

## Changes in Adolescent Response Patterns on the MMPI/MMPI–A Across Four Decades

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The purpose of this study was to explore changes in adolescent self-presentation on the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1940) and MMPI–A (Butcher et al., 1992) over a 40-year period. The primary samples used for comparison in this study include 1,235 adolescents, age 14 through 16, derived from the MMPI–A normative sample (Butcher et al., 1992) collected in 1989 and 10,514 adolescents, age 14 through 16, collected in 1948 and 1954 from Hathaway and Monachesi's (1963) study of adolescent personality and behavior. MMPI basic scale and item-level data were also included for 817 adolescents, age 14 through 16, collected by Colligan and Offord (1992) in 1985 as a further comparison. Between-sample analyses at the profile level revealed that adolescents from the MMPI–A normative sample scored significantly higher across basic clinical scales and lower on validity scales L and K than adolescents from the Hathaway and Monachesi (1963) sample, with mean data from the Colligan and Offord (1992) sample typically falling at a midpoint value. Analyses of Harris–Lingoes (Harris & Lingoes, 1955) subscale and item-level data were conducted to provide refined definitions of the contents of scale-level changes. Results were interpreted as reflecting moderate to large changes in response frequencies between eras of data collection, and emphasis was placed on the relatively high frequency of item endorsements by contemporary adolescents in the clinical direction in the MMPI–A normative sample. A series of cautions and limitations are also offered in interpreting these patterns.

The Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1940) was originally developed in the early 1940s as a self-report personality assessment measure for use with adults. However, early in its history an enduring interest arose in extending the use of this measure to an adolescent population (e.g., Ball, 1960, Baughman & Dahlstrom, 1968; Briggs, Wirt, & Johnson, 1961; Capwell, 1945; Gottesman, 1963; Hathaway & Monachesi, 1953, 1961, 1963; Marks, Seeman, & Haller, 1974; Rempel, 1958; Wirt &

Briggs, 1959). The MMPI was in continuous use with adolescents for over half a century and the Minnesota Multiphasic Personality Inventory–Adolescent (MMPI–A; Butcher et al., 1992), an adolescent form of the MMPI, was released in 1992. Reflecting these instrument's popularity, surveys of practitioners have revealed that the MMPI, and more recently the MMPI–A, are the most frequently used self-report personality instruments with teenagers (e.g., Archer, Maruish, Imhof, & Piotrowski, 1991; Archer & Newsom, 2000).

Capwell (1945) made the first known research application of the MMPI to adolescents in a 1945 study that was also reported in Hathaway and Monachesi's (1953) book, *Analyzing and Predicting Juvenile Delinquency With the MMPI*. Capwell found that Scale 4 (Pd) elevations could be used to discriminate between delinquent and nondelinquent adolescent girls. Following this initial study, numerous researchers used the MMPI in efforts to predict, diagnose, and plan treatment or rehabilitation programs for delinquent youth. The most substantial of these attempts was a landmark study by Hathaway and Monachesi (1963) that provided an impetus for many later applications of the MMPI with adolescents including the eventual development of various adolescent norms sets (Colligan & Offord, 1989, 1992; Gottesman, Hanson, Kroeker, & Briggs, 1987; Marks & Briggs, 1967, 1972, 1987).

Initially, Hathaway and Monachesi (1963) administered the MMPI to 3,971 Minnesota ninth graders during the 1947 to 1948 school year. A collection of a much larger public school sample followed this in 1954, termed the "the statewide sample," which included 11,329 additional ninth graders in 92 representative schools across the state. The combined data set of approximately 15,300 adolescents represented a wide selection of Minnesota children from both urban and rural settings. Hathaway and Monachesi also retested a sample of 3,976 of these children with the MMPI in 1957 when they reached the 12th grade. From this large data set, Hathaway and Monachesi hoped to identify MMPI predictor variables associated with later development of delinquent behaviors. Analysis of their data by themselves and others (e.g., Briggs et al., 1961; Rempel, 1958; Wirt & Briggs, 1959) found that MMPI basic Scales F, 4, 8, and 9 were most useful in these predictive efforts, particularly when combined with data from psychosocial and educational records (Rempel, 1958) or incidents of severe illness or death among family members (Briggs et al., 1961). Adolescent norms for the MMPI were first published in the 1970s when Dahlstrom, Welsh, and Dahlstrom (1972) and Marks et al. (1974) published T-score conversion tables developed by Marks and Briggs (1967). The Marks and Briggs norms remained the most popular and frequently used adolescent normative set with the original form of the MMPI (Archer, 1987, 1997). These norms were based on a subsample of 680 adolescents from Hathaway and Monachesi's data collected during the 1940s and 1950s and an additional 1,046 profiles collected by Marks and Briggs in 1964 and 1965. Additional adolescent norm sets were developed for the original MMPI by Gottesman et al. (1987) and by Colligan and Offord (1989, 1992). The Gottesman et al. norms were based on an extensive reanalysis of the Hathaway and Monachesi adolescent data set. Colligan and Offord (1989, 1992) created contemporary adolescents norms based on a sample of 1,315 adolescents collected in the mid-1980s in and near Rochester, Minnesota. Although both norm sets contained important and unique features (Archer, 1987), these norms never

gained widespread clinical use and were soon supplanted by the contemporary norms created for the MMPI-A (Butcher et al. 1992).

Pancoast and Archer (1988) examined the adequacy of the Marks and Briggs (1967) adolescent norms in a review and analysis of eight normal adolescent samples. Early adolescent samples were collected between 1947 and 1965, representing a combined participant pool of 17,286 adolescents, and an additional four contemporary normal adolescent samples were collected between 1980 and 1987, encompassing 1,758 adolescents. Analysis of these samples supported the adequacy of the Marks and Briggs adolescent norms for use with normal adolescent samples collected between 1947 and 1965. However, MMPI patterns produced by more contemporary samples, collected after 1975, were clearly elevated above a T score of 50 on most clinical scales. These latter findings led Pancoast and Archer to conclude that the traditional adolescent norms did not provide an accurate normative baseline for contemporary adolescents in terms of mean T-score fit and that new norms were needed that more precisely reflected modern adolescent response frequencies and patterns.

The University of Minnesota Press formed a committee in 1989 to consider the advisability of creating an adolescent form of the MMPI, later called the MMPI-A. Primary efforts included the creation of a normative sample that was representative of contemporary U.S. teenagers in terms of ethnicity and geographic regions and the adaptation of items and scale content for use with adolescents. The final result of these efforts was the publication of the 478-item MMPI-A in 1992 (Butcher et al., 1992) based on a sample 1,620 14- to 18-year-old adolescents. In addition to the 58 standard scale item deletions, mostly concentrated in Scales F, 5 (Mf), and 0 (Si), the wording of 70 items was modified in an attempt to eliminate outdated or sexist language, improve awkward phrasing, increase item clarity, or make items more relevant to adolescents' life experiences (Archer, 1997; Butcher et al., 1992). Archer and Gordon (1994) and Williams, Ben-Porath, and Hevern (1994) subsequently demonstrated that the psychometric characteristics of these rewritten items were equivalent to those of the items in their original form.

The MMPI-A normative sample (Butcher et al., 1992), in size and scope, is second only to the landmark Hathaway and Monachesi (1963) study of adolescent personality and behavior with the original MMPI in the 1940s and 1950s. Although changes were made to the original MMPI in the development of the MMPI-A, remarkable consistency was maintained with the original instrument (Butcher et al., 1992). The continuity between the original form of the MMPI and the MMPI-A provides a unique opportunity to examine changes in adolescent response patterns over several decades. When comparing contemporary samples to samples collected prior to 1966, Pancoast and Archer (1988) found reductions in mean values on validity Scales L and K and increases in mean scores of validity Scale F and all clini-

cal scales except Scale 0 (Si). Pancoast and Archer's study, however, examined only general trends on the scale and profile levels and did not investigate item-level data. The availability of the Hathaway and Monachesi and the MMPI-A normative data sets, including item-level data, allows fuller exploration of these trends. Specifically, our study sought to fully evaluate the differences that occur between the MMPI-A contemporary normative sample and the Hathaway and Monachesi sample, as reflected on the profile, scale, subscale, and item levels, with the additional use of the MMPI data from the Colligan and Offord (1989, 1992) adolescent sample as a further reference point for interpreting these findings.

## METHOD

### Participants

The contemporary adolescent sample is comprised of the 805 boys and 815 girls collected in the late 1980s to create the MMPI-A adolescent norms. These adolescents were voluntary participants from junior and senior high schools in Minnesota, Ohio, California, Virginia, Pennsylvania, New York, North Carolina, and Washington. A total of approximately 2,500 adolescents were initially evaluated (Archer, 1997), and participants were eliminated based on the following criteria: (a) participants with incomplete data, (b) Cannot Say (?) > 35, (c)  $F > 25$ , and (d) participant age < 14 or > 18. Employing these exclusion criteria resulted in a sample of 1,620 adolescents with a mean age of 15.5 years ( $SD = 1.17$  years) for boys and 15.6 years ( $SD = 1.18$ ) for girls. Data are not provided, however, concerning the specific number of adolescents eliminated by application of each of the exclusion criterion (Butcher et al., 1992). The ethnic distribution of the sample was 76.5% White, 12.4% Black, and 11.1% other ethnic groups. Preliminary within-sample analyses revealed small but significant effects for age; therefore, participants who were 17 or 18 years of age were eliminated from the MMPI-A sample to create more homogenous samples for comparison with the 14- thru 16-year-old adolescents in the Hathaway and Monachesi (1963) sample. This resulted in a final sample size for the MMPI-A normative subgroup of 1,235 (628 boys, 607 girls) with a mean age of 14.9 years ( $SD = 0.80$ ).

The sample used for the primary comparison was a large subset of the original Hathaway and Monachesi (1963) sample that served as the basis of the adolescent norms by Gottesman et al. (1987). These data were provided by Irving Gottesman and Susan Trumbetta who constructed new computer tapes at the item level for the combined Minneapolis and statewide data collection for a total initial sample of 15,087 ninth-grade adolescents tested between 1948 and 1954. Participants were excluded using criteria similar to those used for the MMPI-A normative sample as follows: (a) Cannot Say (?) > 35, resulting in the loss of

281 participants; (b)  $F > 25$ , resulting in the exclusion of 78 cases; and (c) participant age < 14 or > 16, resulting in the exclusion of 4,064 cases (nominal ninth graders). The final subsample used for this study consists of 5,370 girls and 5,294 boys for a total sample of 10,664 adolescents. The mean age was 14.6 years ( $SD = 0.62$  years) for boys and 14.4 years ( $SD = 0.56$  years) for girls. The ethnic composition of this sample was not reported, but Hathaway and Monachesi stated that few African Americans and Native Americans appeared among their participants.

A secondary comparison sample was based on the MMPI data collection of Colligan and Offord (1992) who sampled adolescents from households within a 50-mile radius of the Mayo Clinic in Rochester, Minnesota. Their final sample consisted of 691 girls and 624 boys between the ages of 13 and 17, inclusive, who completed the original form of the MMPI and were free of physical or psychiatric disabilities. Only 1% of their sample was non-White, and all but three participants were attending school (rather than graduates or dropouts) at the time of data collection in 1985. Thus, the Colligan and Offord adolescent data set was similar to the MMPI-A normative sample (Butcher et al., 1992) in terms of era of data collection but also similar to the Hathaway and Monachesi (1963) sample in terms of the geographic and ethnic origins of the samples. Colligan and Offord provided extensive tabular data on their sample. From these data the basic scale means and standard deviations and item endorsement frequencies for 14- through 16-year-old boys and girls were selected for comparison with comparable age groups from the Hathaway and Monachesi and MMPI-A normative samples.

### Procedure

The MMPI-A manual (Butcher et al., 1992) provides item conversion data and T-score conversion tables that make it possible to compare the Hathaway and Monachesi (1963) data with the MMPI-A data using a comparable T-score format. Specifically, we converted original MMPI scale scores to MMPI-A T scores using a multistep procedure. First, the item membership for each of MMPI-A basic scales was listed, and then the corresponding items from the original form of the MMPI were identified using Table F-1 in the MMPI-A manual. In this way, it was possible to establish MMPI-A basic scale raw-score data for each of the basic scales that could then be converted to the appropriate MMPI-A T-score value using the T-score tables that appear in Appendix A of the MMPI-A manual. This procedure allowed for direct comparisons for all basic validity and clinical scales with the exceptions of validity Scales VRIN, TRIN, F,  $F_1$ , and  $F_2$ . Specifically, the VRIN and TRIN scales do not have counterparts on the original form of the MMPI, and the F scale underwent a substantial item composition revision in the development of the MMPI-A, essentially creating a new frequency scale for the revised instrument. In addition to scale-level and profile-level analysis

conducted on a T-score basis, all analyses were also repeated on a raw-score basis to provide a point of comparison in the interpretation of major findings.

The Harris–Lingoes (Harris & Lingoes, 1955) subscales were created to clarify content endorsement patterns for six of the basic clinical scales: 2, 3, 4, 6, 8, and 9. Overall differences in the raw and T-score values for the Harris–Lingoes subscales were also evaluated by means of a series of multivariate analyses of variance (MANOVAs) within each subscale grouping. Individual subscale differences were further evaluated through the use of univariate ANOVAs. The major independent variables were era of data collection and gender. Effect sizes expressed as a *d* value were also calculated for each subscale.

The MMPI data from the Colligan and Offord (1992) comparison sample were derived from their tabular presentations for analyses based on the original 556-item form of the MMPI. Although item endorsement frequencies for these data can be directly compared to those reported by Hathaway and Monachesi (1963) and by Butcher et al. (1992), the basic scale findings vary in comparability from scale to scale. The MMPI and MMPI–A basic Scales K, Hy, Pa, Pt, and Ma are identical in length, whereas Scales L, Hs, Pd, and Sc each lost 1 item in the test revision process. Furthermore, MMPI Scale D lost three items and Scale Si had 8 items deleted in the revision to MMPI–A. Finally, because Scales F and Mf underwent quite extensive revisions, as well as the Harris–Lingoes Pd subscales, between-sample comparisons for these latter scales and subscales are omitted entirely for the Colligan and Offord sample. Colligan and Offord raw-score means and standard deviations were transformed to T-score values by the use of linear T-score transformation procedures in which MMPI–A normative values (Butcher et al., 1992) were used to provide distribution means and standard deviations for basic scales and the Harris–Lingoes subscales.

Effect sizes (Cohen, 1988) were calculated for between-sample analyses for validity and basic scales and Harris–Lingoes and Si subscales as an additional indicator of the relative magnitude and clinical significance of obtained differences between samples. Effect sizes of .20 were considered small, .50 moderate, and .80 was considered to be the midpoint for large effect sizes.

## RESULTS

### Preliminary Analyses

Preliminary analyses were conducted to evaluate the degree to which MMPI–A raw scores and T scores varied within the Hathaway and Monachesi (1963) sample and within the MMPI–A normative sample (Butcher et al., 1992) as a function of demographic variables. Archer (1997) summarized the available MMPI–A literature as indicating consistent effects for gender, age, and socioeconomic status (SES) such

that girls, younger adolescents, and adolescents from lower SES levels tend to produce higher basic mean raw-score values across numerous MMPI–A scales. The literature on the effects of ethnicity on MMPI–A scales has produced more mixed findings (Archer, 1997) with some evidence of higher mean raw-score values produced by non-White respondents. For the purposes of these analyses, the Mf scale was excluded for all raw-score comparisons but included for all T-score comparisons. Because a detailed description of these within sample analyses would require excessive journal space, a brief summary of these results is provided and additional detail is available from Cassandra Rutledge Newsom on request.

In general, the effects of demographic variables on MMPI–A scores found in this study were consistent with the prior findings in this area. MANOVA results showed gender effects on basic scale raw scores for both samples, with girls more frequently endorsing items in the critical direction than boys. A significant effect was also found for chronological age on basic scale raw scores and T scores in both samples, with univariate effects generally limited to Scales 8, 9, and 0. In terms of the latter scales, older adolescents generally produced lower scores than younger adolescents. The effects of SES were also evaluated on basic scale raw scores and T scores for both samples. Significant MANOVAs followed by univariate tests showed that adolescents from the lower SES categories in the MMPI–A normative sample (Butcher et al., 1992) and in the Hathaway and Monachesi (1963) sample generally produced somewhat higher raw scores and T scores on most of the basic scales. A MANOVA was also conducted to examine the potential effects of ethnicity on MMPI–A basic scale raw score and T scores for the MMPI–A normative sample. Results of this MANOVA indicated a significant effect for ethnic membership categorized as White versus other, and these effects were retained when the potential confounding influence of SES was removed through the use of an analysis of covariance (ANCOVA) procedure. Univariate tests indicated a significant effect for ethnicity, with the effects of SES removed, for all the MMPI–A basic scales except K, 3, 5, and 7, with the general pattern for higher mean T-score values for non-White respondents. Effect sizes for demographic variables, expressed as a *d* statistic, were generally small for both boys and girls.

### Between-Sample Analyses

The main analyses in this study focused on the comparison of basic-scale mean values for adolescents between 14 and 16 years old in the Hathaway and Monachesi (1963) sample versus 14- through 16-year-old adolescents in the MMPI–A normative sample. The Mf scale was again excluded for raw-score analyses but included in T-score level analyses and when analyses were conducted separately by gender. Effect sizes, expressed as a *d* value, were calculated for validity and clinical scales and Harris–Lingoes and Si subscales.

Between-group analyses were initially conducted examining the effects of sample group (Hathaway & Monachesi, 1963, versus MMPI-A [Butcher et al., 1992]) on MMPI-A basic scale raw-score values. The MANOVA results were significant,  $F(11, 11737) = 172.18, p < .0001$ , and significant univariate effects for group membership were found on each of the MMPI-A basic scales. A MANOVA was also conducted to examine the effects of sample group (Hathaway & Monachesi, 1963, versus MMPI-A normative sample) on MMPI-A basic scale T-score values. The results of this MANOVA were significant,  $F(12, 11736) = 174.70, p < .0001$ . Table 1 presents the mean MMPI-A T-score values for each of the basic scales for adolescents in each sample (including estimated values for the Colligan & Offord, 1992, adolescent sample), with associated effect sizes expressed as  $d$  values for all two sample comparisons. Results of these analyses indicated significant group membership effects for each of the MMPI-A basic scales for the Hathaway and Monachesi sample in contrast to the MMPI-A normative group. In this and subsequent tables, the univariate  $F$  values are omitted for these latter comparisons because sample sizes are large (and associated  $F$  values typically quite large because of the resulting statistical power) and  $d$  values better represent the strength of association between variables.

Because small but significant univariate effects were found for the validity Scales L and K, ANCOVAs were conducted to examine the effects of era of data collection on MMPI-A basic scale T-score values with the potential effects of defensiveness removed from the analysis. The Colligan and Offord (1992) data could not be included for

those analyses because it was not available on the individual participant level. The Hathaway and Monachesi (1963) versus MMPI-A normative (Butcher et al., 1992) set results are presented in Table 2 and show a significant effect for era of data collection, with the effects of L and K removed, for all MMPI-A basic scales. Effect sizes expressed as a  $d$  value were also calculated for each validity and basic scale. Overall, effect sizes were reduced by removal of the variance due to L and K, but  $d$  values remained at the medium range (a range of .38 to .64) for all basic scales except the Si scale.

Furthermore, because socioeconomic level showed significant effects on MMPI-A T scores in the preliminary within-group analyses, a between-group analysis was conducted including the variables of era of data collection and three levels of SES on MMPI-A T scores. The results of this two-way MANOVA show significant main effects for the data collection era variable such that MMPI-A basic scale T scores were significantly higher for adolescents from the MMPI-A normative sample (Butcher et al., 1992) in comparison to Hathaway and Monachesi (1963) adolescents across each of the three SES levels,  $F(22, 11190) = 8.06, p < .001$ .

Finally, to ensure that ethnic differences in the normative sample (Butcher et al., 1992), discovered in the preliminary analyses, did not fully account for the observed between-group differences, between-group analyses were repeated at the T-score level with ethnic minorities removed from the MMPI-A normative sample. The results of this MANOVA for between-group effects remained significant,  $F(12, 11456) = 134.19, p < .0001$ .

**TABLE 1**  
**MMPI-A Basic Scale T-Score Means and Standard Deviations for Hathaway and Monachesi (1963), Colligan and Offord (1992), and MMPI-A Normative Adolescents With Associated Effect Sizes**

MMPI-A Basic Scales	Hathaway & Monachesi <sup>a</sup>		Colligan & Offord <sup>b</sup>		MMPI-A Normative <sup>c</sup>		Effect Sizes		
	M	SD	M	SD	M	SD	1 vs. 2	1 vs. 3	2 vs. 3
							$d$	$d$	$d$
L	53.08	10.30	51.16	8.57	50.17	10.10	-.19	-.28	-.10
K	53.45	10.27	49.25	10.24	50.11	10.00	-.41	-.33	.09
Hs	43.61	7.49	45.93	9.19	50.08	9.90	.30	.83	.43
D	45.48	7.40	48.23	8.98	49.87	9.99	.37	.57	.17
Hy	44.48	7.95	45.59	8.56	49.94	10.04	.14	.67	.46
Pd	45.38	7.78	48.87	10.11	49.87	9.95	.44	.56	.10
Mf	46.49	11.59			50.24	9.88		.33	
Pa	44.00	7.94	46.56	9.69	50.06	10.17	.32	.74	.35
Pt	44.19	8.53	47.73	10.62	50.09	9.94	.41	.68	.23
Sc	43.32	7.91	47.62	10.16	50.20	10.12	.53	.84	.25
Ma	42.53	7.98	48.70	10.22	50.32	10.29	.76	.94	.16
Si	48.14	9.46	53.25	11.02	50.37	9.83	.53	.23	-.28

*Note.* All mean comparisons between Hathaway and Monachesi and Minnesota Multiphasic Personality Inventory-Adolescent (MMPI-A) samples produce univariate  $F$  test alpha values of  $p < .0001$ . Means and standard deviations for the Colligan and Offord sample are based on values derived for these scales on the original MMPI. The Colligan and Offord values for the Mf scale are omitted because these data were based on a 60-item version of the Mf scale, whereas the contrasting samples based Mf means and SD values on a 44-item MMPI-A Mf scale. Effect sizes were based on comparisons of data from the Hathaway and Monachesi versus Colligan and Offord 1 versus 2, Hathaway and Monachesi versus MMPI-A normative 1 versus 3, and Colligan and Offord versus MMPI-A normative 2 versus 3.

<sup>a</sup> $N = 10,514$ . <sup>b</sup> $N = 817$ . <sup>c</sup> $N = 1,235$ .

**TABLE 2**  
**MMPI-A Basic Scale T-Score Means**  
**Adjusted for Validity Scale L and K T-Score**  
**Levels, for the Hathaway and Monachesi**  
**(1963), Colligan and Offord (1992),**  
**and MMPI-A Normative Adolescents**  
**With Associated Univariate *F* Tests**  
**and Effect Sizes**

MMPI-A Scale	Hathaway & Monachesi <sup>a</sup>		MMPI-A Normative <sup>b</sup>		Effect Size <i>d</i>
	<i>LS M</i>	<i>SE</i>	<i>LS M</i>	<i>SE</i>	
Hs	43.69	0.71	49.41	0.21	.57
D	45.46	0.73	50.00	0.22	.45
Hy	44.39	0.76	50.72	0.22	.63
Pd	45.46	0.76	49.23	0.22	.38
Mf	46.46	0.11	50.54	0.32	.41
Pa	44.06	0.78	49.59	0.23	.55
Pt	44.41	0.60	48.26	0.18	.38
Sc	43.50	0.62	48.70	0.18	.52
Ma	42.67	0.71	49.07	0.21	.64
Si	48.29	0.76	49.03	0.22	.07

*Note.* All mean comparisons between Hathaway and Monachesi and the Minnesota Multiphasic Personality Inventory-Adolescent (MMPI-A) normative sample produce univariate *F*-test values with alpha levels of  $p < .0001$ .

<sup>a</sup> $N = 10,514$ . <sup>b</sup> $N = 1,235$ .

### Harris-Lingoes and Si Subscale Analyses

After analyses at the basic scale level revealed significant group differences, a series of analyses were then conducted to examine the effects of group membership (Hathaway & Monachesi 1963, versus MMPI-A normative [Butcher et al., 1992] sets) on each of the MMPI-A Harris-Lingoes and Si subscales to more narrowly define these observed differences. The results of these MANOVAs for each of the seven subscale groupings at the T-score level were significant, and are as follows: (a)  $D_1 - D_5$ ,  $F(5, 11743) = 109.14$ ,  $p < .0001$ ; (b)  $Hy_1 - Hy_5$ ,  $F(5, 11743) = 260.95$ ,  $p < .0001$ ; (c)  $Pd_1 - Pd_5$ ,  $F(5, 11743) = 95.41$ ,  $p < .0001$ ; (d)  $Pa_1 - Pa_3$ ,  $F(3, 11745) = 298.17$ ,  $p < .0001$ ; (e)  $Sc_1 - Sc_6$ ,  $F(6, 11742) = 132.18$ ,  $p < .0001$ ; (f)  $Ma_1 - Ma_4$ ,  $F(4, 11744) = 93.79$ ,  $p < .0001$ ; and (g)  $Si_1 - Si_3$ ,  $F(3, 11745) = 70.42$ ,  $p < .0001$ . Table 3 presents the mean MMPI-A T-score values for each of the Harris-Lingoes and Si subscales for adolescents in each sample (including estimated values for the Colligan & Offord, 1992, data) with associated effect size values shown for the comparisons between the Hathaway and Monachesi, Colligan and Offord, and MMPI-A normative samples.

### Item-Level Analyses

In addition to the scale-level analyses, a series of  $2 \times 2$  chi-square analyses on item endorsement frequencies were

conducted, separately by gender, to compare endorsement frequencies for the Hathaway and Monachesi (1963) and MMPI-A normative (Butcher et al., 1992) sample adolescents on the 393 items shared by the MMPI and MMPI-A. Based on the chi-square results, Tables 4 and 5 present for boys and girls, respectively, the 25 items showing the greatest shift in endorsement frequencies. The chi-square values for all of these items shown in these tables exceeded 140 for boys and girls, corresponding to an alpha level of  $p < .0001$ . Similar to the reporting format used for the parametric analyses, the results of nonparametric tests of the frequency differences between the Hathaway and Monachesi and the MMPI-A normative sets are expressed in effect sizes or *d* values. As a further point of comparison, the item endorsement frequencies for 14-through 16-year-old boys and girls in the Colligan and Offord (1992) data collection are also shown in these tables.

## DISCUSSION

Although examination of the demographic variable revealed interesting findings, the central focus of this study was on changes in adolescent response patterns across four decades as reflected in differences found for the Hathaway and Monachesi (1963) data sample in contrast to the MMPI-A normative (Butcher et al., 1992) sample. Generally consistent with the earlier findings by Pancoast and Archer (1988), our contemporary MMPI-A normative sample produced higher scale scores on all the basic clinical scales and lower scores on the validity scales L and K than the Hathaway and Monachesi adolescents. Actual mean T-score differences ranged from 2.4 to 9.5 points for girls and 2.1 to 11.12 points for boys. Because our sample size was large, resulting in statistically significant differences on numerous scales, effect sizes were used to estimate the relative magnitude of mean scale differences. The largest shifts across eras for both genders were noted for Scales Ma, Sc, and Hs. These results suggest that contemporary adolescents in the MMPI-A normative sample have a more rapid personal tempo, greater psychological energy, and may feel more restless and impulsive (Ma) than their Hathaway and Monachesi counterparts. They may also feel more alienated, have greater difficulty developing and maintaining close personal relationships, and may perceive themselves as having less control over their emotions and impulses (Sc). Adolescents from the MMPI-A normative sample also reported more somatic symptoms and bodily concerns (Hs) than adolescents evaluated in the late 1940s and early 1950s. Smaller changes were noted in levels of defensiveness (K), social desirability (L), and social introversion (Si). The relatively limited changes on validity scales compared to the larger shifts on several clinical scales suggests that changes in reporting patterns on basic clinical scales cannot be fully accounted for by validity scale differences. This view was supported when the contribution of L and K was removed using covariance procedures, and mean

T-score differences between these two samples remained statistically significant.

Analysis of sample differences on the Harris–Lingoes and Si subscales and on individual items permits greater definition of scale-level differences between the Hathaway and Monachesi (1963) and the MMPI–A normative (Butcher et al., 1992) adolescent samples, representing data collections separated by 40 years. In terms of the Ma scales, contemporary adolescents reported more feelings of restlessness, tension, and hyperactivity, and they appear to be higher in sensation seeking and more prone to engaging in risk-taking behaviors (Ma<sub>2</sub>). Both boys and girls reported, for example, that they work under a great deal of tension (Item 17). Contemporary girls were also more likely to endorse another item on the Ma<sub>2</sub> subscale: “At times I have very much wanted to leave home” (Item 19). Also related to the Ma<sub>2</sub> subscale, modern adolescents were more likely respond true to items such as “I am an important person” (Item 58). In the 1950s, this item, placed on

the ego inflation (Ma<sub>4</sub>) subscale, was endorsed as true by only about 12% of the Hathaway and Monachesi (1963) sample. In contrast, this item was endorsed as true by 77% (girls) to 80% (boys) of contemporary adolescents. The dramatic shift in endorsement frequency probably reflects a fundamental shift in the connotation of this item, that is, in the Hathaway era this item was likely interpreted by adolescents as related to self-aggrandizement, whereas it is seen as reflective of positive aspects of self-esteem by modern adolescents. Contemporary adolescents were also more likely to perceive others as motivated by self-gain (Ma<sub>1</sub>). Illustrating this point on the item level, contemporary girls were much more likely to state, “I don’t blame people for trying to grab everything they can in this world” (Item 213). Social anxiety (Ma<sub>3</sub>) was the only Harris–Lingoes Ma scale that did not show a significant change between adolescent samples.

Large differences between the Hathaway and Monachesi (1963) and MMPI–A normative (Butcher et al., 1992) sam-

**TABLE 3**  
**MMPI–A Harris–Lingoes Subscale T–Score Means and Standard Deviations for Hathaway and Monachesi (1963), Colligan and Offord (1992), and MMPI–A Normative Adolescents With Associated Effect Sizes**

MMPI–A Harris–Lingoes Subscales	Hathaway & Monachesi <sup>a</sup>		Colligan & Offord <sup>b</sup>		MMPI–A Normative <sup>c</sup>		Effect Sizes		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	1 vs. 2	1 vs. 3	2 vs. 3
							<i>d</i>	<i>d</i>	<i>d</i>
D <sub>1</sub> (Subjective Depression)	44.96	7.73	48.34	9.74	50.20	9.99	.43	.66	.19
D <sub>2</sub> (Psychomotor Retardation)	49.41	9.14	49.65	10.10	50.03	10.07	.03	.07	.04
D <sub>3</sub> (Physical Malfunctioning)	48.70	8.08	48.05	8.26	50.09	9.65	–.08	.17	.22
D <sub>4</sub> (Mental Dullness)	44.60	8.22	47.68	9.84	50.16	10.08	.37	.66	.25
D <sub>5</sub> (Brooding)	45.39	8.02	49.01	9.59	49.88	10.24	.44	.54	.09
Hy <sub>1</sub> (Denial of Social Anxiety)	49.78	9.62	48.17	10.19	49.91	9.90	–.17	.01	.18
Hy <sub>2</sub> (Need for Affection)	53.78	9.89	50.24	9.99	49.82	9.96	–.36	–.40	.05
Hy <sub>3</sub> (Lassitude-Malaise)	42.73	7.70	45.79	9.44	50.10	10.07	.39	.92	.44
Hy <sub>4</sub> (Somatic Complaints)	45.00	8.13	46.66	9.23	50.03	10.03	.20	.60	.35
Hy <sub>5</sub> (Inhibition of Aggression)	47.49	10.04	49.52	9.88	50.16	10.00	.20	.27	.06
Pd <sub>1</sub> (Familial Discord)	46.41	9.05			49.86	10.04		.38	
Pd <sub>2</sub> (Authority Problems)	47.18	8.89			49.76	10.07		.28	
Pd <sub>3</sub> (Social Imperturbability)	49.54	10.00			50.15	9.88		.06	
Pd <sub>4</sub> (Social Alienation)	44.72	9.21			50.12	9.94		.58	
Pd <sub>5</sub> (Self-Alienation)	46.08	8.62			49.90	10.07		.43	
Pa <sub>1</sub> (Persecutory Ideas)	44.43	8.57	48.85	10.22	50.36	10.16	.51	.68	.15
Pa <sub>2</sub> (Poignancy)	42.32	8.78	46.36	10.27	49.88	10.01	.45	.85	.35
Pa <sub>3</sub> (Naivete)	52.78	10.92	48.94	10.10	49.65	10.09	–.35	–.29	.07
Sc <sub>1</sub> (Social Alienation)	45.71	8.38	48.69	10.40	51.98	9.62	.35	.74	.33
Sc <sub>2</sub> (Emotional Alienation)	47.09	7.01	47.65	8.54	50.18	9.93	.08	.42	.27
Sc <sub>3</sub> (Lack of Ego Mastery, Cognitive)	45.15	8.18	47.72	9.86	50.02	9.84	.31	.58	.23
Sc <sub>4</sub> (Lack of Ego Mastery, Conative)	47.09	8.35	48.46	9.96	51.60	9.99	.16	.53	.31
Sc <sub>5</sub> (Lack of Ego Mastery, Defective Inhibition)	43.25	9.28	48.05	9.59	50.28	10.02	.52	.75	.23
Sc <sub>6</sub> (Bizarre Sensory Experiences)	44.73	8.37	46.71	9.38	50.50	10.07	.23	.67	.39
Ma <sub>1</sub> (Amorality)	47.05	9.98	48.51	10.17	50.21	10.18	.15	.32	.17
Ma <sub>2</sub> (Psychomotor Acceleration)	45.10	9.49	49.53	9.68	50.02	9.73	.47	.52	.05
Ma <sub>3</sub> (Imperturbability)	50.01	10.16	49.56	10.12	50.08	10.17	–.04	.01	.05
Ma <sub>4</sub> (Ego Inflation)	48.60	9.99	50.78	10.06	50.13	9.94	.22	.15	–.07

*Note.* Effect sizes were based on comparisons of data from the Hathaway and Monachesi versus Colligan and Offord (1 vs. 2), Hathaway and Monachesi versus Minnesota Multiphasic Personality Inventory–Adolescent (MMPI–A) normative (1 vs. 3), and Colligan and Offord versus MMPI–A normative (2 vs. 3). Means and standard deviations for the Colligan and Offord sample are values derived for these subscales based on item composition for the original MMPI, whereas the means and standard deviations are based on the MMPI–A form of these subscales for the Hathaway and Monachesi and MMPI–A normative samples. Because the item composition of Pd subscales is substantially different between the MMPI and the MMPI–A, the data for these subscales is not included for the Colligan and Offord sample.

<sup>a</sup>*N* = 10,514. <sup>b</sup>*N* = 817. <sup>c</sup>*N* = 1,235.

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ples are also apparent on basic Scale Sc, and review of Harris–Lingoes results shows moderate effect sizes for several Sc subscales including Sc<sub>1</sub>, Sc<sub>5</sub>, and Sc<sub>6</sub>. Contemporary adolescents from the MMPI–A normative sample stated that they feel misunderstood, unfairly criticized, and unjustly punished (Sc<sub>1</sub>). This is reflected in modern girls greater endorsement of “No one seems to understand me” (Item 21). Normative sample boys were more likely to deny that “I get all the sympathy I should” (Item 260) and “I seem to make friends about as quickly as others do” (Item 262). MMPI–A normative sample adolescents were also more likely than their 1950s counterparts to perceive their thought processes as unique and unusual (Sc<sub>3</sub>), and both boys and girls were more likely to report “I am afraid of

losing my mind” (Item 163). In addition, normative sample adolescents also reported less control over their emotions and impulses (Sc<sub>5</sub>). For example, these modern girls and boys more frequently reported “fits of laughing and crying that I cannot control” (Item 21). Furthermore, they indicated more feelings of vulnerability and were more self-critical (Sc<sub>4</sub>). Both boys and girls, for example, were more likely to perceive that “Life is a strain for me much of the time” (Item 255).

The final basic clinical scale showing a large effect size between samples was Scale Hs, with adolescents in 1950s having reported fewer somatic symptoms than contemporary adolescents in the MMPI–A normative (Butcher et al., 1992) sample. Although Harris–Lingoes subscales are not avail-

able for the Hs scale, individual item endorsement differences were found for this scale. For example, adolescents of both genders in the 1950s were more likely to report that they “wake fresh and rested each morning” (Item 3) and modern girls were less likely to endorse “My hands and feet are usually warm enough” (Item 8). Furthermore, male adolescents from the normative sample more frequently reported that they are “bothered by upset stomach several times a week” (Item 25).

Collectively, adolescent response patterns shown substantive changes over the four decades spanning from the late 1940s and early 1950s to the late 1980s; however, several caveats should be kept in mind. The two populations used for this study differ in numerous ways beyond the era of data col-

lection, including geographic location, ethnicity, parental occupation and education, and other important variables. Although we explored the impact of several of these variables (i.e., SES, ethnicity, age) on performance within, and to a limited extent, between samples, many of these variables are not directly comparable across samples. For example, the Hathaway and Monachesi (1963) sample is drawn exclusively from Minnesota, an area that likely differed, particularly in the 1940s, from other parts of the nation. Farming was a dominant occupation for the fathers of the Hathaway and Monachesi sample, and many of the fathers possessed less than a high school education (Hathaway & Monachesi, 1963). The MMPI-A normative sample (Butcher et al., 1992) contained adolescents from eight geographic regions

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and 52.7% of the fathers of this sample had college degrees. Because of the vast differences in the occupation and educational levels that were typical of the 1940s versus the 1980s, direct inferences concerning the specific factors responsible for observed changes between samples are not possible. However, it is possible to glean some information from our findings that White adolescents in MMPI-A normative samples scored consistently higher than White adolescents in the Hathaway and Monachesi sample on the basic clinical scales and from these results that contemporary adolescents also scored higher than their counterparts from the Hathaway and Monachesi sample when compared at low, middle, and higher socioeconomic levels. These results tend to support the view that ethnicity and/or SES can not fully account for the era-related differences found in this study. This view is further supported by comparing the current basic scale mean values for the Hathaway and Monachesi sample and the MMPI-A normative sample to the comparable values reported by Colligan and Offord (1992) for boys and girls that resided within a 50-mile radius of Rochester, Minnesota. The Mayo sample, collected in the mid-1980s, is similar to the Hathaway and Monachesi sample not only in terms of Midwestern geography but also in terms of samples that are based almost entirely on White respondents. Comparison of basic scale and Harris-Lingoes subscale mean values shows that the Mayo data (Colligan & Offord, 1992) typically falls at a midpoint value above the basic scale means reported in the Hathaway and Monachesi study and below the mean values reported for the MMPI-A normative sample (Butcher et al., 1992). Indeed, this pattern is found for all basic scales examined in this study except Scales K and Si and all Harris-Lingoes subscales with the exception of D3, Hy<sub>1</sub>, Hy<sub>2</sub>, Pa<sub>3</sub>, Ma<sub>3</sub>, and Ma<sub>4</sub>. These results suggest that although geographic and ethnicity effects may have some role in the findings reported in this study, these factors do not fully account for the observed differences between adolescent response patterns in the Hathaway and Monachesi sample and the MMPI-A normative sample.

A second qualification of this study is that both samples were derived from school settings rather than clinical populations, and the basic scale mean T scores are within normal ranges across both samples. Thus, we cannot extrapolate these findings to clinical populations, and the latter may or may not show similar shifts over the same four decades. Although adolescents in the MMPI-A normative (Butcher et al., 1992) sample endorsed more items in the clinical direction, one cannot conclude from these data that contemporary adolescents are more likely to be diagnosed with various clinical disorders such as depression, bipolar disorder, or conduct disorder.

Our study identified numerous MMPI-A items that were endorsed in the clinical direction by over half of the MMPI-A normative (Butcher et al., 1992) sample, that is, many behaviors or attitudes that are indicative of emotional distress in an adult population may not have a comparable

meaning for contemporary adolescents. Furthermore, contemporary normal adolescents not only endorse more psychopathological symptoms than do adults (e.g., Archer, Handel, & Lynch, 2001), but also endorse more pathology than did adolescents 40 years ago. Archer (1984, 1997) speculated that normal adolescents experience substantial psychological turbulence and distress, which renders accurate discrimination between normal and abnormal functioning particularly difficult during this developmental period. Archer, Handel, and Lynch recently demonstrated that many MMPI-A items, perhaps approaching nearly 50% of the basic scale item pool, do not show significantly higher rates of endorsement frequency among adolescent inpatients in contrast to adolescents from the normative sample. By identifying and eliminating those items that show poor discrimination between clinical and normative adolescent samples, future researchers might be able to create a shorter version of the MMPI-A while maintaining acceptable performance on important psychometric indexes including sensitivity and positive predictive power.

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