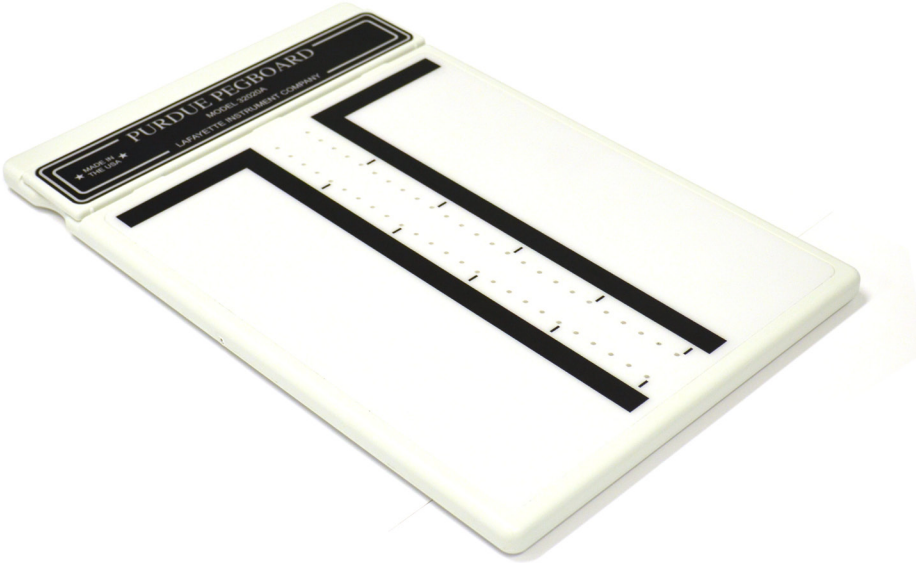
Model 32020A

Purdue Pegboard Test

User Instructions



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Description

The purpose of this test is to measure unimanual and bimanual finger and hand dexterity. The Purdue Pegboard was developed in the 1940s as a test of manipulative dexterity for use in personnel selection (Tiffin, 1968; Tiffin & Asher, 1948). In addition to this use, the Purdue Pegboard Test has been employed in neuropsychological assessment to assist in localizing cerebral lesions and deficits (Reddon et al., 1988). The board consists of two parallel rows of 25 holes each. Pins (pegs) are located at the extreme right-hand and left-hand cups at the top of the board. Collars and washers occupy the two middle cups. In the first three subtests, the subject places as many pins as possible in the holes, first with the preferred hand, then with the nonpreferred hand, and finally with both hands, within a 30-s time period. To test the right hand, the subject must insert as many pins as possible in the holes, starting at the top of the right-hand row. The left-hand test uses the left row. Both hands then are used together to fill both rows top to bottom. In the fourth subtest, the subject uses both hands alternately to construct “assemblies,” which consist of a pin, a washer, a collar, and another washer. The subject must complete as many assemblies as possible within 1 minute.

Cleaning Instructions

Bleach wipes are preferred. Hydrogen peroxide wipes, Lysol wipes or isopropyl wipes are also OK. Do not use ammonium based glass cleaners or liquid bleach.
Clean pins and washers with Isopropyl alcohol only.

Disclaimer: The cleaning instructions for Lafayette Instrument products are a recommendation of compatible cleaning materials only. Product end users are responsible for instituting an appropriate cleaning regimen utilizing best practices and techniques. Lafayette Instrument assumes no responsibility for the cleanliness or sanitation of the products after initial use nor makes any claim that the use of the recommended cleaning materials mitigates all risk of potential cross infection.

Administration

Before administering the Purdue Pegboard Test, the test administrator is advised to carefully read this section of the manual. As with any standardized test, it is important to follow the directions very closely. If the Purdue Pegboard Test is to be used as a basis for employee selection, the test must be administered to all applicants according to the standardized test procedure. If the test is not given identically, irrelevant factors may affect test scores. In order to reduce the variability among test administrators, specific details regarding the arrangement of materials and the testing procedures are presented in detail on the following pages.

Practice the administration of the Purdue Pegboard before conducting a test on a subject. The amount of practice needed in order to become comfortable with the testing process is dependent upon the test administrator's previous testing experience. The test administrator should practice the Purdue Pegboard until he or she is able to perform each of the tests at an average speed for demonstration purposes. **Note: The test administrator will be demonstrating to the test subject what is expected of him or her before each test.**

Test Batteries and Timing

The test administrator will compile 5 separate scores from the complete test procedure, one for each test battery:

1. Right Hand (30 seconds)
2. Left Hand (30 seconds)
3. Both Hands (30 seconds)
4. Right + Left + Both Hands **(Note: This is not an actual test; it is a mathematical sum calculation.)**
5. Assembly (60 seconds)

The test batteries should be done in this consecutive order, unless the subject is left-handed, where test batteries 1 and 2 are reversed: Left Hand first and then Right Hand. Three test trials are highly recommended: the more trials administered, the more test score reliability. **Note: The test is well suited for either group or individual testing.**

Equipment Required

The following equipment and supplies are required to ensure that the Lafayette Instrument Purdue Pegboard Test is consistent, standardized test:

1. Purdue Pegboard Test (Model #32020A)
   - Instruction Manual
   - 1 Test Board
   - Pins, Collars, Washers
   - Score Sheets or Scoring Application (see page 7 for details)
2. At least one testing table approximately 30 inches tall. **Note: The subject must be seated throughout the administration of the test**
3. Stopwatch or clock that reads in seconds

Test Procedures

General Instructions

The subject should be comfortably seated at the testing table directly in front of the Purdue Pegboard, which is placed on the table with the row of cups (under the nameplate) at the top of the board. The far right and far left cups should have 25 pins in each to equal a total of 50 pins. For right-handed subjects, the cup to the left of center should have 40 washers. If the subject is left-handed, the collar and washer locations should be on the reverse side of center. The following directions are for single subject testing and should be appropriately modified for group testing.

When the subject(s) is seated and ready to begin, say:

"This is a test to see how quickly and accurately you can work with your hands. Before you begin each battery of the test, you will be told what to do and then you will have an opportunity to practice. Be sure you understand exactly what to do."

Right Hand (30 seconds)

Begin by saying and demonstrating:

"Pick up one pin at a time with your right hand from the right-handed cup. Starting with the top hole, place each pin in the right-handed row. "

(Leave the pin used for demonstration in the hole.)

"Now you may insert a few pins for practice. If during the testing time you drop a pin, do not stop to pick it up. Simply continue by picking another pin out of the cup."

Correct any errors made in placing the pins and answer any questions. When the subject has inserted three or four pins and appears to understand the operation, say:

"Stop. Now take out the practice pins and put them back into the right-handed cup."

After the subject completes this task, say:

"When I say 'Begin,' place as many pins as possible in the right-handed row, starting with the top hole. Work as rapidly as you can until I say 'Stop.' Are you ready? Begin."

Start timing when you say "Begin." At the end of exactly 30 seconds, say:

"Stop."

Count the number of pins inserted and record the Right Hand score. This is the total number of pins the subject placed with the right hand. Leave the pins in the holes.

Left Hand (30 seconds)

Begin by saying:

> ***"Pick up one pin at a time with your left hand from the left-handed cup. Place each pin in the left-handed row, starting with the top hole. You may insert a few pins for practice."***

When the subject has inserted three or four pins and appears to understand the operation, say:

> ***"Stop. Now take out the practice pins, and put them back into the left-handed cup."***

After the subject completes this task, say:

> ***"When I say 'Begin,' place as many pins as possible in the left-handed row, starting with the top hole. Work as rapidly as you can until I say 'Stop.' Are you ready? Begin."***

Start timing exactly when you say "Begin." At the end of exactly 30 seconds, say:

> ***"Stop."***

Count the number of pins inserted and record the Left-Hand score. This is the total number of pins the subject placed with the left hand. Leave the pins in the holes. After the Right Hand and Left-Hand test batteries have been completed, the subject returns all pins to their proper cups.

Both Hands (30 seconds)

This test battery tests both hands working together. Begin by saying:

> ***"For this part of the test, you will use both hands at the same time. Pick up a pin from the right-handed cup with your right hand, and at the same time pick up a pin from the left-handed cup with your left hand. Then place the pins down the rows. Begin with the top hole of both rows."***
>
> (Demonstrate. Then replace the pins used for demonstration.)
>
> ***"Now you may insert a few pins with both hands for practice."***

After the subject has three of four pairs of practice pins correctly inserted, say:

> ***"Stop. Take out the practice pins, and put them back in their cups."***

Then say:

> ***"When I say 'Begin,' place as many pins as possible with both hands, starting with the top hole of both rows. Work as rapidly as you can, until I say 'Stop.' Are you ready? Begin."***

Start timing when you say "Begin." At the end of exactly 30 seconds, say:

> ***"Stop."***

Count the number of pairs of pins inserted (not the total number of pins), and record the score. The subject then returns the pins to the proper cups.

Right + Left + Both (Sum of Scores)
This score is not based on a separate test; it is obtained from combining the test scores of the previous three test batteries. Add the scores recorder for Right Hand, Left Hand, and Both Hands; this is the score that you record for R + L + Both.

This score does not have to be recorded during the actual testing period. The Assembly test may begin immediately after the Both Hands score is recorded.

Assembly (1 minute)
This test battery consists of assembling pins, collars, and washers. Demonstrate the following operations while saying:

> ***"Pick up one pin from the right-handed cup with your right hand. While you are placing it in the top hole in the right-handed row, pick up a washer with your left hand. As soon as the pin has been placed, drop the washer over the pin. While the washer is being placed over the pin with you left hand, pick up a collar with your right hand. While the collar is being dropped over the pin, pick up another washer with your left hand and drop it over the collar. This completes the first 'assembly,' consisting of a pin, a washer, a collar, and a washer. While the final washer for the first assembly is being placed with your left hand, start the second assembly immediately by picking up another pin with your right hand. Place it in the next hole; drop a washer over it with your left hand, and so on, completing another assembly. Now take a moment to try a few practice assemblies."***

Emphasize that both hands should be operating at all times: one picking up a pin, one a washer, one a collar, and so on,

The subject should be allowed to make four or five complete assemblies before the test is begun to make certain the subject fully understands the "alternating" procedure. The subject must keep both hands moving at the same time. If he or she fails to do this, the administrator should give further instructions. **Note: If the subject is left-handed, the washer and collar locations in the cups are switched. The subject begins by picking up the pin with his/her left hand, the washer with his/her right hand, the collar with his/her left hand, another washer with his/her right hand and so on through all assemblies.**

After the subject has practiced the assemblies say:

> ***"Stop. Now return the pins, collars, and washers to their proper cups."***

Then say:

> ***"When I say 'Begin,' make as many assemblies as possible, beginning with the top hole. Work quickly until I say 'Stop.'"***

Start timing when you say "Begin." After exactly 1 minute (60 seconds), say:

> ***"Stop."***

Count the number of parts assembled and record the Assembly score. Since there are four parts in each assembly, if the subject made eight complete assemblies, the score is 8 multiplied by 4 (parts), or 32. Beyond completed assemblies, if there are additional parts properly placed at the end of the minute, they are also added to the Assembly score. For example, if there is another pin and first washer in addition to those 2 parts, the score is 32 + 2, or 34. After the test administrator records this score, the subject should return the pins, collars, and washers to the proper cups.

Test Procedure: Hamm and Curtis (1980)
The standard instructions for each task were played on a cassette tape to assure standardization across a variety of test conditions and administrators. Up to 3 clients were tested in a single session. Standard test times were utilized and standard raw scores were recorded.

Test Procedure: Leslie, Davidson, and Batey (1985)
The hand preference was determined by the Harris Tests of Lateral Dominance (Harris, 1958). Psychometric assessments were made of both dyslexic and control groups. This data is illustrated in Appendix F, Table 1. The placement part of the Purdue Pegboard Test was administered exactly as prescribed for the original test.

Scoring

Scores are derived for each part of the test. The scores for the pin (peg) placement subtests consist of the number of pins inserted in the time period for each hand. The score for the bimanual condition consists of the total number of pairs of pins inserted. The assembly score refers to the number of parts assembled (see Source).

Scoring Application

Lafayette Instrument Company has developed a Purdue Pegboard Scoring Application that is available for iOS and Android. This application assists administrators in all areas of the testing process by standardizing adminstration through easily set up test batteries with optionally read instructions, creating organizational norms, and keeping track of individualized data.

Demographic Effect

Age

Performance improves during childhood and slows withadvancing age (Agnew et al., 1988; Brito & Santos-Morales, 2002; DesRosiers et al., 1995; Gardner & Broman, 1979; Mathiowetz et al., 1986; McCurry et al., 2001; Wilson et al., 1982).

Gender

Females tend to perform better than males (e.g., Agnew et al.,1988; Brito & Santos-Morales, 2002; DesRosiers et al., 1995; Mathiowetz et al., 1986; Peters, 1990; Sattler & Engelhardt, 1982; Yeudall et al., 1986; but see Costa et al., 1963, who did not find sex-related differences). Gender differences in fine manual dexterity may be confounded by gender differences in finger size. Peters et al. (1990) reported that when measures of index finger and thumb thickness were used as covariates, gender differences in performance disappeared. Further, negative correlations between performance and finger size were observed in both men and women. The implication is that, for most men, the fingers are of a size that is relatively unsuitable for this task. With larger-sized pegs, men may no longer be at a disadvantage.

Education

Education appears to be unrelated to performance (Costa et al., 1963; McCurry et al., 2001; Yeudall et al., 1986)

Handedness

In general, performance is better with the preferred than with the nonpreferred hand (e.g., Brito & Santos-Morales, 2002; DesRosiers et al., 1995; Judge & Stirling, 2003; Triggs et al., 2000). There is evidence that left-handers perform more proficiently on the assembly component (Judge & Stirling, 2003).

Ethnicity/Socioeconomic Status

Ethnicity and social class had no impact on test performance of children residing in the greater Rio de Ianeiro area (Brito & Santo-Morales, 2002). Primary language spoken (English, Japanese) among Iapanese adults (aged 65 years and older) also had no effect on peg placement scores (McCurry et al., 2001).

Normative Data

Norms are available for individuals aged 5 to 89 years.

Adults

Table 14-22 provides normative data for adults, stratified on the basis of age (15-40 years) and gender (Yeudall et al.,1986). Participants were excluded based on evidence from interview of forensic involvement, prenatal or birth complication, psychiatric disorders or substance abuse problems. Hand preference was determined by the hand used to write with. Administration was one trial per subtest.

Table 14-23 shows normative data (DesRosiers et al., 1995) based on a random sample of 360 individuals, stratified for age and gender, drawn from the electoral pool of a city in Quebec. All subjects were aged 60 to 89 years, lucid and independent in activities of daily living; all could see sufficiently well and had no impairment affecting upper limb functioning. Most (92%) were classed as right-handed based on the Edinburgh Handedness Inventory.

McCurry et al. (2001) presented data for the Purdue Peg placing trials based on a sample of Japanese American adults, aged 70 years and older, who were enrolled in a prospective study of aging and dementia in King County, Washington. None was classed as demented based on clinical and screening neuropsychological examinations. Hand preference was determined by asking subjects which hand they preferentially used. Accordingly, 94% of the participants were classed as right-handed (S. McCurry, personal communication May 11, 2004). Participants completed two 30-s trials for each hand. The data are provided in Table 14-24 and represent an important source of information for this understudied segment of the U.S. population.

Agnew et al. (1988) provide data (see Table 14-25) based on a sample of 212 healthy, well-educated, 40- to 85-year-olds, who were screened for cognitive impairment. Subtest scores consist of the average of three trials per subtest. Differences between dominant and nondominant hands were also calculated. The manual difference was greater for women than for men. There was a trend for this difference to become greater with increasing age, but the effect did not prove statistically significant.

Children

Gardner and Broman (1979) provide data (see Tables 14-26 and 14-27) for children, ages 5 years to 15 years 11 months. One trial was given per subtest. The 1334 school children (663 boys, 671 girls) were all in regular classes in a New Jersey suburb. They were primarily in the 95 to 110 IQ range and scored mainly in the middle range on national achievement tests.

No children in special classes or children with a history of grade repetition were included in the study. Similar findings were reported for Brazilian children (Brito & Santo-Morales, 2002). These authors noted that the performance differences between hands were equivalent in boys and girls.

Mathiowetz et al. (1986) provided normative data, based on a three-trial administration, for 176 subjects aged 14 to 19 years. The adolescents had no history of neuromuscular or orthopedic dysfunction that would affect finger dexterity. Unfortunately, hand preference was not reported. The scores, shown in Table 14-28, are somewhat higher than those reported by Gardner and Broman (1979), perhaps reflecting the influence of practice afforded by additional trials.

Others (Tupper cited in Baron, 2004; Wilson et al. 1982) have modified the pegboard by shortening the board from 25 to 15 holes in each row so that it can be used with preschoolers. They compiled data for the peg placement portions only.

Table 14-29 presents the data reported by Wilson et al. (1982). Participants completed one trial on each subtest.

Reliability

Test—Retest Reliability and Practice Effects

The number of trials allowed per subtest affects reliability. For one-trial administrations over intervals of 1 to 2 weeks, correlation coefficients, ranging from .37 to .82, have been obrained for normal individuals (Buddenberg & Davis, 2000; DesRosiers et al., 1995; Reddon et al., 1988; Tiffin, 1968). Three-trial administrations yield higher reliabilities (.76 to .89) after retest intervals of 1 week (.81 to .89; Buddenberg & Davis, 2000) and 6 months (.76 for peg-placing trials; Doyen & Carlier, 2002).

It is important to note that right-left difference scores or ratios tend not to be very reliable, with correlations ranging from .22 to .61 (Reddon et al., 1988; Sappington, 1980). Reddon et al. (1998) noted that, when normal right-handed adults were tested weekly over five occasions, the right-hand was greater than the left-hand score on the average 50% of the time in men (range, 0% to 100%) and in women, the right-hand score was greater than the left-hand score on the average 62.9% of the time (range 10% to 100%). Because changes in performance occur commonly in normal adults, considerable caution should be exercised in interpreting any changes in between-hand asymmetry.

There are practice effects, with scores improving on subsequent trials (DesRosiers et al., 1995; Feinstein et al., 1994; Reddon et al., 1988; Wilson et al., 1982). For example, Peinstein et al. (1994) examined the effects of practice in healthy volunteers tested at 2- to 4-week intervals over eight test sessions. Performance improved with time and was still discernible at the eighth session. Age also appears to interact with practice. The improvement was more marked for younger subjects, aged 25 to 33 years, who performed better than older subjects, aged 41 to 57 years, and who continued to improve for a greater length of time.

Validity

Relationships With Other Measures

Factor-analytic studies (Fleishman & Ellison, 1962; Fleishman & Hempel, 1954) have shown that the Purdue Pegboard Test loads on a finger dexterity factor defined as "the ability to make rapid, skillful, controlled manipulative movements of small objects, where the fingers are primarily involved." However, the assembly test appears to measure something in addition to finger dexterity and also loads on a manual dexterity factor defined as "the ability to make skillful, controlled arm-hand manipulations of larger objects." Strenge et al. (2002) also highlighted the importance of attention as a key factor on the assembly and nondominant hand tasks.

The literature suggests that there is more than one type of dexterity. Pactoranalytic findings suggest that pegboard dexterity and finger tapping measure independent dimensions of manual proficiency (Fleishman & Hempel, 1954; Stanford & Barratt, 1996). However,

when between -hand asymmetry is considered, Purdue peg-placement correlates highly (.78) in normal adults with finger tapping, a task that requires independent, precise finger movements, suggesting that both tasks depend at least in part on a common neural substrate; namely, asymmetry in the corticospinal system (Triggs et al., 2000). Laterality indices derived from the Purdue Pegboard Test also correlates moderately well (.52 to .68) with those from other manual dexterity tasks (e.g., Annett's peg-moving task; Doyen & Carlier, 2002). Correlations between hand preference and relative manual proficiency on the Purdue Pegboard Test are moderately high, about .70 (Triggs et al., 2000). However, left-handers have smaller mean between-hand discrepancy scores in Purdue performance (Judge & Stirling, 2003; Verdino & Dingman, 1998) and much greater variance in performance than right-handed individuals, suggesting that preference may not identify peg-placement proficiency within a left-handed group (Verdino & Dingman, 1998). Left-handers, however, perform more proficiently than right-handers on the assembly component, a task that requires timely coordination of both hands (Judge & Stirling, 2003).

This advantage seems to depend on a more proficient use of the nonpreferred hand in left-handers than in right-handers (Judge & Stirling, 2003).

Clinical Findings

Impairment has been noted in a variety of conditions. For example, Schmidt et al. (1993) reported that normal individuals without neuropsychiatric disorder or other disease, who showed MRI white matter hyperintensities (WMH), performed worse on the Assemblies subtest than did patients without WMH. Impaired peg placement (particularly on the bilateral condition) was observed in patients with Parkinson's disease (Brown et al., I993; Pernat et al., 1996) with improvement noted after pallidotomy (Uitti et al., 1997). Impairment also occurs in progressive supranuclear palsy (Zakzanis et al., 1998), Huntington's (Brown et al., 1993), cerebellar disease (Brown et al., 1993) and schizophrenia (Flyckt et al., 1999; Roy et al., 2003). Occupational lead exposure also reduces performance on the various Purdue tasks (Stewart et al., 1999).

Further, the peg placement portion of the Purdue Pegboard Test may provide information of lateralizing significance in adults (Costa et al., 1983; Gardner & Broman, 1979; Rapin et al., I966; Vaughan & Costa, 1962) as well as children (Braun et al., 2000). Right-hemisphere lesions tend to impair left-hand scores, whereas left-hemisphere lesions result in a right-sided decrement.

Ecological/Predictive Validity

Adequate fine motor dexterity is critical in the performance of almost all tasks of daily living. Therefore, faster performance on the Purdue Pegboard Test is associated with better social functioning in patients with schizophrenia (Lehouit et al., 2003) and with a good vocational outcome after TBI in children and adults (Asikainen et al., 1999; Nybo & Koslciniem, 1999). Perhaps the Purdue Pegboard Test taps not only motor dexterity but also the cognitive speed needed for good social or occupational functioning.

Table 14-22
Mean Performance of Young Adults for the Purdue Pegboard (One Trial Per Subtest)

	Age Groups				
	15-20	21-25	26-30	31-40	15-40
Females					
n	30	36	16	16	98
Preferred Hand	16.69	16.64	17.25	15.94	16.64
SD	2.16	2.31	1.38	1.61	2.10
Nonpreferred Hand	16.10	15.89	16.13	15.63	15.95
SD	1.57	1.79	1.50	1.89	1.68
Both Hands	13.76	13.75	13.31	13.13	13.58
SD	1.41	1.54	1.45	1.31	1.45
Assemblies	41.83	42.47	40.44	41.44	41.77
SD	5.08	5.43	5.90	5.75	5.42
Males					
n	32	37	32	26	127
Preferred Hand	15.56	15.44	16.22	15.35	15.65
SD	1.52	1.71	1.81	1.72	1.71
Nonpreferred Hand	15.09	15.08	15.41	15.12	15.17
SD	1.42	1.98	2.08	1.77	1.82
Both Hands	12.59	12.97	12.94	12.42	12.75
SD	1.56	1.18	1.29	1.65	1.42
Assemblies	40.25	38.89	39.13	37.50	39.01
SD	4.64	6.60	3.58	3.64	4.92

Note: Data were compiled from 225 healthy adults, largely right-handed (87.7%), with above average IQ, residing in a large city in Western Canada.

Source: Adapted from Yeudall et al. (1986).

Table 14-23
Performance (One-Trial) on the Purdue Pegboard in Older Adults, by Age and Sex

	Males		Females	
	Mean	SD	Mean	SD
60-69 years				
Right	12.7	1.5	14.3	1.3
Left	12.7	1.5	13.7	1.3
Both	10.2	1.3	10.9	1.5
Assembly	27.6	5.1	30.6	5.3
70-79 years				
Right	11.2	1.9	12.7	1.8
Left	10.7	2.1	11.8	1.8
Both	8.2	2.0	9.7	1.7
Assembly	23.1	5.5	25.0	5.8
80+ years				
Right	10.1	2.0	11.5	1.8
Left	9.8	1.7	10.7	2.1
Both	7.4	1.6	8.3	1.9
Assembly	18.5	5.2	21.8	5.5

Note: Each age group contained 60 males and 60 females.

Source: Adapted from DesRosiers et al., 1995

Table 14-24
Purdue Peg-Placing Means, Standard Deviations, and Quartiles by Age and Gender for Japanese Americans (Two Trials per Subtest)

	Mean	SD	25th Percentile	Median	75th Percentile
Males 70-79 years					
Dominant Hand (n=52)	12.96	2.30	11	13	14.5
Nondominant Hand (n=52)	11.85	2.08	10	11.5	14.0
Females 70-79 years					
Dominant Hand (n=39)	14.17	1.55	13	13.5	15
Nondominant Hand (n=38)	13.31	2.14	12	13	14
Males 80-89 years					
Dominant Hand (n=17)	11.41	1.79	11	12	12.5
Nondominant Hand (n=17)	11.47	2.52	9.5	12.5	13.5
Females 80-89 years					
Dominant Hand (n=26)	13.08	2.34	11.5	12.5	14.5
Nondominant Hand (n=25)	11.28	1.49	11.0	11.5	12.5

Note: Age and gender but not education or language spoken significantly affected test scores.

Source: From McCurry et al., personal communication, May 10, 2004

Table 14-25
Mean Performance of Adults for the Purdue Pegboard
(Three Trials per Subtest)

	Age Groups				
	40-49	**50-59**	**60-69**	**70-79**	**80-89**
Males					
n	19	20	24	17	11
Preferred Hand	14.6	14.4	13.6	13.0	10.8
SD	2.08	2.15	1.74	1.90	1.33
Nonpreferred Hand	14.4	13.9	13.1	12.4	10.6
SD	2.35	2.19	1.56	1.48	1.84
Both Hands	12.2	11.9	10.9	10.4	8.5
SD	2.43	2.22	1.46	1.27	1.21
Purdue Assembly	34.9	33.8	28.0	27.5	21.5
SD	7.66	9.66	5.06	5.06	4.81
Pref. minus nonpref.	0.16	0.23	0.44	0.59	0.18
SD	1.19	1.21	1.86	0.93	1.46
Females					
n	21	27	29	31	13
Preferred Hand	15.9	15.0	14.6	13.8	12.9
SD	1.45	1.56	2.03	1.27	1.80
Nonpreferred Hand	15.2	14.4	13.9	12.9	11.3
SD	1.48	1.69	1.78	1.52	2.05
Both Hands	13.1	12.1	11.6	10.5	9.2
SD	1.56	1.30	1.87	1.19	1.92
Purdue Assembly	39.8	34.6	31.7	29.1	21.9
SD	4.54	8.21	6.83	4.85	4.54
Pref. minus nonpref.	0.73	0.63	0.71	0.94	1.56
SD	1.05	1.31	1.23	1.39	1.24

Source: Agnew et al., 1988. Reprinted with permission of Lawrence Erlbaum Assocates, Inc.

Table 14-26
Performance of Children on Purdue Pegboard
(One Trial per Subtest)

		Preferred Hand		Nonpreferred Hand		Both Hands		Assembly	
Age	**n**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Boys									
5:0-5:5	30	9.33	1.81	8.40	1.33	6.73	1.17	14.10	3.29
5:6-5:11	30	9.93	1.51	8.83	1.95	6.97	1.54	15.57	3.56
6:0-6:5	30	9.77	1.57	9.13	1.83	7.30	1.53	15.93	2.94
6:6-6:11	30	11.57	1.45	10.17	2.17	8.23	1.77	19.20	3.84
7:0-7:5	30	11.67	1.67	11.00	1.70	8.77	1.41	19.23	4.95
7:6-7:11	30	12.07	1.95	11.23	1.68	9.57	1.59	20.40	4.10
8:0-8:5	30	12.70	1.60	12.17	1.51	9.83	1.51	23.20	3.80
8:6-8:11	30	13.90	2.19	12.57	1.85	10.90	1.73	24.47	5.35
9:0-9:5	30	13.33	1.60	12.43	1.59	10.50	1.48	24.57	3.75
9:6-9:11	30	13.87	1.91	12.87	2.05	11.33	1.65	27.37	4.55
10:0-10:5	30	14.03	1.88	12.87	1.72	10.93	1.84	26.37	6.15
10:6-10:11	30	14.73	1.51	13.90	1.84	11.77	1.65	28.17	5.38
11:0-11:5	30	14.93	1.86	14.00	1.98	11.30	1.68	29.53	6.19
11:6-11:11	30	14.83	1.60	13.93	1.60	12.27	1.41	31.33	5.19
12:0-12:5	30	14.83	1.78	13.67	2.02	11.67	1.52	31.13	5.78
12:6-12:11	30	15.37	2.81	14.00	2.38	11.87	1.87	30.13	6.08
13:0-13:5	40	15.15	1.92	13.90	2.00	11.85	1.58	33.73	5.00
13:6-13:11	30	14.87	1.72	14.10	1.47	11.53	1.80	34.57	5.88
14:0-14:5	30	15.67	1.47	14.40	1.57	12.03	1.67	33.97	6.58
14:6-14:1.1	30	14.70	1.49	14.33	1.65	12.20	1.61	31.37	7.24
15:0-1.5:5	30	15.57	1.59	14.87	1.50	12.57	1.48	32.20	6.21
15:6-15:11	23	15.09	1.50	14.30	1.61	12.65	1.30	33.04	6.24

(continued)

Table 14-26
Performance of Children on Purdue Pegboard
(One Trial per Subtest)
continued

		Preferred Hand		Nonpreferred Hand		Both Hands		Assembly	
Age	**n**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Girls									
5:0-5:5	30	10.00	1.53	8.50	1.36	6.97	1.25	14.70	2.55
5.6-5.11	30	9.30	1.73	9.13	1.59	6.77	1.28	14.37	4.02
6:0-6:5	30	11.43	1.33	10.23	1.52	8.53	1.46	18.03	3.54
6:6-6:11	30	11.87	1.68	10.47	1.38	8.67	1.79	20.63	4.27
7:0-7:5	30	12.03	1.65	10.47	2.08	8.83	1.80	19.77	4.49
7:6-7:11	30	12.47	1.53	11.50	1.80	9.50	1.70	20.20	4.61
8:0-8:5	30	13.07	1.78	12.03	1.40	10.10	1.81	21.93	4.31
8:6-8:11	30	13.77	1.63	12.30	1.26	10.43	1.59	24.50	5.83
9:0-9:5	30	13.37	1.79	11.83	2.12	9.83	1.62	24.97	6.81
9:6-9:11	30	14.40	1.52	13.03	1.67	11.60	1.65	29.07	6.01
10:0-10:5	30	15.13	1.48	13.2	1.35	11.33	1.42	27.90	5.10
10:6-10:11	30	15.47	1.59	13.63	1.33	12.27	1.46	31.70	6.02
11:0-11:5	30	14.90	1.79	14.00	2.00	11.67	1.63	32.77	5.50
11:6-11:11	30	15.70	1.84	13.83	1.88	12.00	1.82	33.47	7.24
12:0-12:5	30	15.57	1.65	14.20	1.73	12.00	1.23	34.57	5.20
12:6-12:11	30	15.40	1.96	14.07	1.66	12.03	1.65	34.70	7.52
13:0-13:5	40	15.55	1.69	14.15	1.64	12.03	1.44	34.85	5.57
13:6-13:11	37	15.38	1.58	14.09	1.44	12.13	1.31	37.40	5.34
14:0-14:5	30	16.33	1.73	14.93	1.78	12.63	1.61	36.43	6.76
14:6-14:11	30	16.03	1.77	14.83	1.66	12.40	1.94	34.17	6.62
15:0-15:5	28	16.68	1.49	14.89	1.40	12.89	1.64	36.89	7.75
15:6-15:11	31	16.42	1.84	15.29	2.04	12.77	1.45	37.35	8.24

Note: Data were derived from 1,334 normal schoolchildren.

Source: Adapted from Gardner & Broman (1979)

Table 14-27
Performance of Children on Purdue Pegboard: Percentiles

Age	n	10	20	30	40	50	60	70	80	90
Percentiles for Boys: Preferred Hand										
5:0-5:5	30	7.0	8.0	8.0	9.0	9.0	10.0	10.0	11.0	11.0
5:6-5:11	30	8.0	9.0	9.0	10.0	10.0	10.0	11.0	11.8	12.0
6:0-6:5	30	7.1	9.0	9.0	9.0	9.5	10.0	11.0	11.0	11.9
6:6-6.11	30	9.1	10.2	11.0	11.0	12.0	12.0	12.0	13.0	13.0
7:0-7:5	30	9.1	10.2	11.0	11.4	12.0	12.0	12.7	13.0	13.9
7:6-7:11	30	9.0	10.0	11.0	12.0	12.0	12.6	13.0	14.0	14.0
8:0-8:5	30	11.0	12.0	12.0	12.0	13.0	13.0	14.0	14.0	14.0
8:6-8:11	30	11.1	12.0	12.3	13.0	14.0	15.0	15.0	16.0	17.0
9:0-9:5	30	11.0	12.0	12.0	13.0	13.0	14.0	15.0	15.0	15.0
9:6-9:11	30	12.0	12.0	13.0	13.0	14.0	14.6	15.0	15.0	15.9
10:0-10:5	30	11.1	12.2	13.0	14.0	14.0	15.0	15.0	15.8	16.9
10:6-10:11	30	13.0	13.2	14.0	14.0	15.0	15.0	15.0	16.0	17.0
11:0-11:5	30	13.0	13.0	13.0	14.0	14.5	16.0	16.0	16.8	17.0
11:6-11:11	30	13.0	14.0	14.0	14.0	15.0	15.0	15.0	16.8	17.0
12:0-12:5	30	13.0	13.0	14.0	14.0	14.5	15.0	15.7	16.0	17.9
12:6-12:11	30	13.0	13.2	15.0	15.0	15.0	15.0	16.0	17.0	18.9
13:0-13:5	40	12.1	14.0	14.0	15.0	15.0	15.0	16.0	16.8	18.0
13:6-13:11	30	13.0	13.0	14.0	14.4	15.0	15.0	16.0	16.0	17.0
14:0-14:5	30	14.0	14.0	14.3	15.0	16.0	16.0	17.0	17.0	17.9
14:6-14:11	30	13.0	13.0	14.0	14.4	15.0	15.0	15.0	16.0	16.9
15:0-15:5	30	14.0	14.0	14.0	15.0	15.5	16.0	16.7	17.0	18.0
15:6-15:11	23	13.0	14.0	14.0	15.0	15.0	15.0	16.0	17.0	17.0
Percentiles for Boys: Nonpreferred Hand										
5:0-5:5	30	6.1	7.0	8.0	8.0	8.5	9.0	9.0	9.0	10.0
5:6-5:11	30	6.1	8.0	8.0	8.0	9.0	9.6	10.0	10.0	11.0
6:0-6:5	30	6.0	8.0	9.0	9.0	9.0	10.0	10.0	10.0	12.0
6:6-6.11	30	7.1	8.2	9.0	10.0	10.5	11.0	11.7	12.0	13.0
7:0-7:5	30	9.0	10.0	10.0	11.0	11.0	11.0	12.0	12.0	12.9
7:6-7:11	30	9.1	10.0	10.0	11.0	11.0	11.0	12.0	13.0	13.9
8:0-8:5	30	10.0	11.0	11.0	12.0	12.5	13.0	13.0	13.0	14.0
8:6-8:11	30	10.1	11.0	11.0	12.0	12.0	13.0	13.7	14.0	15.9
9:0-9:5	30	10.0	11.0	11.3	12.0	13.0	13.0	13.7	14.0	14.0
9:6-9:11	30	10.0	11.2	12.0	12.0	12.0	13.0	14.0	15.0	16.0
10:0-10:5	30	10.1	12.0	12.0	13.0	13.0	13.6	14.0	14.0	15.0
10:6-10:11	30	11.0	12.2	13.0	13.0	14.0	14.0	15.0	15.8	17.0

(continued)

Table 14-27
Performance of Children on Purdue Pegboard: Percentiles
continued

Age	n	10	20	30	40	50	60	70	80	90
11:0-11:5	30	12.0	13.0	13.0	13.0	13.5	14.0	15.0	15.8	16.9
11:6-11:11	30	11.1	13.0	13.0	14.0	14.0	14.0	15.0	15.0	16.0
12:0-12:5	30	12.0	13.0	13.0	13.0	14.0	14.0	15.0	15.0	16.0
12:6-12:11	30	11.0	12.2	13.0	13.4	14.0	14.0	15.0	16.0	16.9
13:0-13:5	40	11.0	11.2	13.0	14.0	14.0	15.0	15.0	16.0	16.0
13:6-13:11	30	12.0	13.0	13.0	14.0	14.0	14.0	15.0	15.8	16.0
14:0-14:5	30	12.1	13.0	14.0	14.0	14.5	15.0	15.7	16.0	16.0
14:6-14:11	30	11.2	13.2	14.0	14.0	14.5	15.0	15.0	15.8	16.0
15:0-15:5	30	13.0	14.0	14.3	15.0	15.0	15.0	16.0	16.0	16.9
15:6-15:11	23	12.0	13.0	13.0	14.0	15.0	15.0	15.0	16.0	16.6
Percentiles for Boys: Both Hands										
5:0-5:3	30	5.1	6.0	6.0	6.0	7.0	7.0	7.0	8.0	8.0
5:6-5:11	30	5.0	6.0	6.0	6.4	7.0	7.0	8.0	8.0	9.0
6:0-6:5	30	5.0	6.0	6.3	7.0	7.0	7.6	8.0	9.0	9.0
6:6-6.11	30	6.0	7.0	8.0	8.0	8.0	8.6	9.0	9.0	10.9
7:0-7:5	30	7.0	8.0	8.0	8.0	8.0	9.0	10.0	10.0	10.0
7:6-7:11	30	8.0	8.0	8.0	9.0	9.5	10.0	10.7	11.0	12.0
8:0-8:5	30	8.0	8.0	9.0	9.0	10.0	10.0	11.0	11.0	12.0
8:6-8:11	30	9.0	9.2	10.0	10.0	11.0	11.0	12.0	12.8	13.0
9:0-9:5	30	8.1	9.0	10.0	10.0	10.0	11.0	11.0	12.0	12.0
9:6-9:11	30	9.1	10.0	10.0	11.0	11.0	11.6	12.0	13.0	13.9
10:0-10:5	30	9.0	9.0	10.0	10.4	11.0	11.0	11.0	12.8	13.9
10:6-10:11	30	10.0	10.2	11.0	11.0	12.0	12.0	12.0	13.0	14.0
11:0-11:5	30	9.0	10.0	10.3	11.0	11.0	12.0	12.7	13.0	13.0
11:6-11:11	30	11.0	11.0	12.0	12.0	12.0	13.0	13.0	13.8	14.0
12:0-12:5	30	9.1	11.0	11.0	11.0	12.0	12.0	12.0	12.8	14.0
12:6-12:11	30	9.1	10.2	11.0	12.0	12.0	12.6	13.0	13.8	14.0
13:0-13:5	40	9.1	11.0	11.0	11.4	12.0	12.0	13.0	13.0	14.0
13:6-13:11	30	9.1	10.0	11.0	11.0	11.0	12.0	12.0	13.0	14.0
14:0-14:5	30	10.1	11.0	11.0	11.0	12.0	12.0	13.0	14.0	14.0
14:6-14:11	30	10.0	11.0	11.0	12.0	12.0	12.0	13.0	14.0	15.0
15:0-15:5	30	10.1	11.0	12.0	12.0	13.0	13.0	13.0	14.0	14.9
15:6-15:11	23	11.0	11.8	12.0	12.0	13.0	13.0	13.0	14.0	14.0

(continued)

Table 14-27
Performance of Children on Purdue Pegboard: Percentiles
continued

Age	n	10	20	30	40	50	60	70	80	90
Percentiles for Boys: Assembly										
5:0-5:5	30	10.0	11.2	12.0	13.0	14.0	14.6	16.0	16.0	17.9
5:6-5:11	30	10.1	12.2	14.0	15.0	16.0	16.0	17.7	18.0	20.9
6:0-6:5	30	12.1	14.0	15.0	15.0	16.0	16.0	17.0	19.0	20.0
6:6-6.11	30	14.0	16.2	18.0	18.0	19.5	20.6	22.0	22.8	24.0
7:0-7:5	30	12.1	16.0	17.3	18.4	19.0	20.6	21.7	23.0	26.7
7:6-7:11	30	16.0	17.2	18.3	19.4	21.0	22.0	22.7	24.0	25.0
8:0-8:5	30	19.0	20.2	21.0	22.4	23.5	24.0	24.0	26.8	28.9
8:6-8:11	30	18.0	20.0	20.3	23.4	24.0	25.0	27.1	30.0	32.0
9:0-9:5	30	20.0	21.2	23.0	24.0	24.0	26.0	26.0	27.0	28.0
9:6-9:11	30	21.1	24.0	24.3	25.4	26.0	29.2	30.7	31.8	32.0
10:0-10:5	30	19.1	20.2	24.0	25.0	26.0	26.0	28.7	30.0	35.7
10:6-10:11	30	22.0	24.0	25.3	28.4	29.0	30.0	30.0	31.0	33.8
11:0-11:5	30	22.0	22.2	26.0	27.4	28.0	31.0	32.0	34.6	39.9
11:6-11:11	30	25.1	27.0	28.6	30.0	31.0	32.6	33.7	35.0	39.0
12:0-12:5	30	25.0	26.0	27.0	29.0	29.0	32.6	35.4	36.0	40.9
12:6-12:11	30	23.1	25.4	28.0	29.0	30.5	32.2	34.0	35.8	37.0
13:0-13:5	40	27.0	30.0	31.0	32.0	34.0	34.8	36.0	37.0	40.9
13:6-13:11	30	27.1	30.0	30.0	33.0	34.5	35.6	36.7	39.8	43.8
14:0-14:5	30	26.1	29.2	31.0	32.0	34.0	36.0	38.7	40.0	41.0
14:6-14:11	30	23.0	25.2	26.3	29.0	30.5	32.0	34.7	35.8	45.4
15:0-15:5	30	24.0	26.0	28.0	31.4	33.5	35.6	36.0	37.8	39.9
15:6-15:11	23	24.4	26.8	29.4	32.0	33.0	34.4	35.8	39.0	42.0
Percentiles for Girls: Preferred Hand										
5:0-5:5	30	8.0	8.2	9.3	10.0	10.0	10.6	11.0	11.0	12.0
5:6-5:11	30	7.0	8.0	8.0	9.0	9.5	10.0	11.0	11.0	11.0
6:0-6:5	30	9.1	10.2	11.0	11.0	11.5	12.0	12.0	12.0	13.0
6:6-6.11	30	10.1	11.0	11.0	11.0	11.0	12.0	13.0	14.0	14.0
7:0-7:5	30	10.0	11.0	11.0	12.0	12.0	12.6	13.0	13.0	14.9
7:6-7:11	30	10.1	11.0	12.0	12.0	13.0	13.0	13.0	14.0	14.0
8:0-8:5	30	11.0	12.0	12.0	12.4	13.0	13.0	14.0	14.8	15.9
8:6-8:11	30	12.0	12.0	13.0	13.0	14.0	14.0	14.7	15.0	16.9
9:0-9:5	30	10.1	12.0	13.0	13.0	13.0	14.0	14.0	15.0	16.0
9:6-9:11	30	12.0	13.0	14.0	14.0	14.0	15.0	15.0	16.0	16.9
10:0-10:5	30	13.0	14.0	14.0	15.0	15.0	15.0	16.0	16.0	17.9
10:6-10:11	30	13.1	14.0	14.3	15.0	15.5	16.0	16.0	16.8	17.9

(continued)

Table 14-27
Performance of Children on Purdue Pegboard: Percentiles
continued

Age	n	10	20	30	40	50	60	70	80	90
11:0-11:5	30	12.0	13.2	14.0	15.0	15.0	15.0	15.7	16.8	17.0
11:6-11:11	30	14.0	14.0	15.0	15.0	16.0	16.0	17.0	17.0	18.0
12:0-12:5	30	14.0	14.0	14.0	15.0	15.0	16.0	17.0	17.0	17.9
12:6-12:11	30	12.1	13.2	15.0	15.0	16.0	16.0	16.0	17.0	18.0
13:0-13:5	40	14.0	14.0	15.0	15.0	16.0	16.0	16.0	17.0	18.0
13:6-13:11	30	13.3	14.0	14.0	15.0	15.0	15.0	16.0	17.0	18.0
14:0-14:5	30	14.1	15.0	15.0	16.0	16.0	16.0	17.0	17.8	19.0
14:6-14:11	30	14.0	14.0	15.0	15.0	16.0	16.6	17.0	17.0	18.9
15:0-15:5	30	15.0	15.0	16.0	16.0	17.0	17.0	18.0	18.0	19.0
15:6-15:11	23	14.0	15.0	15.6	16.0	16.0	17.0	17.4	18.0	19.0
Percentiles for Girls: Nonpreferred Hand										
5:0-5:5	30	7.0	7.0	8.0	8.0	9.0	9.0	9.0	10.0	10.0
5:6-5:11	30	7.0	7.2	8.0	8.4	9.0	10.0	10.0	11.0	11.0
6:0-6:5	30	8.0	8.2	9.3	10.0	10.0	11.0	11.0	11.8	12.0
6:6-6.11	30	9.0	9.2	10.0	10.0	10.0	11.0	11.0	12.0	12.0
7:0-7:5	30	8.0	9.0	10.0	10.0	11.0	11.0	11.0	12.0	13.0
7:6-7:11	30	9.0	10.0	10.3	11.0	11.0	12.0	13.0	13.0	14.0
8:0-8:5	30	10.0	11.0	11.0	12.0	12.0	12.0	12.7	13.0	14.0
8:6-8:11	30	11.0	11.0	12.0	12.0	12.0	12.6	13.0	13.8	14.0
9:0-9:5	30	9.0	10.0	11.0	11.0	11.5	12.6	13.0	14.0	14.9
9:6-9:11	30	11.0	11.0	12.0	12.0	13.0	13.6	14.0	14.8	15.0
10:0-10:5	30	11.0	12.0	13.0	13.0	13.0	13.6	14.0	14.8	15.0
10:6-10:11	30	11.2	13.0	13.0	13.4	14.0	14.0	14.0	14.8	15.0
11:0-11:5	30	10.2	12.4	14.0	14.0	14.0	15.0	15.0	15.0	16.8
11:6-11:11	30	11.0	12.0	13.0	14.0	14.0	14.0	15.0	15.0	16.0
12:0-12:5	30	12.0	13.0	13.3	14.0	14.0	14.0	15.0	16.0	16.9
12:6-12:11	30	12.0	13.0	13.0	13.0	14.0	14.0	15.0	15.0	16.9
13:0-13:5	40	12.1	13.0	13.0	13.4	14.0	14.0	15.0	16.0	16.0
13:6-13:11	30	12.0	13.0	14.0	14.0	14.0	15.0	15.0	15.0	16.0
14:0-14:5	30	13.0	13.0	14.0	15.0	15.0	15.0	15.7	16.0	17.0
14:6-14:11	30	13.0	13.2	14.0	14.0	15.0	15.0	16.0	16.8	17.0
15:0-15:5	30	12.9	14.0	14.0	14.6	15.0	15.4	16.0	16.0	17.0
15:6-15:11	23	13.0	13.0	14.0	14.0	15.0	16.0	16.4	17.6	18.0

(continued)

Table 14-27
Performance of Children on Purdue Pegboard: Percentiles
continued

Age	n	10	20	30	40	50	60	70	80	90
Percentiles for Girls: Both Hands										
5:0-5:5	30	5.0	6.0	6.0	7.0	7.0	7.6	8.0	8.0	8.0
5:6-5:11	30	5.0	6.0	6.0	6.4	7.0	7.0	7.7	8.0	8.0
6:0-6:5	30	6.1	7.2	8.0	8.0	9.0	9.0	9.0	10.0	10.0
6:6-6:11	30	6.1	8.0	8.0	8.0	8.0	8.6	9.7	10.0	12.0
7:0-7:5	30	6.0	7.2	8.0	9.0	9.0	9.0	10.0	10.8	11.0
7:6-7:11	30	7.0	8.0	9.0	9.0	9.5	10.0	10.7	11.0	11.0
8:0-8:5	30	8.0	8.2	9.0	10.0	10.0	11.0	11.0	11.0	12.0
8:6-8:11	30	8.0	9.0	10.0	10.0	10.5	11.0	11.0	12.0	12.9
9:0-9:5	30	8.0	8.0	9.0	9.4	10.0	10.0	11.0	11.0	12.0
9:6-9:11	30	9.0	10.0	11.0	12.0	12.0	12.0	13.0	13.0	13.0
10:0-10:5	30	10.0	10.0	11.0	11.0	11.0	11.6	12.0	12.0	13.0
10:6-10:11	30	11.0	11.0	11.3	12.0	12.0	12.0	13.0	13.8	14.9
11:0-11:5	30	9.1	10.0	11.0	11.4	12.0	12.0	12.7	13.0	13.0
11:6-11:11	30	9.1	10.2	11.0	11.0	13.0	13.0	13.0	14.0	14.0
12:0-12:5	30	10.0	11.0	12.0	12.0	12.0	12.0	12.0	13.0	14.0
12:6-12:11	30	10.0	10.2	11.0	12.0	12.0	12.0	13.0	13.8	14.0
13:0-13:5	40	10.0	11.0	11.0	12.0	12.0	12.0	13.0	13.0	14.0
13:6-13:11	30	10.3	11.0	11.9	12.0	12.0	12.0	13.0	13.0	13.7
14:0-14:5	30	11.0	11.0	12.0	12.0	12.0	13.0	13.0	14.8	15.0
14:6-14:11	30	9.1	11.0	11.3	12.0	12.0	13.0	13.7	14.0	15.0
15:0-15:5	30	11.0	11.0	12.0	12.0	13.0	13.0	14.0	14.0	16.0
15:6-15:11	23	11.0	11.0	12.0	13.0	13.0	13.0	13.4	14.0	14.0
Percentiles for Girls: Assembly										
5:0-5:5	30	11.1	13.0	13.0	14.0	15.0	15.6	16.0	17.0	18.0
5:6-5:11	30	9.0	11.0	12.3	13.4	14.0	15.6	16.0	17.0	20.0
6:0-6:5	30	14.0	16.0	16.0	16.0	17.0	18.0	20.0	22.0	23.9
6:6-6.11	30	16.0	17.0	18.0	19.0	20.0	21.0	22.7	25.6	27.8
7:0-7:5	30	14.0	15.2	17.0	18.0	19.5	21.6	22.0	24.0	24.9
7:6-7:11	30	14.0	16.0	17.0	18.4	19.5	21.6	23.4	25.8	26.9
8:0-8:5	30	16.0	17.0	20.0	21.0	22.0	23.0	23.0	24.8	28.9
8:6-8:11	30	18.0	19.2	20.3	21.4	23.0	24.6	27.4	31.8	32.0
9:0-9:5	30	18.0	19.0	20.3	22.0	23.5	26.0	29.0	31.8	16.0
9:6-9:11	30	22.1	23.2	26.0	27.0	28.0	31.0	32.0	34.8	37.9
10:0-10:5	30	20.3	23.2	26.0	27.0	28.0	29.0	29.7	30.8	35.8
10:6-10:11	30	24.1	27.0	28.3	29.4	30.5	31.6	35.7	37.8	39.8

(continued)

Table 14-27
Performance of Children on Purdue Pegboard: Percentiles
continued

Age	n	10	20	30	40	50	60	70	80	90
11:0-11:5	30	25.1	28.0	29.3	31.4	32.5	34.0	35.7	37.0	40.9
11:6-11:11	30	22.2	25.4	28.3	31.0	34.5	37.0	39.0	40.0	41.0
12:0-12:5	30	28.0	31.0	32.0	34.0	34.0	34.6	36.7	39.0	43.6
12:6-12:11	30	24.0	28.0	30.3	32.8	35.0	36.0	38.7	41.7	45.7
13:0-13:5	40	27.8	31.2	32.3	33.4	35.0	37.6	38.0	39.0	41.9
13:6-13:11	30	29.5	33.0	34.9	36.4	38.0	38.0	40.0	42.0	44.1
14:0-14:5	30	25.3	30.2	34.0	34.0	36.0	38.0	40.7	43.0	45.9
14:6-14:11	30	27.1	28.2	30.3	32.0	33.0	35.2	37.7	40.8	44.9
15:0-15:5	30	28.7	29.8	31.7	33.6	35.5	38.4	41.3	43.2	50.2
15:6-15:11	23	23.2	29.4	33.0	36.8	39.0	40.0	41.0	43.0	47.8

Note: Data were derived from 1,334 normal schoolchildren

Source: Adapted from Gardner & Broman (1979).

Table 14-28
Performance (Sum of Three Trials) on the Purdue Pegboard in Adolescents, by Age and Gender

	Males			Females		
	N	Mean	SD	N	Mean	SD
14-15 years	26			28		
Right		49.5	4.0		51.6	4.8
Left		46.4	5.0		47.9	5.0
Both		39.5	5.1		40.3	3.6
Assembly		119.7	18.4		114.0	17.0
16-17 years	32			33		
Right		49.6	4.5		52.6	4.4
Left		47.8	4.9		49.4	5.2
Both		40.2	4.0		42.4	4.3
Assembly		119.8	18.2		122.4	18.2
18-19 years	29			28		
Right		49.5	5.4		54.8	5.8
Left		48.0	4.6		51.1	4.1
Both		40.4	4.3		44.3	4.9
Assembly		123.2	15.4		134.5	16.4

Note: Based on a sample of 176 males and females, aged 14-19 years, with no history of neuromuscular or orthopedic dysfunction that could affect finger dexterity.

Source: Adapted from Mathiowetz et al., 1986.

Table 14-29
Mean Performance on Purdue Pegboard in Children, by Age
(One Trial per Hand)

			Right Hand			Left Hand			Both Hands		
Age*	n Male	n Female	M	SD	Range	M	SD	Range	M	SD	Range
2.6-2.11	10	10	4.70	1.08	3-7	4.05	1.15	2-7	2.95	1.28	0-5
3.0-3.5	10	14	5.54	1.62	3-9	5.13	1.42	2-8	3.63	1.53	0-6
3.6-3.11	10	15	6.80	1.26	4-9	6.00	1.38	3-8	4.20	1.23	2-7
4.0-4.5	23	17	8.08	1.49	4-11	6.68	1.25	4-9	5.23	1.44	2-8
4.6-4.11	27	19	9.07	1.58	6-13	8.20	1.56	4-11	6.07	1.20	4-9
5.0-5.5	15	16	10.16	1.77	7-14	9.19	2.02	6-14	6.81	1.76	4-10
5.6-5.11	10	10	9.90	1.59	7-13	9.00	1.26	6-11	6.35	1.69	3-9

Source: From Wilson et al., 1982. Reprinted with the kind permission of Psychology Press.

* Age is Years.Months

Comment

The task is brief and easy to administer. Users should note that administration rules vary among studies with respect to the number of trials (one, two, or three). The most reliable scores result from averaging subtest scores for the three-trial administration of the test. However, norms for such a version are not currently available for all segments of the population.

At a minimum, hand preference, age and gender need to be considered when evaluating test scores. Although normative reports provided here do present data stratified by age and gender, hand preference, and the method of determining handedness, is frequently not reported.

As noted earlier, reliability is better when three trials are given per subtest. Accordingly, clinicians who administer the one-trial test should exercise caution when interpreting changes in scores (Buddenberg & Davis, 2000). Further, right-left differences (or ratios) on the Purdue Pegboard Test are not very reliable. Therefore, asymmetries may have diagnostic value only if differences are also found on other tests (Reddon et al., 1988). In this context it is important to bear in mind that measures of lateral preference are imperfect indicators of performance asymmetry.

The Purdue Pegboard Test has proved useful in the assessment of motor deficits in both adults and children. It is perhaps not only because the task taps motor ability but also because it is demanding of cognitive speed and attentional control that it makes a useful predictor of functioning in daily life.

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Securing Faceplate

The Model 32020A Purdue Pegboard utilizes a series of plastic knobs on each end of the faceplate in order to secure the pins, collars, and washers for storage. Simply align the faceplate in the track and slide the faceplate until the knobs are snug together to secure the storage area. Figure 1 shows the faceplate in the track with the knobs separated while Figure 2 is a close up of the 3 knobs fitted snugly together to provide a secure hold on the faceplate.

Figure 1

Figure 2

Terms and Conditions

LIC Worldwide Headquarters
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Phone, Fax, Email or Mail-in Orders
All orders need to be accompanied by a hard copy of your purchase order. All orders must include the following information:

- Quantity
- Part Number
- Description
- Your purchase order number or method of pre-payment
- Your tax status (include tax-exempt numbers)
- Shipping address for this order
- Billing address for the invoice we'll mail when this order is shipped
- Signature and typed name of person authorized to order these products
- Your telephone number
- Your email address
- Your FAX number

Domestic Terms
There is a $50 minimum order. Open accounts can be extended to most recognized businesses. Net amount due 30 days from the date of shipment unless otherwise specified by us. Enclose payment with the order; charge with VISA, MasterCard, American Express, or pay COD. We must have a hard copy of your purchase order by mail, E-mail or fax. Students, individuals and private companies may call for a credit application.

International Payment Information
There is a $50 minimum order. Payment must be made in advance by: draft drawn on a major US bank; wire transfers to our account; charge with VISA, MasterCard, American Express, or confirmed irrevocable letter of credit. Proforma invoices will be provided upon request.

Exports
If ordering instrumentation for use outside the USA, please specify the country of ultimate destination, as well as the power requirements (110V/60Hz or 220V/50Hz). Some model numbers for 220V/50Hz will have a "*C" suffix.

Quotations
Quotations are supplied upon request. Written quotations will include the price of goods, cost of shipping and handling, if requested, and estimated delivery time frame. Quotations are good for 30 days, unless otherwise noted. Following that time, prices are subject to change and will be re-quoted at your request.

Cancellations
Orders for custom products, custom assemblies or instruments built to customer specifications will be subject to a cancellation penalty of 100%. Payment for up to 100% of the invoice value of custom products may be required in advance. Cancellation for a standard Lafayette Instrument manufactured product once the product has been shipped will normally be assessed a charge of 25% of the invoice value, plus shipping charges. Resell items, like custom products, will be subject to a cancellation penalty of 100%.

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Please see the cancellation penalty as described above. No item may be returned without prior authorization of Lafayette Instrument Company and a Return Goods Authorization (RGA#) number which must be affixed to the shipping label of the returned goods. The merchandise should be packed well, insured for the full value and returned along with a cover letter explaining the reason for return. Unopened merchandise may be returned prepaid within thirty (30) days after receipt of the item and in the original shipping carton. Collect shipments will not be accepted. Product must be returned in saleable condition, and credit is subject to inspection of the merchandise.

Repairs
Instrumentation may not be returned without first receiving a Return Goods Authorization Number (RGA). When returning instrumentation for service, please call Lafayette Instrument to receive a RGA number. Your RGA number will be good for 30 days. Address the shipment to:

Lafayette Instrument Company
3700 Sagamore Parkway North
Lafayette, IN 47904, USA.

Shipments cannot be received at the PO Box. The items should be packed well, insured for full value, and returned along with a cover letter explaining the malfunction. An estimate of repair will be given prior to completion ONLY if requested in your enclosed cover letter. We must have a hard copy of your purchase order by mail or fax, or repair work cannot commence for non-warranty repairs.

Damaged Goods
Damaged instrumentation should not be returned to Lafayette Instrument prior to a thorough inspection. If a shipment arrives damaged, note damage on delivery bill and have the driver sign it to acknowledge the damage. Contact the delivery service, and they will file an insurance claim. If damage is not detected at the time of delivery, contact the carrier/shipper and request an inspection within 10 days of the original delivery. Please call the Lafayette Instrument Customer Service Department for repair or replacement of the damaged merchandise.

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Lafayette Instrument Company warrants equipment manufactured by the company to be free of defects in material and workmanship for a period of one year from the date of shipment, except as provided hereinafter. The original manufacturer's warranty will be honored by Lafayette Instrument for items not manufactured by Lafayette Instrument Company, i.e. resell items. This assumes normal usage under commonly accepted operating parameters and excludes consumable products.

Warranty period for repairs or used instrumentation purchased from Lafayette Instrument is 90 days. Lafayette Instrument Company agrees either to repair or replace, at its sole option and free of part charges to the customer, instrumentation which, under proper and normal conditions of use, proves to be defective within the warranty period. Warranty for any parts of such repaired or replaced instrumentation shall be covered under the same limited warranty and shall have a warranty period of 90 days from the date of shipment or the remainder of the original warranty period whichever is greater. This warranty and remedy are given expressly and in lieu of all other warranties, expressed or implied, of merchantability or fitness for a particular purpose and constitutes the only warranty made by Lafayette Instrument Company.

Lafayette Instrument Company neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, service or use of its instrumentation. Lafayette Instrument Company shall have no liability whatsoever for special, consequential, or punitive damages of any kind from any cause arising out of the sale, installation, service or use of its instrumentation. All products manufactured by Lafayette Instrument Company are tested and inspected prior to shipment. Upon prompt notification by the Customer, Lafayette Instrument Company will correct any defect in warranted equipment of its manufacture either, at its option, by return of the item to the factory, or shipment of a repaired or replacement part. Lafayette Instrument Company will not be obliged, however, to replace or repair any piece of equipment, which has been abused, improperly installed, altered, damaged, or repaired by others. Defects in equipment do not include decomposition, wear, or damage by chemical action or corrosion, or damage incurred during shipment.

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1. In the case of instruments not of Lafayette Instrument Company manufacture, the original manufacturer's warranty applies.
2. Shipping charges under warranty are covered only in one direction. The customer is responsible for shipping charges to the factory if return of the part is required.
3. This warranty does not cover damage to components due to improper installation by the customer.
4. Consumable and or expendable items, including but not limited to electrodes, lights, batteries, fuses, O-rings, gaskets, and tubing, are excluded from warranty.
7. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
8. If the original invoice for the instrument is issued to a company that is not the company of the end user, and not an authorized Lafayette Instrument Company distributor, then all requests for warranty must be processed through the company that sold the product to the end user, and not directly to Lafayette Instrument Company.

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