Part I

Becoming an independent researcher

You have to learn the rules of the game. And then you have to play better than anyone else.

Albert Einstein

In the first part of this book we look at the skills needed to make the transition from being a postdoc working with a principal investigator (PI) to becoming an independent research scientist. Successful careers in the sciences are normally built on good time management skills and so in the first chapter we explore how to manage your time and look at the different roles you have to play in academia. We then turn our attention to the task of communicating your research both verbally (Chapter 2) and in writing (Chapter 3). In both cases you need to be able to handle any subsequent criticism and we address how to do this in Chapter 4. We then move on to grant writing in Chapter 5. Convincing others that you and your science are worth funding is an essential skill to learn. Similarly, you must be able to manage the project to successful completion once it is funded, and so we look at tools for managing research projects in Chapter 6. Finally we close this section with three chapters that look at the 'next step'. Chapter 7 looks at alternative careers in science, Chapter 8 analyses the art of applying for an academic job and preparing for the interview, and Chapter 9 extends this analysis to applications for independent research fellowships.

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Managing your time

The focus of your life as a postdoc is research but as a university academic you will increasingly have many more duties and responsibilities. Research becomes just one part of your life – teaching, administration, family life and interests outside of work all have to be fitted into the same amount of time. Using a 'principle-based' framework established by Stephen Covey, adapted here for life as a scientist in a university, this chapter aims to help you balance conflicting demands on your time.

The theory

If you are reading these words now, the chances are that you have become aware of the need to manage your time or have decided that your current system does not quite deliver. Time management theory has evolved over the years through first, second, third and now fourth generations – each generation seemingly improving on those that came before. In a nutshell, the first generation approach aims to bring order into chaos through organisation, and is epitomised by the use of 'to do' tools. In contrast, the second generation centres on the protection of personal time in order to be effective and is about planning and preparation, whereas the third generation focuses on prioritising goals. Perhaps not surprisingly, the fourth generation encompasses all of this and aims to harmonise personal and professional aims. Objectives are set through deep questioning and reflection, and are realised through the pragmatic use of time management tools such as weekly scheduling. Among the sources of fourth generation advice on how to cope with the increasing demands of work and the hectic pace of life are the books authored and co-authored by Stephen Covey. Here, we refer to and make use of his 'principle-based' framework (Covey *et al.*, 1994). According to his philosophy, short- and long-term goals can be achieved by developing independence and interdependence, respectively. Crucially, both are based on sound principles – life-long personal development and successful delegation where appropriate.

Habits

Covey lays the foundations for his theories in his book entitled *The 7 Habits of Highly Effective People* (Covey, 2004). Here, he describes the attributes and actions of effective, successful people. His definition of habits is an unusual one: a habit is an intersection of *knowledge*, *skill* and *desire*. In this framework, knowledge is *what* and *why* to do; skill is *how* to do; and desire is the motivation, or the *want* to do (Covey, 2004). Importantly, while you can teach skills and acquire knowledge, you cannot teach desire – you either have it or have to discover that you have it.

Covey's seven habits are grouped into two categories: those fostering independence and those fostering interdependence. Independence can be achieved by mastering three habits:

1. Be proactive – i.e. recognise actions that are within your circle of influence and act on them.
2. Begin with the end in mind – i.e. know your short- and long-term aims.
3. Put first things first – i.e. know how to prioritise objectives so that you achieve your aims.

Interdependence relies on being able to see your aims in a broad context and on recognising that more can be achieved in synergy with others. Four habits promote interdependence:

4. Think win–win – i.e. think beyond your own gains and engage in mutually beneficial relationships.
5. Seek first to understand and then to be understood – i.e. put yourself into another person's position before making a judgement, analyse arguments objectively and empathise.
6. Synergise – this will follow from mastering 4 and 5 as both will inevitably change your understanding of situations.
7. 'Sharpening the saw'.

Rather obtusely, the seventh term refers to the renewal of physical, mental, spiritual and social/emotional strength – i.e. managing your mind. Maintaining this habit is vital for long-term effective functioning and for finding a balance between your different roles; we will return to this theme in the final part of the book.

Roles

Different people have different areas of responsibility or contribution (*roles*). To excel in each of your roles, Covey advocates that each individual should be guided by a *compass* (ethical principles) and a *clock* (scheduling). The compass helps to

identify the things that are most important in your life, and thus aids personal development (Covey, 2004). The clock enables you to achieve your goals. The mutual dependence of a compass and a clock is explored below.

The practice

The common (mis) perception of life as an academic is that of a dignified pursuit of truth, blue-sky research and learned discourses between fellow inhabitants of ivory towers. This was perhaps true in the nineteenth century, but modern life as an academic is as complex, busy and stressful as that of a company executive. Time is a precious commodity and there are conflicting demands that have to be resolved in order to lead a balanced life. So what can you expect, and what is expected of you as an academic in the sciences? A recent advertisement for a university position spells it out:

> Preference will be given to applicants with experience and research vision in one of the highlighted areas. The appointee will be required to engage in research which will contribute to the Department's reputation; to teach, supervise and examine undergraduate and graduate students, and to contribute to administration.

There is no doubt that balancing these different demands on your time is not easy. While time management in academia is essential, it differs from that needed for business or administration. Partially, this is due to the greater flexibility that academics have in terms of hours and place of work. However, there are similarities that can be exploited if the appropriate framework is used. We have found that Covey's approach that was originally proposed for business (Covey *et al*., 1994) adapts well to academia. The following sections illustrate how you can use this framework.

Focus on the most important things

Somewhat simplistically, the 'what' of time management requires that you identify priorities, organise time around them and keep on executing tasks as you go along. It is the 'how' that is more challenging, as even the best plans may need adjusting. At the risk of being somewhat prescriptive, the following suggests where to start (adapted from Covey *et al*., 1994).

1. Remind yourself frequently 'why bother?' (*identify your aims*).
2. Ask yourself what your duties and responsibilities are (*identify your roles*).
3. Select quality short-, medium- and long-term goals in each role (*identify your objectives*).

4. Classify your objectives in relation to urgency and importance (*identify your priorities*).
5. Plan long term on the basis of an academic year calendar and short-term on a weekly basis (*devise your plan*).
6. Allow for the unexpected (*build in your contingency*).
7. Evaluate your week, your month, your year (*measure your success*).

In a nutshell, only do things which are either important or help you to achieve your goals. Below we look at the seven components in turn.

Your aims

The novelty of Covey's time management methodology was a proposition that the most successful people are guided both by a compass and a clock. What is a compass? In an analogy with walking, rather than wander aimlessly along roads leading from A to B you use a compass to point you in the right direction and you consult it frequently to check whether you are still going in the right direction. In this way, if you have to deal with obstacles in your direct path, you can get back on track quickly. The same reasoning applies to your personal compass – it is informed by your personal objectives (mission) – and should always point to 'true north'.

Some people get uneasy when they hear the word 'mission' because its use has sometimes been abused. However, most of us have a mission in life, though we rarely articulate it. As scientists we are more likely to think of it as our aim in life. Generally, our aims evolve and are refined as our career progresses. Importantly, harmony is only possible if your aims are aligned with the mission of your institution – check what your institution's mission is. Many universities' overarching mission statements address institutional aims first and then make provisions about its members. The same is true for professional bodies.

In the example in Box 1.1, the personal mission statement is an overarching one. It is difficult to say what this person really would do in order to 'share my teaching experience'. However, things become clearer if we are told that 'sharing experience' will be achieved by holding seminars on different aspects of lecturing, and by providing written materials for newly appointed staff, some of which may be published. In that context, the personal mission is clearly concordant with the University aims to 'achieve and sustain excellence in every area of its teaching and research . . . and to publish educational materials'. The personal mission statement then also becomes measurable.

Pause for thought: The significance of a personal mission is that it informs and guides your thoughts and actions. Write a statement of your personal aims now.

Box 1.1
An example of concordant mission statements

Personal mission statement:

To share my teaching experience and to help younger scientists achieve their potential as teachers.

University mission statement (Oxford 2008):

The mission of the University of Oxford is to achieve and sustain excellence in every area of its teaching and research, maintaining and developing its historical position as a world-class university, and enriching the international, national and regional communities through the fruits of its research, the skills of its alumni, and the publishing of academic and educational materials.

The value of knowing what your aims are is stressed in virtually every book on time management (e.g. Godefroy and Clark 1990) but it is most movingly illustrated by the case of Viktor Frankl. During the Second World War, Frankl was incarcerated in a Nazi camp but he survived due to a deep personal conviction that he must live to give evidence to the world after the war (Frankl, 2004).

While setting your aims, it is helpful to have a broader view of what it means to be a scientist (Rothwell, 2002). The recently established Researchers Portal (http://www.vitae.ac.uk/) is an important up-to-date source of information for researchers and their employers. If you are thinking about working in academia in the US, then *Tomorrow's Professor* (Reis, 1997) is a must-read. If you have already decided to follow an academic career in the UK, then Blaxter *et al*. (1998) sets the scene by describing sub-sectors of higher education institutions, and expectations of both the employer and employees.

Your roles

The most frequent roles encountered in academia are:

- Researcher
- Colleague
- Supervisor
- Author
- Teacher (lecturer)
- Friend
- Family member

Manager, mentor, personal tutor, administrator and admissions tutor are some of the other roles.

Identifying your roles allows you to manage potential conflicts of interest, spell out expectations in each role, and to organise a weekly schedule.

Pause for thought: Write down your current roles now. If there are more than seven, identify seven main ones with 'sub-roles'.

Your objectives

For the purpose of planning it is important to identify one or two leading roles for any given timeframe and to identify objectives that can be achieved in that timeframe (see example in Box 1.2). To some extent any role is determined by the rhythm of an academic life. In term time, it is likely that lecturer/tutor roles will dominate a working week, whereas at other times researcher and author will be predominant.

Box 1.2
Examples of defining objectives in the context of roles

Role	Objective for week	Objective for year
Researcher	Generate new transformants	Get funding for rice project
Author	Start draft of Chapter 2	Co-author book on complexity
Lecturer	Complete handouts for second class	Deliver thermodynamics course

Pause for thought: Choose one or two 'leading roles' for the next week, and write down the objectives to be achieved in each now.

Your priorities

Having identified objectives in a broad timeframe, you are still some way from establishing precisely when tasks should be carried out. To bring some order into chaos, it is important to classify your tasks and actions in terms of urgency and importance. The rationale behind this particular classification method is to determine, to *whom* a given activity is urgent or important. A 'time management matrix' as shown in Fig. 1.1 will then allow you to set priorities.

The list below gives an indication of the type of tasks and activities that belong to each quadrant in the time management matrix:

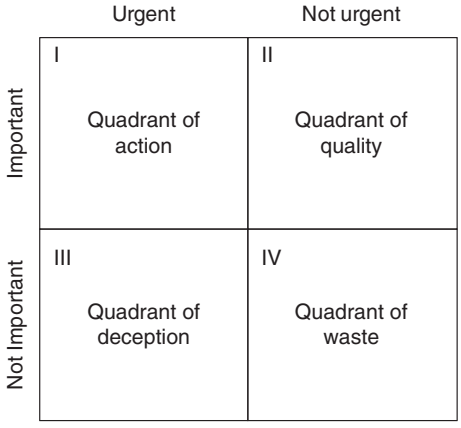

Fig. 1.1. Time management matrix adapted from Covey *et al*. (1994).

QI
- certain meetings
- ongoing experiment
- delivering lectures, classes, seminars or tutorials
- submission deadlines for grant proposals

QII
- preparing a conference presentation
- developing a new course
- planning a new experiment
- supervising graduate or project students
- writing articles, reviews, books
- spending time with family

QIII
- certain meetings
- some emails and phone calls
- some administration
- commuting to work (if avoidable)

QIV
- junk email or emails that can be deleted unanswered
- trivial pursuits, e.g. playing solitaire online or searching for spurious information
- tweaking perfectly working experimental equipment
- too many excuses for cigarette or coffee breaks etc.

In general, Quadrant I (QI) activities should have been scheduled well in advance, and often the times of such activities are beyond your control. A safe assumption is that, at any given time, you will spend 25%–35% of your time in this quadrant (Covey, 2004). However, the skill is to be well prepared for delivery and participation in such activities, and to avoid the urgency addiction. Although some people

thrive on being constantly busy and on crisis management – life is more peaceful if you don't. Any time spent in Quadrant II (QII) on planning and preparation will more than pay off when the time comes to deliver in QI. Quadrant IV (QIV) activities are self-explanatory, and most scientists do not spend much time there. In some cases such activities can have a positive effect, allowing a tired brain to recover. However, if you find yourself spending too much time on them, it can be an indicator of stress or overwork – a sort of alarm bell. The trickiest of all is Quadrant III (QIII) – a legitimate question being: 'if something is not important, then how can it be urgent?' The key here is that QIII activities may be urgent for others but not necessarily important for you. A classical example is being asked to serve on a committee that would be worthwhile but is not a priority for you at *this* time.

Pause for thought: Think about all of the tasks and activities that you are currently involved with or are planning. Classify your tasks and actions according to a four quadrant time management matrix. Remember that the level of importance should be guided by your aims (your compass).

A completed time management matrix holds the key to determining your priorities. In general QII are the highest priority and QIV the lowest but QI are the highest at their scheduled times.

Your plan

When you have a clear overview of your roles, goals and priorities you are ready to start time-tabling. There are three main ways to deal with tasks: you can *schedule*, *delegate* or *barter*. A successful delegation is possible if there is a well-qualified person or persons you can delegate to. By 'bartering', we mean exchanging tasks with somebody else – a classic example would be delivering the same lecture course to different departments while having one of yours delivered by somebody else. The same is true for teaching small groups and tutoring individuals. These two methods can free some time for other tasks.

Having worked out what needs to be scheduled, it is time to map things on to a specific time period. Any time management scheme attempts to make the best use of a clock. It is the length of time slots that vary between different methods. A very popular 'to do' list of tasks to be performed, usually drawn on a daily basis, can be counter-productive. Quite often, tasks that are not done on day one get pushed into the next day and so by the end of the week the list can still be very long. In our experience, weekly planning works well – provided you inspect the big picture first. That is, use a yearly academic calendar and first put in all fixed dates, both work and personal. Even if you do not teach or tutor at the moment, you probably feel the