



The reliability of a Picture Story Exercise measure of implicit motives: Estimates of internal consistency, retest reliability, and ipsative stability

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ABSTRACT

Ninety participants completed an 8-picture picture story exercise (PSE) on two occasions spaced 2 weeks apart. Writing condition (handwrite versus type) was varied experimentally at each occasion. Stories were scored using Winter's [Winter, D. G. (1994). *Manual for scoring motive imagery in running text* (4th ed.). Department of Psychology, University of Michigan, Ann Arbor, unpublished manuscript] integrated coding system for the assessment of motive imagery. Typed stories were longer by a third than handwritten stories. Word count-corrected motive scores from typed stories shared stable variance with and did not significantly differ from motive scores obtained from handwritten stories. Retest stability for word count-corrected power, achievement, and affiliation scores was .39, .37, and .61, respectively. Across all three motive measures, inter-scorer reliability was high (.70–.86), internal consistency as estimated by Cronbach's α was low (–.02 to .43), and motive scores showed substantial ipsative stability as assessed by averaged intraindividual correlations of picture profiles across testing occasions (.21–.40). These findings are consistent with Mischel and Shoda's [Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102, 246–268] conceptualization of personality dispositions as stable if...then contingencies between situational cues and behavioral responses.

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1. Introduction

Research on implicit motives, nonconscious dispositions to experience certain types of incentives as pleasurable, has made considerable strides in recent years, leading to new insights into their biological basis (e.g., McClelland, 1989; Schultheiss, 2007; Schultheiss, in press), and their effects on cognitive processes (e.g., Woike, Lavezzary, & Barsky, 2001), affective consequences (e.g., Fodor, Wick, & Hartzen, 2006), and socio-historical manifestations (e.g., Winter, 1993). Yet, our understanding of the Picture Story Exercise (PSE), the chief instrument for the assessment of implicit motives for over 50 years, appears to be lagging behind. Only very recently researchers have attempted to systematically describe frequently used PSE picture cues in terms of their ability to elicit specific types of scorable motive imagery (Blankenship et al., 2006; Langan-Fox & Grant, 2006; Pang & Schultheiss, 2005; Schultheiss & Brunstein, 2001). And to this day, the question of if and why the PSE can have validity despite its low internal consistency remains a point of contention between advocates and critics of the measure.

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In their pioneering work on the achievement motive, McClelland, Atkinson, Clark, and Lowell (1953) were the first to point out that the PSE, which was derived from Murray's (1943) Thematic Apperception Test, has low reliability in the sense that scores obtained in stories that were written in response to one picture did not correlate very well with scores derived from stories written in response to other pictures. This finding emerged despite the fact that independent coders could typically agree on the presence or absence of motive imagery in a given story in 85% of the cases or more. Subsequently, Entwisle (1972) blasted PSE motive measures, arguing that a measure with low internal consistency is unlikely to predict anything validly according to the laws of classical test theory (cf. Nunnally, 1967). Similar points were raised by Fineman (1977) and Lilienfeld, Wood, and Garb (2000). Notably, however, PSE motive measures have substantial retest reliability, as demonstrated in a recent meta-analysis (Schultheiss & Pang, 2007). Across studies, the average correlation for 1-week retest intervals was .60, for one month it was .52, and after 1 year it was still .37. So how can the PSE be valid, have high inter-scorer and substantial retest reliability and yet have low internal consistency at the same time?

1.1. A classic account of low internal consistency: Dynamics of action theory

The first and, until now, only constructive attempt to solve this riddle was provided by Atkinson (1981) who argued that low consistency of motive imagery scores across pictures is a function of the cyclical arousal and satiation of motivational needs through the story-writing process. Originally, this argument was based on two lines of evidence. First, in a study described in McClelland et al.'s (1953) original book on the achievement motive, participants produced a saw-tooth pattern of motive scores across pictures cueing achievement. Atkinson (1950; see McClelland, 1980) interpreted this finding as evidence that in the presence of a stable environment, represented by a series of pictures all related to achievement, motivation oscillates between arousal (high motive imagery) and satiation (low motive imagery). After Atkinson and Birch (1970) had formalized and elaborated these assumptions into the mathematical models that constituted their dynamics of action (DOA) theory, Atkinson and colleagues used the theory to run simulations of the ebb and flow of motivation in an environment with constant incentive cues (e.g., Atkinson, Bongort, & Price, 1977). These studies demonstrated that the interplay between a stable motive disposition in the writer and stable incentive cues represented in PSE pictures could give rise to variable motive expression from one story to the next. The simulation studies thus represented the second line of evidence in favor of the PSE picking up a cyclical motivational process that, by its very nature, could not produce constant or consistent response from one moment to the next. Note, however, that these studies were computer simulations, not actual empirical studies that would have independently validated the assumptions of DOA.

Reuman's (1982) aimed to provide this empirical support for the DOA theory. He predicted from the dynamics of action theory that higher score variability across PSE pictures should signify that the motive could be assessed more precisely, because several arousal-satisfaction cycles could be observed within one PSE. In contrast, low score variability was assumed to make an exact diagnosis of motive strength more difficult, because the actual length of one arousal-satisfaction cycle exceeded the length of the test. This led Reuman to predict that on a PSE designed to assess achievement motivation, high intraindividual score variability and the resulting low internal consistency should reflect high oscillation and thus be associated with better test validity, whereas low intraindividual score variance and the resulting high internal consistency should reflect low oscillation and thus be associated with low test validity. Empirical data from a study with 61 male students were in agreement with these predictions. In a subsample of individuals with high ipsative (i.e., within-subjects) variability of achievement motive scores across 4 picture stories (Cronbach's $\alpha = -1.23$), the achievement motive correlated at .62 with a criterion (attempted solutions on arithmetic problems). In contrast, in a subsample of individuals with low ipsative score variability (Cronbach's $\alpha = .42$), the achievement motive correlated only at .20 with the criterion.

1.2. Problems with the DOA account of low consistency

Although the basic tenet of DOA—that observable motivated behavior can change dynamically as a function of stable dispositional needs and environmental factors—is consistent with biopsychological and ethological accounts of motivation (cf. Ball & Balthazart, 2008) and other advanced measurement models in personality psychology (e.g., Nesselroade & Boker, 1994), we contend that it is not suitable to explain the low internal consistency of PSE motive measures.

There are two basic assumptions behind the interpretation of both the saw-tooth effect observed by Atkinson (1950) and Reuman's (1982) findings that are particularly problematic. First, the PSE pictures used in these authors' studies were assumed to represent a constant environment, that is, to have *comparable incentive value* for a given motive and a given person.¹ Second, DOA theory assumes that motive expression in response to one picture cue leads to *consummation of the motivational need* and motive expression will therefore become less likely on subsequent pictures.

Both Atkinson (1950) and Reuman (1982) considered the comparable-incentive-value assumption as met because the pictures they used generated similar average achievement motivation scores. However, it is problematic to equate similar motive scores at the sample level with similar incentive value at the individual level. Let us illustrate this point with an example: just because vanilla ice cream and chocolate ice cream are sold in similar quantities in grocery stores does not indi-

¹ As a reviewer pointed out, individual PSE cues can have varying pull for respondents from different cultural or educational background (see Hofer & Chasiotis, 2004).

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