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Assessing Learning Style Differences Between Honors and Non-Honors Students

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What defines an "honors" student and what key differences, if any, exist between honors and non-honors students? One obvious difference exists in measures of academic achievement; college honors students, by virtue of typical admission criteria, have higher GPA's and standardized test scores (Long & Lange, 2002). Consistent with these higher academic credentials, honors students have often been described as more autonomous, more responsible, and more motivated (Grangaard, 2003; Orban & Chalifoux, 2002; Palmer & Wohl, 1972). Additionally, honors students tend to demonstrate to a greater degree many behaviors that positively correlate with academic performance, such as skipping class less often, preparing longer for class, asking more questions per class, spending more time rewriting papers, spending more time meeting with faculty outside class hours, watching less television, drinking less alcohol, and focusing on course grades (Clark, 2000; Harte, 1994; Long & Lange, 2002; Schuman, 1995).

While these comparisons suggest that the high academic credentials of honors students might be partially explained via their study habits, few studies have examined potential cognitive differences between honors and non-honors students. Clark (2000) found that academically talented college students possessed a greater preference for abstract, conceptual, and integrative reflection and tended to score at the intuitive end of the Myers-Briggs personality inventory (indicating more creativity and ability to engage in abstract thought), whereas less talented students tended to be more concrete. Similarly, Shaughnessy and Moore (1994) partially attributed the higher IQ scores of honors students to higher order thinking abilities. This work hints at what honors programs have intuitively asserted for years: honors students think and learn differently, and honors pedagogy should be tailored to meet these students' unique abilities. However, further empirical research is needed to uncover, identify, describe, and define these differences in thinking and learning. The current study will attempt to further elucidate the difference between honors and non-honors students by using the Inventory of Learning Processes (ILP; Schmeck, 1982; Schmeck, Ribich, & Ramanaiah, 1977).

Schmeck *et al*. (1977) developed the ILP to assess students' learning styles from an information processing perspective. The ILP is a self-report survey that focuses on

the behaviors and cognitive processes that a student utilizes to acquire, retain, and recall information, with little emphasis on the modality and environmental conditions in which students prefer to learn (i.e, visual, auditory, etc…). Learning style is measured along four subscales with the ILP. In addition to assessing a student's study habits (Methodical Study subscale), the ILP measures a student's ability to correctly recall facts and details, independent of deeper understanding or synthesis (Fact Retention subscale). Additionally, the Elaborative Processing subscale assesses how students translate new information into their own terminology, generate concrete examples from their experience, apply new information to their daily life, and use visual imagery to encode ideas. Finally, the Deep Processing subscale measures the extent to which a student critically evaluates, conceptually organizes, and compares and contrasts new and existing information.

The ILP has been used in numerous studies and dissertations (approximately 70 at the latest literature search) to investigate the learning styles of students and constructs related to student learning styles. Across the literature, the Deep Processing, Elaborative Processing, and Fact Retention subscales have been found to correlate significantly and positively with measures of academic achievement, such as GPA, college entrance examination scores, and course grades (Albaili, 1993, 1994; Bartling, 1988; Gadzella, 1995; Gadzella & Baloglu, 2003; Gadzella, Ginther, & Williamson, 1987; Kozminsky & Kaufman, 1992; Miller, Alway, & McKinley, 1987; Miller, Finley, & McKinley, 1990; Schmeck & Grove, 1979; Watkins, Hattie, & Astilla, 1983; Westman, 1993). Researchers have also compared the learning styles of students classified as high achievers (GPA's or ACT scores above a median split) with those classified as low achievers. The high achievers are consistently found to score significantly higher on Deep Processing, Elaborative Processing, and Fact Retention (Gadzella, Ginther, & Williamson, 1986; Miller et al., 1987; Schmeck & Grove, 1979), but not Methodical Study.

To date, a comparison of the learning styles of honors and non-honors students has not been conducted using the ILP. Anecdotal evidence would point to differences between the two groups, but data from an information-processing perspective will help clarify how honors students think and learn. Given the numerous differences found between academic groups with the ILP (Clump & Skogsberg, 2003; Gadzella, 1995; Gadzella & Baloglu, 2003; Gadzella et al., 1986; Miller et al., 1987; Schmeck & Grove, 1979), the current investigators hypothesized that a group of new honors students would score significantly higher on the Deep Processing, Elaborative Processing, and Fact Retention subscales compared to a group of non-honors students. However, both groups were expected to score at similar levels on the Methodical Study subscale.

METHOD

PARTICIPANTS

The current study was conducted at Marymount University, a comprehensive, co-educational institution located in the Washington, DC area with approximately 1600 graduate students and 2300 undergraduates. The participants in this study

included 17 honors students (14 females and 3 males; *M* age = 18.29-years-old, *SD* = .47) recruited from an introductory honors course and 28 non-honors students (21 females and 7 males; *M* age = 19.18-years-old, *SD* = 1.59) recruited from a section of an introductory social science course. The honors students were found to be significantly younger than the non-honors students, t (34.14) = -2.76, $p < .01$.

The 17 students comprising the honors group represented almost the entire inaugural class of honors students at the University (N = 19). Entrance requirements to the program included a GPA of at least 3.50 and combined SAT scores of at least 1200. Not surprisingly, the honors students' average high school GPA's were significantly higher than the non-honors students' GPA's, t (35.11) = 8.04, $p < .001$. Additionally, the honors students' combined SAT scores were significantly higher than the non-honors students' SAT's, t (20) = 5.03, $p < .001$. When appropriate, the degrees of freedom for these comparisons were adjusted to compensate for unequal variances (see Table 1).

MATERIALS AND PROCEDURE

All participants provided informed consent before data collection. The ILP (Schmeck et al., 1977) was administered to both groups during the first week of classes of the fall 2004 semester. The students responded to the ILP's 62 statements by selecting either *true* or *false* to indicate if each statement represented the way they generally study and learn. An example of an item from the Deep Processing subscale (18 items) is, "I find it difficult to handle questions requiring comparison of different concepts" (Schmeck et al., 1977, p. 416). The Elaborative Processing subscale (14 items) of the ILP contains items such as, "I learn new words or ideas by visualizing a situation in which they occur" (Schmeck et al., 1977, p. 417). An example from the Fact Retention (7 items) subscale is, "I am good at learning formulas, names, and dates" (Schmeck et al., 1977, p. 417). The statement "For the exam, I prepare a set of notes integrating the information from all sources in the course" (Schmeck et al., 1977, p. 416) is an example of a question from the final subscale, Methodical Study (23 items).

The ILP's subscales have strong internal consistencies (.82 for Deep Processing, .67 for Elaborative Processing, .58 for Fact Retention, and .74 for Methodical Study) and test-retest reliabilities (.88 for Deep Processing, .80 for Elaborative Processing, .79 for Fact Retention, and .83 for Methodical Study; Schmeck et al., 1977). In addition, Gadzella (2003) found that the ILP's subscales continue to have significant and strong test-retest reliabilities 25 years after development.

RESULTS

The two groups' scores on the four subscales of the ILP were compared using separate independent-samples *t*-tests. As a result, the number of individuals on each comparison varied due to missing data on some subscales. The honors students had significantly higher scores than the non-honors students on the Deep Processing subscale, t (36) = 2.60, $p < .05$. The two groups did not significantly differ on the

TABLE 1

Means and Standard Deviations for the Honors and Non-honors Students

	Honors Students			*Non-honors Students*			
Subscale	N	M	SD	N	M	SD	t
High School GPA	17	3.80	.21	24	2.99	.43	8.04***
Combined SAT	11	1300.91	93.00	11	1043.64	141.86	5.03***
Deep Processing	16	14.00	2.94	22	11.05	3.79	2.60*
Elaborative Processing	14	10.00	1.88	24	9.92	2.21	.12
Fact Retention	16	5.56	1.71	26	5.50	1.21	.14
Methodical Study	16	10.38	4.77	26	10.88	4.75	-.34

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; *t*'s for Age, High School GPA, and Combined SAT have been adjusted for unequal variances using Levene's method.

other three subscales, all *t*'s < 1.00. See Table 1 for the means, standard deviations, and *t*-values for the two groups.

DISCUSSION

As hypothesized, new honors students in the current study scored significantly higher on the Deep Processing subscale. This finding suggests that these honors students entered the program already actively organizing and critically evaluating information to a greater degree than their peers. Although it is unclear whether this difference was innate or fostered at the secondary level, college honors courses could build upon this pre-existing proclivity for Deep Processing, which arguably corresponds with critical thinking ability (Gadzella & Masten, 1998; Schmeck & Ribich, 1978). Furthermore, as predicted, the honors and non-honors students did not differ along the Methodical Study subscale, challenging the assumption that honors students demonstrate significantly more effective study skills than their peers or that their high grades are the sole result of these study habits. Contrary to expectations, the honors and non-honors students did not differ in their levels of Elaborative Processing or Fact Retention. While inconsistent with previous research, the lack of difference in Fact Retention scores might be a positive indicator that the honors students' higher academic credentials did not merely result from successful recall of specific details and facts; rather, these students could have engaged in processing these details into higher order concepts. However, the lack of difference in Elaborative Processing scores presents the possibility that honors students do not initially personalize or apply information in more meaningful ways than their non-honors peers. While these results certainly warrant further investigation with additional students and institutions, they do provide an initial glimpse into the way honors students think and learn and suggest that honors courses could be tailored to better facilitate Elaborative Processing.

In addition to illustrating learning style differences between honors and non-honors students, the ILP could also be used as a longitudinal assessment tool, tracking developmental changes in honors students' learning styles across their undergraduate career. For example, Bartling (1988) found that students in general significantly increased their utilization of Deep Processing and significantly decreased their application of Methodical Study throughout college. Additionally, Jakoubek and Swenson (1993), using a full cross-sectional analysis of learning styles for college students, found that students at different college levels had significantly different scores on the Deep Processing, Methodical Study, and Elaborative Processing subscales. Thus, further investigations into the changes among honors students is also warranted to assess whether their initial high level of Deep Processing continues to escalate, if honors students also display increases in the other three subscales, and if these possible increases occur at a more accelerated rate than non-honors students.

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