

EXHIBIT 50

CLASSIC RESIDENCE

BY
HYATT®

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

May 3, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street 3rd Floor
Jacksonville, FL 32202

Redacted

Re: Refund from Master Trust Agreement for CCW-LaJolla, LLC

Dear John,

Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund check for [REDACTED] Per the promissory note, the check should be made payable to [REDACTED] Trustee of that certain Declaration of Trust dated June 21, 2000 in the amount of \$90,000.32. Please overnight the check to the following address:

LaJolla Village Towers, A Classic Residence by Hyatt
Attn: Carolyn Zuehl
8515 Costa Verde Drive
San Diego, California 92122

Also, please cut a check in the amount of \$2,697.88 for work to repair the apartment to its original condition. The check should be made payable to LaJolla Village Towers Care Center and sent overnight to the above address.

Funds to cover this transaction will be wired shortly to the Wachovia Bank CCW-LaJolla, LLC master trust account.

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,



Matt Phillips
Assistant Secretary

Attachments

EXHIBIT 51

CLASSIC RESIDENCE

BY
HYATT®

www.hyattclassic.com

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

July 2, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street, 3rd Floor
Jacksonville, FL 32202

OK per
John Stephens
@ Wachovia

Re: Refund from Master Trust Agreement for CCW-LaJolla, LLC

Redacted

Dear John,

Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund check for [REDACTED]. The check should be made payable to [REDACTED] Trust dated April 22, 1988, in the amount of \$145,107.20 and sent overnight to the following address:

LaJolla Village Towers, A Classic Residence by Hyatt
Attn: Carolyn Zuehl
8515 Costa Verde Drive
San Diego, California 92122

We will notify you when the funds to cover these transactions will be wired to the Wachovia Bank CCW-LaJolla, LLC master trust account.

Also, please forward the cancelled promissory note for the above resident to Carolyn Zuehl at the LaJolla community.

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,



Matt Phillips
Assistant Secretary

cc: Jill Olson

EXHIBIT 52

CLASSIC RESIDENCE

BY

HYATT®

www.hyattclassic.com

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

Wed 7/23/04

July 23, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street, 3rd Floor
Jacksonville, FL 32202

Redacted

Re: Refund from Master Trust Agreement for CCW-LaJolla, LLC

Dear John,

Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund check for [REDACTED]. The check should be made payable to [REDACTED] in the amount of \$443,270.95 and sent overnight to the following address:

LaJolla Village Towers, A Classic Residence by Hyatt
Attn: Carolyn Zuehl
8515 Costa Verde Drive
San Diego, California 92122

We will notify you when the funds to cover these transactions will be wired to the Wachovia Bank CCW-LaJolla, LLC master trust account.

Also, please forward the cancelled promissory note for the above resident to Carolyn Zuehl at the LaJolla community.

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,


Matt Phillips
Assistant Secretary

cc: Jill Olson

EXHIBIT 53

CLASSIC RESIDENCE

BY
HYATT®

www.hyattclassic.com

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

September 3, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street, 3rd Floor
Jacksonville, FL 32202

Redacted

Re: Refund from Master Trust Agreement for CCW-LaJolla, LLC

Dear John,

Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund check for [REDACTED]. The check should be made payable to The Estate of [REDACTED] in the amount of \$104,913.06 and sent overnight to the following address:

LaJolla Village Towers, A Classic Residence by Hyatt
Attn: Carolyn Zuehl
8515 Costa Verde Drive
San Diego, California 92122

We will notify you when the funds to cover these transactions will be wired to the Wachovia Bank CCW-LaJolla, LLC master trust account.

Also, please forward the cancelled promissory note for the above resident to Carolyn Zuehl at the LaJolla community.

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,


Matt Phillips
Assistant Secretary

cc: Jill Olson

EXHIBIT 54

CLASSIC RESIDENCE

BY
HYATT®

www.hyattclassic.com

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

September 7, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street 3rd Floor
Jacksonville, FL 32202

Wired 9/8/04

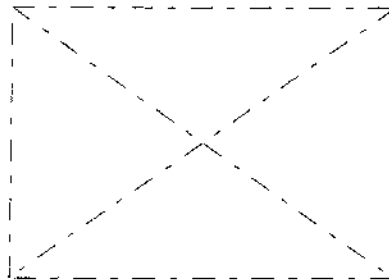
Redacted

Re: Refund from Master Trust Agreement for CCW-LaJolla, LLC

Dear John,

Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund for [REDACTED]. Please wire transfer the amount of \$152,228.39 per the following instructions:

Bank name:
City, State
Bank account name:
Bank account number:
ABA number:
Attn:



Please call (858) 204-3092 to acknowledge receipt of the wire transfer.

Also, please cut a check in the amount of \$4,683.61 for work to repair the apartment to its original condition. The check should be made payable to LaJolla Village Towers and sent via U.S. Mail to: LaJolla Village Towers, A Classic Residence by Hyatt, Attn: Carolyn Zuehl, 8515 Costa Verde Drive, San Diego, California, 92122.

We will notify you when funds to cover this transaction have been wired to the Wachovia Bank CCW-LaJolla, LLC master trust account

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,



Matt Phillips
Assistant Secretary

EXHIBIT 55

CLASSIC RESIDENCE

BY
HYATT®

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

February 2, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street 3rd Floor
Jacksonville, FL 32202

Redacted

Re: Refund from Master Trust Agreement for CCW-LaJolla, LLC

Dear John,

Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund check for [REDACTED] Per the promissory note, the check should be made payable to [REDACTED] Trustee of The [REDACTED] 2002 revocable trust. Please overnight a check in the amount of \$15,501.11 to the following address:

LaJolla Village Towers, A Classic Residence by Hyatt
Attn: Carolyn Zuehl
8515 Costa Verde Drive
San Diego, California 92122

Also, please cut a check in the amount of \$3,226.39 for work to repair the apartment to its original condition. The check should be made payable to LaJolla Village Towers Care Center and sent overnight to the above address.

Funds to cover this transaction will be wired shortly to the Wachovia Bank CCW-LaJolla, LLC master trust account.

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,


Matt Phillips
Assistant Secretary

Attachments

cc: Jill Olson

EXHIBIT 56

CLASSIC RESIDENCE

BY
HYATT®

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

March 1, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street, 3rd Floor
Jacksonville, FL 32202

Redacted

Re: Refund from Master Trust Agreement for CCW-LaJolla, LLC

Dear John,

Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund check for [REDACTED]. The check should be made payable to Trustee, the [REDACTED] Living Trust dated June 3, 2003 in the amount of \$157,122.00 and sent overnight to the following address:

LaJolla Village Towers, A Classic Residence by Hyatt
Attn: Carolyn Zuehl
8515 Costa Verde Drive
San Diego, California 92122

We will notify you when the funds to cover these transactions will be wired to the Wachovia Bank CCW-LaJolla, LLC master trust account.

Also, please forward the cancelled promissory note for the above resident to Carolyn Zuehl at the LaJolla community.

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,



Matt Phillips
Assistant Secretary

cc: Jill Olson

EXHIBIT 57

CLASSIC RESIDENCE

BY
HYATT®

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

April 16, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street 3rd Floor
Jacksonville, FL 32202

Redacted

Re: Refund from Master Trust Agreement for CCW-LaJolla, LLC

Dear John,

Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund check for [REDACTED]. Per the promissory note, the check should be made payable to [REDACTED] Trustee of The [REDACTED] Trust, dated May 7, 1992. Please overnight a check in the amount of \$178,992.00 to the following address:

LaJolla Village Towers, A Classic Residence by Hyatt
Attn: Carolyn Zuehl
8515 Costa Verde Drive
San Diego, California 92122

Also, please cut a check in the amount of \$1,900.00 for work to repair the apartment to its original condition. The check should be made payable to LaJolla Village Towers Care Center and sent overnight to the above address.

Funds to cover this transaction will be wired shortly to the Wachovia Bank CCW-LaJolla, LLC master trust account.

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,



Matt Phillips
Assistant Secretary

Attachments

cc: Jill Olson

EXHIBIT 58

CLASSIC RESIDENCE

BY
HYATT®

Classic Residence by Hyatt
200 W. Madison St., Ste. 3700
Chicago, IL USA 60606-3417

Telephone (312) 920-2400
Facsimile (312) 750-8589

Via Facsimile 904-489-5410

April 27, 2004

Mr. John Stephens
Vice President
Wachovia Bank
225 Water Street 3rd Floor
Jacksonville, FL 32202

Redacted

[Re. Refund from Master Trust Agreement for CCW-LaJolla, LLC]

Dear John,

This letter replaces the previously sent letter dated April 16, 2004. Per the master trust agreement section 5.6 (a), the distribution of trust account upon termination, we are requesting a refund check for [REDACTED]. The check should be made payable to The [REDACTED] Drexler in the amount of \$178,992.00. Please overnight the check to the following address:

LaJolla Village Towers, A Classic Residence by Hyatt
Attn: Carolyn Zuehl
8515 Costa Verde Drive
San Diego, California 92122

Also, please cut a check in the amount of \$1,900.00 for work to repair the apartment to its original condition. The check should be made payable to LaJolla Village Towers Care Center and sent overnight to the above address.

[Funds to cover this transaction have been wired to the Wachovia Bank CCW-LaJolla, LLC master trust account.]

If you should have any questions or comments, please contact Jill Olson at (312) 750-8132.

Sincerely,


Matt Phillips
Assistant Secretary

Attachments

cc: Jill Olson

EXHIBIT 59

**LA JOLLA VILLAGE TOWERS,
A CLASSIC RESIDENCE BY HYATT
CONTINUING CARE RESIDENCY AGREEMENT**

h:\fab\lajollavillajores5.ver\03/06/98

Agreement in effect and may commence Your occupancy in the Off-campus Care Center or Care Center, as the case may be.

D. Term

This Agreement will commence on the Effective Date and will continue until it terminates as set forth in Section VIII.

II. GENERAL SERVICES

A. Services Included in Monthly Fee

You will receive the following services and amenities as part of Your Monthly Fee:

1. Long Term Care. A long term care program providing assisted living, Alzheimer's care and skilled nursing care, as described in Section V. (Note, Your Monthly Fee is adjusted at such time as you permanently transfer to the Off-campus Care Center or Care Center based upon the then current rate Provider charges for services therein).

2. Dining Services. You may select one of the dining service programs described in a., b. or c. for Your individual dining needs while residing in Your Home. All meals provided under the dining service program options will be served in the club-style dining room. The dining service program options will not be available in the private dining room. Your initials below will indicate the dining service program option You have selected. The Provider will establish and may change from time to time on thirty (30) days' notice the amount of the credit or cost of additional meals, based on food costs. The credits and costs shown below are the Provider's estimates for the Community as of the date of this Agreement.

- a. _____ Thirty (30) meals per month (lunches or dinners) plus continental breakfast daily;
- b. _____ Twenty-one (21) meals per month (lunches or dinner) plus daily continental breakfasts. With this option You will receive a credit of _____ against Your Monthly Fee. Each extra meal in excess of twenty-one (21) will cost _____; and
- c. _____ A la carte plan (no prepaid lunches or dinners) plus daily continental breakfast. With this option You will receive a credit of _____ against Your Monthly Fee. Each meal will cost _____.

3. Tray Service. During a temporary illness, when authorized by the Wellness Center Supervisor, tray service will be delivered to You in Your Home (tray service at other times will be subject to an extra charge).

4. Extra Meals. Meals in addition to those you selected pursuant to Section II.A.1. will be subject to an extra charge at Provider's then prevailing rate, and credit for extended absence is outlined in Section III.C.4. You may change Your dining option one time per calendar year, by giving Provider at least sixty (60) days' notice.

5. Special Diets. Meals for special diet prescribed by Your physician as medically necessary will be made available.

6. Housekeeping. Weekly housekeeping services.

7. Linens. Weekly laundering of towels and bed linens.

8. Activity Program. An activity program - social, cultural and recreational - to the extent You wish to participate.

9. Transportation. Local transportation as scheduled by Provider.

10. Community Areas. Use of all recreational amenities at the Community.

11. Parking. One (1) parking space per Home. The Provider will make additional parking spaces available for an extra fee, space permitting.

12. Storage. One (1) storage space.

13. Utilities. Electricity, water, sewer, garbage and basic cable television services.

14. Maintenance. Maintenance of buildings and grounds, including routine maintenance of Your Home.

15. Wellness. Basic health observation and wellness services to ensure that Resident's dietary health needs and needs for Special Services are met (provided through the Wellness Center staffed 24 hours a day by Licensed Vocational Nurses), located on the independent living activities level.

16. Emergency Response. Emergency call response, twenty-four (24) hours per day.

17. Basic Services. Maintenance of house rules, assistance with taking medications, central storage and distribution of medications, and arrangements to meet health needs, including transportation.

Occupancy of Your Unit and use of the accommodations in the Community are contingent upon Your payment of the Monthly Fee, unless deferred as set forth herein.

B. Services Not Included in Monthly Fee

You will pay separately for any services not set forth in Section II.A. above, including the following (the current prevailing extra charges are set forth on Appendix C attached hereto):

EXHIBIT 60



Frequently Asked Questions

The decision to move to a Classic Residence by Hyatt senior living community brings with it a myriad of exciting new choices and options. At La Jolla Village Towers, new residents choose from a variety of thoughtfully designed apartments in varying styles and sizes. Dining is a delight, with regularly changing menus and meals prepared by Hyatt-trained chefs. Our calendar of enriching programs and activities is unparalleled in La Jolla.

Good organization and the right support services can make moving an enjoyable, worry-free experience. Move-in Coordinator Staci Phillips is available to help new residents plan a smart move. According to Phillips, here are some frequently asked questions from new residents of La Jolla Village Towers.

Q. How do I reserve a guest suite for out-of-town visitors?

A. You may reserve a guest suite simply by calling the front desk. At La Jolla Village Towers, two guest suites are available.

Q. Where and when are meals served?

A. Meals are served in our beautiful penthouse dining room overlooking the ocean. Continental breakfast is served between 7:00 a.m. and 9:00 a.m.; lunch is served from 11:30 a.m. to 2:00 p.m., and dinner from 5:00 p.m. to 7:30 p.m.

Q. How do I share information with other residents?

A. We have two internal publications: *Tower Talk* is published monthly by the Activities Department; the deadline for submissions is the 15th of each month.

Tower Talk lists all happenings for the following month, so you won't miss any of the activities! *Monday Morning Press* is published by the Administration each Monday and includes reminders about activities as well as any updates or changes. The deadline is Wednesday prior to Monday publication. There is also a resident bulletin board for posting.

Q. What should I do if I'm going to be away overnight or out of town?

A. If you are planning to be away, fill out a Resident Absence Form at the front desk. This form provides us with information we need to contact you in case of an emergency. Unless instructed otherwise, the front desk will hold your mail for you until you return.



Q. Does La Jolla Village Towers provide transportation?

A. Yes! We provide scheduled transportation, as well as transportation to medical appointments with 24 hours' notice. Drivers are available weekdays from 8:00 a.m. to 5:00 p.m. and on weekends from 8:00 a.m. to 4:00 p.m.

Q. When is a nurse available?

A. A nurse is on duty 24 hours a day, seven days a week. If he or she is not at the Wellness Center, residents can call the front desk staff, who will contact the nurse on the two-way radio.

In addition, our Medical Director is on site every Tuesday from 8:30 a.m. to 12:00 noon. Appointments can be scheduled directly with his office. You do not need an appointment with the Wellness Center to have your blood pressure checked.



Q. How does the "I'm okay" check-in system work?

A. Residents check in every day by 10:00 a.m. by pressing the check-in button located in the living room of their apartments. If a resident does not check in by 10:00 a.m., the front desk staff calls the resident's apartment. If there is no answer, the front desk staff leaves a message on the resident's answering machine and immediately notifies the nurse on duty in the Wellness Center, who visits the apartment.

Q. How do I use the call lights?

A. The call lights are located in the bedroom(s) and bathroom(s) of each apartment. When you push the red button, the call system is activated and alerts the front desk staff, who notifies the Wellness Center nurse immediately by either phone or radio.

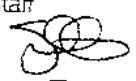
Q. Sounds great!

When can I move to La Jolla Village Towers?

A. Call (858) 646-7745 or 1-800-995-5392 today to learn about apartment availability and the lifestyle that can be yours!



EXHIBIT 61

To: LVT Sales Staff
From: Stacie Mills 
Subject: Additional Long-Term Care Q & A
Date: October 14, 1998
cc: Vicky Simpson, David Kane & Mary Leary

MEMORANDUM

The following are answers to the questions posed regarding the additional long-term care program. **THIS INFORMATION IS FOR INTERNAL USE ONLY AND SHOULD NOT BE SHARED WITH RESIDENTS OR PROSPECTS IN WRITTEN FORM.**



1. Under Approach 1 or Approach 2, how do I know which is the better option financially?

Approach 1 - 0% Approach 2 → 40%

As with the original options offered (42% repayment or 82% repayment), this decision depends on which program works better for you personally. While the Approach 2 repayment option is a greater entrance fee, it allows for a 40% repayment that may go to a family estate or trust. Approach 1 allows for a lesser entrance fee, and possibly for a more spacious apartment based on your desires and finances. Approach 1 amortizes 2% per month down to 0%.

2. Under the Lifetime Care Center Coverage, Approach 1, what if the monthly service fee on my apartment is less than the cost of the Care Center?

Lifetime benefits will cover the difference in the cost, except for additional meals and ancillary services between your Independent Living monthly fee and the cost of care in the Care Center. Your fees will reflect any annual increases that may be made in independent living.

3. What if my IL fee is greater than the Care Center Fee?

We do not anticipate any IL fees will be less than Care Center fees, although if this should happen, you would pay the Care Center fees. *(doesn't make sense)*

4. If I don't use any of the additional long-term care benefit days that I purchased, can I have the cost of each 100 additional days refunded to me?

Long-term care benefit days are not refundable.

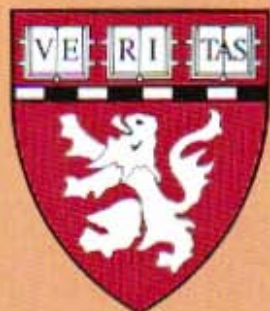
5. Can we still use the long-term "line of credit" and if so, under which option?

Approach 1 is based on a 0% repayment program, therefore does not qualify you for the "line of credit". You may use up to 50% of your repayment (40%) provided for in Approach 2 as your line of credit.

EXHIBIT 62



A Special Health Report from Harvard Medical School



Improving Memory

Understanding age-related
memory loss

In this report

What is memory?

Is memory loss normal?

Diagnosing memory loss

Building a better memory

Drugs, herbs, and memory

Price: \$24

Improving Memory

How's your memory? Memory experts might answer this question with another question: What kind of memory? The word "memory" is a general term that describes a variety of brain functions. It is the ability to recall events from decades ago and from the last few seconds. It is the ability to memorize complex information or simply to connect a name with a face. Many memories last a lifetime, but others fade with age. Some degree of memory loss is a natural part of the aging process for many people. But clearly defining the type of memory loss can help determine whether the problem is a minor, normal change or the first signs of a memory disorder.

Half to two-thirds of people ages 50 and older notice greater difficulty remembering names, appointments, and other details. Memories that are pegged to a specific time and place are especially vulnerable. Fortunately, the small memory lapses that occur with age are not usually signs of a neurological disorder, such as Alzheimer's disease, but rather the result of normal changes in the structure and function of the brain.

It is reassuring to know that the memory difficulties that are caused by the aging process are relatively minor. Although frustrating, they won't interfere with your ability to do your job or run your

household. It is also reassuring to know that there are many things you can do to protect and improve your memory.

Some health conditions that become more common with age can impair memory, including heart disease and its risk factors, such as hypertension. Memory impairment is also among the side effects of some medications, such as sleep aids and some pain relievers. In such cases, controlling health problems and switching medications can often restore memory function.

This report describes age-related changes and other causes of memory impairment. It also discusses the process of memory evaluation and new research on how to prevent memory loss and improve memory.

Perhaps the most encouraging new finding about the brain is that it keeps growing new neurons (brain cells) and making new connections between them. Its capacity for lifelong renewal and rejuvenation raises the potential for medical treatments to stop and reverse memory loss, whether from disease or from aging.

Meanwhile, you can support the growth and development of your brain by taking advantage of more hopeful news: People who keep learning and stay mentally active increase their odds of retaining good brain function as they age. The more you use your brain, the stronger it gets—and the longer it stays strong.



Challenge your brain by learning a new skill.

What is memory?

Memory is all that you remember as well as your capacity for remembering. Not all memories are created equal. Some memories are meant to be retained for a short period and then discarded. For example, you remember the telephone number of the local pizza place only long enough to dial it. But memories that are more important are stored in the brain and can be retrieved at will: the names of close friends and relatives, the multiplication tables, your phone number, and other information you use regularly. Certain kinds of information can be memorized only if you concentrate, whereas other kinds of memories, such as the faces of people you see regularly and the steps of simple everyday routines like brushing your teeth, are absorbed without conscious effort. The process of learning new information, storing it, and recalling it involves a complex interplay of brain functions (see Figure 1).

But what are memories themselves? Let's start by looking at the nature of memories, their surprising intricacy, and the reason some memories endure while others fade away.

Researchers and neuroscientists have devised several classification systems to capture the various forms of memory. One major system relies on time, making a distinction between short-term memories, which are fleeting, and long-term memories, which can persist for a lifetime. Another scheme breaks memories down according to the type of information they contain, such as whether they are straight facts or the procedures for doing something.

Short-term memory

This is information that the mind stores temporarily, encompassing what you need to remember in the next few seconds or minutes. Short-term memories include, for example, the name of the person who just spoke at a dinner party (as well as what that person said), and the date and time of the appointment you just made—and must remember only until you write it in your date book.

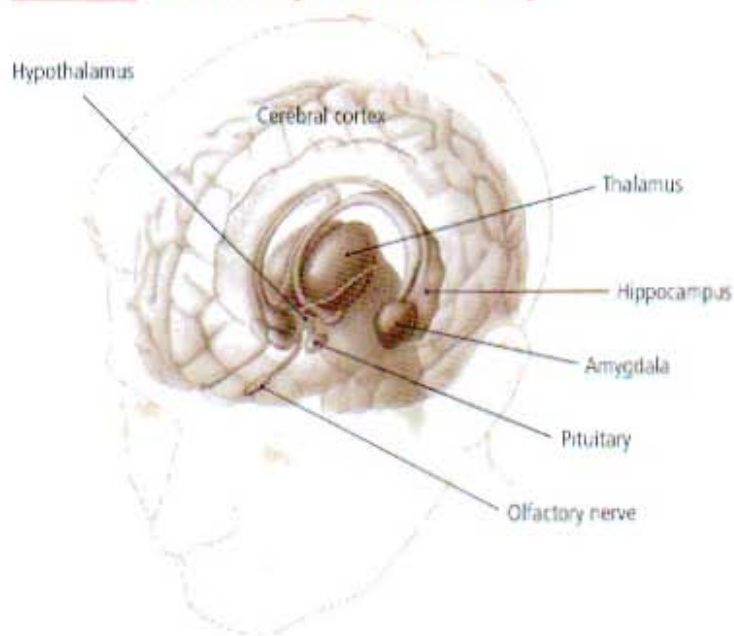
Working memory is a form of short-term memory that involves actively holding information and manipulating it. For example, working

memory comes into play when you remember prices at the supermarket while at the same time performing a computation with them so you can compare costs.

Short-term memories are supposed to be fleeting. They turn over at a high rate because they're continually being replaced by new ones, and there are only so many short-term memories you can keep in mind. Research shows that the average person can hold only about seven (plus or minus two) unrelated "bits" of information in mind at one time. That's why it's easier to remember a seven-digit phone number than a longer number such as the identification number on a driver's license.

The relatively transient nature of your short-term memory is actually beneficial because it allows you to discard unnecessary information. Imagine what life would be like if you kept every short-term

FIGURE 1 Anatomy of a memory



Deep within the brain, a primitive structure, known as the hippocampus, plays a crucial role in acquiring and consolidating new memories. The nearby amygdala is the part of the brain that reacts to emotionally powerful information, helping the brain retain information that has emotional impact. Once a memory is established (consolidated), it is stored mainly in areas of the cerebral cortex, the large, domed outer layer of the brain.



Unimportant details stay in the brain only briefly as short-term memories, but more meaningful experiences tend to remain for the long term.

memory—the name of the telemarketer who called your house an hour ago, the price of each dish you ordered from a Chinese restaurant, what color tie your friend wore yesterday. Your mind would be so overloaded with trivia that you'd have trouble focusing on the things that really are important. It would be as if you kept all your junk mail and let it bury your personal letters, bank statements, and

other important documents. A famous case in the scientific literature describes a man who possessed a seemingly limitless capacity to remember detail—and how this talent undermined his ability to lead a normal life. He retained so much information that he was unable to organize it into meaningful categories. This made it difficult for him to manage his life, set goals, and maintain intimate relationships.

Short-term memory has another limitation. It's fragile and easily disturbed by interruptions. If you're trying to remember a phone number and someone walks into the room and asks you a question, chances are you'll forget the number and have to look it up again. That additional bit of information (the question) "bumps" the short-term memory out of your awareness.

Long-term memory

Although the brain quickly purges most unimportant short-term memories, it stores the important ones—those that are emotionally compelling or personally meaningful. That stored information is long-term memory. It is the total of what you know: a compendium of data ranging from your name, address, and phone number and the names of friends and relatives to more complex information, such as the sounds and images of important events that happened decades ago. It also includes the routine information you use every day, like how to make coffee, operate your computer, and carry out all of the intricate behavioral sequences involved in performing your job or running your household.

Your long-term memory and short-term memory are not distinguished merely by how long the memories last. Another difference is the amount of information each memory system and its associated brain regions can handle. Although the brain can juggle only a relatively small number of short-term memories at a time, it can store a virtually unlimited number of long-term memories. Barring disease or injury, you can always learn and retain something new. Furthermore, long-term memories are less fragile than short-term memories, which means they're not lost when something interrupts your train of thought. Previously learned long-term memories even tend to remain intact in the early stages of dementia, when patients have trouble learning new information.

Maintaining a long-term memory often requires that you periodically "revisit" it. Some long-term memories that go unused or become irrelevant fade or become distorted over time. Have you ever read a book that you loved, but years later found yourself unable to recall much more than the title? That's probably because you hadn't thought of the plot and characters in a long time. On the other hand, some long-term memories are amazingly persistent, no matter how infrequently you use them. For example, many adults are surprised by their ability to remember minute details of their youth—an unjustified punishment they received, a fifth-grade science project, their first date. Interestingly, research demonstrates that although long-term memory is more durable than short-term memory, it is also changeable. For example, the way you remember your first romance can evolve over time in response to experiences and information you acquire years later.

Long-term memory can be divided into two categories: declarative memory and procedural memory.

Declarative memory

Also known as explicit memory, declarative memory is information that requires a conscious effort to recall. There are two types of declarative memory: semantic memory and episodic memory. Semantic memory is factual knowledge, such as the names of the continents, the color of your spouse's eyes, or what winter is. Much of the basic information you acquired dur-

ing your school days falls into this category. In addition to being factual, semantic memory has another key characteristic: It is not bound to a specific point in time. You can't point to the moment in time when you learned your mother's name, for example. And even if you can remember the specific day when you learned the multiplication tables or other facts in school, the timing isn't important to your knowledge of them.

By contrast, episodic memory contains the images and details of experiences you have had. Episodic memories are personal memories tied to specific times and places. The party you attended last weekend, the vacation you took last summer, your children's birthday celebrations (and their births), and your wedding day are all episodic memories (see "Flashbulb memory," below).

Declarative memory is the type of memory that people have trouble with as they age because it is processed through the hippocampus, a brain structure that changes as the years pass and that is particularly vulnerable to degenerative disorders such as Alzheimer's disease. An episodic memory is more fragile than a semantic memory because it is more specific; it occupies less space in your brain and has a smaller associative network. Although patients with Alzheimer's are frequently able to recall episodes from many years ago, they have profound difficulty acquiring new episodic memories.

Procedural memory

Procedural memory, also known as implicit memory, refers to the memory of skills and routines. You draw on procedural memories automatically to perform actions like getting dressed or driving your car. How to ride a bicycle, write in cursive, operate a video recorder—each of these skills required effort and practice at one time, but once you mastered it, you were able to perform it without remembering how you learned it or the separate steps involved. The very fact that you are able to perform the skill demonstrates that learning and memory have taken place. When you take out your bike for a ride, you don't say to yourself, "Okay, first I straddle the seat, then I put my left foot on the left pedal, and then I push off the ground with my right foot..." You just get on and go. It's as though your body does the remembering for you.

In contrast to declarative memory, procedural memory is more resistant to aging and illness. Individuals with Alzheimer's can perform many routine tasks until well into the disease process. Scientists aren't sure why this happens, but it may be because this type of memory is more widely distributed throughout the brain.

Doctors learned how resilient procedural memory is in 1953, after operating on a young man in Connecticut (now famous in the medical literature as patient "H.M.") who sought relief from epileptic seizures. Taking desperate measures to stop the seizures, doctors removed large portions of both medial temporal lobes, including his hippocampus, a structure deep within the brain that is often the focus of epilepsy and is a vital component of the brain's memory system. Although the surgery controlled H.M.'s epilepsy, it left him with amnesia, a devastating impairment of memory (see "Amnesia: Memory loss caused by injury or trauma," page 21). Although H.M. was utterly unable to learn new factual information and create new episodic memories, his procedural memory was largely unaffected. Similarly, studies in which patients with amnesia spend time each day practicing new activities, such as playing computer games, suggest that they can learn new skills. Although the amnesic patients often can't recall ever having played or even seen the computer games, their performance improves over time and with practice, indicating that they are capable of acquiring new procedural memories. ♥

Flashbulb memory

Memory researchers use the term "flashbulb memory" to describe a vivid memory of an unexpected, emotionally charged public event. The assassination of President Kennedy, the Challenger space shuttle disaster, and the destruction of the World Trade Center are all examples of compelling public events that became ingrained in the memories of many who witnessed them, either directly or through television. Flashbulb memories tend to include numerous minute details associated with your experience of the event—where you were standing, what you were doing, who was around you, and so on. It is likely that the combination of profound meaningfulness and emotional impact surrounding the event serves to intensively inscribe it in long-term memory. Experts used to assume that flashbulb memories remained more accurate over time than ordinary memories, but recent research has shown that they are vulnerable to the same biases and distortions as memories of less dramatic events.

How memory changes with age

For many people, memory loss becomes noticeable after about age 50. But one of the myths surrounding the term “age-related memory loss” is that all memories slip with the passing years. In fact, while some information may become harder to recall, other memories will remain as accessible as ever.

In particular, there is truth in the old saying that “you never forget how to ride a bicycle.” Procedural memory—by which you remember processes and skills such as how to ride a bicycle, serve a tennis ball, or accomplish routine tasks—does not fade with age. In fact, it’s so resilient that it remains intact even in people with early- to mid-stage Alzheimer’s.



On the other hand, the idea that “you never forget a face” may be less true. Some research shows that older people’s recall of images such as faces is comparable to that of young people’s.

But other studies suggest a significant decline in the ability of older people to remember new images. In one study, adults of different ages were asked to look at 18 detailed colored pictures; three days later, they were shown several of these pictures as well as others, and asked which ones they’d seen before. Between 60% and 70% of older participants’ memories were inaccurate, compared with just 25%–35% of younger people’s memories.

Why memory fades

Declarative memory may decline somewhat with age. This form of memory depends on the hippocampus for consolidation, and the hippocampus is especially vulnerable to age-related changes. Declarative memory comprises memory for facts and events, and includes, for example, information about your retirement accounts. You may struggle to remember the names of your mutual funds, or you may forget which stock you sold last year. In addition to such verbal facts, you may have more trouble remembering recently learned spatial information, such as the directions to a new location. It’s not just

that you learn this sort of information more slowly; you may have more trouble recalling it because you hadn’t fully learned it in the first place.

Some of what scientists know about age-related memory loss comes from studies of animals. In one such study, older mice took longer to learn to escape from a maze than younger mice. These results are consistent with what scientists observe in people—and what people notice about themselves as they age. If you and your child or grandchild learn a new computer baseball game together, chances are that the next day the child will remember more of the details of how to play the game than you do.

Willpower and effort can overcome some of the age-related difficulties with learning. Researchers now know that in many instances, if you make the effort to learn something well, you will be rewarded—you’ll be able to recall it as well as a younger person can.

When brain cells die

For years, the scientific view of an adult’s brain was anything but encouraging. It was an unquestioned truth that your brain produced new brain cells only early in life and that once you reached adulthood, the growth of new neurons ceased and existing neurons began to die off. You may have heard the oft-repeated “fact” that you lose 10,000 brain cells a day. The idea was that your brain was shrinking, and that could mean only one thing: Your brain functions were slipping away, too. The prevailing theory was that as you lost neurons, you also lost some of your capacity to learn, think, and remember. This is not the whole story.

Some of the old ideas about the brain have proved true. The typical adult brain does lose neurons with age, but far fewer than previously thought. This doesn’t mean that the loss is insignificant: In many older people, the loss of neurons affects the activity of neurotransmitters, chemicals that provide the means for communication among cells in the brain and nervous system. The aging brain seems to lose neurons in structures deep within the brain that produce neurotransmitters, such as dopamine, ace-