
ARTICLES

Assessing Implicit Motives in U.S. College Students: Effects of Picture Type and Position, Gender and Ethnicity, and Cross-Cultural Comparisons

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We assessed implicit needs for power, achievement, and affiliation in 323 U.S. college students using a Picture Story Exercise (PSE; McClelland, Koestner, & Weinberger, 1989) consisting of 6 picture cues and Winter's (1994) content coding system. Picture cues differed markedly in the amount of motive imagery they elicited and picture motive profiles closely resembled those reported by Schultheiss and Brunstein (2001) for a German student sample. Picture position influenced the expression of power and affiliation motivation, with affiliation motivation being most strongly expressed at the beginning and power motivation being most strongly expressed in the middle of the PSE. Women had higher affiliation motive scores than men. Asian Americans had higher affiliation motive scores than Whites, and African Americans had higher levels of achievement motivation than Asian Americans or Whites. PSE motive measures showed little or no overlap with questionnaire measures of impulsivity and anxiety (Behavioral Inhibition System–Behavioral Activation System scales; Carver & White, 1994) or specific motivational orientations (Personality Research Form; Jackson, 1984). Comparisons with Schultheiss and Brunstein's (2001) German sample indicate that U.S. students have higher achievement motivation and lower power motivation and activity inhibition scores than German students.

Recent years have witnessed a resurgence of interest in implicit motives, that is, the nonconscious motivational needs that orient, select, and energize behavior (McClelland, 1987). Researchers have explored with considerable sophistication the influence of the implicit needs for power and affiliation on social cognition (Zurbriggen, 2000), conflict escalation (Langner & Winter, 2001), episodic memory (McAdams, 1982; Woike, Lavezzary, & Barsky, 2001), nonconscious instrumental learning (Schultheiss, Pang, Torges, Wirth, & Treynor, 2005), and hormone release (Schultheiss, Wirth, & Stanton, 2004; Schultheiss et al., 2005). Others have started to contrast the functions of implicit motives with those subserved by individuals' explicit motivational needs and goals (Brunstein & Hoyer, 2002; Brunstein, Schultheiss, & Grässmann, 1998), and after a hiatus of roughly 30 years, there is also a renewed interest in cross-cultural work on motives (Hofer & Chasiotis, 2003, 2004).

Compared to this new thrust toward elucidating the validity of the implicit motive construct and the long history of research in this area, the picture–story instruments commonly

used to assess implicit motives remain poorly described. Because implicit motives are not normally accessible to conscious awareness, they are usually measured by thematic apperception tests that are based on the instrument developed by Morgan and Murray (1935; Thematic Apperception Test [TAT]). Modern versions of the story-based, thematic apperception method, such as the Picture Story Exercise (PSE; Koestner & McClelland, 1992; McClelland, Koestner & Weinberger, 1989), still require participants to produce imaginative stories in response to a series of pictures but differ from Morgan and Murray's original approach in at least two crucial ways: the PSE employs (a) empirically derived scoring systems on written stories collected in a group setting rather than clinician ratings on verbal stories produced in individual client interviews, and (b) diverse picture stimuli, usually from sources other than the original TAT card set, which are more representative of current, "everyday" situations. Despite the PSE's long history of use, however, surprisingly little research has examined the properties of the PSE pictures themselves.

Schultheiss and Brunstein (2001) recently called attention to this issue by pointing out that whereas content coding systems that are used to assess motivational imagery from verbal or written stories have been published and refined over the years (e.g., McAdams, 1984; McClelland, Atkinson, Clark, & Lowell, 1953; Winter, 1994), selection of the picture cues typically used to elicit stories remains guesswork. Only a few of the pictures often used by researchers are published (see Smith, 1992); the rationale for their selection remains largely unknown and so does their suitability for the assessment of specific motivational needs. Therefore, researchers interested in using content coding of imaginative stories to study implicit motives have had to rely on intuition or personal advice from more experienced scholars to decide which picture cues would elicit story material most suitable for assessing a particular motive. The uninitiated researcher is faced with the task of pretesting pictures or relying on informal sources of information (e.g., advice from colleagues) to determine the average amount of motive imagery elicited by each picture, otherwise known as *cue strength* (Smith, Feld, & Franz, 1992).

Work has already been carried out to evaluate a set of pictures based on the criterion of cue strength. Using data from several studies conducted in Germany, Schultheiss and Brunstein (2001) presented information on the cue content of a set of six pictures. Schultheiss and Brunstein (2001) found that picture cues indeed differ in the kinds and amount of motive imagery that they tend to elicit, with some pictures having a high pull for certain motive imagery and others having low pull for the same kind of imagery. The study by Schultheiss and Brunstein (2001) represents a first step toward refining the picture–story technique and simplifying future implicit motivation research.

OVERVIEW OF THIS STUDY

In this study, we extended on Schultheiss and Brunstein's (2001) work. In doing so, we were interested, first, in whether the picture cue profiles reported for German students by Schultheiss and Brunstein (2001) could be replicated in a sample with a different cultural and ethnic background. We analyzed data collected in various studies from 323 students enrolled at the University of Michigan. All students were shown the same set of six pictures cues, five of which were identical to those used in the German study. We present profiles of the amount of power, affiliation, and achievement motive imagery these pictures drew as well as data on the extent to which they elicited activity inhibition, a moderator of the behavioral expression of implicit motives (e.g., Langens & Stucke, 2005; McClelland, 1979; Schultheiss & Brunstein, 2002).

The second issue that we studied is the effect of picture cue position on cue strength. According to the theory of the dynamics of action (Atkinson & Birch, 1970), expressing

imagery reflective of a particular motive reduces the strength of that motivational tendency. Smith (1992) suggested that this may have implications for order of presentation of pictures; the researcher may decide to alternate pictures with high cue value to maximize motivational imagery elicited. However, some researchers have suggested that the reduction in strength of a motivational tendency after its expression is likely to occur at a different rate for different people (Smith et al., 1992). For this reason, effects of picture order should even out across participants. At present, it is not known if the pull of a picture for one motivational theme (cue strength) or a combination of themes (cue profile) is affected by the position it is presented within a given set of pictures. Although Schultheiss and Brunstein (2001) provided detailed information on the cue strength of a set of pictures, they presented all picture cues in the same order, so the effect of picture position was not studied. In this study, we randomized order of presentation of picture cues across participants, allowing us to explore the effect of picture position on cue strength and profiles.

The third issue we studied was whether gender differences exist for motive imagery scores. Past research provides some evidence suggesting higher levels of affiliation motivation, but not of power or achievement motivation, in women compared to men (e.g., McAdams, Lester, Brand, McNamara, & Lensky, 1988; Schultheiss & Brunstein, 2001; Stewart & Chester, 1982). Thus, we sought in this study to investigate the effect of gender on implicit motivation and inhibition scores.

A fourth question we explored was based on the frequent finding (McClelland et al., 1989) that self-report measures of motivation (also called explicit motive measures) assess constructs that are distinct from those assessed by story-based measures of implicit motivation. The distinction between these two aspects of human motivation was emphasized by McClelland and colleagues (e.g., Koestner, Weinberger, & McClelland, 1991; McClelland et al., 1989) and later also by Schultheiss (2001, in press; see also Schultheiss & Brunstein, 2005) who argued that although implicit motives are affect based, preferentially aroused by nonverbal stimuli, and influence nondeclarative measures of motivation and behavior (e.g., implicit learning, physiological responses, nonverbal behavior), self-attributed motives are cognition based, preferentially aroused by verbal cues, and influence declarative measures of motivation (e.g., decisions, judgments, attributions). More important, the validity of the PSE measure of implicit motives is amply documented in studies showing that motivational imagery elicited by pictures similar to or identical with those we describe here predict, among other things, procedural and episodic memory and reinforcement processes (Schultheiss et al., 2005; Woike, Mcleod, & Goggin, 2003), hormonal responses to motivationally charged stimuli (e.g., McClelland, 1989; Schultheiss et al., 2004; Schultheiss et al., 2005), attentional and learning responses to facial expressions of emotion (Klinger, 1967; Schultheiss & Hale, 2004; Schultheiss et al., 2005), emotional well-being (e.g.,

Brunstein et al., 1998; Zeldow, Daugherty, & McAdams, 1988), and career success and life adaptation (e.g., McClelland & Boyatzis, 1982; McClelland & Franz, 1992; see McClelland, 1987, and Winter, 1996, for recent overviews of research supporting the PSE's validity).

Schultheiss and Brunstein (2001) updated the data supporting the lack of congruence between self-attributed and implicit motivation by testing the relationship between PSE-measured implicit motives and explicit motive tendencies in a German student sample; accordingly, they found that the scores did not correlate with one another. Thus, using the Personality Research Form (PRF; Jackson, 1984) scales for dominance, achievement, and affiliation, which at face value assess the same motivational needs as the story-based measures for implicit power, achievement, and affiliation motivation, respectively, we expected to find little overlap between the two types of measures in our U.S. sample.

Less is known, however, about the relationship between implicit motives and basic temperamental traits related to motivational processes such as impulsivity and anxiety, which are also assessed via self-report (cf. Carver & White, 1994; Gray, 1971). Based on the absence of published findings that would suggest substantial convergence between implicit motives and questionnaire measures of temperamental traits, we expected little overlap between both types of measures too. This hypothesis is in agreement with previous research that has consistently found little or no correspondence between scores on free-response instruments and those on self-report scales of conceptually aligned constructs (Meyer, 2000; Schultheiss & Brunstein, 2001). More important, we support the idea that traits and motives interact in important ways; specifically, traits provide the stylistic context in which motives are expressed (for some evidence of this theory, see Winter, John, Stewart, Klohnen, & Duncan, 1998). Thus, although traits and motives are complementary to each other, they act at different levels of personality. Hence, we did not expect the scores on the implicit motive measures to correlate significantly with the temperamental trait scores.

Finally, we compare the differences in motivational imagery produced between our U.S. sample and the German sample (Schultheiss & Brunstein, 2001). There are few cross-cultural comparisons of implicit motive levels either assessed between countries (Hofer & Chasiotis, 2004; McClelland, 1975) or within the same country (Lefkowitz & Frazer, 1980). Our study presents a cross-cultural comparison of implicit motive and inhibition levels between U.S. participants and the German sample described in Schultheiss and Brunstein (2001). Furthermore, we were able to collect data from a more ethnically diversified sample than Schultheiss and Brunstein (2001). Hence, we also investigated the effects of ethnicity by exploring group differences in implicit motive and inhibition levels between the three biggest ethnic groups in our sample—Whites, Asian Americans, and African Americans.

To summarize, in this study, we extended on Schultheiss and Brunstein's (2001) work by evaluating (a) the cue strength

of a picture set similar to theirs in a large sample that is geographically and culturally different from theirs, (b) whether cue strength effects depend on cue position, (c) whether the gender difference in need (*n*) Affiliation found by Schultheiss and Brunstein (2001) and elsewhere can be replicated, (d) whether the implicit–explicit motivation independence effects can be replicated, and (e) whether there are within- and between-culture differences in motive imagery.

METHOD

Participants

A total of 170 female and 154 male students, age 18 to 35 years ($M = 19.96$, $SD = 2.84$) enrolled in the University of Michigan participated in five studies for payment or as partial fulfillment of course credit (Schultheiss & Hale, 2003; Schultheiss & Hale, 2004; Schultheiss, Jones, & Kley, 2004; Schultheiss & Riebel, 2004). Data collection for each study was conducted by different experimenters and at a different time between the winter terms of 2002 and 2003.

Procedure

Members of the undergraduate and graduate student population were either recruited through paper fliers and advertisements placed on online message boards or via the undergraduate Introductory Psychology Subject Pool. Each study session was held in a University building, lasted between 1½ to 2 hr, and administered in groups of no more than six. On arriving, participants were asked to choose and sit at any of the six personal computer stations in a 3 m wide, 9 m long room. The computer stations were separated from each other by at least 1.2 m; three of the stations were lined against one of the walls along the length of the room, whereas the other three were lined against the facing wall such that the 3 participants sitting at the stations on one wall would have their backs facing the other 3 participants. The experimenter then introduced the experiment and pressed a key on each participant's computer to begin the study. After this point, all instructions, PSE pictures, and self-report instruments were displayed on the computer screens in front of the participants. The participants always completed the PSE first, followed by the PRF, Behavioral Inhibition System–Behavioral Activation System scales (BIS–BAS; Carver & White, 1994), biographical questions as well as a series of other psychological measures relevant to the hypotheses of the particular study. For the self-report measures, each item on the scales was presented to participants individually; responses were made using standard keyboards and recorded with Experimental Run Time System (Berlinger, 1996). During the PSE, however, participants wrote stories on writing sheets provided by the experimenter. Participants worked at their own pace and without further instruction from the experimenter who stayed in the room to answer any questions par-

ticipants had while working on the tasks. At the end of the experiment, participants were thoroughly debriefed and either paid \$5 per hour or given partial course credit for their time.

Personality Measures

Implicit motives. A PSE was administered to assess participants' activity inhibition and implicit motives for power, achievement, and affiliation. U.S. participants were instructed to write imaginative stories in response to the following six picture cues: *boxer, women in laboratory, ship captain, couple by river, trapeze artists, and nightclub scene*. All pictures are contained in Smith (1992) with the exception of the nightclub scene, which can be found in McClelland (1975), and the boxer, which was taken from McClelland and Steele (1972). A short description of each picture can be found in the Appendix (on request, a set of these pictures is also available from us). Pictures were presented using standard instructions contained in Smith (1992).

Each PSE picture was displayed on a PC computer screen for 10 sec, after which participants had 5 min to write an imaginative story in response to the picture cue. In Schultheiss and Hale (2003), the data collection software allowed participants to move on to the next picture at any time. In all other studies, the earliest that participants were allowed to move on to the next picture was after 4 min elapsed time since picture presentation. In all studies, the software prompted participants to stop writing and move on to the next picture after 5 min had elapsed since picture presentation. The prompt was then repeated every 20 sec until participants pressed a key and the presentation of the next picture was initiated. Participants wrote stories on numbered sheets, which later allowed matching stories with picture type. Up to 6 participants were tested simultaneously, working on spatially separated computer workstations in one testing room.

Needs for power, achievement, and affiliation were assessed using Winter's (1994) *Manual for Scoring Motive Imagery in Running Text*. The Winter (1994) scoring system has been psychometrically validated and demonstrates extensive predictive validity in a variety of applications ranging from studies of political leaders (Winter, 1980; Winter & Carlson, 1988; Winter & Stewart, 1977), the role of motives in conflict escalation (Winter, 1987), to the effects of motive-goal congruence on emotional well-being (Brunstein et al., 1998; Hofer & Chasiotis, 2003).¹ According to the Winter (1994) manual, *n* Power is scored whenever a story character shows concern with having impact by strong, forceful actions, per-

suading or convincing others, controlling, checking up on, or influencing emotions in other people or the world at large. Need Achievement is scored whenever a character shows concern for attaining a standard of excellence such as in the mention of winning or competition, negative emotional response to failure, or mention of unique accomplishment. Finally, *n* Affiliation is scored whenever a character expresses concern for establishing, maintaining, or restoring friendly relations with others or expresses sadness or other negative emotion about separation or disruption of a relationship. Winter's (1994) scoring system combines *n* Affiliation and *n* Intimacy into one conjoint imagery category because of the theoretical and empirical overlap between the two constructs. For the sake of expediency, we denote this category with *n* Affiliation through the remainder of the article.

Two coders (A and B) who had previously attained greater than 85% reliability (index of concordance) with calibration materials prescored by an expert and contained in the Winter (1994) manual independently coded protocols for motive imagery. Coding for four out of the five studies were done by coder A, and one study was coded by coder B. In one of the four studies coded by coder A, we checked interrater reliability by having a third coder (C) independently score all participants' ($n = 60$) story protocols. Interrater reliability, assessed by the intraclass correlation coefficient (ICC), of coder A with coder C was greater than .70 for all three motives and can thus be considered good to excellent (cf. Meyer et al., 2002; Table 1 reports detailed ICC summary information). We also determined the participants' levels of activity inhibition in the U.S. sample by counting the frequency of the word *not* (cf. McClelland, 1979) in each protocol.

PSE protocol length was significantly correlated with participants' overall scores for *n* Power, $r = .44$; *n* Achievement, $r = .23$; *n* Affiliation, $r = .39$; and for inhibition, $r = .38$, all $ps < .001$. We therefore corrected for the influence of protocol length on motive and inhibition scores by regression and converted the residuals to z scores within studies.

Explicit motives and temperamental traits. Participants completed the PRF scales for dominance (α s ranged between .71 and .87), achievement (α s between .71 and .80), and affiliation (α s between .77 and .86). The PRF subscales have been constructed to capture the same motivational themes that also guided the development of the initial PSE measures of *n* Power, *n* Achievement, and *n* Affiliation that are integrated into Winter's (1994) system. Each PRF subscale included 16 true-false questions that described habits and preferences consistent or inconsistent with each motive domain. We asked participants to decide how representative each statement was as a self-description. An example of an item measuring dominance is "I feel confident when directing the activities of other"; a typical affiliation item is "I seldom put out extra effort to make friends" (reverse keyed); and a typical achievement item reads "I don't mind working while others are having fun." A subset of the U.S. partici-

¹According to Winter (1994), *motive imagery* is any action, wish, concern, or other internal state that the character in the story attributes to self, some other person, or people in general. In other words, whenever a story character makes reference to any action or thought thematically related to *n* Power, *n* Achievement, or *n* Affiliation, they are assumed to be expressing power-motivated, achievement, or affiliative concerns.

TABLE 1
Intraclass Correlation Coefficients (ICCs)
for Implicit Motive Scores between Coder A
and Coder C

Motive	Coder A		Coder C		ICC
	<i>M</i> ^a	<i>SD</i>	<i>M</i> ^b	<i>SD</i>	
<i>n</i> Power	.88	0.91	.78	0.92	.73
<i>n</i> Achievement	.64	0.94	.65	0.94	.83
<i>n</i> Affiliation	.85	1.18	.67	1.05	.85

Note. *N* = 60. *n* = need.

^a*M* = average motive score given to each protocol by Coder A. ^b*M* = average motive score given to each protocol by Coder C.

pants (*n* = 245) also completed the BIS/BAS scales (Carver & White, 1994), which is a 20-item Likert scale designed to assess anxiety, conceived of as a general motivational tendency to avoid punishment (BIS component), and impulsivity, conceived of as a general motivational tendency to approach incentives (BAS component). Whereas the BIS component is unidimensional and measured by the BIS subscale, the BAS component is composed of the subscales Drive (BAS–D), Fun Seeking (BAS–F), and Reward Responsiveness (BAS–R). Each of the four subscales contains between four to seven items worded in both protrait and contrait direction that required participants to rate on a 4-point scale ranging from 1 (*disagree strongly*) to 4 (*agree strongly*) their degree of agreement with each statement. A typical BIS item reads “I worry about making mistakes”; a typical BAS–D item reads “when I want something, I usually go all-out to get it”; a sample BAS–F item is “I often do things for no other reason than that they might be fun”; and a sample BAS–R item is “when I get something I want, I feel excited and energized.” Cronbach’s α ranged between .67 and .82 for the BIS scale, .61 and .82 for BAS–D, .54 and .65 for BAS–F, .53 and .65 for BAS–R, and between .69 and .78 for the BAS (total) Scale.

Demographic Variables

U.S. participants indicated their ethnicity by checking one of six categories: White (61.4%), Asian (20.7%), Black (8.6%), Hispanic (4%), Pacific Islander (2.2%), and Native American (.3%). Ten participants (3.1%) failed to state their ethnicity.

RESULTS

Picture Motive Profiles

To test for differences of motive profiles between pictures, we computed a repeated measures multivariate analysis of variance (MANOVA) with Picture (Pictures 1 to 6) and Motive (*n* Power, *n* Achievement, and *n* Affiliation) as within-subjects factors. There was a highly significant Picture \times Motive interaction indicating that participants’ motive profiles varied

across picture cues, $F(10, 311) = 145.64$, $\eta^2 = .824$, $p < .000005$. This effect persisted even after partialing out protocol length, $F(10, 310) = 4.16$, $\eta^2 = .118$, $p < .00005$. As Table 2 shows, picture cues differed quite markedly in the amount and thematic content of motive imagery they elicited in participants’ story writing. For instance, women in laboratory had a strong pull for *n* Power and *n* Achievement but little for *n* Affiliation, whereas couple by river had a strong pull for *n* Affiliation but little for *n* Power and almost none for *n* Achievement. Following recommendations by Schultheiss and Brunstein (2001) and Smith et al. (1992) to consider pictures as having high pull for a specific motive content category only if more than 50% of participants responded with at least one codable instance of imagery within a given content category, we identified boxer, women in laboratory, ship captain, trapeze artists, and nightclub scene as high-pull pictures for *n* Power; boxer, women in laboratory, and trapeze artists as high-pull pictures for *n* Achievement; and couple by river and nightclub scene as high-pull pictures for *n* Affiliation.

Additional repeated measures analyses of variance (ANOVAs) revealed significant picture effects for activity inhibition, $F(5, 1600) = 7.11$, $\eta^2 = .022$; and word count, $F(5, 1600) = 6.61$, $\eta^2 = .020$, $ps < .000005$. As shown in Table 2, participants had relatively high inhibition scores on ship captain and relatively low inhibition scores on women in laboratory, with inhibition scores on the other pictures falling in between. Women in laboratory was also the picture eliciting the shortest stories and differed in that regard from all other pictures.

Picture Position Effects

Participants’ word counts changed significantly over picture position, $F(5, 1610) = 8.90$, $\eta^2 = .027$, $p < .00001$. As Table 3 shows, this effect reflected an increase in story length from the first to the fourth story and a plateau after that, $F(1, 322) = 6.74$, $\eta^2 = .020$, $p < .01$ for the quadratic trend. Also, participants’ *n* Power, *n* Affiliation, and inhibition scores on each position were positively and significantly correlated with story length (all $ps < .05$; rs ranged from .13 to .31), whereas *n* Achievement scores did not depend on story length on any position (all $ps > .05$; rs ranged from .00 to .11). We therefore corrected *n* Power, *n* Affiliation, and inhibition scores for story length using Winter’s (1994) formula: $(\text{score} \div \text{word count}) \times 1,000$. After word-count correction, motive scores were no longer significantly associated with story length, and only two of the six inhibition scores showed a slight overlap with story length. To test for position effects on motive scores, we computed a repeated measures MANOVA with Position (1 to 6) as between-subject factor and Motive (word-count-corrected *n* Power, word-count-corrected *n* Affiliation, raw *n* Achievement) as within-subjects factor. We obtained a significant Motive \times Position interaction— $F(10, 313) = 3.64$, $\eta^2 = .104$, $p = .0001$ —which was based on significant effects of Position for power motive imagery, $F(5, 1610) = 4.08$, $\eta^2 = .013$, $p = .001$, and af-

TABLE 2
Means and Standard Deviations of Raw Scores Across Coding Categories and Picture Cues
for Women^a and Men^b

Picture	<i>n Power</i>		<i>n Achievement</i>		<i>n Affiliation</i>		<i>Inhibition</i>		<i>Words</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Boxer										
Both	<u>0.79</u>	0.90	1.14	<u>1.06</u>	0.17	0.51	0.80	0.97	97.60	29.09
Women	0.77	0.99	1.14	1.10	0.23	0.58	0.82	1.02	103.20	30.50
Men	0.81	0.91	1.14	1.01	0.12	0.43	0.78	0.92	91.57	26.35
Difference	-0.04		0.00		0.22		0.04		0.41**	
Women in laboratory										
Both	<u>0.77</u>	0.85	1.08	<u>0.93</u>	0.19	0.50	0.64	0.90	93.38	26.09
Women	0.87	0.87	1.34	0.96	0.22	1.02	0.69	0.94	99.93	27.48
Men	0.67	0.81	0.80	0.81	0.16	0.51	0.60	0.82	86.24	22.56
Difference	0.24*		0.61**		0.08		0.10		0.55**	
Ship captain										
Both	<u>1.01</u>	<u>0.88</u>	0.14	0.47	0.21	0.53	1.07	1.20	98.24	27.46
Women	0.97	0.87	0.16	0.54	0.26	0.60	1.07	1.20	103.85	28.85
Men	1.05	0.89	0.12	0.39	0.15	0.44	1.07	1.20	92.19	24.63
Difference	-0.09		0.09		0.21		0.00		0.44**	
Couple by river										
Both	0.23	0.54	0.00	0.21	<u>2.06</u>	<u>1.07</u>	0.80	1.12	99.42	25.73
Women	0.32	0.56	0.00	0.20	3.20	1.07	0.86	1.02	104.92	25.75
Men	0.25	0.52	0.00	0.23	1.92	1.07	0.75	1.22	93.57	24.47
Difference	0.13		0.00		1.20**		0.10		0.45**	
Trapeze artists										
Both	<u>0.70</u>	0.79	0.76	<u>0.83</u>	0.49	0.80	0.73	0.96	97.00	26.96
Women	0.75	0.82	-0.75	0.83	0.68	0.89	0.78	0.89	104.50	27.80
Men	0.65	0.70	0.78	0.83	0.29	0.62	0.66	1.04	88.85	23.61
Difference	0.13		-0.04		0.51**		0.12		0.61**	
Nightclub scene										
Both	<u>0.75</u>	<u>0.82</u>	0.01	0.30	<u>1.32</u>	<u>1.10</u>	0.74	1.03	99.53	28.09
Women	0.79	0.83	0.01	0.29	1.49	1.13	0.80	1.02	105.57	28.38
Men	0.72	0.81	0.01	0.30	1.14	1.05	0.68	1.06	93.09	26.35
Difference	0.09		0.00		0.32*		0.12		0.46**	
Total										
Both	4.33	2.56	3.25	2.00	4.45	2.41	4.76	3.23	584.83	138.52
Women	4.49	2.52	3.51	2.14	5.10	2.34	4.99	3.25	621.33	141.65
Men	4.16	2.61	2.97	1.79	3.76	2.30	4.53	3.21	545.42	124.23
Difference	0.13		0.28*		0.58**		0.14		0.57**	

Note. Underlined motive scores indicate that more than 50% of participants have responded with at least one instance of codable motive imagery to the picture cue. *n* = need; Difference = (Cohen's *d*) significant differences between women and men within a picture and coding category.

^a*n* = 167. ^b*n* = 153.

p* < .05. *p* < .005.

affiliation motive imagery, $F(5, 1610) = 3.00, \eta^2 = .009, p = .01$. As shown in Table 3, whereas the amount of achievement imagery remained relatively constant from the first to the last picture, power motive imagery increased from the first to the fourth picture and then decreased again; for the quadratic trend, $F(1, 322) = 5.87, \eta^2 = .018, p < .05$. In contrast, affiliation motive imagery was high in the first three stories, low in the fourth, and then recovered in the last two stories; for the cubic trend, $F(1, 322) = 3.71, \eta^2 = .011, p = .05$. Thus, affiliation and power motive imagery tended to be expressed in a reciprocal fashion across the six stories, with affiliation imagery being particularly likely to be expressed in the initial and last stories and power motive imagery surfacing most clearly three to four stories into the PSE. Word-count corrected inhibition scores linearly increased from the first to the last story, $F(5, 1610) = 3.63, \eta^2 = .011, p < .005$.

To test for position effects on the motive profiles of individual picture cues, we conducted MANOVAs for each of the six pictures with picture-specific motive scores (*n Power*, *n Achievement*, and *n Affiliation*) as dependent variables, picture position as a quantitative predictor variable, and picture word count as covariate. None of the analyses yielded significant Motive \times Position effects, $ps > .10$, which suggested that each picture's motive profile did not change with the position on which the picture was presented. However, we obtained main effects of position on overall motive imagery for ship captain, $F(1, 318) = 10.74, \eta^2 = .033, p = .001$ and women in laboratory, $F(1, 318) = 5.44, \eta^2 = .017, p < .05$. Follow-up regression analyses with picture position as quantitative predictor and picture word count as covariate revealed a linear effect of position for ship captain ($B = 0.096$, standard error [*SE*] = 0.029, $p = .001$), indicating that the later

TABLE 3
Means and Standard Deviations of Motive Profiles by Picture Position

Motive	Position					
	1	2	3	4	5	6
<i>n</i> Power						
<i>M</i>	0.56	0.66	0.74	0.87	0.70	0.80
<i>SD</i>	0.74	0.82	0.82	0.90	0.77	0.91
<i>n</i> Achievement						
<i>M</i>	0.54	0.46	0.51	0.54	0.65	0.55
<i>SD</i>	0.85	0.77	0.86	0.82	0.93	0.85
<i>n</i> Affiliation						
<i>M</i>	0.72	0.85	0.79	0.60	0.78	0.70
<i>SD</i>	1.08	1.11	1.07	1.00	1.10	1.03
Inhibition						
<i>M</i>	0.65	0.69	0.74	0.84	0.86	0.98
<i>SD</i>	0.94	0.89	1.07	1.03	1.03	1.21
<i>n</i> Power corrected for word count						
<i>M</i>	5.97	6.87	7.64	8.64	7.02	7.84
<i>SD</i>	8.13	8.37	8.73	8.83	7.76	9.15
<i>n</i> Affiliation corrected for word count						
<i>M</i>	7.58	9.06	8.36	5.86	7.91	7.22
<i>SD</i>	11.19	12.01	11.28	9.76	11.10	10.87
Inhibition corrected for word count						
<i>M</i>	6.98	7.28	7.30	8.48	9.35	9.72
<i>SD</i>	9.74	10.30	10.10	10.54	16.28	11.60
Word count						
<i>M</i>	93.08	96.34	96.95	100.24	98.84	99.38
<i>SD</i>	25.35	27.63	27.49	27.23	27.67	27.64

Note. $N = 323$. $n = \text{need}$.

this picture appeared in the series, the more motive imagery participants infused into their stories. For women in laboratory, we found a significant quadratic effect ($B = 0.055$, $SE = 0.021$, $p = .01$), which reflected the fact that from Position 1 to 3, the picture elicited increasing amounts of motive imagery followed by a decrease on Positions 4 and 5 and a final increase on position 6.

Gender Differences

Women wrote significantly longer protocols than men. They were also higher than men in *n* Affiliation and significantly so for three of the six picture cues (see Table 2). Women were also higher than men in total *n* Affiliation. To test whether women's higher levels of overall affiliation imagery would be accounted for by their higher verbal fluency, we partialled out total word count before testing for the influence of gender on total *n* Affiliation. Women remained significantly higher than men in *n* Affiliation, partial $r = -.21$, $p < .001$. Furthermore, although women scored higher than men in total *n* Achievement, this effect did not persist after partialling out word count, partial $r = -.10$, *ns*.

Correlations Among PSE Measures

Using residualized *n* Power, *n* Achievement, *n* Affiliation, and activity inhibition scores, we computed correlation coef-

ficients for PSE measures separately for men and women (see Table 4). We found a significant negative correlation between *n* Power and *n* Affiliation in women, whereas the same correlation did not reach significance in men. A follow-up analysis indicated that the difference between these correlation coefficients approached significance ($z = 1.70$, $p = .09$). Higher levels of *n* Achievement were significantly associated with higher *n* Affiliation ($r = .16$, $p < .005$) and lower inhibition levels ($r = -.23$, $p < .00005$) in the overall sample, and these correlations did not significantly differ in magnitude between men and women. Similarly, higher levels of *n* Affiliation were associated with lower inhibition levels in the overall sample ($r = -.15$, $p < .01$), with no evidence of a significant gender difference in the strength of this association. Using residualized scores for *n* Power, *n* Achievement, and *n* Affiliation as well as activity inhibition, we computed correlation coefficients for these measures and age and found that older participants had significantly lower *n* Achievement (see Table 4).

Correlations Between PSE Measures and Questionnaire-Based Personality Variables

To examine relationships between implicit (PSE) and explicit (PRF) measures of a particular motivational domain, we computed correlations between residualized PSE motive measures and PRF scales. As shown in Table 5, the PRF scales dominance and achievement did not significantly correlate with any PSE motive measure. However, higher scores on the PRF Affiliation scale were significantly associated with lower *n* Power scores and higher *n* Achievement and *n* Affiliation scores. When we regressed PRF affiliation on PSE motive measures, only *n* Power ($B = -0.82$, $SE = 0.21$, $p = .0001$) and *n* Achievement ($B = 0.17$, $SE = 0.21$, $p < .05$) accounted for significant unique variance in self-attributed affiliation motivation. Finally, higher PSE inhibition scores were associated with lower scores in PRF measures of dominance, achievement, and affiliation.

We also computed correlations between residualized PSE measures and the BIS/BAS Scales and subscales. Although total BIS and BAS scores were not significantly associated with PSE motive and inhibition measures, higher scores in

TABLE 4
Correlations Among Residualized Motive Variables and Between Residualized Motive Variables and Age

Variable	1	2	3	4	Age
1. <i>n</i> Power	—	.02	-.32**	.14	-.07
2. <i>n</i> Achievement	-.06	—	.11	-.17*	-.12*
3. <i>n</i> Affiliation	-.14	.19*	—	-.21**	.05
4. Inhibition	-.02	-.31***	-.07	—	-.03

Note. Women ($N = 168$) are represented above the diagonal; men ($N = 154$) are represented below the diagonal. $n = \text{need}$.

* $p < .05$. ** $p < .005$. *** $p < .001$.

TABLE 5
Correlations Between Residualized PSE Measures of Implicit Motives and Activity Inhibition and Questionnaire Measures of Motivational Themes (PRF and BIS/BAS)

Theme	<i>M</i>	<i>SD</i>	<i>PSE</i>			
			<i>n Power</i>	<i>n Achievement</i>	<i>n Affiliation</i>	<i>Inhibition</i>
PRF ^a						
Dominance	9.76	3.82	-.01	.07	-.01	-.23**
Achievement	9.74	3.57	.03	.02	-.06	-.14*
Affiliation	9.99	3.75	-.23**	.14*	.12*	-.12*
BIS/BAS ^b						
BIS	20.82	3.42	-.02	.01	.00	.10
BAS-R	17.17	1.77	-.01	.08	.05	-.12
BAS-F	12.05	1.95	.00	.04	-.21**	-.04
BAS-D	11.14	2.34	-.22**	.05	-.09	-.03
BAS	40.36	4.42	-.12	.07	-.12	-.08

Note. PSE = Picture Story Exercise; PRF = Personality Research Form; BIS/BAS = Behavioral Inhibition System/Behavioral Activation System Scales; *n* = need; BIS = Behavioral Inhibition System total; BAS-R = BAS-Reward Responsiveness subscale; BAS-F = BAS-Fun Seeking subscale; BAS-D = BAS-Drive subscale.

^a*n* = 323. ^b*n* = 245.

p* < .05. *p* < .005.

the BAS Drive subscale were significantly associated with less *n Power*, and higher scores in the BAS-F subscale were significantly associated with less *n Affiliation*.

Ethnic Background

We investigated effects of ethnicity using residualized motive scores from the three largest ethnic groups in our sample: Whites, Asian Americans, and African Americans. A repeated measures ANOVA revealed a significant Ethnicity × Motive effect, $F(4, 576) = 2.33$, $\eta^2 = .016$, $p = .05$. Because implicit motive measures had slight overlap in the overall sample (cf. Table 4) and also in the subsample used in this analysis, we conducted follow-up analyses on each motive covarying out its overlap with the other two motive measures. We found that the three ethnic groups significantly differed in their *n Affiliation*, $F(2, 286) = 4.38$, $\eta^2 = .030$, $p = .01$ and *n Achievement* levels, $F(2, 286) = 2.92$, $\eta^2 = .020$, $p = .05$ but not in their *n Power* levels ($p > .10$). African Americans' *n Achievement* levels (adjusted $M = 0.34$) were significantly higher than Asian Americans' (adjusted $M = -0.19$, $p < .05$; Cohen's $d = .50$) and marginally higher than Whites' (adjusted $M = 0.05$, $p = .08$; Cohen's $d = .28$). Asian Americans' *n Affiliation* levels (adjusted $M = 0.27$) were significantly higher than Whites' (adjusted $M = -0.12$, $p < .005$; Cohen's $d = .43$) but did not differ from those of African Americans (adjusted $M = 0.05$, $p > .10$; Cohen's $d = .23$). The three ethnic groups did not significantly differ in their residualized inhibition scores.

Comparing U.S. and German Motive Levels

To analyze how U.S. students' total motive and inhibition levels compared to those of the German students studied by Schultheiss and Brunstein (2001), we corrected motive

scores in our sample and in their German sample for protocol length using Winter's (1994) previously described formula. This allowed us to express scores from both samples with a common metric (images per 1,000 words; cf. Winter, 1994). As shown in Table 6, German students scored significantly higher in *n Power* and inhibition, but lower than U.S. students in *n Achievement*. Both samples were comparable with regard to level of *n Affiliation*.

DISCUSSION

The results of our study provide evidence for (a) replicable motive signature of PSE pictures, (b) position effects on motivational imagery contained in picture stories, (c) a replicable gender difference in *n Affiliation*, (d) slight overlap between implicit motive and inhibition measures, (e) little overlap between implicit motive measures and self-report measures of motivation and temperament, and (f) ethnic and cultural differences in implicit motive measures. In the following, we discuss each finding in detail.

Picture Motive Profiles

Replicating Schultheiss and Brunstein's (2001) finding of picture cue effects on motivational imagery, we found that pictures strongly differed in their motive profiles, that is, in how much power, achievement, and affiliation imagery each picture elicited in participants' stories. More important, classifying a picture as high pull for a motive if it elicits at least one image in 50% of all respondents (cf. Smith et al., 1992), we arrive at exactly the same conclusions as Schultheiss and Brunstein (2001) for those five pictures that both studies have in common: women in laboratory and trapeze artists both cue *n Power* and *n Achievement*, ship captain cues *n Power*, couple by river

TABLE 6
Mean Motive and Inhibition Levels (Scores per 1,000 Words) in German^a and U.S.^b Samples

Motive	United States		German		<i>t</i> Statistic	<i>p</i> Value	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
<i>n</i> Power	7.21	4.14	9.22	4.91	5.94	.00	.44
<i>n</i> Achievement	4.64	3.31	3.91	3.32	-2.96	.00	-.22
<i>n</i> Affiliation	8.81	3.38	9.25	4.84	1.33	.18	.10
Inhibition	8.02	5.86	9.71	6.19	3.82	.00	.28

Note. *n* = need.

^a*n* = 428. ^b*n* = 323.

cues *n* Affiliation, and nightclub scene cues *n* Power and *n* Affiliation. It is particularly notable that this strong convergence between Schultheiss and Brunstein's (2001) findings and the results of our study emerges despite marked differences in the way stories were collected (Schultheiss & Brunstein, 2001, used a mix of individual and group administrations, a fixed picture sequence, and had an experimenter administer and pace the PSE; we used computer workstations to administer and pace participants individually through the PSE with picture sequence being randomized within participants and progression from one picture story to the next being largely determined by the participant), sociocultural background (they studied an ethnically homogenous, White German sample; we studied a more ethnically and racially diverse sample of U.S. college students), and the language in which stories were written and coded (German vs. English). Our findings therefore provide strong support for the idea that picture cues have specific motivational "signatures" that are robust and can be replicated across cultures.

These findings suggest that researchers using the PSE should pay close attention to stimulus properties. We recommend that picture stimuli be selected based on their cue strength for the variables of interest. Some experts on motive measurement have recommended that researchers choose pictures of intermediate to high cue strength and low ambiguity (the tendency of a picture to evoke alternate themes) because these pictures produce the greatest differentiation among high and low scorers while also yielding adequate test-retest reliability and construct validity (Smith et al., 1992). Pictures that have too high or too low cue strength are likely to elicit little differentiation because the overwhelming pull of the former and the insufficient stimulus value of the latter will yield scores with badly skewed distributions. Applying these guidelines to the pictures in our study, a researcher might for instance choose to use couple by river and nightclub scene as part of a larger stimulus set to optimize their efforts for assessing affiliation motivation, whereas another researcher interested in *n* Power would benefit more from including boxer and ship captain.

Finally, we replaced Schultheiss and Brunstein's (2001) *architect at desk* picture with boxer in our series and found this picture to be a strong cue for *n* Power and *n* Achievement. Thus, boxer turned out to be overall more effective

than architect at desk at eliciting motivational imagery (cf. Schultheiss & Brunstein, 2001, Table 1). Also, as a whole, our slightly modified picture set in conjunction with Winter's (1994) running-text scoring system was more successful than Schultheiss and Brunstein's (2001) at eliciting about equal amounts of imagery for all three motives. We therefore recommend its use in studies in which researchers want to explore the effects of *n* Power, *n* Achievement, and *n* Affiliation all at once.

Picture Positions

Because we had randomized picture sequence within participants, we were able to explore for the first time the effect of picture position on motivational content irrespective of the type of picture used to elicit it. We found evidence that within a series of six pictures, individuals started out writing stories comparatively saturated with affiliation imagery but low in power imagery. Toward the middle of the story sequence, this relationship was reversed, and participants started infusing their stories with more power imagery while affiliation imagery dropped. At the end of the sequence, both motives were expressed about equally strongly in the stories. In contrast to these reciprocal changes in power and affiliation imagery, achievement imagery remained constant across all stories. The observed cue-independent changes in *n* Power and *n* Affiliation across the PSE suggest that expression of these motives has a dynamic component independent of stimulus type and strength but consistent across individuals. We speculate that in novel social situations, such as participating in a laboratory experiment with an unfamiliar experimenter, expression of *n* Affiliation in imaginative thought and behavior takes primacy because it aims at establishing contact (cf. Schachter, 1959). Because the expression of a motivational need in thought or behavior is assumed to have a satiating effect (Atkinson & Birch, 1970; McClelland et al., 1953), other motivational needs may come to the fore after the strength of the initially expressed motive is reduced. That this kind of dynamic "balance of powers" between motives is more likely to be observed between *n* Affiliation and *n* Power than instead between *n* Power or *n* Affiliation on one hand and *n* Achievement on the other can be explained on the basis of the partially incompatible goals of *n* Power and *n* Affiliation

(trying to affiliate precludes to some extent trying to have impact on someone and vice versa; Schultheiss & Brunstein, 2001; McClelland, 1987) and the fact that whereas *n* Power and *n* Affiliation both have other people as their goal object, *n* Achievement is quite literally a task-oriented motive.

The dynamic effects of *n* Power and *n* Affiliation were quite modest in magnitude. Moreover, we have no reason to assume that the observed eigen-oscillation of *n* Power and *n* Affiliation across participants interferes with the assessment of motive differences between participants and, eventually, with predictive validity of the motive scores derived from the PSE we used in our studies (see following).

We also observed that participants increased the length of their stories from the first to the fourth picture and then continued to write long stories about the remaining pictures. We interpret this observation as a “warm-up” phase at the beginning of the PSE after which individuals become consistently more fluent in their stories. Although we did not observe any sign of a reduction of story length due to fatigue at the end of the PSE, other research suggests that such an effect may set in if participants have to write more than six stories (cf. Reitman & Atkinson, 1958). Eron and Ritter (1951) reported that thematic apperceptive stories obtained orally elicit similar thematic content to stories that are written; however, oral stories are longer and contain more diversified themes than written stories, which in turn have a happier and more flippant tone. Accordingly, if the stories in this study had been collected orally, we might expect a different pattern of protocol length over the sequence of pictures because the oral format is less taxing mentally. Finally, we also observed a linear increase in activity inhibition from the first to the last story that went above and beyond the effect of position on story length. Because inhibition scores are frequently interpreted as an indicator of how much a motivational need is barred from impulsive expression (e.g., Langens & Stucke, 2005; Schultheiss & Brunstein, 2002), this increase may reflect a process by which motivational needs become more strongly regulated the longer they are expressed. Further research on the meaning of inhibition increases and on activity inhibition more generally is needed to test the validity of this hypothesis.

Interestingly, we found no evidence that the position in which a picture is being presented alters the picture’s motivational signature significantly. This finding may explain why we obtained with our randomized presentation method picture motive profiles that are very similar to those found by Schultheiss and Brunstein (2001) with a fixed picture sequence. We did detect, however, an effect of picture position on overall amount of motivational imagery elicited by two pictures: ship captain and women in laboratory. The ship captain elicited higher amounts of motive imagery on later positions, and women in laboratory had a lower pull for motive imagery if presented on the fourth or fifth position. For researchers who want to present our picture set in a fixed sequence and who want to maximize the amount of motive imagery they can harvest from the story protocols,

we therefore recommend presenting women in laboratory on the third or sixth position and ship captain on the fourth or sixth position.

Gender Differences

Replicating previous reports of a gender difference in *n* Affiliation, we found that women scored higher than men in *n* Affiliation even after accounting for the influence of protocol length. We found no other significant motive or inhibition differences after controlling for differences in protocol length (consistent with evidence pointing toward higher verbal fluency in women than in men [e.g., Maccoby & Jacklin, 1974], women wrote longer stories than men). Recent findings suggest that the gender difference in *n* Affiliation may be driven, in part, by hormonal factors: women who are in the high-progesterone second half of the menstrual cycle and women who take progestin-based oral contraceptives have higher levels of *n* Affiliation than men or than women who are in the low-progesterone first half of the menstrual cycle and do not use oral contraceptives (Schultheiss, Dargel, & Rohde, 2003). Of course, the *n* Affiliation gender difference may also reflect social expectations. Women are often seen as more capable of experiencing intimacy and are expected to be more communal and affiliative than men (Bem, 1974; Deaux & Lewis, 1983; Spence & Helmreich, 1978). Given that developing interpersonal relationships requires skills and experience, we speculate that women may have more opportunities to develop their affiliation motivation and thus be more likely to express it in their PSE stories.

Correlations Between PSE Measures

Intercorrelations between implicit motives were of low to moderate magnitude. Replicating previously reported findings (Schultheiss & Brunstein, 2001), we observed that *n* Power and *n* Affiliation were significantly negatively correlated in women but not in men, suggesting that the often antagonistic need for social influence and the need for interpersonal closeness are more incompatible for women than for men (cf. Zeldow et al., 1988). Furthermore, *n* Affiliation and *n* Achievement were significantly correlated in the overall sample, suggesting that in contrast to *n* Power, the need to be effective in nonsocial life domains can actually coexist peacefully with the need to be close to others. Consistent with the view that activity inhibition restrains the expression of motivational needs, we also found that higher levels of activity inhibition were associated with less motivational imagery in most cases and in the case of *n* Achievement and female *n* Affiliation, significantly so. Finally, we also obtained some evidence that motive levels (particularly *n* Achievement) are lower in older participants, although our findings were not as strong as Schultheiss and Brunstein’s (2001) who used a sample with a greater age range and variance than ours.

Little Overlap Between PSE and Questionnaire Measures of Motivation

As predicted, we found little overlap between scores on implicit and explicit motive measures. PSE and PRF measures within the domains power/dominance and achievement shared less than 1% variance, and correlations of the PRF dominance and achievement scales with all three PSE motive measures were nonsignificant. The only exception to this pattern was the PRF affiliation scale, which showed a moderate negative correlation with *n* Power (5.2% shared variance) and small positive correlations with *n* Achievement (1.8% shared variance) and *n* Affiliation (1.3% shared variance). This finding is particularly notable in light of the fact that for their German sample, Schultheiss and Brunstein (2001) observed the same pattern of correlations between the PRF Affiliation scale and implicit motive measures. In the case of *n* Achievement and *n* Affiliation, the effect sizes were almost identical to ours, and the PRF Affiliation \times *n* Achievement correlation was significant in their sample too.²

This warrants the question: What does the PRF affiliation scale pick up that the dominance and achievement scales fail to detect? We suggest that the PRF affiliation scale represents a summary measure of the perceived quality of one's interpersonal relationships, with higher scores representing overall better social adjustment. We furthermore suggest that the quality of a person's interpersonal relationships is negatively influenced by the person's *n* Power, which predisposes her or him to antagonistic social interactions, and positively affected by the person's *n* Achievement and *n* Affiliation, which facilitate positive interactions with others (note that *n* Achievement has been found to predict a constructive stance in negotiations with others and to be associated with good "people skills"; cf. Groesbeck, 1958; Terhune, 1968). We do not argue that the correlation between the PSE and the PRF measure of affiliation motivation represents a case of direct translation of a nonconscious need into a consciously accessible representation. Such an interpretation would be inconsistent with our and Schultheiss and Brunstein's (2001) observation that other implicit needs actually have a stronger association with self-attributed affiliation motivation and that *n* Achievement is the

strongest positive predictor of scores on the PRF Affiliation scale. Rather, we suggest that scores on the PRF Affiliation scale represent individuals' perception, aggregated across many social interactions, that they get along well with other people. As expected, we also found no overlap between PSE motive measures and overall measures of impulsivity (BAS scale) and anxiety (BIS scale). Although there was some evidence that subscales of the BAS measure share small but significant amounts of variance with *n* Power and *n* Affiliation, these correlations were not predicted, did not generalize to other subscales or the overall BAS scale, and should therefore be interpreted with caution at this point. More generally, our results are consistent with findings indicating that the personality traits extraversion and neuroticism, which are thought to be related to anxiety and impulsivity (Gray, 1981), do not have substantial overlap with implicit motivational needs either (Winter et al., 1998).

Notably, higher scores on the PSE activity inhibition measures were associated with lower levels of self-attributed dominance, achievement, and affiliation motivation (PRF) but not with temperamental trait measures (BIS/BAS). This finding may suggest that high levels of activity inhibition have not only a restraining effect on implicit needs but also make individuals more hesitant ascribing power-, achievement-, or affiliation-related needs to themselves without affecting their generalized self-attributed tendencies to shun punishment or approach incentives.

Cultural and Ethnic Differences

Using the same five pictures employed both in our and Schultheiss and Brunstein's (2001) study, we found that our U.S. student sample differed from their German sample on three out of four PSE measures: U.S. students showed higher levels of implicit achievement but lower levels of implicit power motivation and activity inhibition than Germans. They were not significantly different from Germans on the *n* Affiliation measure. The observed differences seem to be consistent with cultural comparisons that highlight a strong prevalence of the Protestant work ethic, which is associated with high levels of *n* Achievement, in the United States relative to European countries (e.g., Ferguson, 2003; see also McClelland, 1961) and paint U.S. Americans as more friendly, outgoing, and impulsive than Germans, which may reflect their lower inhibition and *n* Power levels (e.g., Lester, 2000). However, they also raise the question whether it is appropriate to generalize from samples that are not representative of a country (i.e., college students) to between-country differences at the collective level. However, the pattern of differences in motivational needs and restraints we observed in our U.S. sample and Schultheiss and Brunstein's (2001) German sample are consistent with data presented by McClelland (1961, 1975). Using content coding of stories in children's readers from countries around the world, McClelland (1961, 1975) found Germany to be below the in-

²Meyer (1999) reported that correlations between Rorschach Comprehensive System (CS; Exner, 1993) and self-report measures of personality and clinical symptoms can become positive and substantial once individuals' response style is taken into account. Specifically, Meyer (1999) found that individuals who are neither defensive nor exaggerate their responses show convergent responses on Rorschach and MMPI (Hathaway & McKinley, 1943) measures of the same personality traits. To explore the possibility that the low correlations between implicit and explicit measures of motivation we observed in our research may be due to individuals who hold back on the PSE (indicated by very short protocols), we ran a series of regression analyses in which we tested whether protocol length moderated the association between PSE and PRF measures of the same motivational need but without significant results ($ps > .05$).

ternational average in *n* Achievement but above the international average in *n* Power in 1925. At the same time, children's readers from the United States contained above-average levels of imagery related to *n* Achievement and below-average levels of imagery related to *n* Power. The difference between the two countries persisted when a similar analysis was repeated based on children's readers collected in 1950: The United States had higher levels on *n* Achievement and lower levels of *n* Power than Germany. The United States was also lower in activity inhibition than Germany. Thus, despite different data collection methods, samples, and historic contexts, our data corroborate those that have been presented by McClelland (1961, 1975), suggesting that Americans continue to have a stronger concern with achievement and a weaker concern with power than Germans and that they are less inhibited in the expression of their motivational needs than Germans.

When we looked at ethnic differences within our U.S. sample, we found that Asian Americans scored significantly higher in *n* Affiliation than Whites and that African Americans scored higher than both Asian Americans and Whites on *n* Achievement. Whereas the former difference is consistent with the collectivist values of many Asian societies and Asian American immigrants (cf. Triandis, 2001) and thus likely to be replicated in nonstudent samples, we suggest that the latter finding may represent a self-selection effect of African Americans who attend college. Negative prejudice and stereotyping directed against them still makes it more difficult for African Americans to enter higher education (cf. Crosby, Iyer, Clayton, & Downing, 2003). It is therefore conceivable that African Americans need a stronger concern with doing well than other ethnic groups to make it into and succeed in college. Clearly, however, further research is needed to test the validity of this interpretation of our data.

Limitations and Future Directions

In our research, we used the integrated running-text scoring system (Winter, 1994) instead of the more comprehensive original motive coding systems it is based on (cf. Smith, 1992). One of the consequences of this decision is that our per-picture and overall motive scores are almost certainly more limited in range than the scores that would have been obtained with the original coding systems. Future studies might explore what effect the use of the more specific and differentiated original scoring systems for *n* Power, *n* Achievement, and *n* Affiliation has on the motive profiles of the pictures we employed in our research.

Future studies could look at the cue strength characteristics of even more pictures, especially ones that have been canonized for use for particular motives but not used in this work (e.g., in Smith, 1992). Moreover, as this study indicates, cultural and ethnic differences in motive levels do exist, and there is a need for more cross-cultural and within-cultural comparisons and validation of the PSE picture stimuli.

Although it has not been used extensively in clinical practice, we believe the PSE could also potentially be a useful and revealing tool as a part of a multimethod approach to clinical assessment. Given the relationship of the Big Three motives of power, affiliation, and achievement to a variety of behavioral and social patterns and outcomes, the PSE might be particularly useful in assessing implicit reactions to social situations, thus providing a way for the therapist to identify potential areas of conflict or concern. For instance, we speculate that the power motive might have links to antisocial personality disorder. Certainly the description of antisocial individuals who are, among other things, manipulative, deceitful, aggressive, and sexually promiscuous matches key behavioral attributes of power-motivated individuals (Veroff, 1957; Terhune, 1968; Winter & Barenbaum, 1985). More work would be welcomed on the unexplored relationship between the Big Three social motives and their association with the interpersonal aspects of many personality disorders.

One possible limitation of this study is that we do not report findings that could shed light on the criterion validity of the implicit and explicit motive measures we use in this article. However, the data we report here were compiled from studies that tested the predictive validity of PSE motive scores in various ways. For instance, in three of the studies that provided the source of the data we report here, it was demonstrated that implicit power, achievement, and affiliation motives predict automatic orienting of attention to facial expressions of emotion presented within and outside of conscious awareness (Schultheiss & Hale, 2004b; Schultheiss & Riebel, 2004). In another study, implicit motives, in conjunction with progress on motive-congruent personal goals, predicted individuals' emotional well-being (Schultheiss, Jones, & Kley, 2004). These findings underscore that the PSE motive scores we describe here do have substantial criterion validity.

Finally, the limited sample of middle-class, well-educated, young adults in this study is still going through an important developmental phase. Absolute motive levels and motive profiles may be different in a sample that is more mature. It is precisely because of the influence of age and maturity that different forms of apperceptive instruments have been developed (e.g., Bellak, 1975; Silvertown, 1993). Longitudinal designs would be helpful in determining if the motive profiles gathered here remain stable or change after young adulthood. Having said this, we believe that this sample was not entirely inappropriate because our main intention was to replicate Schultheiss & Brunstein's (2001) findings on picture cue effects. By maintaining comparable age and education sample characteristics, we were able to more confidently assess whether the motivational cue strength of each picture is affected by cultural and ethnic factors.

Despite criticisms about the adequacy of its psychometric qualities, the PSE and its cognate instruments have enjoyed longevity because of their theoretical relevance for assessing implicit motivation and because of their amply documented

predictive validity (e.g., McClelland, 1987; Spangler, 1992; Winter, 1996). The purpose of this study was to refine the methodology of the PSE by investigating issues such as picture cue profiles; the effect of picture position; and gender, ethnic, and cultural influences on implicit motive scores. We believe that more empirical investigations of such methodological issues—along with further development and validation of content-coding systems for motive assessment—will help increase the usefulness of the PSE, bolster confidence in implicit motive measures, and provide useful information for researchers generally interested in using picture–story methods in their studies.

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APPENDIX
Pictures Used in the Picture Story Exercise

Boxer

Two male boxers stand with their profiles facing the viewer. The boxer in the foreground has his hands on his hips, stares at an object outside of the frame. The boxer in the background has arms raised in a boxing stance; only his silhouette is visible. Black and white photograph.

Women in Laboratory

Two women in laboratory coats are standing in a laboratory. The woman in the foreground is working with a set of test tubes on a laboratory bench while the woman in the background has her hands behind her back and is observing the first woman. Black and white charcoal drawing.

Ship Captain

Two men are talking in front of a ship. The man on the right is dressed in a captain's cap and uniform while the man on the left is wearing a suit and a hat but has his back facing the viewer, his face silhouetted. Black and white photograph.

Couple by River

A couple is sitting with their backs facing the viewer on a park bench by a river. There is also a bridge in the background. Black and white photograph.

Trapeze Artists

A long shot of a female trapeze artist being caught by her male partner. Black and white print.

Nightclub Scene

A man and a woman are sitting at the same table in a nightclub, smiling. Beside them is the back of a man playing a guitar and wearing a sombrero. Black and white photograph.

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