Preface

This preface describes both the need for, and purpose of this book – an interdisciplinary literature review of the multifaceted issues related to gendered occupational segregation, in particular, women’s under-representation in the science, engineering, and technology sector. The book’s guiding message comes from a social psychological perspective, in that there are a number of multifaceted issues both internal and external to the individual that come into play, when looking at the issue of gendered occupational segregation. To illustrate the issues of the interconnection of internal and external factors, which reinforce and maintain gendered occupational segregation as discussed throughout Sections 2 and 3, the authors present their UK based research. The Breaking Barriers project (www.liverpool.ac.uk/breakingbarriers), funded through the European Union, explores the careers of women in science. The database contains the perceptions of women, from qualitative one to one interviews and focus groups to quantitative data, obtained via questionnaires. The data has been collected since 2005, and the authors have obtained the views of several thousand women, working in the science arena in the public and private sector. Barriers data provide pertinent exemplars of the issues through the voices of the women themselves.

INTRODUCTION

Women and men are segregated within the workforce. Although women are increasing in the workforce, they are segregated into certain jobs (horizontal segregation) and at lower levels (vertical segregation). As discussed in chapter one male dominated occupations tend to pay better than female dominated occupations and gendered occupational segregation into different occupations remains a key factor contributing to the gender gap in earnings. When women are segregated into certain jobs, those jobs usually pay less, have fewer opportunities for progression, less job autonomy, and less authority within an organization. In particular, there is a paucity of women in the SET (science, engineering and technology) sector, especially in certain areas of the sector such as engineering and technology. This book focuses on the position of women’s careers in the SET sector from a predominantly UK and USA perspective, however there is a paucity of women throughout the sector worldwide, making it a global issue and problem. Despite policy, procedure and rhetoric many professions remain gender segregated. This book explores gender occupational segregation through a discussion of individual and social aspects that influence career choice and progression.
DEFINITION OF SET/STEM

Although this book is focused on SET careers (science, engineering, and technology), the term STEM (science, technology, engineering, and mathematics) is also often referred to. Throughout the book, we will use the acronyms SET/STEM interchangeably. We feel it is important to give a brief description of what disciplines and careers we are referring to within this book when discussing SET/STEM. Science includes both the physical and life sciences. Within the life science category are the biological, conservation, and medical sciences. Within the physical science category are the chemists and material sciences, environmental sciences, physicists, and astronomers. Engineering includes a number of specialties, including civil, agricultural, biomedical, electrical, aerospace, chemical, environmental, and petroleum engineers. Technology includes those that study and work in computers and information technology. Occupations include software engineers, computer programmers, computer system designers, computer system analysts, and computer research scientists. Many occupations use mathematics especially those within the SET sector. However, some occupations focus on mathematics almost exclusively, for example, actuaries, mathematicians, and statisticians.

AIMS OF THIS BOOK

The question of gendered occupational segregation is a crucial one in our society especially in light of the ever evident pay gap and the under use of many people’s talents, especially in terms of engineering, computer science, and technology. This book will give readers a comprehensive overview around the issue of gendered occupational segregation taking into account the literature on women in numerous male dominated industries as well as literature on psychological and social issues that can influence women’s careers and career progression. This book will fill a niche for those interested in gendered occupational segregation and provides a comprehensive overview of the literature on women in the male dominated occupations of science, engineering, and technology (SET). The book draws upon both qualitative and quantitative research to discuss the issues. In the book we have given priority to certain areas, especially gendered occupational segregation, male dominated occupations, leadership, promotion, identity, career barriers and work life issues. This book proposes to provide a multi-disciplinary approach with a psychological focus ranging from social and organizational psychology to management and leadership; we offer a predominantly psychological perspective on the issues. The aim of this book is to provide readers of numerous academic disciplines, with a far-reaching insight into women working in male dominated occupations, particularly science, engineering, and technology.

In writing this book, we had a broad mix of audiences in mind. In particular, the book is of relevance to academics and students in the social and behavioral sciences interested in gender, occupational segregation, organisations, and working life. This book is necessary read for gender researchers, organizational researchers, gender scholars, and students of all levels looking into the complexity of gender in the workforce. The book is Western-international in scope, in the sense that the authors utilize literature and examples from a variety of countries, most predominantly from the UK and USA. Statistics used to illustrate the underrepresentation of women in the SET sector are from the UK and the USA, with some acknowledgement of the situation in Europe (Valendue et al., 2004). The book looks at women in different male dominated workplaces, predominantly, as the title suggests, those related to the SET sector.
book considers internal and external factors which previous research suggests may have a contributing effect on the underrepresentation of women in the sector(s). The book draws predominantly upon social psychology, organizational psychology, and management disciplines. Accordingly, we believe the book will appeal to students and scholars from a range of disciplines.

As authors, we believe that differences between the genders generate from numerous cultural and social factors. It is beyond the scope of this book to discuss biological issues or the nature versus nurture debate. Nor do we posit any blame on women, for the gender divide in SET and the persistence of gendered occupational segregation, in most industrial, western societies today. The main premise of our book is that social psychological factors contribute to gender segregation, in male dominated occupations. These factors begin early and continue through one’s career; they include individually held beliefs about ones abilities, competencies, anticipated roles, and persona fit into occupations, professions, and industries.

We felt there was a need for a richer depth and breadth of knowledge, on the complex, multifaceted issues of gendered occupational segregation, in order to start thinking of future solutions. By looking at the issue through a complexity lens and a variety of perspectives, we discuss solutions for change in context. As Mary Kirk suggests in her innovative book: *Gender and Information Technology: Moving Beyond Access to Co-Create Global Partnership*, published by IGI Global, there is great value in interdisciplinary research and dialogue. The book will differ from the other books published in the area, as it will focus predominately but not exclusively on the SET sector, when looking at women in the workplace and occupational segregation. Many books have a narrower scope i.e. women in mathematics or women in ICT. The impetus of the book is to provide a synthesis from across the disciplines and different literature, specifically focused on occupational gendered segregation in SET careers. The aim is to present an overview of the issues and raise awareness of the interplay of internal and external factors, whilst encouraging the reader to think of future research directions.

**ORGANISATION OF BOOK**

Women are underrepresented in a number of employment sectors most notably science, technology, engineering, mathematics, construction, the relatively new industry of computer games development, as well as in the higher echelons and certain jobs within the finance sector. In writing this book, we aim to cover a number of issues deemed important to women’s careers, career choice and therefore issues ultimately related to gendered occupational segregation. Throughout the following chapters, we hope to highlight the range of key psychological, social and organizational factors, that shape women’s’ occupational entry, motivation, performance, development, progression, and persistence in careers. Although the book will focus on gendered occupational segregation largely through looking at male dominated industries, as authors we acknowledge men also are occupationally segregated. We will look at some of the literature surrounding men working in female dominated occupations and industries, especially through the example of the teaching profession.

The authors are aware that through the choice of industries which form the main premise of the book, the books focus is predominantly on professional women, with a focus more on ‘careers’ rather than ‘jobs’. However, due to the constraints of the books scope, it is not possible to consider the issues faced by women (and men) in the full range of occupational classes. Although, having said that, many of the issues discussed will ultimately transcend occupational class, especially if we consider the variations of
jobs, careers, or occupations, within sectors and industries. The dynamics of gender relations in work and employment are complex, we aim to provide the reader with an understanding through an in-depth discussion of gendered occupational segregation. As emphasized earlier, the book focuses, in the main, on the careers of women working in the UK and the USA.

The book is organized into three sections:

Section One, “Gendered Occupational Segregation: Issues, Explanations, and Persistence” (Chapters 1 - 3) lays the foundation for why gendered occupational segregation is an important issue. The chapters in the section also provide the reader with an understanding of how deep the problems are woven into the fabric of society, through a consideration of the issue of gendered occupational segregation from numerous occupations. We have provided chapter aims and what readers will gain from reading each chapter. A brief description of each of the chapters within this section follows.

Chapter 1, “Engendered Workplace Segregation: Work is Still Essentially a Male Domain,” provides an overview of gendered occupational segregation. In particular, the chapter identifies and discusses why occupational segregation is important to women in the workplace. The chapter discusses the disadvantages of working in female dominated occupations for women, such as the concentration in low status, low paying jobs with less career opportunities, in contrast to male dominated occupations. The chapter identifies what is deemed appropriate behavior for men and women and why ‘appropriate behavior’ based on gender is influential in the workplace. For instance, research suggests that women in particular who work in gender incongruent occupations or roles, such as management suffer a ‘backlash’. These issues are discussed through a look at the literature and research conducted on women who work in male dominated occupations. The chapter also looks at gendered occupational segregation, through looking at men who work in female dominated occupations. The chapter refers to a number of occupations, which are highly gender segregated, in particular, the UK’s finance sector and the teaching profession.

Chapter 2, “Male Dominated Industries: Jobs for the Boys,” considers male dominated industries with a focus on the Science, Engineering and Technology (SET) sector. This is a large sector, also highly male dominated. This chapter will discuss at length the position of women working in SET occupations. In particular, the chapter provides readers with a rich discussion of the issues women face working in the male dominated ICT and construction industries. The ICT sector is important to discuss, we live in an ever-increasing technological society, and women should have a prominent voice in technology design and use. The construction industry (from a predominantly UK perspective) was considered important, due to the relative lack of studies on, and scholarly interest in this industry and also because it is extremely male dominated, with perhaps the most overtly sexist working environment, the construction site.

Chapter 3, “The Computer Games Industry: New Industry, Same Old Issues,” offers a discussion of the new industry of computer games. This industry is relevant as not only is it a relatively new industry (approximately 40 years) which falls under the umbrella of the more established science, engineering, and technology sector discussed in chapter two, but it is again highly male dominated. The authors look at this industry in a separate chapter, due to the industries current and increasing impact and influence on society, culturally and economically. The computer games industry has only really established itself as an industry, since the UK’s Sex Discrimination Act 1975, which makes this industry particularly interesting when considering gendered occupational segregation in science, engineering and technology careers. There is also a paucity of research looking at women working in the computer games industry, which also adds the chapter’s relevance and importance in light of the book’s focus.
Section Two, “The Individual, Career, and Culture: The Multifaceted Interplay of Factors,” (Chapters 4 through 6), explores how internal and external factors interplay to impact and constrain women’s choice, as well as provide barriers, in which gendered occupational segregation is maintained, reinforced, and perpetuated in society and cultural practices. The section begins with a focus on issues of the self and stereotypes. The first chapter considers the self and the working environment, including aspects such as job satisfaction. The second chapter in the section (Chapter 5) considers how stereotypes influence careers. Within this chapter, a number of theories such as identity theory and social role theory are considered. The final chapter of the section (Chapter 6) considers theories of occupational choice and career development and considers issues such as career motivation, organizational identity and commitment. A brief description of each of the chapters within this section follows.

Chapter 4, “The Self, Career, and Gender Issues: Internal/External Factors,” explores self concept and how the self influences stereotypes and how stereotypes influence our self concept and ultimately maintains gendered occupational segregation. This chapter takes into account issues of the self, self-image, self-discrepancy, self-efficacy and self esteem. The chapter focuses on self-efficacy and self esteem as self-concepts important to career choice and career development. Both self-efficacy (a person’s belief in their own capabilities) and self esteem (a person’s sense of worth) have been viewed as particularly important to women’s careers, especially when considering women who work in gender incongruent occupations as working environment may influence their sense of worth, as well as their belief in their capabilities. Self-efficacy is a particularly pertinent issue throughout career choice and development and forms a major part of Social Cognitive Career Theory (Lent, Brown and Hackett, 1994), as highlighted and discussed at length in chapter six. Also discussed within this chapter are the psychological constructs of personality, person-environment fit, and job satisfaction, which integrate individual and organizational factors.

Chapter 5, “Stereotypes, Attitudes, and Identity: Gendered Expectations and Behaviours” reviews and explores the literature on stereotypes, attitudes, and identity due to their importance and impact on women in the workplace. Gendered attitudes and beliefs are found in social institutions, from early school through to organizational culture. Stereotypes help perceive and categorize others. Cultural stereotypes are a significant barrier to women and girls studying for or choosing male dominated careers. The chapter opens with a discussion of two related issues, stereotype threat, and solos status. Attitudes influenced by stereotypes are influential to men and women in the workplace are considered at length in the chapter. The chapter will also discuss identity, its importance in both the workplace and during career choice. Identity is an important issue to consider when looking at people’s careers as career can form a significant part of individual identity. Identity is also important when discussing women’s careers, especially when considering role conflict. Women are still in the main responsible for the majority of domestic responsibilities and child/elder care. This can influence career choice and cause conflict between the numerous social roles, working women may have. This chapter will also discuss identity theory, social identity theory and gender role identity.

Chapter 6, “Career Development, Occupational Choice, and Organizational Culture: Societal Expectations, Constraints, and Embedded Practices,” discusses a number of dominant career development and occupational choice theories relevant to women working in male dominated industries. This chapter provides the reader with understanding of the theories put forward to explain why women tend to choose certain occupations and careers, perpetuating occupational segregation based on gender. The
Chapter focuses on three main theories of career development, considered in the context of women’s career development, Holland’s career typology theory (1973), Schein’s career anchors (1975), and Social Cognitive Career Theory (SCCT) as proposed by Lent, Brown, and Hackett (1994). SCCT is considered in depth, as it looks at individual and environmental factors that can influence career choice and career development. With regard to women’s occupational/career choice, three models will form the focus of the chapter’s discussion. The three theories/models are, Gottfredson’s (1981) model of circumscription and compromise, Eccles (1987) model of occupational decision making for women, and Astin’s (1984) model, of four inter-related factors, motivation, work expectations, socialization and structure of opportunity. Organisational culture is also discussed, focussing on the concepts of career motivation, organisational identity and organisational commitment.

Section Three, “Self, Society, and Organizations: Aspirations and Barriers,” (Chapters 7 through 9), explores the influence of work life balance, career barriers, drivers, and promoters and how these factors can enable change or reinforce and maintain gendered occupational segregation. The section considers work life balance issues, issues surrounding parenthood, and women who do not have children. Barriers influenced by the male dominated culture of work and those women face within their careers, especially in terms of career promotion are reviewed. The authors also look at two important aides to women’s careers, the potential career promoters of mentoring and networking. The concluding chapter draws together the book, refocuses its message, and points to future possibilities and potential solutions. A brief description of each of the chapters within this section follows.

Chapter 7, “Work Life Balance Issues: The Choice, or Women’s Lack of it,” discusses one of the main barriers put forward to explain the underrepresentation of women in male dominated sectors and industries, particularly science, engineering and technology, that of work life balance. This chapter focuses on work life balance and discusses at length the long hour’s culture, flexible working practices and parenthood. The chapter also considers women who do not have children in order to give this often overlooked demographic a voice in the literature surrounding women’s careers and experiences in the workplace. In particular, the chapter gives an emphasis to women who do not have children who work in senior positions. It is often suggested that many women, especially those in senior/management roles, forsake a family in order to progress in many careers and this chapter will take account of this viewpoint by looking at some the literature in the area. Within this chapter, we also consider cultural and generational differences. The work of Hofstede (1984, 2001) forms the focus of the discussion on cultural issues due to the significance of the work in taking into account masculinity and femininity in the workforce on a cross-cultural level. Hofstede’s work is one of the most highly regarded cross-cultural works and is relevant in the context of this book. Hofstede developed a masculinity index (MAS) and gave each of the fifty-three countries involved in his research a MAS score, with high-MAS countries being more masculine and low-MAS being more feminine. Generational differences are interesting when discussing occupations and workforce issues as research suggests the generations expect different things from their working lives. At present, there are three, possibly four generations in the workforce. Research on generational differences in the workforce provides an insight into how careers develop and evolve, all of which may influence women’s careers.

Chapter 8, “Career Barriers: The Glass Ceiling, Glass Wall, and More,” focuses on the barriers women encounter in the workplace. There are a number of barriers which prevent women entering certain occupations and progressing to senior roles. In particular, the chapter will address the issues of
career progression, promotion and aspirations, career barriers, women in leadership/senior roles, and the characteristics of what makes a good leader.

Chapter 9, “Career Promoters: A Gender Divide,” identifies and explores career promoters by discussing mentoring and networking as two important aides to women’s careers and career development. Mentoring and networking can be problematic for women working in male dominated industries, if opportunity to participate is difficult and we discuss the issues surrounding mentoring and networking.

We close with our final chapter, “Final Thoughts and Concluding Comments,” to consider findings and aide further research. We provide useful international internet resources for reading and networking opportunities. This book is a good starting point for research and resources in the area.

A COMMON GROUND

In writing this book, the authors want to offer a social psychological perspective on gendered occupational segregation, whilst also providing a multi-disciplinary viewpoint, in order to discuss and explore the underrepresentation of women in science, engineering and technology careers. It is apparent that many women start with and face disadvantage in their careers, especially women working in male dominated careers. Notably, a ‘one size fits all’ approach is not appropriate when trying to overcome such complex issues. One-dimensional solutions, do not necessarily address multi-dimensional problems. This book is our story of gendered occupational segregation, we hope you enjoy it and it stimulates both reflection and action.

REFERENCES


