# Table of Contents

## Introduction
- The Miller Analogies Test ................................................................. 5
- The Psychological Corporation ........................................................ 5

## Fees and Special Services
- Test Fee ........................................................................................... 7
- Optional Fees .................................................................................. 7

## Applying to Take the Miller Analogies Test
- Applying to a Controlled Testing Center ........................................... 8
- Requesting an Alternative Testing Site .............................................. 8
- Applying to Retake the MAT ............................................................ 10
- Requesting Special Testing Accommodations .................................. 11

## Taking the Miller Analogies Test
- Testing Center Guidelines and Procedures ........................................ 12
- Specifying Score Recipients .............................................................. 13
- The No Score Option ....................................................................... 14

## Scoring and Score Reporting
- Scoring Your Test ............................................................................ 14
- Reporting Your Test Results .............................................................. 15
- Your Personal Score Report .............................................................. 15
- Official Score Reports ...................................................................... 16
- Handscoring .................................................................................... 17
- Replacement Score Reports ............................................................. 17
- Transcript Service ........................................................................... 17
- Cancellation of Scores by The Psychological Corporation ................ 19

## The Miller Analogies Test
- The MAT Analogy ........................................................................... 21
- Solving MAT Analogies ................................................................. 22
- Types of Relationships in MAT Analogies ....................................... 23
- The Content of MAT Analogies ...................................................... 28
- Test-taking Strategies for the MAT .................................................. 31

## Sample Analogies and Annotated Answers
- Sample Analogies ........................................................................... 34
- Annotated Answers ......................................................................... 36

## Appendix A—Controlled Testing Centers of The Psychological Corporation .......................... 40
## Appendix B—Accommodation Request Form .................................................. 45
## Appendix C—Sample Personal Score Report/Interpreting the Personal Score Report ........... 46
## Appendix D—Raw-Score-to-Percentile Chart ............................................. 48
Introduction

This Candidate Information Booklet contains complete information about the Miller Analogies Test (MAT). In it you will find information about how to apply to take the test, about the contents of the test, and about what happens after you have taken the test. You will also find strategies for taking the MAT and actual sample items.

Read this booklet carefully. If you feel that you would like to call or write The Psychological Corporation with questions, please read this booklet carefully before doing so because many of your questions are undoubtedly answered here.

Keep this booklet for reference. It contains information you will need both after you apply for the test and after you take the test. The information in this booklet applies to both paper-and-pencil and computer-delivered versions of the MAT.

It is critical that you understand and strictly adhere to all procedures and deadlines described in this booklet.

The Miller Analogies Test

There are several equivalent forms of the MAT administered in paper-and-pencil versions that are administered through a network of Controlled Testing Centers (CTCs) licensed by The Psychological Corporation to administer the MAT. The Psychological Corporation has rigorous procedures that all CTCs must follow to administer the MAT. However, each CTC establishes its own testing schedule, application process, and fees.

Candidates apply directly to a specific CTC to take the MAT. While The Psychological Corporation does all the scoring and reporting of scores for the MAT, the CTCs are responsible for administering the MAT.

The Psychological Corporation

Founded in 1921, The Psychological Corporation is the oldest commercial test publisher in the nation and is an acknowledged leader in the test development and publishing industry. The Psychological Corporation is a subsidiary of Harcourt General, one of the world’s leading educational publishers.

The Psychological Corporation develops and publishes tests for use by college and graduate school admissions offices. It also develops and publishes tests and other materials for use in higher education, clinical psychology, and guidance and counseling services.

Feel free to contact The Psychological Corporation if you have any questions that are not answered by this booklet at 1-800-622-3231.
Information about the *Miller Analogies Test* can also be found at The Psychological Corporation’s website:

www.milleranalogies.com
Fees and Special Services

Test Fee
The fee that you pay for taking the MAT is paid directly to the same Controlled Testing Center (CTC) where you apply to take the MAT. The CTC will tell you what its test fee is and how you should pay it. This test fee covers one personal Score Report that will be mailed to you and official score reports that will be sent to up to three schools specified by you when you take the MAT. (See the section of this booklet “Scoring and Score Reporting,” pages 15–20, for a full explanation of score reporting.)

Optional Fees
Any additional services that you would like beyond the personal Score Report and the three official score reports are optional and will require additional fees. Any additional fees are paid directly to The Psychological Corporation and must be in the form of a money order payable to The Psychological Corporation. If you are paying from outside the United States, you must submit an international money order payable in U.S. dollars. The following fees are required for the following services:

■ Domestic Alternative Testing Site Fee—$75.00 (See the explanation in the section “Requesting an Alternative Testing Site,” pages 8–9.)

■ Foreign Alternative Testing Site Fee—$100.00 (See the explanation in the section “Requesting an Alternative Testing Site,” pages 8–9.)

■ Replacement Retest Admission Ticket Fee—$14.00 (See the explanation in the section “Applying to Retake the MAT,” page 10.)

■ Transcript Fee—$21.00 per transcript (See the explanation in the section “Transcript Service,” page 17.)

■ Handscoring Fee—$14.00 (See the explanation in the section “Handscoring,” pages 17–18.)

Send additional fee payments to The Psychological Corporation at one of the following addresses.

• If by regular mail:
The Psychological Corporation
Miller Analogies Test
P.O. Box 98215
Chicago, IL 60693

• If by overnight courier service:
The Psychological Corporation
c/o Bank of America
98215 Collections Center Drive
Chicago, IL 60693
Applying to Take the *Miller Analogies Test*

**Applying to a Controlled Testing Center**

To take the MAT at one of the more than 600 Controlled Testing Centers (CTCs) in the United States, Canada, or overseas, you will apply directly to the Controlled Testing Center of your choice.

The locations and phone numbers of all the current CTCs are listed in Appendix A—Controlled Testing Centers of The Psychological Corporation (pages 40–44). Once you determine where you wish to take the MAT, contact that CTC for instructions concerning how to apply to take the MAT and about its fee requirement. The MAT fees vary from CTC to CTC. If you are unable to reach a CTC at the number listed in this booklet, please contact directory assistance for the phone number of the institution where the CTC is located.

There are no nationally scheduled test administrations for the MAT. Each CTC determines its own test schedule and test fees. When you contact a CTC, you will be told if there are any special procedures that you must follow beyond those described in this booklet.

If you are making arrangements to retake the MAT, inform your CTC that you have taken the test before. (See the section in this booklet “Applying to Retake the MAT,” page 10, for more information.)

**Requesting an Alternative Testing Site**

If you live more than 100 miles from a CTC, you may request to take the MAT at an alternative testing site by writing to The Psychological Corporation. (See page 7 for the address.)

An examiner for an alternative testing site must be an individual willing to administer the MAT who has at least a master’s degree (but preferably a doctorate) and has had experience administering a standardized test. This could be a private individual or a person who holds one of the following positions:

- A faculty member or administrator at a university, college, or school
- A U.S. Embassy administrator or consulate
- A Dantes TCO
After making your arrangements with an examiner, you must again write to The Psychological Corporation to explain the arrangements you have made and to pay the alternative testing site fee. (See page 6 for the address and page 7 for the fee information.) In this letter to The Psychological Corporation, you must provide the following information:

- Your name, address, and Social Security number (American) or Social Insurance number (Canadian)
- Your daytime telephone number
- The name and address of the MAT examiner you have made arrangements with
- The tentative test date that you and your examiner have agreed upon
- A money order for the alternative testing site fee made payable to The Psychological Corporation and displaying your name

If you are writing from outside the United States, you must submit an international money order payable in U.S. dollars. The alternative testing site fee is nonrefundable.

The examiner with whom you arrange to take the MAT must also notify The Psychological Corporation in a letter that states the following:

- An agreement to administer the MAT to you (by name)
- A brief resume stating the examiner’s educational background and any standardized tests the examiner has administered
- A street address to which the testing materials can be sent
- A phone number (and fax number if available) where the examiner can be reached in case The Psychological Corporation has questions regarding the information provided
- The tentative date on which the test is to be administered

Only after The Psychological Corporation has received the letters from you (with the alternative testing site fee payment) and from the examiner will the testing materials be mailed to the examiner. Since the time it takes for the testing materials to be shipped and received may vary, you should stay in touch with the examiner so you can take the MAT as soon as possible after he or she receives these materials. The examiner will only be able to keep the testing materials for a limited time before returning them to The Psychological Corporation.

Alternative testing sites ordinarily charge an additional fee to cover shipping and other expenses involved in administering the MAT. This fee is paid directly to your examiner and is in addition to the alternative testing site fee that you pay to The Psychological Corporation.
Applying to Retake the MAT

After taking the MAT, you will receive both a personal Score Report and a Retest Admission Ticket. The Retest Admission Ticket indicates your MAT testing history. If you go to a CTC to retake the MAT after taking it on one or more previous occasions, you will be assigned a form of the MAT that is determined by the test administrator.

If an examinee retaking the MAT is administered the same form more than once in a twelve-month period, the retest score will be voided and will not be reported to the examinee or to any recipient schools. For this reason, it is necessary for you to present your Retest Admission Ticket when applying to retake the MAT at a CTC and to inform the CTC that you have taken the MAT within the previous 12 months.

Failure to present your Retest Admission Ticket may result in your retest score being voided.

If you need to retake the MAT but have lost your Retest Admission Ticket, you must write to The Psychological Corporation to request a replacement. (See page 7 for the address.) The letter requesting a replacement Retest Admission Ticket must include the following information:

■ Your name, address, and Social Security number (American) or Social Insurance number (Canadian)
■ Your daytime telephone number
■ The approximate date that you most recently took the MAT
■ A previous name, if your name has changed since the last time that you took the MAT
■ A money order for the $14.00 replacement retest admission fee made payable to The Psychological Corporation and displaying your name

If you are writing from outside the United States, you must submit an international money order payable in U.S. dollars. The replacement Retest Admission Ticket fee is nonrefundable.
Requesting Special Testing Accommodations

Most CTCs are able to administer the MAT to candidates requiring special accommodations. It is important that you notify your chosen CTC of your needs several weeks before your desired test date. If your needs are such that you will require extra time or assistance to take the MAT, you will be given a nonstandard administration.

Complete the *Accommodations Request Form*, found in Appendix B on page 46, and give this form to the CTC administrator where you wish to take the MAT. To qualify for a nonstandard administration, you must also provide your CTC with a current letter from a licensed physician, optometrist, social worker, or psychologist (including this person’s title, address, and telephone number). This letter must be written on the person’s letterhead and must explain the nature of your disability as it applies to taking a multiple-choice, standardized test and must describe the specific testing accommodations that you will need. Your CTC will need to consider this letter before testing arrangements are made and will inform you when you are to report for testing.

Braille and large-print editions of the MAT are available for examinees with visual impairments and, if necessary, a reader will be provided by the CTC.

If you have any questions, call The Psychological Corporation for assistance.
Taking the *Miller Analogies Test*

**Testing Center Guidelines and Procedures**

When you report to the Controlled Testing Center (CTC) to take the *Miller Analogies Test* (MAT), there are a few guidelines that you should be prepared to observe and a few things that you should know to expect.

- Be sure to arrive at the CTC on time. Testing will begin promptly, and latecomers (arriving after the test has begun) will not be admitted.

- If you will be retaking the MAT, be sure to follow the instructions in the section of this booklet “Applying to Retake the MAT.” (See page 10.)

- Take with you several sharpened number 2 pencils (also called HB pencils) with erasers. For accurate scoring of your answer document, only number 2 (or HB) pencils can be used. You **cannot** use mechanical pencils or felt-tip, ballpoint, or other ink pens.

- Also, take with you two forms of identification: one must be a government-issued photo ID (such as a driver’s license or passport) or a school-issued photo ID with a signature; the second can be another form of identification, such as a Social Security card or a birth certificate. You will be required to present both forms of ID before being admitted for testing. A credit card photo will **not** be considered an acceptable form of identification.

- You may **not** take calculators (including watch calculators), books (including dictionaries), papers, or any reference materials into the testing room.

- No food or beverages may be taken into the testing room.

- Visitors are not allowed in the testing room.

- It is extremely important that you carefully follow all the directions given to you at the CTC. Listen carefully to all the instructions given by the examiner, and follow these directions completely. **You are responsible for providing the information asked for on your answer document according to the instructions you will be given when you take the MAT. If you give incomplete or inaccurate information, the reporting of your test results may be affected.**

- You will be asked to enter your Social Security number (American) or Social Insurance number (Canadian) on your answer document. **Failure to provide this number (if you have one) can delay the processing of your scores.**

- Be sure to sign your answer document. **Unsigned answer documents will result in your score reports being held.** If you do not sign your answer document, The Psychological Corporation will send you a form requiring your signature to authorize the release of your score. As soon as you sign and return this form, your score reports will be mailed to you and to the recipient schools that you listed on your answer document.
You may not ask any questions after the test begins, so be sure to ask any questions that you have before the test starts.

There will be no rest break during the test.

No one will be permitted to leave the testing room until the scheduled end of the test (except in the case of a medical or other emergency).

Any examinee who gives or receives assistance during the test will be required to immediately turn in all the test materials and leave the room. Such an examinee’s test will not be scored, and his or her fees will not be refunded.

Specifying Score Recipients

Score recipients are those schools and other institutions that you designate to receive official reports or transcripts of your MAT score. Official reports will only be sent to accredited institutions of higher education and approved fellowship or scholarship organizations.

If you are applying to an educational institution that requires or accepts MAT scores as part of its admission or financial aid process, you will want to request that your score be sent there. Similarly, if the MAT is required or accepted as part of the application process for a fellowship or scholarship, you will want your score reported in support of your application.

As a general rule, it is reasonable to assume that admissions offices and counseling departments in educational institutions that require or accept MAT scores have staff members who are qualified to interpret MAT scores.

Specifying Score Recipients When You Take the MAT—Your test fee includes a personal Score Report that will be sent to you and up to three official score reports sent to recipients specified when you take the MAT. You are not required to specify any score recipient when you take the MAT. However, your test fee pays for the reporting of your score only to score recipients that you specify when you take the MAT.

You may specify no more than three score recipients when you take the MAT. You will not be able to request that your score be reported to additional score recipients until after you have taken the MAT. If you decide after taking the MAT that you wish to have an official score report sent to an institution, you must send a written request to The Psychological Corporation and pay an additional transcript fee for each one requested. (See page 6 for the address, page 7 for the fee, and pages 17–18 for a description of this process.)

Selecting Score Recipient Codes—On your answer document you will specify up to three score recipients by entering code numbers from a list that will be distributed before the test begins. Failure to properly complete this section may cause your scores to be reported to the wrong school or not at all. In addition, if you indicate a school code incorrectly at the time of the test, you will later be required to pay a transcript fee to have an official report sent to that score recipient. Under no circumstances will you be able to change or delete a recipient school code after the examination has been completed.
The Psychological Corporation periodically uses MAT data for research purposes, such as investigating trends and creating new MAT test forms. It is possible that your MAT demographic and score information will be used for research purposes.
Scoring and Score Reporting

Scoring Your Test
Your answers to the items on the Miller Analogies Test (MAT) are scored electronically, and the data are stored on computer files from which score reports are printed. The Psychological Corporation understands the importance of your test results and uses many quality control procedures, both computerized and manual, during and after the scoring process to ensure the accuracy of scores.

Because of the need to maintain test security, test booklets are not made available for review, and The Psychological Corporation does not provide a list of the questions you answered incorrectly or correctly.

Reporting Your Test Results
After you take the MAT, your answer document will be mailed to The Psychological Corporation for scoring and score reporting.

Considering the transit time from the Controlled Testing Center (CTC) to The Psychological Corporation. You can reasonably expect that your score reports will be received 10 to 15 business days from the date of receipt. The high volume of mail during holiday seasons may delay the delivery of score reports during that time of year. The Psychological Corporation is not responsible for lost, misdirected, or delayed mail.

Occasionally, The Psychological Corporation must cancel the scores of an examinee. In such cases, the examinee does not receive a personal Score Report, and the examinee’s designated score recipients do not receive official score reports. Instead, the examinee receives an official letter from The Psychological Corporation stating the circumstances and offering the opportunity to retest at no charge. (See page 19 for more information about this situation.)

Your Personal Score Report
After you take the MAT, you will be sent a personal Score Report, a Transcript Request Form for requesting additional official score reports, and a Retest Admission Ticket that you must use to gain admittance to retake the MAT (See the information on pages 15–16, 17–18, and 10 respectively.)

Three MAT scores will appear on your personal Score Report: your raw score, your percentile based on the intended major you indicated, and your percentile based on the general population of MAT examinees (the total group percentile). A sample personal Score Report appears in Appendix C on pages 46–47 of this booklet, along with information about how to interpret the Score Report.

The personal Score Report is for your information only and cannot be used as a substitute for an official score report or a transcript. Examinees are never sent official score reports.
Your personal *Score Report* will list the following information:

- **Personal Information**—Your name, address, and Social Security number (American) or Social Insurance number (Canadian), exactly as you have indicated them on your answer document.

- **Raw Score**—The total number correct.

- **Percentile for Intended Major**—Your percentile rank for the intended area of study that you indicate when you take the MAT. (See Appendix C, pages 46–47, for an explanation of percentile ranks, and see Appendix D, page 48, for a chart showing raw scores and corresponding percentiles for a number of areas of study.)

- **Percentile for Total Group**—Your total-group percentile rank, relative to the general population of MAT examinees.

- **Score Recipients**—The schools and other institutions that will receive official score reports for your MAT performance, indicated by you on the answer document when you take the MAT.

There is no passing raw score or percentile established or recommended by The Psychological Corporation for the MAT. Score recipient schools and institutions have their own standards, and these standards vary widely. A score interpreted as “high” by one institution may be seen as “average” by another. In addition, the weight that score recipient schools place on MAT scores varies from institution to institution. A MAT score is only one of a number of factors used to select candidates for admission to graduate school programs.

**Official Score Reports**

Official score reports will be sent to the score recipients you specify when you take the MAT. Official score reports will list the following information:

- Your name, address, Social Security number (American) or Social Insurance number (Canadian), date of birth, and intended major exactly as you state them on your answer document

- The date on which you have taken the MAT

- Your raw score

- Your percentile score based on the current normative data of the general population of MAT examinees

- Your percentile score based on the current normative data for your intended major as indicated on your answer document or computerized registration form

- Any other MAT scores you have earned during the previous five years (Scores more than five years old will **not** be reported.)
Handscoring

After you receive your personal Score Report, you may request that your raw score be verified by handscoring. There is a $14.00 fee for this service. However, the scoring methods used by The Psychological Corporation are highly reliable and accurate, and handscoring rarely results in a score change.

To have your score verified by handscoring, write to The Psychological Corporation, and include a money order for $14.00. (See page 6 for the address.) Your money order must be made out to The Psychological Corporation and must display your name. Your letter must specify the date you took the MAT, the location at which you took it, and your complete name, address, and Social Security number (American) or Social Insurance number (Canadian), if you have one. Requests for handscoring must be received by The Psychological Corporation within 60 days of your test date.

Replacement Score Reports

If you do not receive your personal Score Report by four weeks after the date on which you test, or if you receive a damaged Score Report, The Psychological Corporation will replace it at no cost to you. Replacement score reports will not list any score recipients.

If a designated score recipient does not receive an official score report by four weeks after the date you tested, The Psychological Corporation will provide a replacement score report at no cost to you, providing that you specified the proper score recipient code when you took the MAT.

If you do not enter the proper recipient code on your answer document. You will be required to submit a Transcript Request Form (which is included with your personal Score Report) along with the transcript fee of $21.00.

Written requests for replacement score reports must be received by The Psychological Corporation no later than six weeks after your test date. Requests for replacement score reports received more than six weeks after your test date must include the transcript fee of $21.00 for each replacement score report requested.

Transcript Service

For five years after your MAT test date, you may have transcripts of your MAT score sent to additional score recipients. Scores more than five years old will not be reported. After you take the MAT, you can have your score reported to score recipient schools and other institutions by using the Transcript Request Form that you will receive with your personal Score Report or by submitting a letter to The Psychological Corporation. (See page 6 for the address.) Only requests submitted in writing will be accepted.
If you do not use the Transcript Request Form to request additional official score reports, your letter to The Psychological Corporation must specify that you are requesting a transcript of your MAT score and must include the following information:

- Your name as you gave it when you took the MAT and your current address (If your name has changed, also give your current name.)
- Your daytime telephone number
- Your Social Security number (American) or Social Insurance number (Canadian), if you have one
- The date of your request
- The place and approximate date on which you took the MAT
- The complete address or addresses to which you want your score reported
- Your signature

With your Transcript Request Form or your letter, you must include a money order for the transcript fee of $21.00 per transcript. The money order must be payable to The Psychological Corporation and must display your name. If you are submitting your request from outside the United States, you must submit an international money order payable in U.S. dollars.

Within five business days of receiving your transcript request, The Psychological Corporation will send a transcript to your designated score recipient. Transcripts are sent by first class mail. The transcripts that you request will list the following information:

- Your name, address, Social Security number (American) or Social Insurance number (Canadian), date of birth, and intended major exactly as you stated them on your answer document
- The date on which you took the MAT
- Your raw score
- Your percentile based on the current normative data of the general population of MAT examinees
- Your percentile based on the current normative data for your intended major as indicated on your answer document
- Any other MAT scores you earned during the five years preceding the date of your latest test date

If a score recipient for whom you requested a transcript has not received the transcript by three weeks after your request, The Psychological Corporation will provide a replacement transcript at no cost to you.
Cancellation of Scores by The Psychological Corporation

The Psychological Corporation is responsible for reporting scores that accurately reflect the performance of examinees. For this reason, The Psychological Corporation adheres to test administration and security standards that require the review of all MAT scores and administrative conditions.

The Psychological Corporation reserves the right to cancel any score believed to be obtained in a questionable manner. In the event that a score is canceled, the examinee will be notified in writing and will be given the opportunity to provide additional information about the situation. The examinee will also be given the option to retest to verify the score at no additional charge. The Psychological Corporation will make no reimbursements for any expenses incurred by an examinee whose score is canceled. All score cancellations are held in strict confidence, with the reason for the cancellation disclosed only to the examinee. Possible reasons for a score cancellation include the following:

- **No Retest Admission Ticket**—The examinee did not submit the most recent Retest Admission Ticket to the Controlled Testing Center where the MAT was taken.

- **MAT Form Repetition**—The examinee took the same form of the MAT more than once within a 12-month period.

- **Administrative Irregularity**—An administrative irregularity occurred at the Controlled Testing Center where the MAT was taken.

- **Questionable Score Gain**—This situation applied only to examinees who retake the MAT after taking it on one or more previous occasions. If an examinee’s score seems questionable when compared to MAT scores obtained previously by the examinee, the score may be invalidated. The following policy is followed by The Psychological Corporation in determining when a score gain is considered questionable and thus invalid:

  1. If an examinee’s second (or most recent) test score is 25 points or more greater than the first (or most recent previous) score, the second score is invalidated. The examinee is notified that his or her score has been invalidated, and the examinee is allowed to retake the MAT at no cost to verify that the increase on the second score is accurate.

  2. If the raw score on the free retest (a third test score) after an excessive score gain (a 25 point difference between the first and second tests) is within 14 points above or below the second score, the second score is validated and will be released.

  3. If the raw score on the free retest (the third test score) after an excessive score gain (a 25 point difference between the first and second tests) is more than 14 points above or below the second score, the second score is invalidated and will not be released.
The invalidation of an examinee’s MAT score as a result of this policy in no way suggests that cheating or any other inappropriate action has occurred. A score invalidation is a technicality that may be an inconvenience for both the examinee and The Psychological Corporation, but it is necessary in order to maintain the integrity of the test and to assure that MAT scores are as accurate and as reflective of each examinee’s ability as possible.

An exception to this score-gain policy can be made only if a recipient school needs a MAT score before an examinee has time to retake the test after a score gain invalidation (more than 14 point difference between second and third tests). In this exceptional case, the third score can be released if it is within 14 points above or below the first score. This arrangement must be made individually by contacting The Psychological Corporation. (See page 6.)
The **Miller Analogies Test**

The *Miller Analogies Test* (MAT) is a high-level analytic ability test requiring the solution of problems stated as analogies. Most of the analogies on the MAT are verbal analogies, and a few are quantitative. The test consists of 100 partial analogies that are to be completed in 50 minutes.

The MAT is intended to assess your ability to recognize relationships between ideas, your fluency in the English language, and your general knowledge of literature, philosophy, history, science, mathematics, and fine arts. There is no foreign-language edition of the MAT. You are not permitted to use a dictionary or any other reference aid when taking the MAT.

**The MAT Analogy**

An analogy is a statement suggesting that two things are related to each other in the same way that two other things are related to each other. The MAT analogy items are written as equations in the form “A : B :: C : D,” which can be read as “A is to B as C is to D” or as “A is related to B in the same way that C is related to D.”

In each MAT analogy item, one term in the analogy is missing and has been replaced with four options, only one of which correctly completes the analogy. The terms in most of the MAT analogy items are words, but in some cases they may be numbers or symbols. An example of a MAT analogy is as follows:

**PLANE : AIR :: BOAT :** (a. submarine, b. fish, c. water, d. pilot)

The first step in solving a MAT analogy is to decide which two of the three given terms form a complete pair. On the MAT, this could either be “PLANE is related to AIR” (the first term is related to the second term) or “PLANE is related to BOAT” (the first term is related to the third term). On the MAT, it will never be “PLANE is related to (a. submarine, b. fish, c. water, d. pilot)”; the first term is never related to the fourth term:

```
\[ \text{PLANE : AIR :: BOAT : (a. submarine, b. fish, c. water, d. pilot)} \]
```

Even though there is an obvious relationship between a **PLANE** and a **BOAT**—they are both vehicles—this analogy makes sense only when the complete pair is seen as “**PLANE** is related to **AIR**.” This is because the solution to a MAT analogy item requires that you select the option (a, b, c, or d) that forms a second pair of terms that are in the same relationship to each other as the terms in the complete pair. In this example, none of the available options form a second pair of terms if the analogy is seen as a relationship between two vehicles—**AIR** is definitely not a vehicle. However, when the complete pair is seen as “**PLANE** travels on **AIR**,” the second pair, and the correct answer, becomes obvious as “**BOAT** travels on (c. water)”:

```
\[ \text{PLANE : AIR :: BOAT : (a. submarine, b. fish, c. water, d. pilot)} \]
```
The missing term in a MAT analogy—the term represented by the four answer options—could be in any one of the four positions. All of the possible formats for MAT analogies are represented in the following examples:

- **SALT : HYPERTENSION :: SUGAR : (a. cholesterol, b. carbohydrates, c. hyperthyroidism, d. diabetes)**
  
  **Solution**—The answer is “d. diabetes”; salt contributes to or aggravates the symptoms of hypertension, and sugar does the same for diabetes.

- **SEEK : FIND :: (a. locate, b. book, c. retrieve, d. listen) : HEAR**
  
  **Solution**—The answer is “d. listen”; one seeks something in order to find it, and one listens to something in order to hear it.

- **INDUCTION : (a. confirmation, b. graduation, c. ordination, d. resistance) :: SOLDIER : PRIEST**
  
  **Solution**—The answer is “c. ordination”; induction is the ceremony for becoming a soldier, and ordination is the ceremony for becoming a priest.

- **(a. cure, b. epidemic, c. immunity, d. patient) : SHADE :: INOCULATION : PARASOL**
  
  **Solution**—The answer is “c. immunity”; a parasol produces shade, and an inoculation produces immunity.

Notice in these examples that the relationships between the two pairs of terms may be either “A is to B as C is to D” or “A is to C as B is to D.” However, remember that a MAT analogy will never be “A is to D as B is to C.” Regardless of how the terms in a MAT analogy are presented, there is only one valid and logical relationship that exists between each pair of terms.

**Solving MAT Analogies**

There are four basic steps in solving a MAT analogy:

- First, read the three given terms in the analogy carefully.
- Next, determine the relationship between two of the terms that seems to form the most logical complete pair. Remember that the order of the terms may vary.
- Then look at the remaining given term, and think of another term that would have the same kind of relationship to it as do the two terms in the complete pair. Do this without looking at the answer options yet.
- Finally, examine the answer choices, and select the option that most closely resembles your idea of a term that would form a second pair.

However, if none of the answer choices seems to form an analogy, rethink the two given terms that you first identified as forming the complete pair. You may find that the relationship you first identified is not the relationship that forms an analogy, in which case you would then repeat these four steps to arrive at an acceptable answer.
For example, consider the following:

\[ \text{PINT} : (a. \text{ cup, b. quart, c. liter, d. gallon}) :: 1 : 2 \]

Reading the three given terms in this analogy may at first seem to provide little in the way of obvious clues as to which option will complete it, until you consider the relationship of 1 to 2, a likely candidate for a complete pair. These two numerals can be seen as either a sequence of numbers (1, 2) or as one representing twice the value of the other (2 is twice the value of 1). If the relationship is seen as a sequence, then none of the answer choices seems to form a similar relationship with “PINT,” the third given term. However, if the relationship is seen as 2 being twice the value of 1, then the correct answer would be a measure that is twice the volume of a \text{pint}. This solution seems to work, since answer choice “b. quart” represents a volume that is twice that of a \text{pint}. While the other options are related to “PINT” in the sense that each one is a measure of volume, none is related in the same way that 1 is to 2.

This analogy represents an example of one type of analogy that you will see on the MAT. You will find examples and explanations of each type of analogy in a variety of arrangements on the pages that follow (23–27).

**Types of Relationships in MAT Analogies**

There are many ways in which a pair of words can be related. Sometimes the relationship is obvious as soon as you read the terms. Sometimes, however, you have to form a statement before the relationship becomes apparent. Although there are many possible types of relationships, within a particular item only one or two types will be present.

The relationships most frequently found in MAT items can be grouped into three broad categories: meaning, inclusion, and association. Each of these groups contains several subclassifications.

When you actually take the MAT, you do not need to classify each item. In fact, different people may assign the same item to different categories. Reviewing the types of classifications that exist, however, may help you see the relationships present in MAT analogy items.

- **Meaning**—The meaning type of analogy can be thought of as involving the definitions of the terms. Relationships of this type have to do with what a word stands for and how that word is linguistically connected to others. The words may be any part of speech.

  1. **Synonym or Definition**—The terms have the same or similar meaning.

     | Term 1 | Term 2 | Meaning                                    |
     |--------|--------|--------------------------------------------|
     | TEACH  | INSTRUCT | Both words *mean* “to impart knowledge.”   |
     | EDGE   | BORDER  | Both words *refer to* “a boundary.”        |
     | EMPTY  | VACUOUS | Both words *mean* “lacking in substance.”  |
2. **Antonym or Contrast**—The terms have opposite meanings or are used to express unlike concepts.

- **RARELY : FREQUENTLY**  
  The word “rarely” means not often or infrequently.

- **ORDER : CHAOS**  
  Chaos is a state of total disorder, the opposite of order.

- **LEGALIZE : OUTLAW**  
  To outlaw something is not to legalize it but to make it illegal.

3. **Intensity**—One term expresses a greater size or degree of something than the other. This category can be difficult if you misinterpret the analogy as a simple synonym or antonym.

- **JOYFUL : ECSTATIC**  
  To be ecstatic is to be wildly and intensely joyful.

- **SLAM : CLOSE**  
  To slam is to close forcefully and loudly.

- **STREAM : TORRENT**  
  A torrent is a swift-flowing stream.

4. **Word Part/ Meaning**—One term explains what the other term means.

- **-ISM : PRACTICE**  
  One meaning of the suffix “-ism” is the practice of something; for example, criticism is the act or practice of criticizing.

- **NOT : UN-**  
  The prefix “un-” means not; for example, something unalterable cannot be changed.

- **PENTA- : FIVE**  
  The prefix “penta-” means five; for example, a pentagon is a five-sided polygon.

**Inclusion**—The inclusion type of analogy is concerned with the hierarchy of words and concepts. For example, when you outline a topic, you list main headings, subtitles, and so on. In an inclusion analogy, one word could be a heading for the other word, or both words might fall under the same heading.

1. **Category**—One term is a subordinate or superordinate class of the other. In other words, one term is a type or example of the other one.

- **SPECIES : GENUS**  
  A species is a subdivision of a genus.

- **EMOTION : LOVE**  
  Love is one type of emotion.

- **MEASLES : DISEASE**  
  Measles is an example of a disease.

2. **Membership**—Either one term is a part of the other term, or both terms are parts of the same thing or members of a larger category.

- **Whole/part**—One term is a part of another term:

  - **WHEEL : CAR**  
    A wheel is part of a car.

  - **GALAXY : STAR**  
    A galaxy is made up of stars.

  - **YEAR : CENTURY**  
    A century consists of one hundred years.
Category—Both terms belong to the same category:

**WHEEL : FENDER** Both are *parts* of a car.

**FINGERS : THUMBS** Both are *parts* (digits) of the hand.

**LOVE : FEAR** Both are *examples* of emotions.

**Association**—The association type of analogy represents the largest group. This type deals with relationships between two distinct but related ideas. The terms are often nouns but may be any part of speech.

1. **Transformation**—One term is either a translation, grammatical form, fraction, or a different letter arrangement of another term.

Both terms are names in different cultures or languages for the same concept:

**JUNO : HERA** These are the Roman and Greek names for the principal goddess.

**NOEL : CHRISTMAS** These are the French and English names for the same holiday.

**EIRE : IRELAND** Both are names for the same country.

The one word is a grammatical transformation of the other:

**BRING : BROUGHT** The verb changes from present to past tense.

**MY : MINE** The possessive form changes from adjective to pronoun.

**DATUM : DATA** The noun changes from singular to plural.

One term is a fraction or multiple of another:

**11 : 121** 121 is the square of 11.

**ANNUAL : BIENNIAL** A biennial time period (two years) is twice as long as an annual time period (one year).

**1/2 : 1/20** 1/2 is ten times as much as 1/20.

The terms are related through some nonsemantic similarity or change, such as rhyming, homophones, letter reversal, or other wordplay. There are not many such word puzzles on the MAT, but you should be prepared for the few that you may encounter:

**EMIT : TIME** The two words are spelled with the same letters in reverse order.

**BOUGH : BOW** Two of the meanings of the word “bow” (“the front of a ship” and “to bend downward”) are pronounced the same as the word “bough” (bou).

**SPRUNG : RUN** The word “run” is contained within the word “sprung.”
2. **Object/Characteristic**—One term is a characteristic, source, or location of another term.

One term is an attribute, characteristic, or description of the other:

- **Parrot:** Beak
  
  A parrot’s jaw is a beak.

- **Monster:** Ferocious
  
  A monster has a ferocious disposition.

- **Imaginary:** Fable
  
  A fable is a story about imaginary characters.

One term is an attribute that the other term **lacks**:

- **Hair:** Bald
  
  A person who has *lost* his hair is bald.

- **Inept:** Skill
  
  An inept person is *lacking* in skill.

- **Deliberate:** Haste
  
  A deliberate action is *free from* haste.

One term is the source of the other or the material out of which the other is composed:

- **Book:** Paper
  
  A book is *printed on* paper.

- **Flour:** Bread
  
  Bread is *made from* flour.

- **Cable:** Wire
  
  A cable is *composed of* wires.

One term gives the location or setting of the other:

- **India:** Rupee
  
  A rupee is a denomination of the currency used in India.

- **Stomata:** Leaf
  
  Stomata are tiny pores in a leaf.

- **Parthenon:** Athens
  
  The Parthenon temple is in Athens.

3. **Order**—The terms are in a sequential or reciprocal relationship to one another.

The terms have a time or other sequential relationship, but one does **not cause** the other:

- **Dawn:** Sunrise
  
  The dawn occurs just *before* a sunrise.

- **7:** 11
  
  These are consecutive prime numbers.

- **Alpha:** Omega
  
  These are the first and last letters of the Greek alphabet.

The terms have a reciprocal relationship so that one concept cannot exist without the other:

- **Aunt:** Niece
  
  A niece is related to an aunt through the same person; the niece’s parent is the aunt’s sibling.

- **Weight:** Mass
  
  On earth, anything with mass also has weight, due to the force of gravity acting on it.

- **Object:** Transitive
  
  In a sentence, a transitive verb must have a direct object that it links to the subject.
4. **Agent/Object**—There are many possibilities within this group, all of which involve one term that causes, creates, provides, requires, uses, or in some other way relies on the other term. Some of the most common types of agent/object analogy include the following.

**Cause/effect**—One term causes the other:

- **RAIN : FLOOD**
  - Excessive rain can *cause* a flood.
- **HUNGER : FASTING**
  - Fasting from food *results in* hunger.
- **CRIME : PUNISHMENT**
  - Punishment is a *consequence* of crime.

**Creator/creation**—One term creates the other:

- **ROBIN : NEST**
  - A robin *builds* a nest.
- **SUIT : TAILOR**
  - A tailor *makes* a suit.
- **HOMER : ILIAD**
  - Homer *wrote* the epic poem the *Iliad*.

One term provides the other or makes it possible:

- **EDUCATION : TEACHER**
  - A teacher *provides* education.
- **FOOD : NUTRITION**
  - Food *provides* the body with nutrition.
- **POSTAGE : MAIL**
  - Postage covers the cost and *enables* mail to be delivered.

One term represents the function or purpose of the other:

- **KNIFE : CUT**
  - A knife is *used to* cut something.
- **SOUND : AUDIOMETER**
  - The *purpose* of an audiometer is to measure sound.
- **SALUTE : RESPECT**
  - A salute *shows* respect.

One term is a tool or object used by the other:

- **PLUMBER : WRENCH**
  - A plumber *uses* a wrench to work on pipe.
- **SEAMSTRESS : NEEDLE**
  - A seamstress *uses* a needle to pull thread through cloth.
- **VIOLINIST : BOW**
  - A violinist *uses* a bow to play a violin.
The Content of MAT Analogies

In order to measure your ability to recognize relationships and parallels between relationships, MAT analogy items test your general knowledge in a variety of fields. A number of items are drawn from areas of everyday experience, such as food, clothing, tools, transportation, education, and common expressions. Other analogy items rely upon your knowledge of the various academic disciplines or subjects that are studied in a general way by every undergraduate student.

When the terms in an analogy item are taken from a specific academic area, the two pairs of terms that form the analogy will come from that same subject matter.

WASHINGTON : ADAMS :: BUSH : CLINTON

In this analogy, all four of the terms are from American history; the analogy here is that John Adams followed George Washington into the presidency just as Bill Clinton followed George Bush. However, sometimes the terms in the two pairs that form the analogy come from different subject matter.

STEINBECK : GERSHWIN :: LITERATURE : MUSIC

An analogy such as this involves pairs of terms from different subject-matter areas. However, it is the relationship between terms that is crucial here: both John Steinbeck and George Gershwin were creative artists in their respective areas—Literature and Music.

While there is no specific body of information that can be studied or memorized to improve your MAT score, you may also find it useful to be aware of the subject areas represented on the MAT.

- **Vocabulary and Language**—Vocabulary analogy items test your understanding of word meanings and your ability to recognize the relationships between those meanings. Language items test aspects of English grammar and usage.

Vocabulary analogy items most often use one of three relationships: synonym (words with similar meanings), antonym (words with opposite meanings), or intensity (words with the same general meaning, but with a difference in degree).

1. **Synonyms and Antonyms:**

   NAIVE : *(a. foolish, b. innocent, c. unconcerned, d. devious)* :: SOPHISTICATED : WORLDLY

   In examining the three given terms in this vocabulary analogy, you need to recognize that sophisticated and worldly have similar meanings and form a complete pair. The correct answer will then be a synonym for naive. Thus, the correct answer is “b. innocent.” This item can also be interpreted as an antonym analogy by interchanging the middle terms: since naive is the opposite of sophisticated, the opposite of worldly is innocent.
2. **Differences in Degree:**

ANNoy : EnRAGE :: EnLARGE: (a. increase, b. exaggerate, c. augment, d. reduce)

This analogy involves degrees of meaning: to enrage is to annoy to a greater degree. The correct answer should then be the word that means to enlarge, but to a greater degree. Thus, the correct answer is “b. exaggerate.” This is an example of an item that requires you to distinguish fine shades of meaning between terms. If you incorrectly consider annoy and enrage to be synonyms, then you would have to choose between “a. increase,” “b. exaggerate,” or “c. augment” for an answer, all of which are generally related to enlarge. However, to choose between these three options, you need to see that the difference between them is the same as the difference between annoy and enrage—a difference in degree.

### Humanities—MAT analogy items from the humanities include literature, philosophy, and the fine arts. Literature items may test your knowledge of authors, their works, literary genres, or literary devices. These items use a variety of relationships. Two common ones are “creator/creation” (such as “author : title”) and “whole/part” (such as a portion of a certain genre).

1. **Creator/Creation:**

**Spenser : Poetry :: Shakespeare :** (a. novel, b. drama, c. lyric, d. essay)

Looking at the three given terms in this literary analogy, you will notice that there is a creator/creation relationship between Spenser and Poetry, since Edmund Spenser is best known for his poetry (especially, *The Faerie Queen*). For this reason, the correct answer should be the type of literature that William Shakespeare is best known for creating. The correct answer is therefore “b. drama.”

2. **Whole/Part:**

**Poem :** (a. line, b. rhyme, c. stanza, d. sonnet) :: **Book : Chapter**

In this analogy, the last two of the three given terms have a whole/part relationship to each other. A section of a book is a chapter. The missing term, then, should be a section of a poem. The correct answer is “c. stanza.” Even though a line (option b.) is also part of a poem, it is not a complete section in the same way that a chapter is a complete section of a book.

Philosophy items are concerned with philosophers, their works, and their beliefs or schools of thought. Fine arts analogy items cover the entire spectrum of the fine arts: the performing arts of music, drama, and dance; the visual arts of painting and sculpting; and other contemporary arts such as filmmaking and sound recording. These items involve the same kinds of relationships as analogies from the field of literature.
Social Sciences—MAT analogy items with content from the social sciences include subject matter from history, geography, political science, economics, sociology, and psychology. Analogy items from the field of social sciences may use many different types of relationships.

1. **Historical:**

A historical event, for example, may be paired with any of the following: the year it occurred, a key person associated with the event, the country in which it occurred, a piece of legislation associated with the event, or a cause or result of the event.

**INDEPENDENCE** : 1776 :: **EMANCIPATION** : (a. 1787, b. 1812, c. 1863, d. 1916)

In this analogy, the relationship between the first two given terms is event/date. In this analogy, you need to supply implied words in order for the relationship to become obvious. The “Declaration of” **Independence** was issued in **1776**, whereby the American colonies declared their independence from Great Britain. The missing term should then be the year that the **Emancipation** “Proclamation” was issued, whereby slaves were declared free in the states still at war with the federal government. The correct answer is “c. 1863.”

2. **Other Social Sciences:**

**STRIKE** : (a. picket, b. union, c. customer, d. employer) :: **BOYCOTT** : **SELLER**

This item represents a relationship of action/object, which may not be immediately obvious until the given words are considered in economic terms. A **boycott** is a protest action taken against a **seller**. In a similar way, a **strike** is a protest directed against the correct answer—“d. employer.”

Natural Sciences—Both the biological and physical sciences provide subject matter for MAT analogy items. Some commonly used relationships in such items include “agent/object” (such as “FLOWER : BLOOM”) and “category” (such as “HYDROGEN : ELEMENT”).

1. **Biological Sciences:**

**CARNIVORE** :: **HERBIVORE** :: **TIGER** : (a. shark, b. predator, c. antelope, d. lion)

A **tiger** is an example of a **carnivore**—a meat-eating animal. The missing term should be an example of a **herbivore**—an animal that eats only plants. Thus, the correct answer is “c. antelope.”

2. **Physical Sciences:**

**LIMESTONE** : (a. sedimentary, b. metamorphic, c. volcanic, d. metallic) :: **GRANITE** : **IGNEOUS**

The last two given terms have a member/group relationship. **Granite** is an example of **igneous** rock. **Limestone** is an example of “sedimentary” rock (choice “a”).
Mathematics—Mathematics analogies include concepts from number theory, arithmetic, algebra, and geometry. Mathematics analogy items may use numbers, words, or combinations of the two. Mathematics items often employ “transformation,” “order,” or “object/characteristic” relationships.

In solving mathematics analogies, you must recognize the conceptual relationship between two of the three given terms. For some of these items, you may also have to use computation to determine the value of the missing term.

1. Conceptual Relationships:

   \((a. \text{ radius}, \ b. \text{ diameter}, \ c. \text{ area}, \ d. \text{ circumference}) : \text{PERIMETER} :: \text{CIRCLE} : \text{SQUARE}\)

   Examining the three given terms, you may recognize that a **perimeter** is the distance around a **square**. You can then also recognize that the distance around a **circle** is “\(d.\) circumference.”

2. Relationships Involving Computation:

   \(4 : 64 :: 5 : (a. \ 25, \ b. \ 50, \ c. \ 90, \ d. \ 125)\)

   You might suppose that a possible relationship between the first two given numbers is that an implied “16” multiplied by 4 equals 64. However, this cannot be the relationship, since “16” multiplied by 5 equals 80, which is not one of the answer choices. The relationship here is that 4 “cubed” equals 64. Since 5 cubed equals 125, the correct answer is “\(d.\)”

**Test-taking Strategies for the MAT**

MAT analogies are not designed to be tricky, but they often require you to think in creative ways. Learning to think past the obvious and to analyze implied meanings and relationships does indeed require some creative thought. Since this is often what it takes to solve MAT analogies, you may find a few strategies helpful in this task.

- **Read All the Answer Options Carefully**—Do not select the first answer that seems to make sense. One choice may seem to fit, but a better answer choice may also be listed. Remember that you are looking for the **best** answer among options that may all make sense. Many of the incorrect answer choices on the MAT have some relationship to the term that you are trying to match it with. However, you will correctly solve the analogy only when you determine which answer choice most accurately reflects the same relationship as the two terms in the complete pair.

- **Consider Alternative Meanings of Words**—If at first an analogy doesn’t seem to make sense, you may need to think of one or more of the terms in a different way. For instance, in the analogy “**NAPOLEON** : **WAGON** :: (\(a.\) coin, \(b.\) baker, \(c.\) general, \(d.\) statue) : **WAINRIGHT,”** the analogy makes no sense if you think of **Napoleon** as the French emperor. However, a **napoleon** is also a pastry. Once you define **napoleon** in that way, you can reason that a **wagon** is made by a **wainright**, and a **napoleon** (the pastry) is made by a **baker** \((b.\).)
Reorder the Analogy—Sometimes the relationship in an analogy becomes clearer if
you change the order of the terms, since the location of the terms of a valid analogy can
be changed without affecting the meaning. In other words, the analogy “A : B :: C : D”
will remain a valid analogy even if it is rearranged to “A : C :: B : D.”

Thus, the analogy “FRENCH : ROMAN :: RUSSIAN : CYRILLIC,” where the relationship is
that the French language uses the Roman alphabet, and Russian uses the Cyrillic
alphabet, remains a valid analogy even when it is reordered to read “FRENCH : RUSSIAN ::
ROMAN : CYRILLIC.” In this second arrangement, the relevant relationships remain the
same: “the French language uses the Roman alphabet in the same way that the Russian
language uses the Cyrillic alphabet.”

Check the Part of Speech—The answer you choose should be the same part of speech
as the corresponding term in the complete pair. For example, the answer to the analogy
“FOOD : ATE :: BALL : (a. red, b. slow, c. game, d. threw)” would have to be the verb
“threw” (d.), corresponding to the verb ate in the complete pair.

However, it is not always this obvious. For instance, in the analogy “TABLE : BILL ::
(a. shelf, b. shelve, c. conveyer, d. convey) : MOTION,” two options are nouns and two
options are verbs, requiring a solution that involves a further distinction. If your first
reaction is to think of table, bill, and motion as nouns, then none of the options seems
to make complete sense. However, once you think of table as a verb, you realize that to
delay consideration of a bill is to table it, and to delay consideration of a motion is to
“shelve” it (“b.”). Thus, it is necessary to recognize both the part of speech and the
relevant meaning of the terms in order to solve an analogy like this one.

Make Informed Guesses—If you are uncertain about the answer to an analogy, try to
eliminate the answer options that do not seem to fit and then guess from among the
remaining options. If you make a random guess at an answer, you have a one-in-four
chance of getting it right. However, the more options you can eliminate, the better the
odds are that you will guess the correct answer.

If an analogy completely baffles you, look for clues. For instance, you may at first be
uncertain about the analogy “SINANTHROPUS : PITHECANTHROPUS :: (a. Peking, b. Hong
Kong, c. Cairo, d. Kabul) : JAVA.” However, the root “anthropus” in the first and second
terms suggests that this analogy has to do with human beings. From there you may well
make the connection between these first two terms and the common names for these two
famous early anthropological finds—“Peking man” and “Java man”—and arrive at the
correct answer of “a. Peking.” Another way that you might reason through this analogy
is that since the first two terms share the same root (anthropus) it must be the prefixes
that distinguish them. If you know that “Sino-” means Chinese, you can reasonably
narrow the choices to either “a. Peking” or “b. Hong Kong.”

Postpone Difficult Items—The MAT is a timed test. Since you have 50 minutes to
answer 100 questions, you have an average of 30 seconds to solve each analogy and to
indicate your answer. Since each item counts the same, you may not want to spend too
much time on an analogy if the relationship is not apparent to you. Your time would be
more wisely used by moving on to the next analogy and returning to analogies that were unclear to you after you have completed the ones that are clear to you. Try to use the last 10 minutes or so of the testing period to go back to these items.

When you return to an analogy, you may understand it more clearly than you did the first time you looked at it. One explanation for this new clarity may be that the more analogies you complete, the more skilled at solving them you become. Another reason may be that you have unconsciously been thinking about the analogies you skipped. If the answer does not come to you quickly on your second try, make your best guess and move on.

- **Answer Every Question**—Your score is based entirely on the number of correct answers you provide, and there are no extra penalties for incorrect answers. If you have no idea what the correct answer is to an analogy item, go with a hunch or a straight guess, since an item that you leave unanswered definitely cannot contribute to your score. If you guess, at least you have a one-in-four chance of getting the item right.

- **Indicate Your Answers Carefully**—If you are taking a paper-and-pencil version of the MAT, be sure to mark your answer to each numbered item in the corresponding number on your answer document. Be especially careful if you skip items. Putting the right answer in the wrong place can be extremely frustrating, and will of course result in an inaccurate score. Also, make sure your marks completely fill the circles. Do not mark more than one answer for each question. **Questions with more than one circle marked are always scored as incorrect.**

If you are taking a computer-delivered version of the MAT, be sure to see that the answer you select is reflected on the screen. You will be unable to select more than one answer per item on the screen display, but it will be up to you to confirm that the answer you intend is the one that is displayed on the screen before you move to the next item. With a computer-delivered version of the MAT, you will have the opportunity to review your answer choices at the end of the test if time permits.
Sample Analogies and Annotated Answers

Sample Analogies

One of the best ways to prepare for the Miller Analogies Test (MAT) is to become familiar and comfortable with analogies through exposure and practice. The 50 analogies that follow are typical of those you will encounter when you take the MAT. You will find answers and explanations to these analogies on the pages immediately following them. (See pages 36–39.)

If you would like to time yourself, allow 25 minutes to complete these 50 items, one-half the time allowed on the 100-item MAT. You may want to record your answers on a separate piece of paper or circle your answer choices directly on the items. When you have finished these practice items, check your answers against the answers provided with the explanations that follow.

You may be able to improve your performance on the actual MAT by looking for patterns in your incorrect answers on these practice items. If you notice that most of your errors are caused by misinterpreting the relationships between terms, then you may need more practice with reasoning skills. Or if you notice that most of your errors result from not knowing the meanings of words or from unfamiliarity with certain facts, then you may need more background in vocabulary or specific content areas.

Sample Analogies

1. **SPRING** : **RING** :: **COIL** : (a. rope, b. cowl, c. loop, d. stretch)
2. **97°** : **45°** :: (a. obtuse, b. equilateral, c. angle, d. cosine) : **ACUTE**
3. **GUTENBERG** : (a. broadcasting, b. theology, c. genetics, d. printing) :: **MARCONI** : **RADIO**
4. (a. sausage, b. pork, c. cow, d. bull) : **PIG** :: **VEAL** : **CALF**
5. **WISDOM** : (a. science, b. sage, c. goodness, d. educator) :: **SKILL** : **VIRTUOSO**
6. (a. Brahmin, b. orange, c. Catholic, d. aristocrat) : **MANDARIN** :: **PRIEST** : **BUREAUCRAT**
7. **DIVE** : (a. descend, b. water, c. float, d. sink) :: **DEPTH** : **SURFACE**
8. **MOLLUSK** : (a. fish, b. cell, c. plant, d. mammal) :: **PEARL** : **AMBERGRIS**
9. **ARITHMETIC MEAN** : **AVERAGE** :: **MOHAMMEDANISM** : (a. abacus, b. Islam, c. median, d. Mohammed)
10. **SURNAMe** : **PSEUDONYM** :: **CLEMENS** : (a. Samuel, b. Eliot, c. Finn, d. Twain)
11. (a. epistemology, b. axiology, c. teleology, d. pedagogy) : **ONTHEOLOGY** :: **KNOWLEDGE** : **BEING**
12. **GOLD** : (a. brass, b. silver, c. dross, d. lead) :: **WHEAT** : **CHAFF**
13. **ELBOW** : **NERVE** :: **HINGE** : (a. lever, b. electricity, c. fulcrum, d. wire)
14. (a. interest, b. bond, c. principal, d. certificate) :: **MUNICIPALITY** :: **LOAN** : **INDIVIDUAL**
15. **LIGHT** : **SNACK** : (a. consume, b. simple, c. hearty, d. gobble) : **FEAST**
16. VASE : AMPHORA :: FLOWERS : (a. wine, b. glass, c. leaves, d. grain)

17. PLANK : (a. board, b. hammer, c. piece, d. saw) :: LOAF : SLICE

18. (a. onionskin, b. seal, c. security, d. tie) : BOND :: TRANSLUCENT : OPAQUE

19. MASON : (a. jar, b. trowel, c. brick, d. divider) :: DRAFTSMAN : COMPASS

20. WAGON : LIMOUSINE :: (a. passenger, b. vehicle, c. buckboard, d. teamster) : CHAUFFEUR

21. HOMOPHONE : (a. paradigm, b. antonym, c. synonym, d. acronym) :: SOUND : MEANING

22. VINEGAR : (a. apple, b. oil, c. tea, d. lemon) :: ACETIC : CITRIC


24. COMMON : (a. combined, b. plain, c. stock, d. crossing) :: INTERSECTION : UNION


26. -IVE : -ION :: ADJECTIVE : (a. verb, b. conjunction, c. noun, d. adverb)

27. CINNAMON : (a. root, b. bark, c. leaf, d. fruit) :: SUGAR : SAP

28. SPUN : SPINNING :: PARTICIPLE : (a. predicate, b. tense, c. present, d. gerund)

29. PUPIL : (a. iris, b. speed, c. lens, d. opening) :: APERTURE : MEMBRANE


31. 10 mm : 1 cm : 10 : (a. 1, b. 10, c. 100, d. 1000)

32. (a. architect, b. vandal, c. curator, d. thief) : PROPERTY :: ICONOCLAST : TRADITION

33. SALK : POLIO :: (a. Pasteur, b. Sabin, c. Lister, d. Curie) :: RABIES

34. (a. festival, b. week, c. moon, d. calendar) : MONDAY :: HOLY : HOLIDAY

35. DESIDERATUM : DESIDERATA :: WOMAN : (a. man, b. desire, c. gender, d. women)

36. * : ASTERISK :: (a. @, b. &, c. #, d. $) : AMPERSAND

37. CENOZOIC : ERA :: PLEISTOCENE : (a. epoch, b. age, c. period, d. time)


40. (a. 2, b. 4, c. 6, d. 8) : 1 :: 2³ : 2²
41. **LINES : POINT :: PLANES : (a. circle, b. surface, c. intersection, d. line)**

42. **BOLIVAR : COLOMBIA :: (a. Madison, b. Washington, c. Franklin, d. Hamilton) : UNITED STATES**

43. **(a. water, b. crowds, c. noise, d. heights) : ACROPHOBIA :: SPIDERS : ARACHNOPHOBIA**

44. **(a. keys, b. pedals, c. wires, d. notes) : PIPES :: PIANO : ORGAN**

45. **PULMONARY VEIN : LEFT ATRIUM :: LEFT VENTRICLE : (a. jugular, b. carotid, c. coronary, d. aorta)**

46. **HEN : DOE :: CHICKEN : (a. fox, b. turkey, c. kangaroo, d. raccoon)**


48. **(a. pride, b. brood, c. hold, d. soar) : CLUTCH :: ROAR : CLUCK**

49. **STOCKHOLDER : (a. exchange, b. owner, c. proxy, d. repertory) :: REGULAR : UNDERSTUDY**


### Annotated Answers

For each item, the correct answer is given first in parentheses and is then followed by an explanation.

1. **(c) A spring forms or has the shape of a coil, and a ring forms a loop.**

2. **(a) A 45° angle is acute; a 97° angle is obtuse.**

3. **(d) Guglielmo Marconi is recognized as the inventor of radio, and Johann Gutenberg is recognized as the inventor of movable type for printing.**

4. **(b) Veal is meat that comes from a calf, and pork is meat that comes from a pig. (A sausage is usually made from pork.)**

5. **(b) A sage possesses an extraordinary degree of wisdom; a virtuoso possesses an extraordinary degree of skill.**

6. **(a) In imperial China, a mandarin was a government official or bureaucrat; in the traditional Hindu caste system, a Brahmin is a priest.**

7. **(c) To dive is to descend into the water’s depth; to float is to stay on the surface of the water.**

8. **(d) Pearls are found in oysters, a type of mollusk; ambergris is found in sperm whales, a type of mammal.**

9. **(b) In mathematics, an arithmetic mean is another term for average, just as the religion Mohammedanism is another name for Islam. (A median is a mathematical term for the middle number in a series of numbers; an abacus is an ancient calculating device; and Mohammed is the founder of Mohammedanism.)**
10. (d) The American author Mark Twain’s real name was Samuel Clemens; his real surname was Clemens, but he used Twain as a pseudonym.

11. (a) In the discipline of philosophy, ontology is the branch that deals with the nature or being, and epistemology is the branch that deals with the nature of knowledge. (Axiology is the study of values, teleology is the study of purpose in nature, and pedagogy is the art of teaching.)

12. (c) The waste product of wheat and other grains is called chaff; the waste product of gold and other metals is called dross.

13. (d) The elbow of an arm functions similar to a hinge on a door or gate, a nerve is a cordlike bundle of fibers that functions in the nervous system similar to a wire in an electrical system.

14. (b) An individual borrows money by obtaining a loan; a municipality borrows money by issuing a bond.

15. (c) A snack is a light meal, while a feast is a hearty meal.

16. (a) A vase is used to hold flowers, and an amphora was used in ancient Greece and Rome to hold wine or oil.

17. (d) To cut a loaf is to slice it; to cut a plank is to saw it. (If you interpret “slice” as a noun, there is not a corresponding analogy; a board is not part of a plank.)

18. (a) Onionskin paper is thin and translucent, while bond paper is thicker and opaque. (Note that this meaning of the word “bond” differs from that in item number 14.)

19. (b) A compass is a tool used by a draftsman, and a trowel is a tool used by a mason. (Masons do use bricks, but bricks are not considered tools; a divider is another tool used by draftsmen.)

20. (d) A wagon is driven by a teamster (a term deriving from the “team” of horses that pulls the wagon), and a limousine is driven by a chauffeur.

21. (c) Words that have the same sound are called homophones; words that have the same meaning are called synonyms.

22. (d) Vinegar contains acetic acid; a lemon contains citric acid.

23. (c) Claude Monet and Paul Cezanne were two French painters, and Mary Cassatt and James Whistler were two American painters, all of whom were born in the nineteenth century and lived into the early twentieth century. (Rembrandt, Dali, and Matisse were all painters, but they were Dutch, Spanish, and French respectively.)

24. (a) In mathematics, the intersection of two sets is a set that contains only the elements that are common to both sets; the union of two sets is a new set that contains all the combined elements of both sets.

25. (c) Candide is a character in a novel by the French author Voltaire; Don Quixote is a character in a novel by the Spanish author Cervantes.

26. (c) The suffix “-ive” is used to form an adjective denoting action; the suffix “-ion” is used to form a noun denoting action.
27. (b) Sugar is made from the sap or juice of several plants; cinnamon is made from the bark of a cinnamon tree.

28. (d) Spun is the past participle of the verb “spin,” and spinning is its gerund, a verbal form that functions as a noun.

29. (a) The pupil is the aperture or opening of the eye, and the iris is the membrane on which the pupil is located.

30. (c) The Constitution is the defining political and legal document of the United States; the Magna Charta was a political charter granted by the King of England in which basic rights were delineated.

31. (a) 10 mm equal 1 cm; 1\(^{10}\) (or actually 1 to any power) equals 1.

32. (b) An iconoclast attacks or tries to overthrow traditions; a vandal destroys property. (A thief takes property to make use of it, not necessarily to destroy it.)

33. (a) Jonas Salk developed the first polio vaccine, Louis Pasteur developed the first rabies treatment. (Albert Sabin developed another polio vaccine, Joseph Lister promoted antiseptics, and Marie Curie discovered radium.)

34. (c) The word holiday derives from the word holy (“holy day”), and the word Monday derives from the word moon (“moon day”).

35. (d) The plural of desideratum (something considered highly desirable) is desiderata; the plural of woman is women.

36. (b) The symbol * is an asterisk; the symbol & is an ampersand.

37. (a) In geology, one refers to the Cenozoic era and the Pleistocene epoch. (An era is divided into periods, which in turn are divided into epochs; the Pleistocene is part of the Quaternary period, which is part of the Cenozoic era.)

38. (c) Mohandas Gandhi led India to independence from Great Britain through nonviolent civil disobedience, while Vladimir Lenin led the violent Bolshevik revolution in Russia that established the U.S.S.R. (Thomas Jefferson, Napoleon Bonaparte, and Mao Zedong were all leaders during and after periods of violent revolution in their respective countries—the United States, France, and China.)

39. (b) Among the most famous medieval European romances were those between Abelard and Heloise and between Dante and Beatrice. (In Arthurian legend, Tristan loved Iseult; in Homer’s Iliad, Hector loved Helen; in Shakespeare’s Much Ado About Nothing, Benedict loved Beatrice, but this pair could not form an analogy here.)

40. (a) The ratio \(2^3\) to \(2^2\) is equal to 8 to 4, which reduces to 2 to 1.

41. (d) In geometry, lines intersect in a point, and planes intersect in a line.

42. (b) Simon Bolivar led successful revolutions against Spain in South America and then became the first president of an independent Colombia; similarly, George Washington was a revolutionary leader against Great Britain in North America and became the first president of the United States.

43. (d) Acrophobia is the fear of heights and arachnophobia is the fear of spiders.
44. (c) An **organ** is a wind instrument that sounds notes by forcing air through** pipes, and a **piano** is a stringed instrument that sounds notes by striking **wires** with hammers. (Both instruments sound notes and have keys and pedals.)

45. (d) In the heart, arterial blood flows from the lung through the **pulmonary vein** to the **left atrium**, and then flows from the **left ventricle** to the **aorta**.

46. (c) A **hen** is a female **chicken**, and a **doe** is a female **kangaroo**. (The female of various other mammals is also called a doe, including the deer, hare, and goat.)

47. (b) The **Ptolemaic** system of **astronomy** (holding that the earth was the center of the universe) is no longer accepted; similarly, the **Lamarckian** theory of **evolution** (holding that acquired characteristics can be inherited) is no longer accepted.

48. (a) A bunch of chickens is known as a **clutch**, and the sound a chicken makes is referred to as a **cluck**; a gathering of lions is known as a **pride**, and the sound a lion makes is referred to as a **roar**.

49. (c) **Stockholders** may give power of attorney to a **proxy**, authorizing that person to vote on their behalf at a corporate meeting; a **regular** theatrical performer who cannot appear in a performance is replaced by an **understudy**.

50. (b) A **sari** is a traditional **Indian** dress, and a **dashiki** is a traditional **African** garment.
### American Centers

<table>
<thead>
<tr>
<th>State</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALABAMA</td>
<td>Athens State University</td>
<td>256-233-8285</td>
</tr>
<tr>
<td></td>
<td>Birmingham Southern College</td>
<td>205-226-4803</td>
</tr>
<tr>
<td></td>
<td>University of Alabama—Birmingham</td>
<td>205-934-1904</td>
</tr>
<tr>
<td></td>
<td>Daphne University</td>
<td>251-263-3003</td>
</tr>
<tr>
<td></td>
<td>Dothan University</td>
<td>334-983-6556</td>
</tr>
<tr>
<td></td>
<td>Florence University</td>
<td>256-765-4252</td>
</tr>
<tr>
<td></td>
<td>Gadsden University</td>
<td>256-406-2886</td>
</tr>
<tr>
<td></td>
<td>Huntsville University</td>
<td>256-824-6725</td>
</tr>
<tr>
<td></td>
<td>Jacksonville State University</td>
<td>256-782-5475</td>
</tr>
<tr>
<td></td>
<td>Livingston University</td>
<td>205-665-6350</td>
</tr>
<tr>
<td></td>
<td>Mobile University</td>
<td>334-460-6271</td>
</tr>
<tr>
<td></td>
<td>Montgomery University</td>
<td>334-229-4308</td>
</tr>
<tr>
<td></td>
<td>Montgomery University—Montgomery</td>
<td>334-244-3306</td>
</tr>
<tr>
<td></td>
<td>Phoenix City University</td>
<td>334-448-5120</td>
</tr>
<tr>
<td></td>
<td>Troy University</td>
<td>334-670-3379</td>
</tr>
<tr>
<td></td>
<td>Tuscaloosa University</td>
<td>205-348-6760</td>
</tr>
<tr>
<td>ALASKA</td>
<td>Anchorage University—Anchorage</td>
<td>907-786-4500</td>
</tr>
<tr>
<td></td>
<td>Fairbanks University</td>
<td>907-474-5277</td>
</tr>
<tr>
<td></td>
<td>Nome University</td>
<td>907-443-2201</td>
</tr>
<tr>
<td></td>
<td>Soldotna Kenai Peninsula College</td>
<td>907-262-0328</td>
</tr>
<tr>
<td>ARKANSAS</td>
<td>Arkadelphia Henderson State University</td>
<td>870-230-5470</td>
</tr>
<tr>
<td></td>
<td>Fayetteville University</td>
<td>501-575-3948</td>
</tr>
<tr>
<td></td>
<td>Little Rock University</td>
<td>501-569-3199</td>
</tr>
<tr>
<td></td>
<td>Magnolia Southern Arkansas University</td>
<td>870-235-4145</td>
</tr>
<tr>
<td></td>
<td>Monticello University</td>
<td>870-460-1453</td>
</tr>
<tr>
<td></td>
<td>Russellville University</td>
<td>479-968-0302</td>
</tr>
<tr>
<td></td>
<td>Searcy Harding University</td>
<td>501-279-4415</td>
</tr>
<tr>
<td></td>
<td>State University Arkansas</td>
<td>870-972-2038</td>
</tr>
<tr>
<td>ARIZONA</td>
<td>Davis-Monthan AFB University</td>
<td>520-748-2625</td>
</tr>
<tr>
<td></td>
<td>Flagstaff Northern Arizona University</td>
<td>928-523-2261</td>
</tr>
<tr>
<td></td>
<td>Phoenix Arizona State University West</td>
<td>602-543-8136</td>
</tr>
<tr>
<td></td>
<td>Tempe Arizona State University—Tempe</td>
<td>480-965-7146</td>
</tr>
<tr>
<td></td>
<td>Tucson University</td>
<td>520-621-7589</td>
</tr>
<tr>
<td>CALIFORNIA</td>
<td>Arcata Humboldt State University</td>
<td>707-826-3611</td>
</tr>
<tr>
<td></td>
<td>Berkeley University of California—Berkeley</td>
<td>510-642-6520</td>
</tr>
<tr>
<td></td>
<td>Culver City Pepperdine University—BBA</td>
<td>310-568-5529</td>
</tr>
<tr>
<td></td>
<td>Fairfield Chapman University—Fairfield</td>
<td>707-438-0108</td>
</tr>
<tr>
<td></td>
<td>Fresno California State University—Fresno</td>
<td>559-278-2457</td>
</tr>
<tr>
<td></td>
<td>Fresno Pacific College</td>
<td>559-453-2123</td>
</tr>
<tr>
<td></td>
<td>Hayward California State University—Hayward</td>
<td>510-885-3661</td>
</tr>
<tr>
<td></td>
<td>La Verne University</td>
<td>909-593-3511</td>
</tr>
<tr>
<td></td>
<td>Loma Linda University</td>
<td>909-594-4547</td>
</tr>
<tr>
<td></td>
<td>Los Angeles California State University—Los Angeles</td>
<td>323-343-3160</td>
</tr>
<tr>
<td></td>
<td>Palm Desert Chapman University—Palm Desert</td>
<td>760-341-4051</td>
</tr>
<tr>
<td></td>
<td>Palm Desert University</td>
<td>661-267-2001</td>
</tr>
<tr>
<td></td>
<td>Riverside California State University—Riverside</td>
<td>909-785-2452</td>
</tr>
<tr>
<td></td>
<td>Sacramento Chapman University—Sacramento</td>
<td>916-922-0119</td>
</tr>
<tr>
<td></td>
<td>San Diego University</td>
<td>619-260-4585</td>
</tr>
<tr>
<td></td>
<td>San Francisco State University</td>
<td>415-338-2271</td>
</tr>
<tr>
<td></td>
<td>San Luis Obispo California Polytechnic State University</td>
<td>805-756-1551</td>
</tr>
<tr>
<td></td>
<td>Santa Barbara California University—Santa Barbara</td>
<td>805-893-4411</td>
</tr>
<tr>
<td></td>
<td>Santa Cruz California University—Santa Cruz</td>
<td>831-499-2629</td>
</tr>
<tr>
<td></td>
<td>Stockton University</td>
<td>209-946-2521</td>
</tr>
<tr>
<td></td>
<td>Turlock California State University—Stanislaus</td>
<td>209-667-3157</td>
</tr>
<tr>
<td></td>
<td>Whittier Whittier College</td>
<td>562-907-4847</td>
</tr>
<tr>
<td>COLORADO</td>
<td>Alamosa Adams State College</td>
<td>719-587-7847</td>
</tr>
<tr>
<td></td>
<td>Boulder University of Colorado—Boulder</td>
<td>303-492-5854</td>
</tr>
<tr>
<td></td>
<td>Breckenridge Colorado Mountain College</td>
<td>970-453-6757</td>
</tr>
<tr>
<td></td>
<td>Colorado Springs University—Colorado Springs</td>
<td>719-262-3255</td>
</tr>
<tr>
<td></td>
<td>Denver Regis University</td>
<td>303-458-3575</td>
</tr>
<tr>
<td></td>
<td>Denver University of Denver</td>
<td>303-471-2150</td>
</tr>
<tr>
<td></td>
<td>Grand Junction University</td>
<td>970-222-8709</td>
</tr>
<tr>
<td></td>
<td>Greeley University of Northern Colorado</td>
<td>970-351-2790</td>
</tr>
<tr>
<td></td>
<td>Gunnison Western State College of Colorado</td>
<td>970-943-2130</td>
</tr>
<tr>
<td></td>
<td>Pueblo Colorado State University—Pueblo</td>
<td>719-549-2663</td>
</tr>
<tr>
<td>CONNECTICUT</td>
<td>Danbury Western Connecticut State University</td>
<td>203-837-6860</td>
</tr>
<tr>
<td></td>
<td>Hartford Trinity College</td>
<td>860-297-2415</td>
</tr>
<tr>
<td></td>
<td>New London Connecticut College</td>
<td>860-439-2330</td>
</tr>
<tr>
<td></td>
<td>Storrs University of Connecticut</td>
<td>860-486-0774</td>
</tr>
<tr>
<td>DELAWARE</td>
<td>Newark University of Delaware</td>
<td>302-831-6717</td>
</tr>
<tr>
<td>DISTRICT OF COLUMBIA</td>
<td>Washington Catholic University of America</td>
<td>202-319-5765</td>
</tr>
<tr>
<td></td>
<td>Washington Gallaudet University</td>
<td>202-651-5355</td>
</tr>
<tr>
<td></td>
<td>Washington Georgetown University</td>
<td>202-467-6926</td>
</tr>
<tr>
<td>FLORIDA</td>
<td>Boca Raton Florida Atlantic University</td>
<td>561-297-3209</td>
</tr>
<tr>
<td></td>
<td>Boca Raton Lynn University</td>
<td>561-237-7308</td>
</tr>
<tr>
<td></td>
<td>Deland Florida Gulf Coast University</td>
<td>252-590-7992</td>
</tr>
<tr>
<td></td>
<td>Fort Myers Florida Gulf Coast University</td>
<td>252-590-7992</td>
</tr>
<tr>
<td></td>
<td>Ft Walton Beach Troy State University—Ft Walton Beach</td>
<td>850-244-7414</td>
</tr>
<tr>
<td></td>
<td>Gainesville University of Florida</td>
<td>352-392-1575</td>
</tr>
<tr>
<td></td>
<td>Jacksonville Jacksonville University</td>
<td>904-256-7193</td>
</tr>
<tr>
<td></td>
<td>Lakeland Florida Southern College</td>
<td>863-680-4299</td>
</tr>
<tr>
<td></td>
<td>Miami Shores Barry University—Miami Shores</td>
<td>305-899-3950</td>
</tr>
<tr>
<td></td>
<td>Orlando Barry University—Orlando</td>
<td>407-275-2000</td>
</tr>
<tr>
<td></td>
<td>Winter Park Troy State University—Florida Region</td>
<td>407-599-6693</td>
</tr>
<tr>
<td>GEORGIA</td>
<td>Albany Albany State University</td>
<td>912-430-4667</td>
</tr>
<tr>
<td></td>
<td>Atlanta Georgia State University</td>
<td>404-651-2217</td>
</tr>
<tr>
<td></td>
<td>Augusta Augusta State University</td>
<td>706-737-1471</td>
</tr>
<tr>
<td></td>
<td>Brunswick Troy State University</td>
<td>706-264-9258</td>
</tr>
<tr>
<td></td>
<td>Columbus Columbus State University</td>
<td>706-568-2226</td>
</tr>
<tr>
<td></td>
<td>Dalton Georgia College &amp; State University</td>
<td>706-864-1799</td>
</tr>
<tr>
<td></td>
<td>Decatur Gwinnett County University</td>
<td>706-778-6118</td>
</tr>
<tr>
<td></td>
<td>Damascus Piedmont College</td>
<td>678-407-5322</td>
</tr>
<tr>
<td></td>
<td>Gainesville Gwinnett County University</td>
<td>770-634-6220</td>
</tr>
<tr>
<td></td>
<td>Kings Bay Brevard University</td>
<td>912-882-7125</td>
</tr>
<tr>
<td></td>
<td>Lawrenceville Georgia Perimeter College</td>
<td>478-445-5016</td>
</tr>
<tr>
<td></td>
<td>Macon Mercer University</td>
<td>478-301-2863</td>
</tr>
<tr>
<td></td>
<td>Marietta Shorter College</td>
<td>770-951-8382</td>
</tr>
<tr>
<td></td>
<td>Milledgeville Georgia College &amp; State University</td>
<td>747-640-4826</td>
</tr>
<tr>
<td></td>
<td>Mt Berry Berry College</td>
<td>706-290-2660</td>
</tr>
<tr>
<td></td>
<td>Savannah Armstrong Atlantic State University</td>
<td>912-927-5269</td>
</tr>
<tr>
<td></td>
<td>Statesboro Georgia Southern University</td>
<td>912-681-5415</td>
</tr>
<tr>
<td></td>
<td>Valdosta Valdosta State University</td>
<td>229-245-3878</td>
</tr>
</tbody>
</table>
HAWAII
HONOLULU UNIVERSITY OF HAWAII—MANOA 808-956-3455
LAIE BRIGHAM YOUNG UNIVERSITY—HAWAII CAMPUS 808-293-3536

IDAHO
BOISE BOISE STATE UNIVERSITY 208-426-1583
MOSCOW UNIVERSITY OF IDAHO 208-885-6776
POCATELLO IDAHO STATE UNIVERSITY 208-236-2130

ILLINOIS
CARBONDALE SOUTHERN ILLINOIS UNIVERSITY 618-536-3303
CHAMPAIGN UNIVERSITY OF ILLINOIS—URBANA-CHAMPAIGN 217-333-3706
CHARLESTON EASTERN ILLINOIS UNIVERSITY 217-581-5996
CHICAGO ILLINOIS INSTITUTE OF TECHNOLOGY 312-602-7732
CHICAGO ROOSEVELT UNIVERSITY 312-341-2108
CHICAGO SAINX JAVIER UNIVERSITY 773-298-3503
CHICAGO UNIVERSITY OF ILLINOIS—CHICAGO 312-996-9019
DEERFIELD TRINITY INTERNATIONAL UNIVERSITY 847-374-4067
DEKALB NORTHERN ILLINOIS UNIVERSITY 815-753-1204
EDWARDSVILLE SOUTHERN ILLINOIS UNIVERSITY 618-650-3371
GREENVILLE GREENVILLE COLLEGE 618-644-2000
MACOMB WESTERN ILLINOIS UNIVERSITY 309-268-2433
NORMAL ILLINOIS STATE UNIVERSITY 309-438-2500
PEORIA BRADLEY UNIVERSITY 309-673-3181
QUINCY QUINCY UNIVERSITY 217-228-5200
ROCK ISLAND QUAD-CITIES GRADUATE STUDY CENTER 309-784-7376
WHEELING NATIONAL-LOUIS UNIVERSITY 847-465-0755

INDIANA
BLOOMINGTON BUREAU OF EVALUATIVE STUDIES & TESTING 812-855-1995
FORT WAYNE INDIANA-PURDUE UNIVERSITY—FORT WAYNE 260-401-6999
INDIANAPOLIS BUTLER UNIVERSITY 317-906-9266
INDIANAPOLIS INDIANA-PURDUE UNIVERSITY—INDIANAPOLIS 317-274-2260
MARRION INDIANA WELSHYAN UNIVERSITY 765-677-2257
MUNCIE BALL STATE UNIVERSITY 765-677-1290
OAKLAND CITY OAKLAND CITY UNIVERSITY 812-749-1296
WEST LAFAYETTE PURDUE UNIVERSITY—WEST LAFAYETTE 765-494-1145

IOWA
AMES IOWA STATE UNIVERSITY 515-294-5058
CEDAR FALLS UNIVERSITY OF NORTHERN IOWA 319-273-6023
DES MOINES DRAKE UNIVERSITY 515-271-2096
DES MOINES DRAKE UNIVERSITY 515-271-3721
DUBUQUE CLARKE COLLEGE 563-588-6331
OTTOMUA INDIAN HILLS COMMUNITY COLLEGE 641-683-5233
SIoux CITY MORNINGSTAR COLLEGE 712-274-5375
STORM LAKE BUENA VISTA COLLEGE 712-749-2218
WEST DES MOINES VITEROBO UNIVERSITY 515-224-8411

KANSAS
ATCHISON BENEDICTINE COLLEGE 913-362-7078
EMPERIA EMPORIA STATE UNIVERSITY 620-341-5103
HAYS FORT HAYS STATE UNIVERSITY 785-628-4401
LAWRENCE UNIVERSITY OF KANSAS 785-844-2768
MANHATTAN KANSAS STATE UNIVERSITY 785-532-6492
PITTSBURG PITTSBURG STATE UNIVERSITY 620-235-4276
TOPEKA WASHBURN UNIVERSITY 755-231-1010
WICHITA FRIENDS UNIVERSITY 316-295-5824
WICHITA WICHITA STATE UNIVERSITY 316-978-5359

KENTUCKY
BOWLING GREEN WESTERN KENTUCKY UNIVERSITY 270-745-3139
LOUISVILLE UNIVERSITY OF LOUISVILLE 502-823-6066
MOREHEAD MOREHEAD STATE UNIVERSITY 606-783-2526
MURRAY MURRAY STATE UNIVERSITY 278-762-6851
RICHMOND EASTERN KENTUCKY UNIVERSITY 859-622-1281

LOUISIANA
LAFAYETTE UNIVERSITY OF LOUISIANA—LAFAYETTE 337-482-6480
LAKE CHARLES McNEES STATE UNIVERSITY 337-475-5142
NEW ORLEANS LOYOLA UNIVERSITY 504-864-7480
NEW ORLEANS OUR LADY OF HOLY CROSS COLLEGE 504-384-7744
NEW ORLEANS UNIVERSITY OF NEW ORLEANS 504-208-7219
NEW ORLEANS XAVIER UNIVERSITY OF LOUISIANA 504-483-7487
RUSTON LOUISIANA TECH UNIVERSITY 318-257-2488
SHREVEPORT CENTENARY COLLEGE OF LOUISIANI 318-869-5053

MAINE
FARMINGTON UNIVERSITY OF MAINE—FARMINGTON 207-776-0724
MACIAS UNIVERSITY OF MAINE—MACIAS 207-255-1228
ORONO UNIVERSITY OF MAINE—ORONO 207-581-4119
PORTLAND UNIVERSITY OF SOUTHERN MAINE 207-780-4383
PRESQUE ISLE UNIVERSITY OF MAINE—PRESQUE ISLE 207-768-9569
WATERVILLE COLBY COLLEGE 207-872-3424

MARYLAND
BALTIMORE JOHNS HOPKINS UNIVERSITY 410-316-7819
COLLEGE PARK UNIVERSITY OF MARYLAND—COLLEGE PARK 301-314-7888
FROSTBURG FROSTBURG STATE UNIVERSITY 301-867-8493
LA PLATA COLLEGE OF SOUTHERN MARYLAND 301-934-6575
ROCKVILLE MONTGOMERY COLLEGE 301-279-5086
WESTMINSTER WESTERN MARYLAND COLLEGE 410-857-2500

MASSACHUSETTS
BOSTON NORTHEASTERN UNIVERSITY 617-373-3231
BRIDGEWATER BRIDGEWATER STATE COLLEGE 508-531-7388
FITZHIBURG FITZHIBURG STATE COLLEGE 978-665-4472
MEDFORD TUFUS UNIVERSITY 617-627-3360
NORTH ADAMS MASSACHUSETTS COLLEGE OF LIBERAL ARTS 413-662-5332
SALEM SALEM STATE COLLEGE 978-542-7044
SPRINGFIELD AMERICAN INTERNATIONAL COLLEGE 413-747-6269
WESTFIELD WESTFIELD STATE COLLEGE 413-572-5380
WORCESTER WORCESTER STATE COLLEGE 508-929-8072

MICHIGAN
ANN ARBOR UNIVERSITY OF MICHIGAN 734-764-8312
BIG RAPIDS FERRIS STATE UNIVERSITY 231-591-3628
DETROIT MARYGROVE COLLEGE 313-927-1509
DETROIT WAYNE STATE UNIVERSITY 313-577-3400
EAST LANSING MICHIGAN STATE UNIVERSITY 517-355-8385
KALAMAZOO WESTERN MICHIGAN UNIVERSITY 616-387-1859
MOUNT PLEASANT CENTRAL MICHIGAN UNIVERSITY 517-774-1092
ROCHESTER OAKLAND UNIVERSITY 248-730-3229
SAUL STEELE LAKE SUPERIOR STATE UNIVERSITY 906-635-2452

MINNESOTA
BEMIDJI BEMIDJI STATE UNIVERSITY 218-755-2075
DU LUTH COLLEGE OF ST. SCHOLASTICA 218-723-6085
DU LUTH UNIVERSITY OF MINNESOTA—DU LUTH 218-726-7985
MANKATO MINNESOTA STATE UNIVERSITY—MANKATO 507-389-1455
MINNEAPOLIS UNIVERSITY OF MINNESOTA—MINNEAPOLIS 612-624-9853
MOORHEAD MINNESOTA STATE UNIVERSITY—MOORHEAD 218-477-2227
MORRIS UNIVERSITY OF MINNESOTA—MORRIS 320-589-6060
NORTHLAND CARLETON COLLEGE 507-666-4293
ST. CLOUD ST. CLOUD STATE UNIVERSITY 320-308-1112
ST. PAUL UNIVERSITY OF ST. THOMAS 651-962-6781

MISISSIPPI
ALCORN STATE ALCORN STATE UNIVERSITY 662-877-5999
CLEVELAND DELTA STATE UNIVERSITY 662-846-4699
COLUMBUS MISSISSIPPI UNIVERSITY FOR WOMEN 662-329-7349
HATTIESBURG UNIVERSITY OF SOUTHERN MISSISSIPPI 662-206-4602
JACKSON STATE UNIVERSITY 662-777-2484
MISSISSIPPI STATE MISSISSIPPI STATE UNIVERSITY—MERIDIAN BRANCH 662-325-0718
WISCONSIN

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beloit</td>
<td>Beloit College</td>
<td>608-363-2675</td>
</tr>
<tr>
<td>Eau Claire</td>
<td>University of Wisconsin—Eau Claire</td>
<td>715-836-5522</td>
</tr>
<tr>
<td>Green Bay</td>
<td>University of Wisconsin—Green Bay</td>
<td>920-465-2163</td>
</tr>
<tr>
<td>Jefferson</td>
<td>Nova Southeastern University</td>
<td>920-563-2961</td>
</tr>
<tr>
<td>Kenosha</td>
<td>Carthage College</td>
<td>414-551-9599</td>
</tr>
<tr>
<td>La Crosse</td>
<td>University of Wisconsin—La Crosse</td>
<td>608-785-8073</td>
</tr>
<tr>
<td>Menomonie</td>
<td>University of Wisconsin—Stout</td>
<td>715-232-1211</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>Marquette University</td>
<td>414-288-7172</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>University of Wisconsin—Milwaukee</td>
<td>414-229-4689</td>
</tr>
<tr>
<td>Oshkosh</td>
<td>University of Wisconsin—Oshkosh</td>
<td>920-424-0068</td>
</tr>
<tr>
<td>Platteville</td>
<td>University of Wisconsin—Platteville</td>
<td>608-342-1865</td>
</tr>
<tr>
<td>Stevens Point</td>
<td>University of Wisconsin—Stevens Point</td>
<td>715-346-4472</td>
</tr>
<tr>
<td>Superior</td>
<td>University of Wisconsin—Superior</td>
<td>715-394-8308</td>
</tr>
<tr>
<td>Whitewater</td>
<td>University of Wisconsin—Whitewater</td>
<td>414-472-5613</td>
</tr>
</tbody>
</table>

CANADIAN AND OTHER FOREIGN CENTERS

ALBERTA

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calgary</td>
<td>University of Calgary</td>
<td>403-220-5524</td>
</tr>
<tr>
<td>Edmonton</td>
<td>University of Alberta</td>
<td>780-492-7773</td>
</tr>
<tr>
<td>Lethbridge</td>
<td>University of Lethbridge</td>
<td>403-329-2192</td>
</tr>
</tbody>
</table>

BRITISH COLUMBIA

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancouver</td>
<td>University of British Columbia</td>
<td>604-822-3180</td>
</tr>
<tr>
<td>Victoria</td>
<td>University of Victoria</td>
<td>250-324-3341</td>
</tr>
</tbody>
</table>

MANITOBA

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winnipeg</td>
<td>University of Manitoba</td>
<td>204-474-8593</td>
</tr>
</tbody>
</table>

NEW BRUNSWICK

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fredericton</td>
<td>ST. Thomas University</td>
<td>506-452-0418</td>
</tr>
</tbody>
</table>

NEWFOUNDLAND

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. John's</td>
<td>Memorial University—Newfoundland</td>
<td>709-737-8874</td>
</tr>
</tbody>
</table>

NOVA SCOTIA

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halifax</td>
<td>Dalhousie University</td>
<td>902-494-2081</td>
</tr>
</tbody>
</table>

ONTARIO

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamilton</td>
<td>McMaster University</td>
<td>905-525-9140</td>
</tr>
<tr>
<td>Kingston</td>
<td>Queen's University</td>
<td>613-533-6004</td>
</tr>
<tr>
<td>London</td>
<td>University of Western Ontario</td>
<td>519-661-3559</td>
</tr>
<tr>
<td>Ottawa</td>
<td>University of Ottawa</td>
<td>613-562-5201</td>
</tr>
<tr>
<td>Thunder Bay</td>
<td>Lakehead University</td>
<td>807-343-8498</td>
</tr>
</tbody>
</table>

QUEBEC

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montreal</td>
<td>Concordia University—SGW Campus</td>
<td>514-848-3545</td>
</tr>
</tbody>
</table>

SASKATCHEWAN

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saskatoon</td>
<td>St. Thomas More College</td>
<td>306-244-3821</td>
</tr>
</tbody>
</table>

OTHER FOREIGN CENTERS

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minatoo-KU</td>
<td>Temple University – Japan</td>
<td>355-419-8000</td>
</tr>
<tr>
<td>Tokyo, Japan</td>
<td>Tipperary Rural &amp; Business Devel. Inst.</td>
<td>353-183-8097</td>
</tr>
<tr>
<td>Tipperary, Ireland</td>
<td>Tipperary Rural &amp; Business Devel. Inst.</td>
<td>353-183-8097</td>
</tr>
</tbody>
</table>

UNITED STATES ARMED FORCERS

<table>
<thead>
<tr>
<th>City</th>
<th>University Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>APO</td>
<td>Troy State University—Pacific Region</td>
<td>732-793-3000</td>
</tr>
</tbody>
</table>
## Accommodations Request Form

Any individual who has a physical or mental impairment or limitation described as a disability under the Americans with Disabilities Act (ADA) may request special testing arrangements.

To request an examination accommodation because of a disability, complete this form (or a photocopy) and submit it to the Test Center of your choice. Include with this form documentation on official letterhead from a licensed physician, school official, licensed psychiatrist, licensed psychologist, or other appropriate authority (including title, address, and telephone number). This documentation should identify your disability and your need for the requested accommodations. This documentation could be in the form of a letter, test results, signed school Individual Education Plan (diagnosis and plan), or other official documentation identifying your disability and the accommodations prescribed.

<table>
<thead>
<tr>
<th>Name: ________________________________________________</th>
<th>Date: __________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last First M.I.</td>
<td></td>
</tr>
<tr>
<td>Address: ______________________________________________</td>
<td>Examination Title: _______</td>
</tr>
<tr>
<td></td>
<td>Examination Date: _______</td>
</tr>
<tr>
<td>Daytime Telephone Number: _____________________________</td>
<td></td>
</tr>
<tr>
<td>Description of Disability: ______________________________</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Accommodations Requested (Check all that apply):**

- [ ] Taped Exam
- [ ] Reader
- [ ] Braille Exam
- [ ] Writer
- [ ] Large Print Exam
- [ ] Sign Language Interpreter
- [ ] Large Print Answer Sheet
- [ ] American Sign Language
- [ ] Additional Breaks
- [ ] Cued Speech
- [ ] Additional Time
- [ ] Other _______________________
  - [ ] Time and a Half
  - [ ] Double Time
  - [ ] Separate Testing Room
  - [ ] Accessible Facilities
  - [ ] Additional Time (Please Explain) ____________________________________________

- [ ] Other Equipment or Accommodation (Please Explain) ____________________________

Accommodations previously provided to you (List accommodations and for what purpose, such as “Sign Language Interpreter for MAT examination”):

If you have any questions about your accommodations, please do not hesitate to write or call The Psychological Corporation at 1-800-622-3231 or 210-339-8710

Copyright © 2001 by The Psychological Corporation, a Harcourt Assessment Company.
Sample Personal Score Report

Below, you will see an example of a personal Score Report, similar to the one you will receive in the mail after taking the Miller Analogies Test (MAT).

**Interpreting the Personal Score Report**

This sample personal Score Report is similar to the one you will receive in the mail after taking the Miller Analogies Test. Your personal Score Report will list the following information:

- **Personal Information**—In the bottom left corner you will see your name, address, and Social Security number (American) or Social Insurance number (Canadian), exactly as you indicate them on your answer document (for a paper-and-pencil version) or computerized registration form (for a computer-delivered version). The prefix “800” indicates the MAT.

- **Raw Score**—The raw score you have earned (the number of questions that you answered correctly) will be displayed in the upper left, beneath The Psychological Corporation logo and address. A raw score of 50 would mean that you answered 50 items correctly out of the 100 items on the MAT.
■ **Percentile for Intended Major**—Directly under the raw score, you will see the corresponding percentile for your intended area of study (based on the intended major you indicate when you take the MAT).

A percentile (%ile) ranks your performance relative to the performance of individuals in a specified group. It tells what percentage of the group earned raw scores equal to or lower than your raw score. For example, a percentile of 60 would mean that your raw score was equal to or higher than the raw scores earned by 60% of the individuals to whom you are being compared. A chart showing raw scores and corresponding percentiles for a number of areas of study appears in Appendix D on page 48 of this booklet.

Your intended-major percentile ranks your performance relative to the performance of MAT examinees who specified an intended major in the same area of study as the intended major you gave on your answer document (for paper-and-pencil versions) or on the computerized registration form (for a computer-delivered version). Thus, if you were to specify an intended major listed in the field of education, your intended-major percentile would rank your performance relative to the performances of other examinees who specified an intended major listed in the field of education.

■ **Percentile for Total Group**—Directly under the percentile for intended major, you will see your total-group percentile, which ranks your performance relative to the general population of MAT examinees. This percentile is based on the current normative data of the general population of MAT examinees. (See in Appendix D, on page 48, the column “All Majors.”)

■ **Score Recipients**—In the upper right, beneath the Miller Analogies Test logo, you will see listed the schools and other institutions that will receive official score reports for your MAT performance. These are the score recipients that you specify by the codes you enter on the answer document (for paper-and-pencil versions) or on the computerized registration form (for a computer-delivered version) when you take the MAT.

There is no passing raw score or percentile established or recommended by The Psychological Corporation for the MAT. Score recipient schools and institutions have their own standards, and these standards vary widely. A score interpreted as “high” by one institution may be seen as “average” by another. In addition, the weight that score recipient schools place on MAT scores varies from institution to institution. A MAT score is only one of a number of factors used to select candidates for admission to graduate school programs.
Raw-Score-to-Percentile Chart

Using this raw-score-to-percentile chart, you can compare your performance on the *Miller Analogies Test* with the performance of several reference groups. The percentiles presented are based on the results of test administrations that occurred from 1990 through 1992.

Estimated percentiles appear in the far left and far right columns. Corresponding raw scores are listed between the percentiles. For an explanation of percentiles, see the section “Percentile for Intended Major” in Appendix C on page 47.

<table>
<thead>
<tr>
<th>Percentile</th>
<th>All Majors</th>
<th>Business</th>
<th>Education</th>
<th>Engineering</th>
<th>Humanities</th>
<th>Natural Sciences</th>
<th>Social Sciences</th>
<th>Other</th>
<th>Undecided</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td>86–100</td>
<td>83–100</td>
<td>85–100</td>
<td>89–100</td>
<td>89–100</td>
<td>84–100</td>
<td>88–100</td>
<td>88–100</td>
<td>85–100</td>
<td>99</td>
</tr>
<tr>
<td>95</td>
<td>74–80</td>
<td>72–76</td>
<td>73–79</td>
<td>78–84</td>
<td>80–84</td>
<td>72–77</td>
<td>77–83</td>
<td>76–81</td>
<td>71–78</td>
<td>95</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Natural Sciences</th>
<th>Social Sciences</th>
<th>Other</th>
<th>Undecided</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>50–52</td>
<td>50–51</td>
<td>55–57</td>
<td>58–59</td>
<td>49–51</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentile</th>
<th>All Majors</th>
<th>Business</th>
<th>Education</th>
<th>Engineering</th>
<th>Humanities</th>
<th>Natural Sciences</th>
<th>Social Sciences</th>
<th>Other</th>
<th>Undecided</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0–18</td>
<td>0–16</td>
<td>0–17</td>
<td>0–21</td>
<td>0–19</td>
<td>0–19</td>
<td>0–18</td>
<td>0–16</td>
<td>0–15</td>
<td>1</td>
</tr>
</tbody>
</table>

| N          | 148,326 | 6,942  | 86,644 | 434  | 2,675  | 13,245 | 17,838 | 19,505| 1,043 | N |

| Mean       | 47.5     | 47.0   | 46.7   | 51.9 | 53.7   | 47.2   | 50.5   | 48.3  | 43.9  | Mean |
| SD         | 16.8     | 16.1   | 16.6   | 16.9 | 15.5   | 17.3   | 17.6   | 16.8  | SD    |     |