. In completing the TAT, the respondent is asked to write a brief “imaginative” story in response to a number of ambiguous picture cues. The assumption is that the respondent will project onto the image, thus expressing unconscious needs that he or she is ordinarily unable or unwilling to report (Anderson, 1999). The TAT was introduced in 1935 with distribution following in 1936 (Stein & Gieser, 1999). It quickly gained popularity and by the mid-1940s had been modified for use in cross-cultural research (Dana, 1999). However, lack of consistency in the application of the test (e.g., picture cards, scoring) meant there was little generalizability from one study to the next or in clinical practice (Winter, 1999). Subsequently, interest in developing a standard scoring system for the TAT declined (Dana, 1999). The Murray TAT was not well validated in the academic realm, and it is McClelland who is credited with the test’s transition to scientific personality psychology (Winter, 1999).

1McClelland’s TAT is often referred to as a “thematic apperceptive measure” or “picture-story exercise” to distinguish it from Murray’s (1943) original published test and is typically described as a nonevaluative, spontaneous thought sampling technique (Smith, 1992a).
THE McCLELLAND TAT

Based on the notion that associative thought content could be used to provide an indication of motive arousal, McClelland, Atkinson, Clark, and Lowell (1953) adopted a modified TAT procedure to devise a scoring system for the achievement motive by comparing story content in an achievement arousal versus a neutral condition. They found that story content in the achievement arousal condition frequently included achievement imagery as well as one or more of the following criteria relating to an achievement goal: a statement of a desire to reach a goal, mental or overt goal-directed activity, a positive or negative anticipatory goal state, a personal or environmental obstacle to a goal, a force aiding the character in his or her attempt to reach a goal, positive or negative affect associated with the attainment of a goal, and achievement theme as the central plot of the story. The presence of these criteria was used to derive an overall score for nAch, although a story was only subjected to further scoring if achievement imagery was present in the first instance. McClelland and colleagues reasoned that those who scored high on nAch in the neutral condition were in a state of “chronic achievement arousal” and thus concluded that a valid measure of nAch could only be obtained in a neutral testing environment (McClelland & Koestner, 1992).

McClelland’s work was the catalyst for research on the arousal of other motives and led to the development of an empirically derived scoring system for need for affiliation (nAff; Heyns, Veroff, & Atkinson, 1992) and, later, need for power (nPow; Winter, 1992b) as well as other motives such as intimacy (McAdams, 1992). Activity inhibition, an important moderator of nPow, is measured by counting the frequency of the word not in a story protocol (McClelland & Boyatzis, 1982). People who score high on nPow and low on activity inhibition (“personalized” power) use power for self-gain, whereas those who score high on nPow and high on activity inhibition (“socialized” power) use power for group, organizational, or social gain (Jemmott, 1987). McClelland’s research saw the emergence of a literature that focused on fewer needs and provided a powerful demonstration of the “real-world” application of free response measures (Stahl, 1986).

In contrast to Murray’s TAT, McClelland’s TAT was designed to measure normal dimensions of personality in the general population. McClelland’s objective, empirically derived scoring system combined the humanistic approach pioneered by Murray at Harvard with the experimental tradition of his own training at Yale (Winter, 1999). There is substantial research to support the predictive validity of motives measured via the McClelland TAT for a range of behavioral criteria (McClelland, 1985).

Criticism of the McClelland Approach

Despite the predictive validity of the TAT, there has been considerable effort to supplant it with an alternative, self-report measure on the basis that it is (a) uneconomical to administer and score; (b) “unreliable” (e.g., low internal consistency and test–retest reliability); (c) inconsistently and weakly correlated with actual behavior; and (d) unrelated to self-report measures of motives, which is typically regarded as indicating a lack of convergent validity (McClelland, Koestner, & Weinberger, 1989).

However, there has been considerable defense of the TAT hence justifying its labor-intensive administration and scoring as well as the motive dispositions approach more generally (e.g., Koestner, Weinberger, & McClelland, 1991; Lundy, 1985; McClelland et al., 1989; Spangler, 1992; Weinberger & McClelland, 1990; Winter & Stewart, 1977). Emmons (1993) noted that psychometric criticism of the TAT has generally subsided. Nonetheless, a number of issues have arisen that relate to the robustness of the measure. For instance, Winter (1992a) argued that the internal consistency of the TAT is confounded by the fact that the expression of a motive in one story may temporarily reduce its arousal and hence the likelihood of its expression in the next story. A problem is that the amount of reduction in motive arousal may vary from person to person, depending on absolute motive strength. A recent investigation (Tuerlinckx, De Boeck, & Lens, 2002) found that the response process underlying need-related fantasy was best explained by a Stochastic Drop-Out Apperception Model (SDAM). According to this model, some stories are irrelevant and unrelated to motive strength, either because extraneous information about the person or the cue itself is provided or because other motives are more important in determining story content. In contrast, other stories are influenced by motive strength and the instigating force of the cue and thus have a diagnostic value, meaning that motive-related fantasy is activated and story content is indicative of the interaction between motive and cue strength. Tuerlinckx et al. found that although some cues were a better “trigger” of diagnostic motive imagery than were other cues (as indicated by variation in non-drop-out probabilities), rather than showing a consummatory effect, motive imagery was somewhat “erratic and irregular” and was far from “lawful and predictable” (p. 458). On the basis of their results, they argued that fantasy behavior has no satisfying effect on the underlying tendency controlling it, at least not over different cues. They concluded that if some stories just drop-out from the test in this way ... the test would actually be shorter, thereby narrowing the basis for statistical and psychological inference. Of course a given set of cards may be more reliable for one motive than for others. (p. 28)

A further problem is that the test–retest reliability of the TAT may also be confounded, in this case by the instructional set “to be creative” (Winter & Stewart, 1977). Indeed, Lundy (1985) found that test–retest reliability was substantially improved by using the prompt “feel free to re-
measured, cue content should reflect more than one motive-relevant situation, to permit the assessment of several motives at once (Smith, 1992a). An important issue is relevance: The respondent should be able to identify with the character(s), and these should not be restricted to a particular age, sex, or social group (Veroff, 1992). Haward (1969) found that cues that had manifest relevance to participants produced greater facility in verbal expression.

A common assumption is that people identify more with cues depicting same-sex characters than opposite-sex characters. Chusmir (1983) measured nAch, nAff, and nPow in a managerial sample using both traditionally male-oriented cues and sex-balanced cues. Results indicated the cues were interchangeable in identifying individual differences in nAch and nPow among men and women and that overall scores were also comparable. For nAff, however, interchangeability was clouded and overall scores were no longer comparable, suggesting modification of cues by sex may be required for this motive. A study of college students (Katz, Russ, & Overholser, 1993) failed to support the use of sex-balanced cues for men and women.

**Ambiguity**, the tendency for a cue to elicit alternative thema, is likely to influence the amount of information about the Self revealed by the respondent (Smith et al., 1992). Generally speaking, low-ambiguity cues should increase the strength of the motive at which they are targeted. However, there is also evidence to suggest that thema produced in response to high-ambiguity cues may be a more sensitive indicator of motive strength. For example, Dutton and Strachan (1987) compared wife assaultive men with maritally conflicted but nonassaultive men and with satisfactorily married men (control group) on nPow and found that when the picture cue depicted an ambiguous male–female relationship, the wife assaultive men group generated higher nPow on average than both the nonassaultive men and control group combined. Murstein (1959) argued that increasing the ambiguity of a cue will not necessarily generate an increase in imagery and that cues that elicit idiosyncratic imagery typically contain readily identifiable people whose expression is open to interpretation. Smith et al. recommended the use of relatively low-ambiguity combined with high cue strength (cue strength is discussed next).

The suitability of ambiguous versus nonambiguous cues is likely to depend on the number of motives to be measured (Smith et al., 1992). For example, if a researcher wanted to measure nAch only, then a low-ambiguity picture would probably be suitable. In contrast, if one wanted to measure the relative strength of nAch and nAff, then one would need to select low-ambiguity cues for each motive or high-ambiguity cues so as to permit expression of either motive. Although the latter approach is more common, there is a risk that this may measure the relative strength rather than the absolute strength of each motive (Smith et al., 1992).

Variability in cue strength, that is, the percentage of people who generate imagery of a certain type in response to a
Refining the Structure of the TAT

Although psychometrically based tests are continuously refined and improved through large-scale analysis of their psychometric properties, empirical research dedicated to refining and improving the TAT has been scarce. The usual criteria for item retention (e.g., loading ≥ .40 in factor analysis; Cronbach's α ≥ .70 in reliability analysis) are not readily transferable to the TAT, and the extent to which different scoring subcategories contribute to motive scores has not been considered previously. An examination of the prevalence of subcategories could provide an alternative method of evaluating the internal structure of the test, and it is possible that a more efficient scoring system could be developed by removing redundant subcategories. Recently, Blankenship, Romero, Vega, Keenan, and Ramos (2005) used the Rasch (1980) model to develop a refined scoring system for nAch. A standard practice in administering the TAT is to provide the following prompts at the top of each page: What is happening? Who are the people? What led up to this situation? That is, what has happened in the past? What is being thought? What is wanted? By whom? What will happen? What will be done? Although McClelland and colleagues argued that these prompts should be clustered at the top of the page to obtain a continuous storyline, a common procedure is to separate them down the page, allowing enough room for a short paragraph for each prompt (Smith et al., 1992). Blankenship et al. argued that the reliability of the TAT could be improved by coding each paragraph independently as a separate “item,” thus meeting the assumption of independence.

In Blankenship et al.'s (2005) revised scoring system, subcategories are scored once per paragraph, as opposed to once per story. Each character is also coded. Applying this method, they reduced the original scoring system of 10 subcategories to 7. Block in the person and block in the world were collapsed on the basis that it is rare for both to occur in the same story and it can be difficult to distinguish between the two, leading to lower interscorer agreement. Nurturant press was eliminated, as “giving help” is also a criterion for scoring power, thus violating the assumption of unidimensionality. Thema was also eliminated, given that each paragraph is coded separately and the overall theme of the story is not evaluated. Our research examined the frequency with which different subcategories in the scoring system for each motive were scored to evaluate their necessity. It was of interest to determine whether the most frequently occurring subcategories were consistent across different cues and samples. To our knowledge, this has not been investigated previously. The aim was to develop a more efficient scoring system, that is, fewer subcategories.

THE CURRENT RESEARCH

We examined the effectiveness of picture cues in eliciting motive imagery and the frequency of occurrence of scoring subcategories for motive scoring systems in two studies. For both studies, test administration and scoring, including training, were conducted in accordance with Smith (1992b). All stories were scored using the Scoring Manual for the Achievement Motive (McClelland, Atkinson, Clark, & Lowell, 1992), the Scoring Manual for the Affiliation Motive (Heyns et al., 1992), and the Revised Scoring System for the Power Motive (Winter, 1992b). Activity inhibition was measured by counting the frequency of the word not in each story protocol (McClelland & Boyatzis, 1982).

STUDY 1

The primary purpose of Study 1 was to determine whether there was variation in the effectiveness of different picture cues in eliciting imagery for the Big Three motives and, if so, which cues were more effective. A second purpose was to determine whether there was variation in the frequency with which different subcategories within each motive scoring system were scored. Sex differences in the three motives and activity inhibition, for individual picture cues and overall, were also examined.

Based on the criteria for cue selection discussed previously, Smith et al. (1992) reproduced 15 picture cues for use in research on the Big Three motives. McClelland and colleagues used 6 of these cues to elicit imagery for nAch, nAff, nPow, and activity inhibition: (a) Ship captain, (b) Architect at desk, (c) Couple on bench by river, (d) Two women in lab coats in a laboratory, (e) Trapeze artists, and (f) Man and woman with horses and dog. Winter recommended (a), (c), (d), and (e) in that order for a 4-picture set. At present, these 6 cues are the closest approximation of a standard set of cues. However, although they have been widely used, there is a scarcity of research on their effectiveness in eliciting motive imagery. Accordingly, we sought to address this research gap.
Schultheiss and Brunstein (2001) noted that despite considerable work on the construction, revision, and validation of motive scoring systems, there has been little attention to the specification and selection of cues. They examined the effectiveness of six picture cues in eliciting nAch, nAff, and nPow in a college sample and found that Two women in lab coats in a laboratory and Trapeze artists had strong stimulus pull for nAch; Architect at desk, Couple on bench by river, and Nightclub scene had strong stimulus pull for nAff; and Two women in lab coats in a laboratory, Ship captain, Trapeze artists, and Nightclub scene had strong stimulus pull for nPow.

Although there is no overwhelming evidence in the literature to suggest that there are sex differences in Big Three motives (McClelland, 1985), one review of the literature (Stewart & Chester, 1982) concluded that women may be higher in nAch than men. This finding was confirmed by Schultheiss and Brunstein (2001), who found that women scored significantly higher than men on nAch for most picture cues and there were no significant sex differences for the other motives. Accordingly, we hypothesized that men and women would not significantly differ in their scores for nAch or nPow for individual picture cues or overall (H1), and women would score significantly higher than men on nAff both in terms of their scores for the various cues and their overall scores (H2). There is also some evidence to suggest that men and women may express social motives differently (Stewart & Winter, 1976). For example, power-motivated men tend to be aggressive, argumentative, competitive, and action oriented (McClelland, 1975), whereas power-motivated women are more concerned with the construction of the Self (e.g., physical appearance, clothing, dieting, image), deriving “internal power” from being a capable resource (Langan-Fox, 1991; McClelland, 1975). Given these sex differences in the expression of the power motive, we also hypothesized that women would score significantly higher on activity inhibition (self-restraint) than men (H3).

Method

Participants. Participants were 334 first-year psychology students (77 men, 257 women) enrolled at a major university in the State of Victoria, Australia. Students participated in the research in fulfillment of a course requirement. The mean age for the sample was 19.42 years. The data were obtained as part of a larger study (Langan-Fox, Grant, & Shirley, 2005) that examined the relationship between overall power motivation scores and arousal and anxiety. Our study is based on a new analysis of this data set. The effectiveness of picture cues in eliciting motive imagery for the Big Three motives and the prevalence of scoring subcategories within each motive scoring system have not been previously analyzed using this data set.

Measures. The TAT consisted of McClelland’s “standard six” picture cues (listed in order of presentation): (a) Ship captain, (b) Architect at desk, (c) Couple on bench by river, (d) Two women in lab coats in a laboratory, (e) Trapeze artists, and (f) Man and woman with horses and dog (see Smith et al., 1992).

Procedure. The TAT was administered in small groups of 20 to 30 participants in a classroom setting in a single week at the same time of day. Instructions (based on Atkinson, 1958) were provided to participants verbally. Picture cues were presented in an individual test booklet, and participants were required to hand write their stories. Pictures cues were viewed for the standard 20-sec interval with a 5-min time limit for story writing. The standard prompts for story writing (e.g., What is happening? Who are the people? What is being thought? What is wanted? By whom?) appeared down the page, with enough space to write a short paragraph in response to each prompt. Participants were instructed to use the reverse side of the page if they required more space.

The investigator underwent a training program prior to scoring the TAT protocols. Thirty case protocols, consisting of 180 stories available from previous research that were already expert scored, were provided and used for computing interrater reliability. Results for all three motives were well within the prescribed range, with intercategory agreement and the total score rank order correlation (rho) averaging 87% and .89, respectively.

Briefly, the scoring system for nAch is composed of 12 subcategories: need (N); instrumental activity with a successful, unsuccessful, or doubtful outcome (I+, I–, or I?); positive anticipatory goal state (Ga+); negative anticipatory goal state (Ga–); block within the person (Bp); block in the world (Bw); nurturant press (Nup); positive affective state (G+); negative affective state (G–), and achievement thematic (Ach Th; for more detail, see McClelland et al., 1992). For the purpose of the subcategories analysis (see Results section), I+, I–, and I? were collapsed into a single subcategory (I), given that instrumental activity may only be scored once per story even though more than one instrumental act may occur. Note that this approach is also adopted in the subcategories analysis for nAch in Study 2.

In computing the nAch score for a given story, “unrelated imagery” is scored −1, “doubtful imagery” is scored 0, and “achievement imagery” is scored +1, and subcategories that are present are scored +1.3 Thus, the score range for the

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*An “expert scorer” is someone who has thoroughly mastered the motive scoring systems and has had extensive experience in using the systems in research (Smith et al., 1992).

The continuum from unrelated imagery through to achievement imagery is used to denote the scorer’s degree of certainty that achievement imagery is present within a particular story. Doubtful imagery is scored when there is some reference to achievement but the criteria for scoring achievement imagery are not met.*
achievement motive is −1 to +11. Subcategories are only scored if achievement imagery is present in the first instance.

Although doubtful imagery and unrelated imagery are also scored in the affiliation motive scoring system, there is no quantitative distinction between the two in this scoring system, that is, both are scored 0. Similarly, unrelated imagery is scored 0 in the power motive scoring system. Perhaps the nAch scoring system should abandon the practice of subtracting 1 point for unrelated imagery. Especially in the context of measuring the Big Three motives in the same study, scoring unrelated imagery as −1 for nAch but not nAff or nPow may simply build in an unwanted confounding of the achievement motive with the other two motives.

It should be noted that in the scoring system for nAch, only positively signed (approach) subcategories are used in computing the overall score for a given story, that is, need (N), instrumental activity with a successful outcome (I+), positive anticipatory goal state (Ga+), block in the world (Bw), positive affective state (G+), and affiliation theme (Th; see Heynes et al., 1992, for more detail). Positively signed subcategories that are present are scored +1 and added with affiliation imagery (also scored +1) to obtain the overall score. All other subcategories are scored 0 regardless of whether they are present. Subcategories are scored only if affiliation imagery is present in the first instance. Thus, the score range for the affiliation motive is 0 to +7. The question of whether to count all subcategories, as in the nAch scoring system, is yet to be resolved in the literature. Accordingly, we also looked at the frequency with which negative subcategories (i.e., I−, I?, Ga−, Bp, G−) were scored for this motive. This approach is also adopted in Study 2.

The revised scoring system for nPow is based on 10 subcategories: positive prestige of the actor (Pa+), negative prestige of the actor (Pa−), need (N), instrumental activity (I), block in the world (Bw), positive goal anticipation (Ga+), negative goal anticipation (Ga−), positive goal state (G+), negative goal state (G−), and effect (Eff; see Winter, 1992b, for more detail). In computing the nPow score for a given story, power imagery is scored +1 and subcategories that are present are scored +1. Again, subcategories are scored only if power imagery is present in the first instance. Thus, the score range for the power motive is 0 to +11.

Results

Relationships between motives and picture cues. The means and standard deviations for nAch, nAff, nPow, and activity inhibition for the total sample and by picture cue, sex, and Picture Cue × Sex are provided in Table 1. Picture cue means in Table 1 represent the average score for that cue (for a given motive) across all participants, including those who did not produce motive-relevant imagery. Scores for individual picture cues were summed to obtain overall scores. Thus, overall means in Table 1 represent the average overall score (for a given motive) across all participants, including those who did not produce motive-relevant imagery in response to any of the cues. Note that because the possible range of scores for the three motives differs (nAch = −1 to +11, nAff = 0 to +7, nPow = 0 to +11), it is not possible to compare scores across motives for the different picture cues, although it is possible to compare scores across picture cues for a given motive. Accordingly, as per Schultheiss and Brunstein (2001), a repeated measures multivariate analysis of variance (MANOVA) was conducted with motive (nAch, nAff, nPow) and picture cue (Ship captain, Architect at desk, Couple on bench by river, Two women in lab coats in a laboratory, Trapeze artists, Man and woman with horses and dog) as within-subjects factors. This analysis enabled an examination of whether respondents’ scores for a given motive differed according to the picture cue used. The analysis revealed a significant interaction between motive and picture cue, confirming that the scores for particular motives differed depending on the picture cues used, $F(10, 324) = 89.24, p < .001$, partial $\eta^2 = .73$. Inspection of the means revealed that Two women in lab coats in a laboratory and Trapeze artists elicited high scores for nAch, Couple on bench by river elicited high scores for nAff, and Ship captain and Two women in lab coats in a laboratory elicited high scores for nPow. A repeated measures analysis of variance (ANOVA) indicated that activity inhibition significantly differed according to the picture cue used, $F(5, 329) = 2.50, p < .05$, partial $\eta^2 = .04$. Inspection of the means revealed that Ship captain and Couple on bench by river produced slightly higher scores for activity inhibition (see Table 1 for detail regarding statistically significant differences between means for different cues). There was a trend for picture cues that produced higher mean scores to display larger variances, suggesting that they were more sensitive to interindividual differences in motive scores (Schultheiss & Brunstein, 2001).

Schultheiss and Brunstein (2001) suggested that cues that elicit motive imagery from approximately 50% (or more) of participants can be seen to have strong stimulus pull for a given motive. In the research presented here, 56% of participants produced achievement imagery in response to Two women in lab coats in a laboratory; 77% of participants produced affiliation imagery in response to Couple on bench by river; and 56% and 47% of participants produced power imagery in response to Ship captain and Two women in lab coats in a laboratory, respectively. A comparison of the stimulus pull of the six picture cues for each motive is presented in Figure 1.

Sex differences in motive scores. T tests were performed to test for sex differences in nAch, nAff and nPow for the six picture cues and sex differences in overall scores for the Big Three motives (Bonferroni adjustment was applied to correct for Type I error, setting the significance level at .002). In support of H1, there were no sex differences in nAch or nPow for any of the picture cues and no sex differences in the overall scores for these motives (Cohen’s $d = −0.36$ to 0.29).
### Table 1

Means and Standard Deviations of Raw Scores for nAch, nAff, nPow, and Activity Inhibition for Each Picture Cue (Study 1)

<table>
<thead>
<tr>
<th>Picture Cue</th>
<th>Motives</th>
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<tbody>
<tr>
<td></td>
<td>nAch&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Ship captain</td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>-0.70</td>
</tr>
<tr>
<td>Men only&lt;sup&gt;d&lt;/sup&gt;</td>
<td>-0.64</td>
</tr>
<tr>
<td>Women only&lt;sup&gt;e&lt;/sup&gt;</td>
<td>-0.72</td>
</tr>
<tr>
<td>Architect at desk</td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>0.11</td>
</tr>
<tr>
<td>Men only</td>
<td>0.06</td>
</tr>
<tr>
<td>Women only</td>
<td>0.13</td>
</tr>
<tr>
<td>Couple on bench by river</td>
<td></td>
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<tr>
<td>Total sample</td>
<td>-0.90</td>
</tr>
<tr>
<td>Men only</td>
<td>-0.83</td>
</tr>
<tr>
<td>Women only</td>
<td>-0.92</td>
</tr>
<tr>
<td>Architect at desk</td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>1.66</td>
</tr>
<tr>
<td>Women only</td>
<td>1.10</td>
</tr>
<tr>
<td>Women only</td>
<td>1.82</td>
</tr>
<tr>
<td>Trapeze artists</td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>1.00</td>
</tr>
<tr>
<td>Men only</td>
<td>0.36</td>
</tr>
<tr>
<td>Women only</td>
<td>1.19</td>
</tr>
<tr>
<td>Men and woman with horses and dog</td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>-0.63</td>
</tr>
<tr>
<td>Men only</td>
<td>-0.73</td>
</tr>
<tr>
<td>Women only</td>
<td>-0.60</td>
</tr>
<tr>
<td>Overall score</td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>0.54</td>
</tr>
<tr>
<td>Men only</td>
<td>-0.66</td>
</tr>
<tr>
<td>Women only</td>
<td>0.91</td>
</tr>
</tbody>
</table>

**Note.** All differences between the means for different cues were significant at the .05 level except Ship captain versus Man and woman with horses and dog for nAch; Ship captain versus Two woman in lab coats in a laboratory for nAch; Architect at desk versus Man and woman with horses and dog for nAch; Ship captain versus Two woman in lab coats in a laboratory for nAff; Architect at desk versus Couple on bench by river, Trapeze artists, and Man and woman with horses and dog for nAff; Ship captain versus Two women in lab coats in a laboratory for nPow; Architect at desk versus Couple on bench by river, Trapeze artists, and Man and woman with horses and dog for nPow; and Couple on bench by river versus Trapeze artists and Man and woman with horses and dog for nPow. Differences for activity inhibition were not significant at the .05 level.

<sup>a</sup>Score range –1 to +11.<sup>b</sup>Score range 0 to +7.<sup>c</sup>Score range 0 to +11.<sup>d</sup>n = 77.<sup>e</sup>n = 257.

![Achievement, affiliation, and power motive imagery as a function of picture cue (Study 1).](image-url)
In partial support of H2, Architect at desk elicited significantly higher nAff from women than men, \( t(197) = -5.22, p < .001 \), Cohen’s \( d = -0.60 \); however, there were no sex differences for any of the other picture cues (Cohen’s \( d = -0.33 \) to 0.09). Women also scored significantly higher than men overall for nAff, \( t(332) = -3.34, p = .001 \), Cohen’s \( d = -0.49 \). Contrary to H3, there were no sex differences in activity inhibition for any of the picture cues or for overall scores (Cohen’s \( d = -0.17 \) to 0.15).

**Analysis of scoring subcategories.** The analysis of scoring subcategories for nAch focused on the Two women in lab coats in a laboratory and Trapeze artists cues (hereafter referred to as Cues 4 and 5, respectively), given that these cues had the strongest stimulus pull for this motive. For each cue, only those participants who produced achievement imagery in response to that cue were retained for the scoring subcategories analysis. As such, the analysis for Cue 4 was based on 188 participants, and the analysis for Cue 5 was based on 142 participants. The frequency with which each scoring subcategory occurred for a particular cue was thus expressed as a percentage of the total number of participants who produced motive-relevant imagery in response to that cue. Again, this procedure is adopted throughout this article for the subcategories analyses. The results were highly similar for both cues: I was the most frequently occurring subcategory, with 79% and 69% of participants who produced achievement imagery for Cues 4 and 5, respectively, including this subcategory in their stories. The least frequently occurring subcategories were Bp and G–, which were scored for less than 10% of participants who produced achievement imagery. Nup was scored for less than 10% of achievement-oriented participants for Cue 4 but was scored for 14% of achievement-oriented participants for Cue 5. The remaining cues were scored between 12% and 42% of the time for participants who produced achievement imagery.

The analysis of subcategories for the affiliation motive focused on Architect at desk and Couple on bench by river (hereafter referred to as Cues 2 and 3, respectively), given that these cues had the strongest stimulus pull for this motive. The analyses for Cues 2 and 3 were based on 149 and 259 participants, respectively. The most frequently occurring subcategories were N, Bw, and G–, which were scored between 34% and 52% of the time for both cues for participants who produced affiliation imagery. It is noteworthy that G– (excluded from the conventional scoring system) was scored more frequently than G+ (included in the conventional scoring system). The least frequently occurring subcategories were Ga+ and Ga–, which were scored for less than 10% of participants who produced affiliation imagery for both cues. I– and Bp, both excluded from the conventional scoring system, were also scored relatively infrequently (5% to 13%), although it is interesting that I+, which is excluded from the conventional scoring system, was scored almost as frequently as I+. Thus, overall, these results do not support the exclusion of negatively signed subcategories.

The analysis of the scoring subcategories for the power motive focused on Ship captain (hereafter referred to as Cue 1) and Cue 4, as these cues had the strongest stimulus pull for this motive. The analyses for Cues 1 and 4 were based on 189 and 159 participants, respectively. The results were highly consistent across the two cues. I emerged as the most frequently occurring subcategory, with 66% and 59% of power-oriented participants including a power-related instrumental act in their stories for Cues 1 and 4, respectively. Pa+, N, and Eff were scored between 22% and 36% of the time for participants who produced power imagery. The least frequently occurring subcategories for both cues were Ga+, Ga–, Bw, G+, and G–, all of which were scored for less than 10% of participants who produced power imagery.

**Discussion**

The results for Study 1 are comparable to those of Schultheiss and Brunstein (2001): Two women in lab coats in a laboratory and Trapeze artists produced the highest mean scores for nAch, Couple on bench by river and Architect at desk produced the highest mean scores for nAff, and Ship captain and Two women in lab coats in a laboratory produced the highest mean scores for nPow. The Nightclub scene cue, which also performed well for nAff and nPow in the Schultheiss and Brunstein study, was not evaluated here. Consistent with Schultheiss and Brunstein, Two women in lab coats in a laboratory, Couple on bench by river, and Ship captain showed strong stimulus pull for nAch, nAff, and nPow, respectively. In contrast to their findings, however, Trapeze artists, Architect at desk, and Two women in lab coats in a laboratory only showed moderate stimulus pull for nAch, nAff, and nPow, respectively, in this study. Couple on bench by river and Ship captain tended to produce higher scores for activity inhibition on average than the other cues. Once again, this result is analogous to Schultheiss and Brunstein and may reflect the higher stimulus pull of these cues for nAff and nPow, respectively. In line with Schultheiss and Brunstein, women scored significantly higher than men on nAff overall. The scoring subcategories analyses revealed that the following subcategories were consistently scored for less than 10% of participants who produced motive-relevant imagery: nAch – Bp and G–; nAff – Ga+ and Ga–; and nPow – Ga+, Ga–, Bw, G+, and G.

**STUDY 2**

As in Study 1, the purpose of this study was to determine (a) whether there was variation in the effectiveness of different cues in eliciting imagery for the Big Three motives and, if so,
which cues were more effective, and (b) whether there was variation in the frequency with which different subcategories within each motive scoring system were scored. H1 to H3 (see the previous section), which were concerned with sex differences in the three motives and activity inhibition, were reexamined in this study.

**Method**

**Participants.** Participants were 213 managers (90 men, 123 women) in a leading Australian department store. The age range was 20 to 61 years, with a mean of 36 years. The data were obtained as part of a larger study that examined the relationship between personality (motives, traits) and occupational health and well-being (see Code & Langan-Fox, 2001; Grant & Langan-Fox, 2006, in press). Our study is based on a new analysis of this data set. The effectiveness of picture cues in eliciting motive imagery for the Big Three motives and the prevalence of scoring subcategories within each motive scoring system have not been previously analyzed using this data set.

**Measures.** The TAT consisted of the following four picture cues (listed in order of presentation): (a) Ship captain, (b) Trapeze artists, (c) Two women in lab coats in a laboratory, and (d) Conference group: Seven men around a table. Four picture cues instead of six were used due to the already-lengthy questionnaire battery (there were several personality, occupational stress and health and well-being measures) to avoid compromising the validity of the latter part of the test (Reitman & Atkinson, 1958, as cited in Smith et al., 1992). As previously mentioned, Winter’s recommendation for a four-picture set was (a) Ship captain, (b) Couple on bench by river, (c) Two women in lab coats in a laboratory, and (d) Trapeze artists (see Smith, 1992a). However, (b) was replaced with Conference group: Seven men around a table (used by Veroff and colleagues; see Smith, 1992a) given its manifest relevance to a managerial sample (see Haward, 1969).

**Procedure.** The TAT was administered in small groups of up to 20 participants in a quiet place such as a conference room. Instructions (based on Atkinson, 1958) were provided to participants verbally. Picture cues were presented in an individual test booklet, and participants were required to hand write their stories. Pictures cues were viewed for the standard 20-sec interval with a 5-min time limit for story writing. One page of space was provided for each story, although participants were instructed to use the reverse side of the page if they required more space. A nondescriptive story title (e.g., “Ship Captain”) was printed at the top of each page, along with the following prompts: What is happening? Who are the people? What led up to this situation? That is, what has happened in the past? What is being thought? What is wanted? By whom? What will happen? What will be done? To maximize accuracy, each story was scored simultaneously (though independently) by two scorers so that any divergence in scoring could be reconciled prior to data entry. Interscorer agreement (rho) for all three motives averaged above .90.

**Results**

**Relationships between motives and picture cues.** The means and standard deviations for nAch, nAff, nPow, and activity inhibition for the total sample and by picture cue, sex, and Picture Cue × Sex are provided in Table 2. A repeated measures MANOVA revealed that there was a significant interaction between motive and picture cue, indicating that motive scores differed according to the picture cue used, $F(6, 207) = 68.28, p < .001$, partial $\eta^2 = .66$. Inspection of the means revealed Two women in lab coats in a laboratory elicited high scores for nAch and Ship captain and Conference group: Seven men around a table elicited high scores for nPow. Trapeze artists and Conference group: Seven men around a table elicited moderate scores for nAff (see Table 2 for detail regarding statistically significant differences between means for different cues). As in Study 1, there was a trend for picture cues with higher mean scores to display larger variances, suggesting that they were more sensitive to interindividual differences in motive scores. A repeated measures ANOVA indicated that activity inhibition did not significantly differ according to the picture cue used, $F(3, 210) = 0.69, p > .05$.

Almost two thirds of the sample (62%) produced achievement imagery in response to Two women in lab coats in a laboratory. Based on Schultheiss and Brunstein’s (2001) criterion, none of the cues had strong pull for the affiliation or power motives in this study: 29% and 37% of participants produced affiliation imagery in response to Ship captain and Conference group: Seven men around a table, respectively, and 39% and 40% of participants produced power imagery in response to Two women in lab coats and Conference group: Seven men around a table, respectively, suggesting that these cues had at least moderate stimulus pull. A comparison of the stimulus pull of the four picture cues for the three motives is presented in Figure 2.

**Sex differences in motive scores.** In support of H1, there were no significant sex differences for any of the picture cues and no sex differences in the overall scores for nAch and nPow (Cohen’s $d = –0.16$ to 0.25). In contrast, H2 and H3 were not supported: Women did not score significantly higher than men on nAff (Cohen’s $d = –0.19$ to –0.03) or activity inhibition (Cohen’s $d = –0.29$ to 0.19).

**Analysis of scoring subcategories.** The analysis of scoring subcategories for nAch focused on Trapeze artists and Two women in lab coats in laboratory (hereafter referred to as Cues 2 and 3, respectively), which had the strongest...
### Table 2
Means and Standard Deviations of Raw Scores for nAch, nAff, nPow, and Activity Inhibition for Each Picture Cue (Study 2)

<table>
<thead>
<tr>
<th>Motives</th>
<th>nAch</th>
<th>nAff</th>
<th>nPow</th>
<th>Activity Inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Ship captain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>-0.88</td>
<td>0.51</td>
<td>0.32</td>
<td>0.84</td>
</tr>
<tr>
<td>Men only</td>
<td>-0.89</td>
<td>0.44</td>
<td>0.23</td>
<td>0.81</td>
</tr>
<tr>
<td>Women only</td>
<td>-0.87</td>
<td>0.56</td>
<td>0.39</td>
<td>0.86</td>
</tr>
<tr>
<td>Trapeze artists</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>0.73</td>
<td>2.18</td>
<td>0.54</td>
<td>1.00</td>
</tr>
<tr>
<td>Men only</td>
<td>0.81</td>
<td>1.16</td>
<td>0.52</td>
<td>0.97</td>
</tr>
<tr>
<td>Women only</td>
<td>0.67</td>
<td>2.21</td>
<td>0.55</td>
<td>1.02</td>
</tr>
<tr>
<td>Two women in lab coats in a laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>1.91</td>
<td>2.24</td>
<td>0.22</td>
<td>0.60</td>
</tr>
<tr>
<td>Men only</td>
<td>2.23</td>
<td>2.22</td>
<td>0.20</td>
<td>0.60</td>
</tr>
<tr>
<td>Women only</td>
<td>1.67</td>
<td>2.24</td>
<td>0.23</td>
<td>0.66</td>
</tr>
<tr>
<td>Conference group: Seven men around a table</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>-0.59</td>
<td>1.12</td>
<td>0.68</td>
<td>1.09</td>
</tr>
<tr>
<td>Men only</td>
<td>-0.69</td>
<td>0.80</td>
<td>0.63</td>
<td>1.03</td>
</tr>
<tr>
<td>Women only</td>
<td>-0.52</td>
<td>1.30</td>
<td>0.71</td>
<td>1.13</td>
</tr>
<tr>
<td>Overall score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>1.17</td>
<td>3.98</td>
<td>1.76</td>
<td>1.90</td>
</tr>
<tr>
<td>Men only</td>
<td>1.47</td>
<td>3.71</td>
<td>1.59</td>
<td>1.84</td>
</tr>
<tr>
<td>Women only</td>
<td>0.96</td>
<td>4.17</td>
<td>1.88</td>
<td>1.94</td>
</tr>
</tbody>
</table>

Note. All differences between the means for different cues were significant at the .05 level except Ship captain versus Trapeze artists and Two women in lab coats in a laboratory for nAff; Trapeze artists versus Conference group: Seven men around a table for nAff; Ship captain versus Conference group: Seven men around a table for nPow; and Trapeze artists versus Two women in lab coats in a laboratory for nPow. Differences for activity inhibition were not significant at the .05 level.

aScore range –1 to +11. bScore range 0 to +7. cScore range 0 to +11. d\(n = 123\). e\(n = 90\).

---

**FIGURE 2** Achievement, affiliation, and power motive imagery as a function of picture cue (Study 2).
stimulus pull for this motive. The analysis for Cues 2 and 3 were based on 72 and 133 participants, respectively. The results were highly similar across both cues: I was the most frequently occurring subcategory, with approximately 90% of achievement-oriented participants including this subcategory in their stories. The least frequently occurring subcategories were Bp and G–, which were scored for less than 10% of achievement-oriented participants. Nup was also scored relatively infrequently across the two cues (11% and 15%, respectively). The remaining subcategories were scored between 13% and 31% of the time for participants who produced achievement imagery.

The analysis of subcategories for nAff focused on Cue 2 and Conference group: Seven men around a table (hereafter referred to as Cue 4), given that these had the strongest stimulus pull for this motive. The analyses for Cues 2 and 4 were based on 62 and 78 participants, respectively. The results for both cues generally supported the current convention of including only subcategories with a positive sign in computing the overall score for nAff, with I–, Ga–, Bp, and G– all occurring less than 10% of the time for participants who produced affiliation imagery. Exceptions were I?, which was scored between 21% and 42% of the time, and Ga+, which was only scored between 3% and 8% of the time for participants who produced affiliation imagery.

The analysis of the scoring subcategories for nPow focused on Ship captain (hereafter referred to as Cue 1) and Cue 4, as these had the strongest stimulus pull for this motive. The analyses for Cues 1 and 4 were based on 84 and 85 participants, respectively. The results were highly consistent across the two cues. I emerged as the most frequently occurring subcategory, with 70% and 79% of power-oriented participants including instrumental activity in their stories for Cues 1 and 4, respectively. The least frequently occurring scoring subcategories were Ga+, Ga–, Bw, G+, and G–, all of which were scored less than (or equal to) 10% of the time for both cues for participants who produced power imagery. N was also scored relatively infrequently for power-oriented participants in this study (13% and 6% for Cues 1 and 4, respectively). The remaining subcategories were reasonably prevalent.

Discussion

The results for Study 2 partially support the results of Study 1 and Schultheiss and Brunstein (2001). Once again, the highest mean scores for nAch were produced by Two women in lab coats in a laboratory and Trapeze artists, in that order. Ship captain produced the highest mean score for nPow in all three studies. However Conference group: Seven men around a table, not used in the previous studies, was the second strongest performer for this motive in Study 2. The cues that produced the highest mean scores for nAff in Study 1 and in Schultheiss and Brunstein were not included in Study 2. Conference group: Seven men around a table and Trapeze artists elicited the highest mean scores for nAff in this study. Activity inhibition did not significantly differ as a function of cue in Study 2. There were no sex differences for any of the motives or activity inhibition in Study 2. Consistent with Study 1 and Schultheiss and Brunstein, Two women in lab coats in a laboratory had strong stimulus pull for nAch. Contrary to these studies, none of the remaining cues met the 50% criterion for strong stimulus pull for any of the motives. Consistent with Study 1, Bp and G– were the least frequently scored subcategories for nAch. In regard to the scoring system for nAff, Study 2 generally supported the convention of only including subcategories with a positive sign and, consistent with Study 1, Ga+, Ga–, Bw, G+, and G– were the least frequently occurring subcategories for nPow, all occurring 10% or less of the time for participants who produced power imagery.

GENERAL DISCUSSION AND CONCLUSIONS

Although McClelland’s empirically justified approach to assessing motives in associative thought content is well established, currently there is no standard battery of cues for measuring the Big Three motives. Furthermore, effort to improve and refine the TAT, for example, developing more efficient scoring systems by eliminating redundant subcategories, has been limited. Our research investigated the effectiveness of different picture cues in eliciting motive imagery for achievement, affiliation, and power and the frequency of occurrence of scoring subcategories within each motive scoring system across two studies that incorporated 547 men and women. In particular, it was of interest to determine whether the most frequently occurring scoring subcategories were consistent across picture cues and samples.

Our findings indicated that scores for particular motives differed depending on the picture cues used. In regard to the development of a standard set of cues, overall, the results suggested that the following cues should be retained for use in future motivation research: Two women in lab coats in a laboratory (nAch), Couple on bench by river (nAff; used in Study 1 only), and Ship captain (nPow). Two women in lab coats in a laboratory had strong stimulus pull for the achievement motive for college students (Study 1) and managers (Study 2). In contrast, Ship captain had strong stimulus pull for the power motive for college students but not managers. Similarly, Two women in lab coats in a laboratory also had reasonably strong stimulus pull for the power motive for college students but not managers. This finding suggests that further work is needed to establish effective cues for nPow in different occupational groups. The remaining cues used showed low to moderate stimulus pull for the different motives (see Table 3). Thus, only three of the picture cues from McClelland’s standard six picture cues worked effectively in our research, with each showing strong stimulus pull for a different motive. McClelland’s Architect at desk, Trapeze artists, and Man...
and woman with horses and dog did not show strong stimulus pull for any of the Big Three motives. An important question is whether cues that have weak stimulus pull for a given motive should be included in computing the overall score for that motive. For instance, Smith et al. (1992) noted that cues that generate imagery from very few people do not adequately distinguish individual differences in motives, whereas cues that generate imagery from approximately 50% to 80% of respondents are likely to have greater validity.

Findings for sex differences differed across the two studies. Consistent with past research, Study 1 revealed sex differences for nAff but not nAch or nPow; however, Study 2 found that there were no sex differences in any of the social motives. The findings for Study 2 could reflect the nature of the sample (i.e., managerial). That is, it is possible that the motive profiles of male and female managers are similar by virtue of their profession. Further research is needed to clarify differences in male and female motive profiles in different groups.

In regard to refining the subcategories underlying each motive scoring system, there were several subcategories that consistently emerged as low prevalence subcategories across both different cues and samples. For nAch, consistently scored subcategories were N, I, Ga+, G+, and Ach Th, and less frequently scored subcategories were Ga–, Bp, Bw, Nup, and G–. The results for Bp, Bw, and Nup are consistent with the recommendations made by Blankenship et al. (2005). For nAff, in general, the results indicated that positively signed subcategories were scored more frequently than negatively signed subcategories: N, I+, Ga+, Bw, and Th. However, the results for G+ (included in the conventional scoring system) versus G– (excluded in the conventional scoring system) were less clear cut. In addition, I? (also excluded in the conventional scoring system) was frequently scored among participants who produced affiliation imagery. For the power motive scoring system, only Pa+, N, I, and Eff were consistently scored (among those who produced power imagery) across all cues and both samples. In contrast, Pa–, Bw, Ga+, Ga–, G+, and G– were scored relatively infrequently among power-oriented participants (see Figures 3 to 5 for a summary of the prevalence of scoring subcategories by study for nAch, nAff, and nPow, respectively. Note that for each study, results are shown for the two cues that elicited the most imagery for a particular motive).

In summary, our results indicated that certain subcategories were consistently scored 10% to 15% (or less) of the time for participants who produced motive-relevant imagery. Although these findings await further replication, we suggest that low-frequency scoring subcategories could be considered for removal (note that similar work with sentence cues has produced parallel findings, see Langan-Fox & Grant, in press). However, it should be noted that the analysis of scoring subcategories alone is not sufficient to argue for or against the elimination of particular subcategories; evidence of differential validity is needed. That is, further research, incorporating criterion variables, is required to determine whether revised motive scoring systems produce more valid findings. Such research would have to demonstrate that the motives are more valid when computed without the low-frequency scoring subcategories. Until such research is undertaken, it is not appropriate to suggest a criterion for subcategory removal. Such research has the potential to benefit practitioners through the development of more efficient and parsimonious scoring systems with improved validity.

In conclusion, the TAT is a powerful and revealing measure that has made an undeniable contribution to the motivation literature. However, to the extent that the administration and scoring of the test can be improved and refined through the development of a standard set of cues, group norms, and a more efficient scoring system, the true potential of this measure is at present untapped.

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**TABLE 3**

Summary of Cue Strength (Stimulus Pull) by Motive and Study

<table>
<thead>
<tr>
<th>Cue</th>
<th>nAch Study 1</th>
<th>nAch Study 2</th>
<th>nAff Study 1</th>
<th>nAff Study 2</th>
<th>nPow Study 1</th>
<th>nPow Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple on bench by river</td>
<td>3</td>
<td>77</td>
<td>7</td>
<td>15</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>Two women in lab coats in laboratory</td>
<td>56</td>
<td>62</td>
<td>10</td>
<td>15</td>
<td>47</td>
<td>18</td>
</tr>
<tr>
<td>Ship captain</td>
<td>7</td>
<td>2</td>
<td>13</td>
<td>16</td>
<td>56</td>
<td>39</td>
</tr>
<tr>
<td>Architect at desk</td>
<td>25</td>
<td>44</td>
<td>25</td>
<td>29</td>
<td>42</td>
<td>23</td>
</tr>
<tr>
<td>Trapeze artists</td>
<td>43</td>
<td>34</td>
<td>44</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man and woman with horses and dog</td>
<td>10</td>
<td>41</td>
<td>37</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conference group: Seven men around a table</td>
<td>6</td>
<td></td>
<td></td>
<td>37</td>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>

Note. Underlined values indicate moderate to high cue strength.

*aCue strength was defined as the percentage of participants who produced motive-relevant imagery in response to a given cue. Cue strength in the range of 50% to 80% is considered moderate to high, reflecting greater validity.*
FIGURE 3  Prevalence of nAch scoring subcategories among participants who produced achievement imagery by study. For each study, results are shown for the two cues that elicited the most achievement imagery; Study 1: Cue 4 (Two women in lab coats in laboratory; \( n = 188 \)) and Cue 5 (Trapeze artists; \( n = 142 \)); Study 2: Cue 2 (Trapeze artists; \( n = 72 \)) and Cue 3 (Two women in lab coats in laboratory; \( n = 133 \)). N = need; I = instrumental activity; Ga+ = positive anticipatory goal state; Bp = block within the person; Bw = block in the world; Nup = nurtuant press; G+ = positive affective state; G– = negative affective state; Ach Th = achievement thema.

FIGURE 4  Prevalence of nAff scoring subcategories among participants who produced achievement imagery by study. For each study, results are shown for the two cues that elicited the most affiliation imagery; Study 1: Cue 2 (Architect at desk; \( n = 149 \)) and Cue 3 (Couple on bench by river; \( n = 259 \)); Study 2: Cue 2 (Trapeze artists; \( n = 62 \)) and Cue 4 (Conference group: Seven men around a table; \( n = 78 \)). N = need; I+ = instrumental activity with a successful outcome; I– = instrumental activity with a unsuccessful outcome; I? = instrumental activity with a doubtful outcome; Ga+ = positive anticipatory goal state; Ga– = negative anticipatory goal state; Bp = block within the person; Bw = block in the world; G+ = positive affective state; G– = negative affective state; Ach Th = achievement thema.
FIGURE 5  Prevalence of nPow scoring subcategories among participants who produced achievement imagery by study. For each study, results are shown for the two cues that elicited the most power imagery; Study 1: Cue 1 (Ship captain; \( n = 189 \)) and Cue 4 (Two women in lab coats in a laboratory; \( n = 159 \)); Study 2: Cue 1 (Ship captain; \( n = 84 \)) and Cue 4 (Conference group: Seven men around a table; \( n = 85 \)). Pa+ = positive prestige of the actor; Pa– = negative prestige of the actor; N = need; I = instrumental activity; Bw = block in the world; Ga+ = positive goal anticipation; Ga– = negative goal anticipation; G+ = positive goal state; G– = negative goal state; Eff = effect.

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MEASURING THE BIG THREE MOTIVES

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