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Gender role stereotypes and women's career progression into senior leadership in the South African information technology industry

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Gender role stereotypes and women's career progression into senior leadership in the South African information technology industry.

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A research report submitted to the Faculty of Management, University of Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of

Master of Business Administration

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ABSTRACT

Legislation in terms of The Employment Equity Act of 1998 and associated employment equity policies, procedures and scorecards by which organisations are measured on their adherence to the above legislation, requires them to have a more equal spread of race and gender within their organisational structure. Although South African firms have been and are still focused on ensuring that there is equality with regard to gender (representation) in their organisational structure, it seems that organisations are still struggling to ensure that this spread is representative in respect of women in senior leadership roles. An overview of the literature reveals that there are gender stereotypes which still exist in organisations globally, and there is significant research to show that the proportion of women in senior positions across industries remains very low. With the evolving role of women in society, it is evident that they are under pressure not only to be economically active but also to play a multitude of roles in the home. It would, therefore, be a likely assumption that business needs to think differently about how it engages women in the organisation to ensure that they are retained long enough to progress into leadership roles.

This research explored an area, where very few studies have been conducted in a South African context, regarding gender role stereotypes and their perceived impact on the career progression of women into senior leadership positions within the Information Technology industry. The researcher believes that this study is critical in helping organisations in this industry understand why there are still so few females in senior positions, specifically relating to prevalent gender role stereotypes which may exist.

This paper investigated the perceptions of a sample of both men and women in the information technology (IT) industry, who are in middle and senior management roles in their respective organisations. Two organisations were used, both multinationals based in the Gauteng area. A sample of 80 respondents was sent access to a web-based survey questionnaire which asked a series of questions relating to gender roles and stereotypes, and gender bias and its impact on career progression. The data was analysed using the statistical software package SPSS. Statistical manipulations,

specifically using a Mann Whitney U test for comparing means of the genders, showed that there was a significant statistical difference in more than 50% of the items between male and female responses.

The overall conclusion was that all three of the propositions put forward by the researcher were true, namely that there are gender role stereotypes present in the IT industry; they do have an impact on women's career progression; and finally that there is a difference in the perception of these issues by men and women working in this industry. Given the importance of technical fields in our modern society, with all the growth in technology and therefore the rapid expansion of employment opportunities in these fields, the lack of women in this area is puzzling and worrying from an academic perspective. This research goes some way to understanding these issues better and provides a solid foundation for further analysis into these areas. It is hoped that the research will assist organisations in the IT industry in making changes to support development and progression of women into leadership roles.

DECLARATION

I, *Leigh-Ann Monk*, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

_____

Leigh-Ann Monk

Signed at ……

On the …….. day of …….. 2012

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TABLE OF CONTENTS

ABSTRACT ..... **II**

DECLARATION ..... **IV**

ACKNOWLEDGEMENTS ..... **V**

TABLE OF CONTENTS ..... **VII**

LIST OF TABLES ..... **X**

LIST OF FIGURES **1**

1 INTRODUCTION **2**

1.1 PURPOSE OF THE STUDY 2
1.2 CONTEXT OF THE STUDY 2
1.3 PROBLEM STATEMENT 5
1.3.1 MAIN PROBLEM 5
1.3.2 SUB-PROBLEMS 5
1.4 SIGNIFICANCE OF THE STUDY 5
1.5 DELIMITATIONS OF THE STUDY 6
1.6 DEFINITION OF TERMS 7
1.7 ASSUMPTIONS 8

2 LITERATURE REVIEW **9**

2.1 INTRODUCTION 9
2.2 THE CHANGING GENDER ROLES IN SOCIETY 10
2.3 GENDER ROLE STEREOTYPES 11
2.3.1 SEEKING A DEFINITION FOR GENDER ROLE STEREOTYPES 12
2.3.2 THE GLASS CEILING EFFECT 13
2.3.3 THEORETICAL APPROACHES TO GENDER DISCRIMINATION 14
2.4 IMPACT OF NEGATIVE DISCRIMINATION ON WOMEN'S CAREERS 16
2.4.1 GENERAL FINDINGS 17
2.4.2 A LOOK INTO THE IT INDUSTRY 18
2.5 CONCLUSION OF LITERATURE REVIEW 19
2.5.1 PROPOSITION 1: THERE ARE GENDER ROLE STEREOTYPES AT PLAY IN THE IT INDUSTRY 19

2.5.2 Proposition 2: The gender role stereotypes at play have a negative impact on the progression of women in this industry 20
2.5.3 Proposition 3: There is a difference between what men and women believe about gender stereotypes and their impact on women's career progression 20

3 RESEARCH METHODOLOGY 21

3.1 Research methodology / paradigm 21
3.2 Research Design 22
3.3 Population and sample 23
3.3.1 Population 23
3.3.2 Sample and sampling method 23
3.4 The research instrument 24
3.5 Procedure for data collection 32
3.6 Data analysis and interpretation 33
3.7 Limitations of the study 34
3.8 Validity and reliability 35
3.8.1 External validity 35
3.8.2 Internal validity 36
3.8.3 Reliability 37

4 PRESENTATION OF RESULTS 39

4.1 Introduction 39
4.2 Demographic profile of respondents 39
4.3 Questionnaire Results 41
4.4 Summary of the Results 52

5 DISCUSSION OF RESULTS 54

5.1 Introduction 54
5.2 Demographic Profile of Respondents 54
5.3 Results of research questionnaire 56
5.4 Results pertaining to propositions 61
5.4.1 Results pertaining to Proposition 1: There are gender role stereotypes at play in the IT industry 61
5.4.2 Results pertaining to Proposition 2: The gender role stereotypes at play have a negative impact on the progression of women in this industry 64
5.4.3 Results pertaining to Proposition 3: There is a difference between what men and women believe about gender stereotypes and their impact on women's career progression 67
5.5 Conclusion 71

6 CONCLUSIONS AND RECOMMENDATIONS 73

6.1 INTRODUCTION 73
6.2 CONCLUSIONS OF THE STUDY 73
6.2.1 PROPOSITION 1: THERE ARE GENDER ROLE STEREOTYPES AT PLAY IN THE IT INDUSTRY 74
6.2.2 PROPOSITION 2: THE GENDER ROLE STEREOTYPES AT PLAY HAVE A NEGATIVE IMPACT ON THE PROGRESSION OF WOMEN IN THIS INDUSTRY 74
6.2.3 PROPOSITION 3: THERE IS A DIFFERENCE BETWEEN WHAT MEN AND WOMEN BELIEVE ABOUT GENDER STEREOTYPES AND THEIR IMPACT ON WOMEN'S CAREER PROGRESSION 75
6.3 RECOMMENDATIONS 75
6.4 SUGGESTIONS FOR FURTHER RESEARCH 80
6.5 CONCLUSION 81

REFERENCES 83

APPENDIX A 86

APPENDIX B 88

APPENDIX C 90

APPENDIX D 94

APPENDIX E 97

LIST OF TABLES

Table 1: Profile of respondents 24

Table 2: Reversed Items 26

Table 3: Summary of Constructs, Questions and Literature Reference 29

Table 4: Actual response rate 32

Table 5: Demographic and Work profile of respondents 40

Table 6: Full frequency table 42

Table 7: Summarised frequency table 44

Table 8: Questionnaire Results - Question Means 47

Table 9: Questions with high Standard Deviation 49

Table 10: Mann Whitney Test for significance 49

Table 11: Highest female means 51

Table 12: Demographic profile of respondents 54

Table 13: Work profile of respondents 55

Table 14: Summary highest question means 57

Table 15: Questionnaire results - means 59

Table 16: Questions with high standard deviation 60

Table 17: Mann Whitney Test for significance question 1-15 62

Table 18: Mann Whitney Test for significance question 16-26 65

Table 19: Difference between male and female means 69

Table 20: Total mean comparison by gender 70

LIST OF FIGURES

Figure 1: The 3 elements for consideration for successful gender diversity……..79

1 INTRODUCTION

1.1 Purpose of the study

The purpose of this research was to explore managers' perceptions of gender role stereotypes and their perceived impact on women's career progression into senior leadership positions. The study focused only on women in the Information Technology Industry in South Africa.

1.2 Context of the study

According to a McKinsey report (Barsh, Cranston and Craske 2008), women start careers in business and other professions with the same level of intelligence, education, and commitment as men, yet comparatively few reach the top echelons. In South Africa, by 2009, 45.8% of women, compared to 54.2% men of all races were reported to be economically active in the workforce (CEE Annual Report 2010/11). However, studies have shown that women in the labour market are still disproportionally represented in management positions in South Africa, in terms of the gender diversity in the general population. There are very different reports as to the actual numbers of women in management positions. The South African Commission for Employment Equity (CEE) Annual Report for 2010/11 revealed that women only represented 29.3% of all employees at senior management level (CEE Annual Report 2010/11). While this number is up from the 17.8% reflected in 2008/09, it is still far from being what could be called representative. Earlier research by De Bruin (2000) reported that, although 40% of economically active people in South Africa are women, only 28% of management positions were filled by women at this time. Although these numbers may have increased more recently, questions are still being asked by people in business why there are still proportionally fewer women at the highest levels of the corporate hierarchy than men, whereas there seems to be a balance in the recruitment at a junior level (Dambrin and Lambert 2008). The reported disparity of these numbers also indicates that there does not seem to be a standard view on "senior leadership".

It would seem from a study by Busrai (2008), that even where women managers are recruited, their upward movement in the organisation is rather stunted when compared to their male counterparts (Busrai 2008). For example, compare a typical company organisational structure, looking at the presence of women. The chances are, you will find most of them in the lower half of the pyramid. If the top layers continue to be almost exclusively male dominant then the segregation invariably denies the organisation access to capable female talent at senior level (Busrai 2008).

This seems to be an observable trend in many organisations, and much research has been done in order to identify what is causing the trend commonly known as the 'glass ceiling'. This term, dubbed by the *Wall Street Journal* in 1986 (Wentling 2003), is defined as the invisible barriers that women confront as they approach the top of the corporate hierarchy. Over the years since this term was dubbed, there has been much research done into why women seem not to be able to break through the proverbial 'glass ceiling'. One theory on this is a study by Brubaker (2002). He identified three reasons why women do not make senior management positions. According to Brubaker (2002), these are due to biblical teachings about male and female roles; the way work in organisations is structured; as well as societal expectations of women and their roles. Two of these explanations offered by Brubaker (2002) revolve around the role of women and the stereotypes associated with this gender and the third has more to do with organisational structure. The possibility of gender stereotypes which have been intrinsically and inherently ingrained into society for generations is a plausible solution to the question of inequality in leadership and also one which has been extensively explored by other authors and researchers over the years.

The 'role associated' explanations of Brubaker (2002) link very clearly to research done by Gammie and Gammie (1997) who state that the scarcity of women in management positions has tended to focus on personality characteristics and behavioural patterns as possible explanations for the lack of upward mobility for women. They also state, however, that psychological research suggests that reasons for women's low job status can focus on either the individual or the context. Schein's (2001) hypothesis of "think-manager, think-male maxim" supports this theory. This concept of gender stereotyping

of the managerial position assesses the extent to which the manager role is viewed as “male” and the personal characteristics which people in these positions need to have are similarly male in character, hence the term “think-manager, think-male”.

Therefore, it seems that with regard to women’s career development opportunities, the limitations may not be in terms of their abilities and achievements, but rather due to assumptions about their family life, responsibilities and future intentions (Gammie and Gammie 1997) which, at face value, appears to be contrary to societal expectations of a ‘manager’s role’ and qualities. This may also include the nature of the work environment faced by women; in other words, organisational characteristics rather than inner traits or skills which may shape or define a woman’s behaviour at work (Gammie and Gammie 1997).

The business problem (addressed by this research was thus to understand to what extent gender role stereotypes are prevalent, and if these have an impact on women’s career progression into senior leadership positions. This study specifically focused on women in Information Technology (IT) organisations, as it is still perceived as a ‘male dominated’ industry which has typically been able to better attract and retain more male employees than women in this field. This study aimed to uncover the extent to which gender role stereotypes exist within organisations in this industry, and also to understand whether these stereotypes do have a perceived impact on career progression of women into senior leadership positions. These insights will support organisations in the IT industry to become more aware of stereotypes. Additionally, they will help provide greater understanding to organisations to better support women into these roles so as to ensure a more balanced diversity of managers.

1.3 Problem statement

1.3.1 *Main problem*

To understand the extent to which the existence of gender role stereotypes within organisations in the IT industry has a perceived impact on women's career progression and opportunities into senior leadership positions.

1.3.2 *Sub-problems*

The first sub-problem is to uncover the extent of current gender role stereotypes at play in IT organisations.

The second sub-problem is to understand if these stereotypes have a perceived impact in terms of negative discrimination on women's career progression and opportunities in this industry.

The third sub-problem is to uncover whether there are differences between what men and women believe about gender stereotypes and their impact on women's career progression.

1.4 Significance of the study

Although there has been some work done on gender stereotyping in South African organisations through previous studies, the relevance of this theory has not been explored in a typically 'male-dominated' industry such as IT. In addition, although great strides have been made by multinational organisations to ensure a greater diversity and a more fully representative management team, there still seems to be some way to go to ensuring a fully representative organisation. Evidence shows that there are an equal number of juniors to mid-management level men versus women, yet women tend to leave before making it into senior management roles (Dambrin and Lambert 2008).

Legislation in terms of The Employment Equity Act (1998) and associated scorecards by which firms are measured, requires firms to have a more equal spread of race and

gender within the organisational structure. Therefore, this issue of a lack of female representation is a major problem for organisations, particularly as there exists a need for feminine values in leadership so that organisations can meet the challenges of this millennium more successfully (Booysens 1999).

Firms in South Africa have been, and are still, focused on ensuring that there is equality in the organisation in terms of a representative spread of the general population with regard to the organisational structure. This representative spread is not only in the form of race but also gender. As can be seen from the literature above, organisations are struggling to ensure that this spread is representative regarding women in senior leadership roles.

The study provides guidance to organisations in the IT industry (specifically the multinationals used for sampling purposes) in assessing whether gender role stereotypes have an impact on women's career progression into senior leadership roles. Therefore providing these firms with insights to better understand the prevalent issues. Armed with this information these organisations will therefore be able to improve and address any possible inequality or areas of discrimination (overt or covert) and provide better support for women in climbing the corporate ladder. This will benefit these organisations in that they will be able to make changes which should assist in supporting women into these roles and will therefore improve their organisational representation.

1.5 Delimitations of the study

- The study only looked at this issue in the context of the IT industry with a specific focus on multinational firms, and, therefore, cannot be generalised to other industries.
- Only two organisations were used in the sample, both of which are large multinationals. Therefore, caution should be used when generalising the outcomes of the study to smaller organisations as there may be organisational culture differences which exist.

- The study focused on women's progression into leadership positions and does not include any analysis about men and the impact of stereotypes on their career progression at all. The questionnaire only included questions on men as a comparison to women, however this was not the focus of the study.
- The study only considered women in management (middle and senior) roles and not stereotypes of general career progression of junior staff.
- The study did not take into account race or economic background at all, therefore it did not look at the differences between, for example, white and black women.

1.6 Definition of terms

- **Information Technology industry:** The industry sector in the economy specifically focusing on generation of revenue through selling products and services which are related to technology development.
- **Career progression:** promotion or upward movement into more senior roles.
- **Senior leadership positions**: For the purpose of this study, senior leadership positions refers to senior management, executive and director level positions which are the highest levels of management in the organisation.
- **Gender:** Can be referred to as a social attribute that prescribes differentiated roles, responsibilities, expectations, norms and modes of behaviour to males and females (Ridgeway 2001).
- **Gender roles**: Refers to culturally or socially defined expectations of the duties and responsibilities, rights and privileges of males and females (Ridgeway 2001). As such, **gender stereotypes** are defined as the general view held by society that males are overall more competent than females (Ridgeway 2001). For the purpose of this study, this is taken in the context of work within an organisation.
- **Glass ceiling**: The invisible barriers that women confront as they approach the top of the corporate hierarchy (Alimo-Metcalfe 1994 cited in Wentling 2003).

1.7 Assumptions

The following assumptions were made with respect to the research:

1.7.1. Gender role stereotypes do exist in organisations in the IT industry. This is assumed, as the literature review deals with studies conducted in multiple industries, and countries that gender role stereotypes are prevalent across the board in the areas studied.

1.7.2. The women and men who responded to this research have had some experience with role stereotypes in the workplace, either positive or negative.

1.7.3. The people who responded to this research request have had sufficient experience in the IT industry to enable the researcher to make a generalisation about the industry. They should have been working in the industry for at least 18 months prior to engaging in this study. Should they not have had sufficient exposure to this industry it would have made the responses more generic and not allowed for a thorough analysis of the IT industry itself.

1.7.4. The firms targeted for this study were open and willing to share information and allow me access to their employees for research purposes.

1.7.5. The use of only two organisations does not affect reliability of the study as using multiple organisations allows for sufficient comparison, ensuring that it is the factors being measured which have an impact on the results and not extenuating circumstances such as organisational culture, etc.

1.7.6. The respondents in the sample were willing to share information with regard to their experiences, and responded honestly and truthfully knowing that their responses were anonymous.

1.7.7. Due to anonymity of the responses, respondents did not fear that they would be victimised or that their responses may be held against them, which might add to the ‘glass ceiling’ perception.

2 LITERATURE REVIEW

2.1 Introduction

In preparing this literature review, it was found that there is a wide array of scholarly literature already existing which addresses the issues of gender stereotyping and its related topics. However, the relevance of these theories has not been explored in a typically 'male-dominated' industry such as IT. In addition great strides have, on the face of it, been made by multinational organisations to ensure a greater diversity and more fully representative management team, yet there still seems to be a long way to go in ensuring a fully representative organisation. Evidence shows that there are an equal number of juniors to mid management level men versus women, yet women tend to leave the organisation before making it into senior management roles (Dambrin and Lambert 2008).

This chapter presents a review of some of the literature available and specifically focuses firstly, on the definitions critical to understanding some of the reasons for the lack of women at a leadership level, and secondly, on exploring how traditional gender stereotypes impact on women's careers in the world of business. The following two sections, based on existing literature, specifically outline the sex role identities and stereotypes which modern society still holds, with a focus on understanding some key trends, such as: the 'glass ceiling effect'; gender stereotypes; and the "think-manager think-male" phenomenon. Following this, is an analysis of the impact of these on the progression and opportunities for women in business.

According to the 11th CEE Annual Report (2010/11), a total of 38.9% of people employed in organisations are women. The report also states that at a senior management level, 29.3% of employees are women, and at a top management level 19.0% are women. Similarly an article by Kausch (2010) in the Mail and Guardian reported that 10.2% of top management positions in the private sector are held by White females, while African females hold a mere 3.4% of these positions.

A report from the Business Women's Association in March 2011 containing information from a census of 339 companies, of which 319 were JSE listed and 20 state-owned enterprises, showed some surprising results. It reported that the number of Executive Female Managers has increased steadily over the past three years, from 18.6% in 2009, to 19.3% in 2010, and 21.6% in 2011. The number of Directorships increased from 14.6% in 2009 to 16.6% in 2010, but decreased for the 2011 reporting period to 15.8%; while the number of female Chairpersons was 5.8% in 2009 and increased to 6.0% in 2010, but decreased to 5.3% in 2011. CEOs/MDs decreased by 0.1% in 2011 from 4.5% in 2010 to 4.4% in 2011. These statistics show that there seem to be some positive strides being made, yet the numbers quoted are still exceptionally low and not representative of men and women being on an 'equal footing'.

Legislation in terms of The Employment Equity Act of 1998 and associated employment equity policies, procedures and scorecards by which organisations are measured on their adherence to this legislation, requires them to have a more equal spread of race and gender within the organisational structure. Therefore the issue of a lack of female representation is a major problem for organisations, particularly as there exists a need for feminine values in leadership so that organisations can meet the challenges of this millennium more successfully (Booysens 1999).

Firms in South Africa have been, and are still, focused on ensuring that there is equality in the organisation in terms of a representative spread of the general population pertaining to the organisational structure. This representative spread is not only in the form of race but also gender. As can be seen from the statistics above, organisations are still struggling to ensure that this spread is representative with regard to women in senior leadership roles in South Africa.

2.2 The changing gender roles in society

Times have changed since the days of women in the home as the homemaker, with 'house wife' being the only 'job description', or even since times when women were only seen as suitable for soft careers such as support and administrative roles, teaching or

nursing. Females are entering the workplace in increasing numbers and are occupying leadership and management positions in both the public and private sector (Schein 2001). However, as is demonstrated in the statistics above, females are still poorly represented in senior leadership or executive positions in South Africa. Research indicates similar trends in the United States, United Kingdom and Australia (Wood and Lindorff 2001), indicating that this problem is not limited to South Africa.

Although it seems that more women are entering the workplace, the question needs to be asked as to whether women are decreasing their household responsibilities as they take on more roles in the business world and economy? Research has shown that women play multiple roles in modern society. Multiple role playing has been found to have negative and stressful effects on individuals. Whitehead and Kotze (2003) state that "women still experience the highest levels of conflict between work and family life since women are still expected to perform the bulk of family and household tasks" (2003: 77), although they also play a more dominant role in the workplace. In this study women identified seven roles expected of them, namely: mother, wife, worker, housekeeper, family member, community member, and friend. Women have too many demands on their time and are, it seems, constantly juggling the conflicting priorities of work, home, and family (Survey results, www.womenspeakworldwide.com 2011).

There is also a constant debate about the concern that gender equality is frequently seen as a women's battle and ignores the important role that men play in facilitating a change in gender relations (Sowetan article "Women's freedom will benefit men, 11/08/2010: 13). If there has really been so much progress made and we have come so far, can it be considered far enough and are both men and women taking the issues seriously enough for there to be sufficient and sustained change?

2.3 Gender role stereotypes

The premise of the discussion in this paper is that although times have changed and women are more active in business, there is still a bias created through perceptions of what the 'roles' of women and men in business are. In order to unpack this issue, we

need to first decipher a definition of what gender role stereotypes are, and then unpack some theoretical approaches to these concepts. Although there are a multitude of theories that deal with women in the work context, the discussion in the following sections will focus specifically on the issues of the 'glass ceiling' and the 'think manager-think male' phenomenon.

2.3.1 *Seeking a definition for gender role stereotypes*

Gender stereotyping is an important concept upon which the premise of this study is based. In defining gender stereotypes, it is useful to first define the concept of gender and gender roles. Gender can be referred to as a social attribute prescribing differentiated roles, responsibilities, expectations, norms and behaviours of males and females (Ridgeway 2001). Assumptions of stereotypes come from societal expectations of entrenched gender roles. Gender roles refer to culturally or socially defined expectations of the duties and responsibilities, rights and privileges of males and females and are entrenched in generations of legacy (Ridgeway 2001). Stereotypes can create a self-fulfilling prophecy in that behaviour may become mediated by the expectations created by the stereotype.

Banaji and Greenwald (1994), cited in Agars (2004: 105), defined stereotyping as "the unconscious or conscious application of (accurate or inaccurate) knowledge of a group in judging a member of the group". According to Agars (2004), the act of stereotyping is not necessarily the result of intent, malice, or blatant prejudice. She states that gender stereotypes are common and may be applied due to an accepted cultural, societal, or unconscious belief about women or women's role in the workplace. As has been discussed above, this may come from a belief stemming from biblical teachings which has been entrenched into society for generations.

As such, when putting this all together, gender stereotypes can be defined as the general view held by society that males are overall more competent than females due to assumptions about the way they 'are' or behave (Ridgeway 2001). Ridgeway (2001) states that gender role stereotypes are ideas which are generally held by large groups of members in a society that tend to associate certain sets of personality traits to one sex,

and these stereotypes also grant each sex type particular skills and behaviour. Additionally, Ridgeway (2001) offers examples of such stereotypes as she states that males are perceived to possess mechanical skills, while domestic skills are granted to females. It would seem, therefore, that gender stereotypes are a generic idea or assumption about how men and women act, think and behave.

Whether or not these assumptions are true or not has been assessed widely in academic research, using a variety of instruments. One of these, the Schein 92-item Descriptive Index (Schein 2001), was used to define sex role stereotypes and the characteristics of successful managers. This research and its findings will be discussed later under theoretical approaches to gender discrimination.

2.3.2 *The Glass Ceiling Effect*

"The phrase 'glass ceiling' sums up all the frustrations of working women at every level who can see where they want to get to but who find themselves blocked by an invisible barrier. The attitudes of society generally, group or individual prejudice, restrictive male-based working practices, lack of the support available to men through their 'old boy network' – these and many more factors conspire to build and strengthen the barriers around and above us." (Flanders 1994: 1). There are a myriad of books written on the concept of the 'glass ceiling' and much of the research around the lack of women in leadership has motivated further research, aiming to identify what the organisational and/or personal factors are that contribute to the perceived 'glass ceiling'. The term has become a colloquialism of business. Agars (2004) identified issues including sexual harassment, work-family conflict, and social strategies (e.g., networking and negotiation). These issues have been extensively explored, resulting in organisations and, by implication, women, making great strides in many of these areas, yet the 'glass ceiling' is still perceived as a barrier to women's entry into leadership and still remains a focus for research and literature review.

2.3.3 *Theoretical approaches to gender discrimination*

As discussed previously, discrimination (as with bias or stereotype), is the unequal treatment of individuals or groups compared to other like individuals or groups. There are a number of ways in which gender discrimination can occur in the work environment, some of these include: recruitment, selection testing, training, promotion, equal pay, general conditions of service, etc. (Flanders 1994). A well-researched type of discrimination or bias is the 'think manager-think male' hypothesis, about which there are over 50 published studies (Booysen 2010).

Schein has been a significant source of these published works, based particularly on research conducted using his own developed tool, the 92-item Descriptive Index (Schein 1973 and 1975), to define sex role stereotypes and the characteristics of successful managers. His early work demonstrated empirically that the managerial position was sex typed as a male occupation. Similarly later research, despite changes in women's progress in the workforce, has continued to show that successful middle management (and above) positions are viewed to be more commonly held by men than women (Schein and Mueller 1992). This research also showed that in Germany, Great Britain, and the US middle managers are perceived to possess characteristics, attitudes and temperaments more commonly ascribed to men in general than to women such as being tough, aggressive, and decisive (Meyerson and Fletcher 2000). The extent to which this attitude is unchecked by structural limitations, means the male decision-maker may still favour the male candidate. "As a psychological barrier to the advancement of women in management, the 'think manager-think male' phenomenon can foster bias against women in managerial selection, placement, promotion and training decisions" (Schein 2001: 34). Similarly, Adler and Izraeli (1994: 63), in an overview of women in management worldwide, state that, "probably the single most important hurdle for women in management in all industrialized countries, is the persistent stereotype that associates management with being male".

In 2001 Schein's research found that, compared to female managers in the 1970s, female managers in the 1990s no longer 'sex-typed' the managerial position as a male

role. They saw the two sexes as equally likely to possess characteristics necessary for managerial success and were not as strongly influenced by stereotypical thinking. These managers would be expected to treat men and women equally in work related decision making. However, in replication studies of male managers it was reflected that men in the 1990s held similar attitudes to those of male managers in the 1970s (Schein 2001). Despite all the societal, legal, and organisational changes that occurred in the almost 20 years between the studies, male managers continue to perceive that successful managerial characteristics are more likely to be held by men in general than by women (Schein 2001). This demonstrates that there has been little progress in men's thinking, again emphasising the fact that it is women's awareness of these issues which has led to changes being made.

Interestingly, a study recently conducted by Nkuna (2010) used previous work done by Bem (1974) to further explore the Theory of Androgony within a South African context. Androgony is the idea that masculinity and femininity are not mutually exclusive; instead one can possess both masculine and feminine traits, usually in a balance. Bem (1974) sited in Nkuna (2010), states that this situation often means that traditional females have to adopt masculine qualities and give up their traditional feminine traits if they want to be successful managers. But the Theory of Androgony shows that women do not have to give up feminine traits and androgynous females will make better managers as they are able to keep the balance between the two. This may, for example, be visible in a woman being more assertive than her female counterparts and more adept at problem solving, while the more female characteristics of appropriate emotional support and caring are also evident.

Heilman (2001) argues, however, that early social psychology literature uncovered that similar behaviours between males and females may be interpreted differently. Essentially this literature states that males and females can exhibit the same kinds of behaviours; but the behaviours may come to be perceived or interpreted differently, which was referred to as double standards (Heilman 2001). This could have dangerous implications, as it shows not only that women may in actual fact have different attributes and behaviours to men, but that if they do exhibit the same behaviours these may be

interpreted very differently. In other words the same behaviour displayed in a male and female manager would be seen and interpreted differently due to their difference in gender.

While it is seen as positive to have some of the traits portrayed typically by men, there is a shift in thinking that certain qualities that typically pertain to women are also positive in managers. In this vein, Eagly (2007) said that women leaders on average manifest valued, effective leadership styles, and are often associated with successful business organisations, more so than their male counterparts. While this may be true, Meyerson and Fletcher (2000) say that this behaviour in itself is a form of gender discrimination and can also have a negative impact on women's career progression.

2.4 Impact of negative discrimination on women's careers

Females in increasing numbers are entering the workplace and are occupying leadership and management positions in both the public and private sector (Schein 2001). However, as has been represented in the statistics above, this split is still not representative of the general population spread.

It is believed that stereotypes of any nature will have a negative effect on an individual's performance. Negative stereotypes will negatively impact on an individual's ability to perform at their best. In research conducted by Schein (2001), men said it was women's lack of general management experience or line experience that barred their entry into top positions. However, women identified male stereotyping as the major barrier. Once again gender stereotyping works to suggest that women don't have the masculine characteristics necessary for the tough line positions, while women recognise the effects of such stereotyping on their careers. Schein (2001: 684) believes that "men continue to operate with blinders on when it comes to the influence of gender stereotyping on decision making".

Agars (2004) stated that gender discrimination remains a reality in our society today. However, she reconsidered the impact of gender stereotypes on the advancement of women in organisations from a different perspective. She showed that it is the

culmination of biases, even small and unintentional sex biases that cumulatively have a large impact over time on a woman's career. Similar to this, Meyerson and Fletcher (2000) wrote that these small bits of gender discrimination are deeply embedded in organisations' cultural norms or status quo, and therefore virtually indiscernible. They believe that the 'glass ceiling' will only be shattered through a strategy of incremental changes which they call 'small wins' which will slowly chip away at the status quo to ensure long term sustained change.

If women are being required by modern society to play a multitude of roles including home-maker and economically active individual, it would be a likely assumption that business needs to think differently about how it interacts with women in the organisation. It would also seem that few companies have responded to women's need for time-saving solutions, processes, policies or products and services designed specifically for them to support them in achieving the seemingly impossible task of balancing multiple roles (Survey results, www.womenspeakworldwide.com 2011).

2.4.1 *General findings*

Sex discrimination, or as is referred to above, gender stereotype and bias, refers to cases where a person or group of people may be denied opportunities for employment or engaging in certain activities on the basis of their biological sex (Albertyn 2003). When females fought for the provision of gender equality, they were fighting against the removal of such stereotypically formulated views at a broader social level. However, this form of discrimination is still prevalent today, although to a lesser degree in general society but more visible, as has been discussed above, in the workplace.

As mentioned, this is evident in that more females are continuing to enter the workplace, with some having even entered into management, and now occupy roles that were traditionally reserved for males. Yet, this accommodation of females in the world of work does not necessarily imply that they are no longer being discriminated against. It has already been argued, and many studies have, over the last few decades, demonstrated that despite all the above mentioned societal changes, the world of work and therefore organisations, are still seen as being typically ' a man's world' (Schein 2001). It does,

however, seem that discrimination in today's world is more subtle. It is not an organisation's unwillingness to hire females on the basis of their sex, but rather that 'trait discrimination' occurs when an employer is willing to hire females but not as likely to promote them into leadership roles (Yuracko 2004). According to Schein (2001: 676) as a "psychological barrier to the advancement of women in management, the 'think manager-think male' phenomenon can foster bias against women in managerial selection, placement, promotion, and training decisions".

2.4.2 *A look into the IT industry*

According to the National Centre for Women and Information Technology (USA), 56% of women with technical jobs leave their work midway through their careers, double the turnover rate for men. 20% of them leave the work force entirely, and an additional 31% take non-technical jobs (Ashcraft and Blithe 2010, www.ncwit.org), suggesting that child-rearing isn't necessarily the primary reason women move on. Given the importance of technical fields in our modern society, with all the growth in technology and, therefore, the rapid expansion of employment opportunities in the field of technology, the lack of women in this area is puzzling and worrying from an academic perspective.

Silicon Valley, in particular, remains largely a boys' club. In May 2007, Women in Technology International published a survey of 2,000 working women, about half of whom reported gender-based workplace inequality or said their opinions were less respected or sought out than those of male counterparts (Johnson, McGirt and Smith 2009). Maya Baratz (2009) writes that although there are a number of inspirational women in the field of IT, there are very few women entering this field through study and staying in it as entrepreneurial thinkers. She goes on to question the reason for this phenomenon (writing specifically from an American perspective), when there are organisations such as "girls in tech" and "women 2.0" which support the development of women in this industry through offering a variety of resources and tools for women to supplement and further enhance their professional careers and aspirations in technology. One possible theory given by Sapna Cheryan, an assistant professor of psychology at the University of Washington, as cited in Miller (2010), blames the image

of computer scientists as male, skinny, no social life, eating junk food and playing video games, who like science fiction, saying that people who don't fit that image don't think of IT as an option for them. Anu Shukla, an entrepreneur in IT, is cited in the same article as saying it all comes down to education, accessibility and role models (Miller 2010). Whatever the reasons, it is evident from the research and literature available, that the trend of a lack of women in leadership is prevalent in the IT industry and therefore the considerations of this research are critical to business.

2.5 Conclusion of Literature Review

Based on the literature reviewed, the present study maintains that despite legislation and the progressive changes in society over the last few decades, female managers may still encounter discrimination in the workplace. This discrimination is not necessarily overt, nor is it intentional; however, the study proposes that it will negatively impact on women's career growth and opportunities for entering senior roles in organisations, not only within South Africa, but also in international organisations in the IT industry.

Following the literature review, the following research propositions have been formulated for the purposes of this study:

2.5.1 *Proposition 1: There are gender role stereotypes at play in the IT industry*

Based on Ridgeway's (2001) definitions of gender and gender roles, and the definition by Agars (2004: 105) that stereotyping is "the unconscious or conscious application of (accurate or inaccurate) knowledge of a group in judging a member of the group", the researcher proposes that gender role stereotypes are an area of concern in the IT industry. Established research by Schein has shown that the 'think-manager-think-male' phenomenon has existed and is still prevalent as a bias towards women in organisations today. The literature reviewed above has discussed stereotypes that exist in organisations regarding the behaviours and traits relevant in today's society.

2.5.2 *Proposition 2: The gender role stereotypes at play have a negative impact on the progression of women in this industry*

Schein (2001), talks about the impact of 'think-manager-think-male', while Fletcher (1994) talks about the impact of the 'glass ceiling', both saying that these phenomena have an impact on the progression of women in the organisation. Agars (2004), as well as Meyerton and Fletcher (2000), discuss the culmination of small and unintentional biases that cumulatively have an impact over time on a woman's career. The researcher therefore is investigating in Proposition 2 whether these biases described in the literature have a negative impact on the careers of women in the IT industry.

2.5.3 *Proposition 3: There is a difference between what men and women believe about gender stereotypes and their impact on women's career progression*

The final proposition aims to uncover if there are differences in perception between the two genders about these issues and their impact in the IT industry. This is an important question based on Schein's (2001: 684) research which states that men "continue to operate with blinkers on when it comes to the influence of gender stereotyping on decision making" (684), as well as questions around why there are still so few women in senior leadership roles in South Africa. The researcher feels this is important to understand, as men play a significant role in women's progression in organisations.

The researcher believes, based on the literature reviewed, that there is still a great need for empirical research in this field, specifically with regard to the IT industry, as there is very little research in the industry as a whole and within a South African context. With such rapid changes in technology and as so much of our modern lives is based on technology, empirical research on women in this industry will go a long way to

understanding some of the possible issues which exist and support organisations in starting to find solutions for the problem of a lack of women in leadership roles.

3 RESEARCH METHODOLOGY

The research objectives for this study were to investigate if there are gender role stereotypes in the IT industry, and if these have a negative impact on the progression of women in this industry. The methodology chosen for this study was quantitative in nature, as there has already been much research done on gender roles in business which focuses on qualitative research.

This chapter describes the design and methods employed in conducting the study. The first section discusses the methodology and design. The following sections discuss the population, sample and sampling procedures employed. In the third section, the study provides details of the measuring and data collection instrument utilised in collecting the data, as well as the analysis and interpretation of this data. This section is followed by an analysis of the limitations, reliability and validity of these instruments.

3.1 Research methodology / paradigm

The research method chosen for use in this study was quantitative in nature. Quantitative research is research in which the researcher uses primarily positivist claims to develop knowledge or testing of theories and employs strategies such as surveys, data collection yielding statistical data, and so on (Creswell 2003).

The researcher has chosen to conduct an on-line, self-assessed survey. The choice of a survey design was chosen as it is a quantitative tool which can be used to generalise from a sample to a population so that the inferences made in the study can be made about the general behaviours and beliefs of the whole population (Creswell 2003). Using a quantitative technique over qualitative research provided the researcher with different and new insights into work in this area. As most of the work done previously has been qualitative in nature, a quantitative analysis provided a different perspective for

discussion. This study was a once off study and not cross sectional over a period of time (Creswell 2003).

3.2 Research Design

A web-based self-administered survey was chosen as the method for data collection as it allowed for a larger sample size than doing interviews. Therefore, it was more applicable and generalizable to the broader population. It was also the best way to reach a broad sample, as the sample chosen had access to computers and the internet and used them on a daily basis at work. The participants filled in the questionnaire in their own time. This, along with the length of the survey, made it relatively quick to complete and increased the convenience for respondents. The researcher also did not have to be present each time it was completed increasing convenience for respondents to complete in their own time. Using a quantitative analysis technique also decreased turnaround time for results to be generated (Creswell 2003). The converse to this, however, was that the researcher was not able to track who had and who had not completed the questionnaire and was therefore not able to follow up with non-respondents to increase the response rate.

A web-based self-administered survey was used as distribution was quick and easy, at the click of a button, and respondents who use technology daily are familiar with receiving information and surveys in this way as most organisations move to a paperless environment. This fact could have had a positive and negative impact on the study. It was positive in that everyone who received the link to the questionnaire knew what to do, how to access the link and complete it, etc. However, people tend to be overloaded with information by e-mail on a daily basis and they may, therefore, have ‘lost’ this mail as one of the unimportant things which needed to be completed. This was however accounted for and is discussed in more detail below. Also, through using the well-known survey tool “SurveyMonkey”, the researcher was able to ensure that every respondent received the same questions, and was forced to answer all the questions. With a printed questionnaire pages could get lost, but with the on-line tool the respondents are forced to answer each question before proceeding to the next.

The actual design of the questionnaire is discussed in detail under the research instrument discussion below.

3.3 Population and sample

3.3.1 *Population*

The population for this research included men and women in middle to senior management roles in Information Technology-focused organisations within Gauteng, South Africa. Although the organisations chosen were multinational and also located in other areas nationally and internationally, the sample was only taken from their Gauteng based locations.

There were no limitations as to the age of the individuals as long as they were in middle to senior management positions. There were also no race, education or background limitations. It was, however, necessary for participants to be currently employed in the IT sector and to have been in at least a mid-management role for a minimum of 12 months prior to taking part in the study. This was to ensure that there was more of a possibility that they had exposure to the type of situations posed in the questionnaires and were, therefore, responding from a position of personal understanding and not assumption or 'hear-say' from other's experiences.

3.3.2 *Sample and sampling method*

The desired sample size was a minimum of 60 respondents, comprising male and female managers (middle and senior) from two different multinational IT organisations in Gauteng. The researcher sent a total of 40 surveys to each organisation, hoping for at least 30 responses from each. As the study was of a quantitative nature it was important to get the right number of responses to ensure reliability and validity of the study. It was estimated that the sample would be between the ages of 30-45, and would be a mix of White, Black, Indian and Coloured respondents. As the sample was taken from multinational organisations there was also a possibility that a small proportion of the surveyed employees might be foreign.

The survey was sent to every middle and senior manager in the IT consulting division of PricewaterhouseCoopers (hereafter PwC) and a division of Dimension Data (hereafter Di-Data), therefore convenience sampling can be said to have been used as the sample selection method. Convenience sampling means a sample is taken for the convenience of the researcher, in this case using all the managers in divisions which are available to the researcher and not selecting specific individuals from these populations (Wegner 2003). This is a non-probability sampling method, meaning that the sample is not randomly selected (Wegner 2003). There was no stratification of the sample,. This means that the researcher cannot ensure that the sample is representative of the population (Creswell 2003). This may be a negative feature of the sampling. If a probability sample had been used then it could generally be assumed that a representative sample would more likely be the outcome and sampling errors could be kept to a minimum (Ghauri and Gronhaug 2010).

The respondents in the sample from both organisations have client facing roles, in other words, they consult to external clients and do not provide IT services internally. Table 1 below reflects the representative breakdown of the sample selected.

Table 1: Profile of respondents

Description of respondent type	# Male respondents	# Female respondents
Di-Data Managers	21	15
PwC Managers	30	14

3.4 The research instrument

A web-based self-administered survey questionnaire was used to conduct the research for this study. As discussed above, this instrument was chosen as the researcher believed that it would gain the best response rate, being a familiar way of day to day life for respondents; whilst at the same time providing the respondent with flexibility and convenience in their response (Creswell 2003). The survey questionnaire used in this study is included in Appendix C.

The survey questionnaire used was designed specifically for this study by the researcher and was not based on, nor modified from, any previous research. Therefore, no permission to use any previous questionnaire was necessary. The questions were designed using information gathered in the literature review, and then consolidated these into 4 key constructs for the study. The 26 questions and the 4 constructs which they measured were broken down according to the literature on which they were based, as shown in Table 3 as set out later in this section. The disadvantage of designing a survey completely from scratch was that it had not been tested before and, therefore, was not proven in terms of validity and reliability. Thus the researcher chose to conduct a pilot study prior to conducting the actual research.

The researcher used reversed items for 13 of the 26 questions in the survey design, as is discussed in the validity and reliability section. This method increases the internal validity of the questionnaire. Some of the items were reversed in the way they were phrased, and some have been reversed in terms of their meaning on the Likert scale scoring. When the data was captured, these items were captured in their un-reversed state,. Therefore, the rest of this report contains the items in their un-reversed state, where all 26 questions now reflect that statements to which respondents ‘agree’, support a bias or stereotype against women. Table 2 below shows the reversed questions in their original state as per the questionnaire, as well as the un-reversed version used in the rest of this report.

Table 2: Reversed Items

Question number	Method of Reversal	Reverse Phrased Questions	Un-reversed Questions
8	Scale reversal	Women can be feminine and have feminine characteristics in the IT industry and will still be seen as good managers	Women can be feminine and have feminine characteristics in the IT industry and will still be seen as good managers
9	Scale reversal	Men can be seen as softer and do not need to be macho in the IT industry and will be seen as good managers	Men can be seen as softer and do not need to be macho in the IT industry and will be seen as good managers
10	Question reversal	Women do not usually end up doing the clerical tasks in meetings where there is no formal admin support	Women usually end up doing the clerical tasks in meetings where there is no formal admin support
14	Question reversal	Men do not need to exhibit “masculine” characteristics in order to succeed in the IT industry	Men need to exhibit “masculine” characteristics in order to succeed in the IT industry
16	Question reversal	The IT industry is not seen as a ‘male dominated’ environment	The IT industry is seen as a ‘male dominated’ environment
17	Scale reversal	The IT industry is well represented by men and women	The IT industry is well represented by men and women
18	Scale reversal	My organisation spends as much time and money to develop women as it does to develop men (on training and personal development)	My organisation spends as much time and money to develop women as it does to develop men (on training and personal development)
20	Question reversal	At my organisation, women do earn more than men in the same positions and it is not explained by differences in performance, education, experience	At my organisation, women earn less than men in the same positions and it is not explained by differences in performance, education, experience
21	Question reversal	Female managers/supervisors at my organisation are not excluded from important senior management communications	Female managers/supervisors at my organisation are excluded from important senior management communications

Question number	Method of Reversal	Reverse Phrased Questions	Un-reversed Questions
22	Question reversal	Being ‘buddies’ with more senior managers does not enable people to be considered for a promotion over others who do not have these close personal friendships with the decision makers	Being ‘buddies’ with more senior managers enables people to be considered for a promotion over others who do not have these close personal friendships with the decision makers
24	Question reversal	It is not more difficult to get promoted to top positions if you are a woman working in the IT industry	It is more difficult to get promoted to top positions if you are a woman working in the IT industry
25	Scale reversal	Organisations in the IT industry are serious about eliminating barriers that prevent women from reaching their potential	Organisations in the IT industry are serious about eliminating barriers that prevent women from reaching their potential
26	Question reversal	People who focus on family will not see a negative impact on their career, preventing them from reaching their full potential in terms of promotion	People who focus on family will see a negative impact on their career, preventing them from reaching their full potential in terms of promotion

The pilot group consisted of 4 individuals from PwC, 2 women and 2 men. They were asked to fill in the questionnaire exactly as they would if they were participating in the study. The researcher then conducted a short interview in addition, after completion of the web-based tool, in which they were asked to discuss and give insight into their experience of the questionnaire and how they filled it out. Some of the topics discussed with them were raised in order to assess if they understood all the questions; if they were able to answer all the questions and why; if the questions were phrased in such a way that they were led into answering in a certain way; if the questions were too emotionally charged; the length of the questionnaire; and so on. The responses from this analysis were considered in terms of revised changes to the questionnaire before it was sent out to the actual participants. It was found during the pilot, however, that there were no changes required to the survey and, therefore, the researcher included these responses in the actual research. In addition, it was decided that there was no need to add randomising to the questionnaire as the respondents believed that the questions flowed

better when grouped together under the constructs and that there would be confusion added by randomisation. The only change made to the questionnaire after the pilot study was that it was decided that it was not necessary to ask as many biographical questions as were present in the first round of the survey and so questions regarding race, age and marital status were dropped. This was done as these would not be used in the analysis and therefore were not deemed necessary and just added unnecessarily to the length of the survey.

The major sections into which the questionnaire was split are:

- cover letter,
- demographic and personal details section,
- main body of the questionnaire, and
- closing instructions.

The body of the questionnaire used a 7 point Likert scale to rate responses on the constructs (Creswell 2003). The process of using a questionnaire with a Likert scale enabled the researcher to understand specific perceptions around gender role stereotypes. It was also possible to differentiate and link the answers to perceptions expressed by different genders within the organisations. However, this process had limitations in terms of only providing participants with specific questions and not generating open- ended responses or explanations on their experiences.

Below, Table 3 reflects each of the 4 constructs in the survey, how each of these has been mapped to the 26 questions, and the literature on which each was based.

Table 3: Summary of Constructs, Questions and Literature Reference

Proposition	Construct	Questions	Literature Reference (in Alphabetical Order)
Proposition 1: To understand the extent of current gender role stereotypes at play in IT organisations.	**Construct 1:** Gender Roles (compensating for gender)	See questions 1-7	- Dambrin, C. and Lambert, C. (2008) Mothering or auditing? The case of two Big Four in France, *Accounting, Auditing and Accountability Journal*, 21(4), pp.474-506. - Whitehead, T. and Kotze, M.E. (2003) Career and Life-balance of professional women: A South African Study, *SA Journal of Human Resources Management 1 (3), pp. 77-84.*
	Construct 2: Gender Stereotypes	See questions 8-15	- Agars, M. D. (2004) Reconsidering the impact of gender stereotypes on the advancement of women in organizations, *Psychology of Women Quarterly*, 28, pp.103–111. - Meyerson, D.E. and Fletcher, J.K. (2000) "A modest Manifesto for Shattering the Glass Ceiling*"* in *Harvard Business Review on Managing Diversity*, Harvard Business School Press, USA. - Ridgeway, C.L. (2001). Gender, status and leadership. *Journal of Social Issues,* 54, pp.637-655. - Schein, V.E. (2001) The global look at psychological barriers to woman's progress in management, *Journal of Social Sciences*, 57 (4), pp. 675-88.

Proposition	Construct	Questions	Literature Reference (in Alphabetical Order)
Proposition 2: To understand if these stereotypes have a perceived impact in terms of negative discrimination on women's career progression and opportunities in this industry.	**Construct 3:** Gender Bias	See questions 16-21	- Agars, M. D. (2004) Reconsidering the impact of gender stereotypes on the advancement of women in organizations, *Psychology of Women Quarterly*, 28, pp.103–111. - Booysens, A.E. (1999) Challenges facing black and white women managers in South Africa, *Management Today*, 16 (5), pp.22-28. - Johnson, L.; McGirt, E. and Smith, S. (2009, 1 February 2009) "*The Most Influential Women in Technology"* accessed on 21st January 2012, http://www.fastcompany.com/magazine/132/the-most-influential-women-in-technology.html - Schein, V.E. (2001) The global look at psychological barriers to woman's progress in management, *Journal of Social Sciences*, 57 (4), pp. 675-88.
	Construct 4: Perceived Impact (on career progression)	See questions 22-26	- Agars, M. D. (2004) Reconsidering the impact of gender stereotypes on the advancement of women in organizations, *Psychology of Women Quarterly*, 28, pp.103–111. - Booysens, A.E. (1999) Challenges facing black and white women managers in South Africa, *Management Today*, 16 (5), pp.22-28. - Dambrin, C. and Lambert, C. (2008) Mothering or auditing? The case of two Big Four in France, *Accounting, Auditing and Accountability Journal*, 21(4), pp.474-506. - Flanders, M.L. (1994) Breakthrough the career woman's guide to shattering the glass ceiling, Paul Chapman Publishing Ltd, London. - Meyerson, D.E. and Fletcher, J.K. (2000) "A modest Manifesto for Shattering the Glass Ceiling" in Harvard Business Review on Managing Diversity, Harvard Business School Press, USA.

Proposition	Construct	Questions	Literature Reference (in Alphabetical Order)
Proposition 3: To understand if there is a difference between what men and women believe about these stereotypes and their impact on women's career progression.	All constructs – difference in male versus female responses	See questions 1-26, men versus women's responses tested using Mann Whitney U Statistical Test	

3.5 Procedure for data collection

Following the pilot study (which used the same process as described in the section above), the researcher initially corresponded by e-mail to personal contacts within each of the two organisations (Di-Data and PwC). This e-mail explained the research topic and the survey, and requested permission to gain access to the sample and send them the questionnaire. Refer to Appendix A for a copy of the request letter to the organisation's representative. The original engagement was followed by a telephonic discussion with each organisation's representative to discuss with them the best method to employ to ensure high levels of participation from staff.

Once the positive response was received, the web questionnaire was sent to the selected sample. Refer to Appendix B for a copy of the request letter to respondents. The respondents were given a deadline of two weeks within which to respond, and a follow up reminder communication was sent after one week; and then again two days before the deadline. A response rate of 75% was hoped for in the study, in other words that 30 of the 40 surveys would be responded to by participants in each organisation. The response rate actually generated is represented in Table 4 below:

Table 4: Actual response rate

Description of respondent type	# Male respondents	# Female respondents
Di-Data Managers	16/21 = **76.20%**	12/15 = **80%**
PwC Managers	27/30 = **90%**	13/14 = **92.86%**

This reflects that a response rate of 85% was achieved, higher than the researcher required for the study.

3.6 Data analysis and interpretation

As can be seen in Table 4 above, 68 usable responses were received from the 80 distributed questionnaires giving a response rate of 85%. The post coding of responses resulted in a 68 x 34 data matrix., with the 68 rows representing the responses of the 68 respondents. 26 of the 31 columns represented the responses to the statements and 5 of the columns represented demographic and situational information (with one row for the respondent number). The data matrix was analysed by using the statistical computer based software SPSS.

The first test done on the data involved running basic descriptive statistics. This was used to analyse the means of the questions and rank these means from highest to lowest, which assisted the researcher in seeing where the main issues lay and which questions had generated the highest scores supporting gender stereotypes and a negative impact on career progression. The researcher also analysed each of the means by gender. Here the researcher was looking for perceptions, and trends of perceptions of gender stereotypes and gender differences in the sample, which helped answer research question 3 regarding differences in the responses by gender.

The descriptive statistics were also used to assess the reliability of each question by looking at the Cronbach's coefficient alpha, to see whether all the questions in each construct measured that construct and therefore could be grouped together to analyse the construct. "A scale is internally consistent to the extent that its items are highly inter-correlated. High inter-item correlations suggest that the items are measuring the same things. … Internal consistency is typically equated with Cronbach's (1991) coefficient alpha" (DeVellis 1991: 25). According to DeVellis (1991), a Cronbach coefficient alpha greater than 0,7 indicates that the items are measuring the same thing.

The researcher also ran a factor analysis on the data. The use of this multivariate statistical technique showed interrelationships of variables to analyse patterns between and structure among the variables (Hair, Black, Babin and Anderson 2010). This helped the researcher in understanding which of the variables in each construct was more highly

correlated, or related to each other, and could, therefore, be analysed together or independently. The factor analysis was only used to check the stability of the items and will not be discussed at length. Its main purpose was to provide further information, and should someone want to use the questionnaire for other research the factor analysis will assist in understanding the reliability of the questionnaire.

The researcher then ran a Mann Whitney two sample test on all 26 items, this technique assisted in determining whether there was a significant difference between the mean of a variable for the male respondents and the mean of the same variable for female respondents (Pallant 2005). The Mann Whitney test is a non-parametric test used to test for differences between two independent samples (in this case males and females). The test ranks all the data and then summarises the total ranks of each of the two populations. Using the number of occurrences in each sample and the sample ranks, a U statistic is calculated. Based on this, the null hypothesis that the means are equal is either accepted or rejected at a certain level (Pallant 2005). The significance used in this research is at a level of 0.05. Using this significance level means that the probability is 95% that the confidence interval will contain the true population value and indicates a degree of precision as it is not a wide significance level.

3.7 Limitations of the study

Limitations for this particular study included the following:

- The research was exploratory in nature and the researcher was making use of a survey which had not been used in previous research.
- The research relied on participants' honesty. Considering the study was on stereotypes this may have put people off answering honestly if they were not sure about the confidentiality of their answers.
- The researcher was not able to track who had and who had not completed the questionnaire and this made it impossible to follow up with non-respondents.
- The survey was sent out as an anonymous internet based survey. Participants were therefore not able to clarify any questions they did not fully understand.

- There is always a risk with surveys that people will fill it in for the sake of it and not devote sufficient ‘mindshare’ to completing it accurately.
- As the researcher has only used a sample of 80 from two different organisations, it could be questioned as to whether these results can be generalised to the broader population and this may decrease the validity of the study.
- This study was open to single researcher bias, meaning that the methodology was limited by, and to, the researcher’s abilities, integrity and sensitivity. The results may therefore be open to misinterpretation, whether intended or accidental (Leedy and Ormrod 2005). The researcher, however, did adopt strict procedures and a standard protocol in order to minimise and overcome this limitation.

3.8 Validity and reliability

According to Ghauri and Gronhaug (2010), every study must address threats to validity and reliability. Validity refers to the ability of the measurement instrument, which in this instance is the structured questionnaire, to measure what it is intended to measure so the researcher knows if the results are ‘true’ (Ghauri and Gronhaug 2010); whereas reliability refers to the extent to which a measurement procedure provides the same answer whenever and however it is conducted (Kirk and Miller 1986).

3.8.1 *External validity*

External validity is defined as the extrapolation of particular research findings beyond the immediate form of inquiry to the general (Riege 2003).

External validity refers to the question of whether findings of a study can be generalised to other populations, settings or periods beyond the current study (Ghauri and Gronhaug 2010). In the context of the current study, this raised two questions. The first of these questions was whether the results gained from this research, using a sample of 80 people, could be generalised to the entire population of managers within these specific organisations, as well as across other organisations within the industry. The second was whether the results could be generalised to other industries which are also typically seen as ‘male dominated’, such as engineering, mining, manufacturing, and so on.

In answer to the first question, the researcher believes that the 75% response rate is sufficiently strong to be able to generalise across the organisations. This high response rate supports an increased external validity.

With regard to the second question, the researcher hopes that the study will be replicated at some stage using samples in other industries to see if similar results are achieved. However, this will not be able to be answered by this research.

Another threat to external validity was that there was no discernible difference in this research made between race or age groups, therefore the samples were treated the same and the outcomes of the study assumed that all these respondents would in actual fact have had similar responses regardless of race or age demographics.

In order for the statistical conclusion to have had validity, the study had to be sufficiently sensitive,. In other words, the size of the sample needed to ensure that sufficient responses were received (Ghauri and Gronhaug 2010). The researcher believes that this criterion has been met.

3.8.2 *Internal validity*

Internal validity looks at whether the results obtained within a study are able to establish cause and effect relationships, in other words to be confident that x is really causing y (Ghauri and Gronhaug 2010). With regard to this specific study, the internal validity referred distinctively to the second hypothesis: “The gender role stereotypes at play have a negative impact on the progression of women in this industry”. In this study the researcher made the assumption that it is the gender role stereotypes which have an effect on women’s career progression. However, this ‘glass ceiling’ could be caused by a number of factors, not only limited to the gender stereotype, and these may also differ from organisation to organisation.

The researcher has decreased any possible negative effect on internal validity through a thorough literature review of previous research, identifying where it has previously been shown that gender role stereotypes do negatively affect women’s career progression.

Also, as only two organisations were used in the sample, this decreases the chances that other factors such as organisational culture may have had an impact, as compared to, for example, if the researcher had sent the survey to 80 random people from a multitude of different organisations.

The study also had a carefully designed questionnaire which looked at various constructs, and the relationships established through the constructs were tested in the pilot study with the four PwC staff members. The pilot study helped to increase the internal validity of the study as the questionnaire could have been modified before it was sent to the actual participants. Also, through using two men and two women in the pilot it ensured that a representative insight was achieved into how these gender groups viewed the questionnaire.

In addition, the questionnaire had a number of reverse framed items which support an improvement in the internal validity, as the researcher was able to see if respondents were really reading and taking note of the questions through their responses to these or if they were just randomly ticking boxes.

3.8.3 *Reliability*

The concept of reliability (Riege 2003) depends on the extent of findings being possibly replicated ceteris paribus. Therein lay the challenge for the researcher, considering that people are not static and their responses will be dependent on a variety of factors on the day including recent events, mood, time of the day, and so on. Even if researchers were concerned to ensure that others could precisely trace and replicate each step, results might still differ (Reige 2003).

Reliability in a study is, therefore, the ability of a measurement instrument to provide the same answer every time the research is conducted, whenever and however it may be conducted (Kirk and Miller 1986). A research instrument is reliable to the extent that it measures whatever it is measuring in a consistent manner.

In order to ensure higher reliability in this study, the researcher endeavoured to guarantee that each construct being measured had a minimum of 50 responses to each question. If less than this were received, then those questions or constructs would have been deleted from the study. However, as the total response rate was 68 and each question on the survey needed to be answered in order to allow the respondent to move onto the next question, each question had 68 responses and the minimum was achieved.

The questionnaire also had only 26 questions in order to try and avoid respondent fatigue which could decrease the reliability. If respondents become tired and bored when responding then their answers to the questions would not be as honest and truly reflective of the situation/context.

4 PRESENTATION OF RESULTS

This chapter presents the results of the research. No effort is made to interpret the results at this stage. The interpretation of the results will be covered in the following chapter.

4.1 Introduction

The research results have been presented in two broad categories. The first category investigates the demographics of the sample under review. As this is not a very well researched field and to keep the analysis simple, the demographic questions only delved into gender, organisation and years of experience in the role in the organisation. Results have been tabulated for ease of review and analysis.

Section two consists of the results of the actual questionnaire which have been summarised and presented. The first set of results reflects the responses captured by the sample and analysed as a group using basic descriptive statistics. This is followed by an analysis of the means of the male respondents versus the female respondents pertaining to the research propositions stipulated, using the Mann Whitney U test. The researcher also ran a factor analysis. The tables representing the inter-item correlation are represented in Appendix E.

4.2 Demographic profile of respondents

In order to gain insight into the demographics of each respondent, four questions were asked at the beginning of the survey. These included the organisation they work for, gender and years of experience in their current position. It was deemed by the researcher that these demographics would be the only ones necessary for this research and therefore additional irrelevant questions such as age, race, etc. were deleted after the pilot study as these would not add any value to the analysis or research.

The question regarding how many years they had been in their current organisation was used to ensure that all respondents did have a minimum of 12 months in their current

role and organisation and, therefore, had the experience with which to respond to the questions.

Results from the demographic questionnaire have been presented in Table 5 below:

Table 5: Demographic and Work profile of respondents

Category	Response Option	Frequency
Organisation	Di-Data	28
	PwC	40
Gender	Male	43
	Female	25
Number of years in the current position in the organisation	1-3 yrs	48
	4-6 yrs	13
	7-10 yrs	4
	11-15 yrs	3
	16-19 yrs	0
	20+ yrs	0
Number of years working in current organisation	1-3 yrs	31
	4-6 yrs	19
	7-10 yrs	6
	11-15 yrs	9
	16-19 yrs	3
	20+ yrs	0

In Table 5 above it can be seen that the majority of respondents are male (63.2%) and out of the organisations, 58.8% are from PwC. In respect of the male:female split, the researcher believes that this is more or less representative of the management population and was satisfied with the respondents' diversity.

The majority of respondents have been with the organisation and in their current position for 1-6 years. There were only 26.5% of respondents who had been working at their current organisation for more than 7 years, and none who had tenure of over 20 years.

4.3 Questionnaire Results

The chosen sample was sent a 26 question, on-line survey (Appendix C) which was evaluated using a 7 point Likert scale. The respondents were asked to rank their responses from ‘strongly disagree’ (1) to ‘strongly agree’ (7).

There were 13 reversed items in the questionnaire. These were all captured in their un-reversed state during the data capture to ensure that in all cases the responses above neutral, ‘slightly agree’, ‘agree’ and ‘strongly agree’, represented a gender role or stereotype or bias against women, or a negative impact on their career progression.

Frequency

Frequency is the number of occurrences of data values that fall within a certain group or response category (Wegner 2003). The response frequency table is represented as Table 6 below. This table is a summary of each question showing what percentage of people responded to each of the ratings.

Table 6: Full frequency table

Construct: Question	Rating 1 Strongly Disagree	Rating 2 Disagree	Rating 3 Slightly Disagree	Rating 4 Neutral	Rating 5 Slightly Agree	Rating 6 Agree	Rating 7 Strongly Agree
Gender Roles:							
1	12%	25%	10%	10%	13%	24%	6%
2	15%	34%	10%	9%	13%	15%	4%
3	10%	38%	10%	15%	15%	5%	7%
4	10%	28%	4%	4%	16%	25%	13%
5	10%	19%	9%	15%	9%	34%	4%
6	6%	10%	13%	9%	15%	26%	21%
7	3%	9%	3%	3%	24%	46%	12%
Gender Stereotypes:							
8	21%	53%	5%	9%	9%	3%	0%
9	9%	31%	16%	16%	13%	12%	3%
10	4%	18%	10%	12%	32%	21%	3%
11	7%	16%	9%	16%	26%	22%	4%
12	6%	18%	9%	15%	18%	28%	6%
13	21%	38%	12%	12%	13%	1%	3%
14	3%	41%	9%	22%	16%	3%	6%
15	10%	28%	12%	10%	19%	21%	0%

Construct: Question	Rating 1 Strongly Disagree	Rating 2 Disagree	Rating 3 Slightly Disagree	Rating 4 Neutral	Rating 5 Slightly Agree	Rating 6 Agree	Rating 7 Strongly Agree
Gender Bias:							
16	3%	10%	7%	16%	26%	34%	4%
17	1%	34%	32%	7%	4%	18%	4%
18	31%	43%	7%	13%	4%	2%	0%
19	25%	24%	4%	35%	3%	6%	3%
20	1%	1%	1%	44%	3%	34%	16%
21	28%	38%	9%	10%	3%	8%	4%
Career Impact:							
22	3%	23%	10%	13%	15%	24%	12%
23	10%	35%	10%	6%	18%	17%	4%
24	7%	21%	12%	16%	18%	22%	4%
25	15%	28%	15%	24%	9%	9%	0%
26	7%	15%	16%	12%	28%	15%	7%

In the full frequency table above (Table 6) the researcher has shaded the modal category responses. Where there are two response categories which have the same percentage (or 1% difference) respondents, both blocks are highlighted.

There were only two responses where most of the respondents said they were neutral to the statement. These were: “At my organisation, men earn more than women in the same positions and it is not explained by differences in performance, education, experience” and the same item asking about women: “At my organisation, women earn more than women in the same positions and it is not explained by differences in performance, education, experience”. These were both in the gender bias construct and reflect a paired question, meaning that the same question was asked with regard to how both women and men are treated in the organisation.

For ease of analysis, a summarised version of this modal response table, where the 7 items of the Likert scale have been consolidated into 3 categories: ‘disagree’, ‘neutral’ and ‘agree’ , is presented in Table 7. The responses for ‘slightly disagree’, ‘disagree’ and ‘strongly disagree’ were summed to give a total percentage for ‘disagree’. Similarly, the responses for, ‘slightly agree’, ‘agree’ and ‘strongly agree’, were summed up to give a total percentage for ‘agree’.

Table 7: Summarised frequency table

Construct/ Question	Disagree	Neutral	Agree
Gender Roles:			
1. Female managers are more closely scrutinised in their roles as managers in the IT industry	47%	10%	43%
2. Women need a male sponsor to be successful in the IT industry	59%	9%	32%
3. Men need a male sponsor to be successful in the IT industry	58%	15%	27%
4. Women have to do more than men to prove themselves	42%	4%	54%
5. Women must work harder and smarter than men in a similar role	38%	15%	47%
6. There is an ‘old boys’ network that exists in the IT industry	29%	9%	62%
7. The IT industry is a male dominated environment	15%	3%	82%

Construct/ Question	Disagree	Neutral	Agree
Gender Stereotypes:			
8. Women can be feminine and have feminine characteristics in the IT industry and will still be seen as good managers	79%	9%	12%
9. Men can be seen as softer and do not need to be macho in the IT industry and will be seen as good managers	56%	16%	28%
10. Women usually end up doing the clerical tasks in meetings where there is no formal admin support	32%	12%	56%
11. When women choose family responsibilities over work it makes upper management question their commitment to the organisation	32%	16%	52%
12. It is difficult for women to be assertive without being labelled assertive	33%	15%	52%
13. Women need to exhibit “masculine” characteristics in order to succeed in the IT industry	71%	12%	17%
14. Men need to exhibit “masculine” characteristics in order to succeed in the IT industry	53%	22%	25%
15. Female managers in my organisation who “make it” (into very senior leadership roles) behave more like their male counterparts than the women who don’t	50%	10%	40%
Gender Bias:			
16. The IT industry is seen as a ‘male dominated’ environment	20%	16%	64%
17. The IT industry is well represented by men and women	67%	7%	26%
18. My organisation spends as much time and money to develop women as it does to develop men (on training and personal development)	81%	13%	6%
19. At my organisation, men earn more than women in the same positions and it is not explained by differences in performance, education, experience	53%	35%	12%
20. At my organisation, women earn less than men in the same positions and it is not explained by differences in performance, education, experience	3%	44%	53%
21. Female managers/supervisors at my organisation are excluded from important senior management communications	75%	10%	15%

Construct/ Question	Disagree	Neutral	Agree
Career Impact:			
22. Being 'buddies' with more senior managers enables people to be considered for a promotion over others who do not have these close personal friendships with the decision makers	36%	13%	51%
23. Female managers/supervisors generally progress to a certain level, then go no further	55%	6%	39%
24. It is more difficult to get promoted to top positions if you are a woman working in the IT industry	40%	16%	44%
25. Organisations in the IT industry are serious about eliminating barriers that prevent women from reaching their potential	58%	24%	18%
26. People who focus on family will see a negative impact on their career, preventing them from reaching their full potential in terms of promotion	38%	12%	50%

In Table 7 above, containing the summarised modal frequency responses, the researcher has shaded the modal category responses. It can be seen that 14 out of the 26 responses lie within the 'disagree' category.

The constructs where the majority of respondents answered that they 'agree' with the statements about a role difference in gender, a gender bias, stereotype or impact on women's career progression were the questions relating to the following constructs:

- Gender roles (4 out of 7 questions had the highest frequency in the agree column)
- Career impact (3 out of 5 questions had the highest frequency in the agree column)

The constructs where the majority of respondents answered that they 'disagree' with the statement about a role difference in gender, gender bias, stereotype or impact on women's career progression were the questions relating to the following constructs:

- Gender stereotypes (3 out of 9 questions had the highest frequency in the agree column)
- Gender bias (2 out of 6 questions had the highest frequency in the agree column)

Mean and Standard Deviation

The responses have been analysed using the statistical programme SPSS and the results from the analysis of mean and standard deviation are summarised in Table 8 below.

Table 8: Questionnaire Results - Question Means

Construct	Question	Mean	Std. Deviation
Gender Roles	1	3.82	1.947
	2	3.34	1.874
	3	3.28	1.752
	4	4.12	2.106
	5	4.12	1.912
	6	4.78	1.891
	7	5.19	1.548
Gender Stereotypes	8	2.41	1.318
	9	3.41	1.659
	10	4.24	1.613
	11	4.19	1.713
	12	4.28	1.769
	13	2.75	1.559
	14	3.40	1.575
	15	3.62	1.754
Gender Bias	16	4.68	1.511
	17	4.54	1.625
	18	2.22	1.232
	19	2.97	1.657
	20	5.04	1.429
	21	2.62	1.728
Career Impact	22	4.31	1.847
	23	3.51	1.865
	24	4.00	1.762
	25	3.09	1.513
	26	4.12	1.724

As can be seen in Table 8 above, there are only two questions which have a mean (average) of above 4.9, indicating that the respondents ‘slightly agree’ to agree with the statements. These questions were:

- The IT industry is a male dominated environment (question 7)
- At my organisation, women earn less than men in the same positions and it is not explained by differences in performance, education, experience (question 20)

The five responses with the lowest means (from lowest at the top to highest at the bottom) all have a mean below 3, indicating that the respondents ‘slightly disagree’ to ‘disagree’ with the statements:

- My organisation spends as much time and money to develop women as it does to develop men (on training and personal development) (question 18)
- Women can be feminine and have feminine characteristics in the IT industry and will still be seen as good managers (question 8)
- Female managers/supervisors at my organisation are excluded from important senior management communications (question 21)
- Women need to exhibit “masculine” characteristics in order to succeed in the IT industry (question 13)
- At my organisation, men earn more than women in the same positions and it is not explained by differences in performance, education, experience (question 19)

Table 8 above also reflects the questions in their cluster groupings with the mean of each question and the standard deviation. It can be seen in the responses that there is no one construct which has consistently high (above 4.00) or low (below 4.00) means. The standard deviation indicates variance in responses around the mean (Wegner 2003). A high standard deviation has been interpreted by the researcher as being anything above 1.9, where anything below that is considered acceptable. The interval within 2 standard deviations around the mean includes about 95.5% of all observations (Wegner 2003). There are three questions which have a standard deviation above 1.9, indicating that

these lie outside the 95.5%. This could mean either that the question was confusing or that there are significant differences in responses. The questions with a high standard deviation are represented in Table 9 below.

Table 9: Questions with high Standard Deviation

Construct	Question	Mean	Std. Deviation
Gender Roles	1	3.82	1.947
	4	4.12	2.106
	5	4.12	1.912

It is of interest that the three questions with a high standard deviation are all in one construct, gender roles, indicating great variation in opinions on these questions. The analysis and further reasons for this will be discussed in the next chapter. discussion of results.

Mann Whitney U test

The non-parametric test, Mann Whitney U test was run on the data to determine whether there was a significant difference between the variable means for the male respondents versus the mean of the same variable for female respondents. These results are represented in Table 10 below.

Table 10: Mann Whitney Test for significance

Cluster: Question	Mean Males	Mean Females	Mann Whitney U test significance
Gender Roles			
1	3.12	5.04	*
2	2.49	4.80	*
3	3.07	3.64	
4	3.28	5.56	*

Cluster: Question	Mean Males	Mean Females	Mann Whitney U test significance
5	3.74	4.76	*
6	4.28	5.64	*
7	4.77	5.92	*
Gender Stereotype			
8	2.35	2.52	
9	3.40	3.44	
10	3.77	5.04	*
11	3.86	4.76	*
12	3.58	5.48	*
13	2.19	3.72	*
14	3.33	3.52	
15	3.23	4.28	*
Gender Bias			
16	4.49	5.00	
17	4.53	4.56	
18	1.95	2.68	*
19	2.26	4.20	*
20	5.00	5.12	
21	2.19	3.36	*
Career Impact			
22	4.02	4.80	
23	2.91	4.56	*
24	4.09	3.84	
25	2.53	4.04	*
26	3.88	4.52	

Table 10 above displays the results from the Mann Whitney U test in the last column, and reflects the mean of men's and women's responses in the third and fourth columns respectively. The rows which have a ***** indicate the questions which have a statistically significant difference in the mean response between men and women at a 95% confidence interval (meaning that anything in the significance column which was

represented in the statistics as being below 0.05, reflects a difference). The full table of the Mann Whitney U results can be seen in Appendix D. It can be seen in Table 10 above that 16 of the 26 questions have a statistically significant difference between men's and women's responses. These questions are spread over all of the identified constructs.

Therefore, although overall respondents 'slightly agree' with only two statements, as was seen in Table 6 above, in this analysis, using only women's responses to calculate the means, there are 8 questions where women 'slightly agree' or 'agree' (anything above 4.9) with the question. This will be discussed in detail in the next chapter. Table 11 below reflects the 8 questions with the highest means as responded to by female respondents (in order of highest to lowest mean):

Table 11: Highest female means

Construct	Question	Mean Females
Gender Roles	7. The IT industry is a male dominated environment	5.92
Gender Roles	6. There is an 'old boys' network that exists in the IT industry	5.64
Gender Roles	4. Women have to do more than men to prove themselves	5.56
Gender Stereotypes	12. It is difficult for women to be assertive without being labelled assertive	5.48
Gender Bias	20. At my organisation, women earn less than men in the same positions and it is not explained by difference in performance, education, experience	5.12
Gender Roles	1. Female managers are more closely scrutinised in their roles as managers in the IT industry	5.04
Gender Stereotypes	10. Women usually end up doing the clerical tasks in meetings where there is no formal support	5.04
Gender Bias	16. The IT industry is seen as a 'male dominated' environment	5.00

Factor Analysis

Running a factor analysis helped the researcher in understanding which of the variables in each construct were more highly correlated, or related, to each other and could therefore be analysed together or independently. The factor analysis was only used to assess the stability of the items and will not be discussed at length. Its main purpose was to provide further information and should someone want to use the questionnaire for further research, the factor analysis will assist in understanding the reliability of the questionnaire. The inter-item correlation matrix for each construct representing this can be viewed in Appendix E.

4.4 Summary of the Results

The researcher has in this chapter presented the results from the research. This has been done in two categories. The first deals with the demographics of the sample, and the second is the presentation of the questionnaire results. The demographic results have been presented in frequency Table 5.

The questionnaire results were analysed using the statistical programme SPSS. A frequency table, and a summarised version of the table, are presented as Tables 6 and 7, which assess the modal categories of responses. These showed that most respondents have responded in the ‘disagree’ category.

The researcher then ran the means and standard deviations of the entire group of respondents, and these are presented in Table 8. There are 2 questions which have a mean above 4.9 and 5 reflecting a mean lower than 3. This table also reflects 3 questions with a high standard deviation (above 1.9). These will be discussed further in the next chapter..

The researcher ran a Mann Whitney U test to ascertain whether there was a significant difference between the responses of male and female samples. The results reflected that 16 of the 26 questions did in fact have a statistically significant difference in means, as can be seen in Table10. It shows that women responded more frequently to agreeing

with the statements provided. These, as well as the 8 highest female means reflected in Table 11, will be discussed further in the following chapter.

Finally a factor analysis was run and the full results of this are in Appendix E.

5 DISCUSSION OF RESULTS

This chapter discusses the interpretation of the results presented in the previous chapter. The analysis follows the progression outlined in the methodology section of this research.

5.1 Introduction

Results have been analysed and presented in two sections. The first section analyses the demographics of the sample and the second the results from the questionnaire.

The second section on results from the research first deals with general statistical findings from the whole group with regard to frequency and mean analysis. General comments are also made on the items with a high standard deviation. A detailed analysis was then done on each of the three propositions using a mean distribution analysis and Mann Whitney test. The results between male and female respondents have been analysed to identify commonalities and discrepancies between the responses. The researcher also ran a factor analysis, the tables representing the inter-item correlation are represented in Appendix E.

5.2 Demographic Profile of Respondents

The chosen sample is tabulated below in Table 12 and comprises the responses from all 68 respondents split between Di-Data and PwC, both men and women.

Table 12: Demographic profile of respondents

Category	Response Option	Frequency
Organisation	Di-Data	28
	PwC	40
Gender	Male	43
	Female	25

In Table 12 above it can be seen that the majority of respondents were male (63.2%) and out of the organisations, 58.8% were from PwC. With regard to the male:female split the researcher believes that this is more or less representative of the management population and was satisfied with the respondents' diversity. On analysis of the statistics, however, the researcher believes that the majority of male responses have skewed the responses in a certain way and that is why a Mann? Whitney test was done, to enable comparison between the different genders. This is discussed later in this chapter under the section Mann Whitney U Test.

The work profile of the sample has been tabulated in Table 13 below.

Table 13: Work profile of respondents

Category	Response Option	Frequency
Number of years in the current position in the organisation	1-3 yrs	48
	4-6 yrs	13
	7-10 yrs	4
	11-15 yrs	3
	16-19 yrs	0
	20+ yrs	0
Number of years working in current organisation	1-3 yrs	31
	4-6 yrs	19
	7-10 yrs	6
	11-15 yrs	9
	16-19 yrs	3
	20+ yrs	0

The majority of respondents have been with the organisation and in their current position for 1-6 years. There were only 26.5% of respondents who had been working at their current organisation for more than 7 years, and none who had tenure of over 20 years. The high percentage of lower tenure respondents will possibly increase their chance of responding from their general experience as they have not gone through the ranks at

their current organisation and therefore will not be influenced by the cultural impact in their current organisation.

5.3 Results of research questionnaire

The data from the 68 survey responses received has been collated, sorted and analysed using the statistical programme SPSS. The researcher reversed all items required when capturing the data so that the “agree” side of the scale represents a role difference in gender, a gender bias against women, a gender stereotype against women, or a negative impact on women’s career progression. The reversed items have been rephrased throughout this research report as was discussed in the methodology chapter.

Frequency

From the frequency table looking at male and female responses combined, which was presented in the previous chapter in Table 5 and Table 6, it is evident that the majority of responses lie in the “disagree” category of responses in both tables.

In Table 7 the summarised modal frequency responses reflect that 14 out of the 26 responses lie within the ‘disagree’ category. The constructs where the majority of respondents answered that they ‘agree’ with the statements about a role difference in gender, a gender bias, stereotype or impact on women’s career progression were the questions relating to the following constructs:

- Gender roles (4 out of 7 questions had the highest frequency in the agree column)
- Career impact (3 out of 5 questions had the highest frequency in the agree column)

This reflects that in these two constructs, respondents were answering more frequently in agreement with the statements. This could reflect that there is general agreement with the fact that there are differences in the perception of gender roles in the IT industry, and that they will have an impact on career progression. The question with the highest modal response of 82% was question 7: “The IT industry is a male dominated environment”,

reflecting the sample's belief about the gender split in the industry. It should be noted however, that this does not mean that the sample believes that this is negative or positive, just that there is a discrepancy in the weighting of the genders. It is, therefore, necessary to look at these areas in further detail through the statistical analysis that follows below.

The constructs where the majority of respondents answered that they 'disagree' with the statement about a role difference in gender, gender bias, stereotype or impact on women's career progression were the questions relating to the following constructs:

- Gender stereotypes (3 out of 9 questions had the highest frequency in the agree column)
- Gender bias (2 out of 6 questions had the highest frequency in the agree column)

This could imply that in general the surveyed sample believes that strong stereotypes or bias against women does not exist in the IT industry. This will also be discussed in more detail later on.

Mean and Standard Deviation

The mean responses of all respondents (both genders) were analysed, and are reflected in Table12 in the previous chapter. There are only two questions which have a mean of above 4.9, indicating that on average, the respondents 'slightly agree' to 'agree' with the statements. These questions are summarised in Table 14 below:

Table 14: Summary highest question means

Construct	Question	Mean
Gender Role	7. The IT industry is a male dominated environment	5.19
Gender Bias	20. At my organisation, women earn less than men in the same positions and it is not explained by differences in performance, education, experience	5.04

With the first question “The IT industry is a male dominated environment” (question 7), the statement was part of the first construct, namely gender roles. The mean of this question was 5.19, showing that the average response lies in the category of ‘slightly agree’. This shows that most people, regardless of gender believe that the IT industry is still very male dominated. This supports statements discussed in the literature review regarding women in this industry in the USA (Ashcraft and Blithe 2010, www.ncwit.org), which also has significant bearing on South Africa. The findings from this question do not, however, reflect the respondents’ belief that this is positive or negative. The statement merely proves that there is a perception that there are more men in IT than women.

The second question as above is, “At my organisation, women earn less than men in the same positions and it is not explained by differences in performance, education, experience” (question 20 relating to gender bias), which received a mean score of 5.04, and thus also falls into the ‘slightly agree’ category. This was a reversed item and has been presented in the un-reversed state above. The statement shows that most people believe that women earn less than men in the same positions and, therefore, reflects a perception about a bias in the pay levels between male and female staff. As this question was paired with a question to the opposite, asking the same about men, we can compare the two. The response to the same question about men was answered with a mean of 2.97, indicating that most respondents slightly ‘disagree’ with the statement that men earn more than women. Looking at these two items together we see a disparity in the belief about the financial rewards for men and women. It seems that when asked if women earn less, respondents believe they do. However they do not respond in such an affirmative manner to the statement about men earning more.

The five responses with the lowest means all have a mean below 3, indicating that the respondents ‘slightly disagree’ to ‘disagree’ with the statements and are summarised below in Table 15:

Table 15: Questionnaire results - means

Construct	Question	Mean
Gender Stereotypes	8. Women can be feminine and have feminine characteristics in the IT industry and will still be seen as good managers	2.41
	13. Women need to exhibit “masculine” characteristics in order to succeed in the IT industry	2.75
Gender Bias	18. My organisation spends as much time and money to develop women as it does to develop men (on training and personal development)	2.22
	19. At my organisation, men do earn more than men in the same positions and it is not explained by differences in performance, education, experience	2.97
	21. Female managers/supervisors at my organisation are not excluded from important senior management communications	2.62

As can be seen above in Table 15, the lowest means fall into the constructs gender stereotypes and gender bias, reflecting that respondents ‘disagree’ with the five statements above.

The questions with a high standard deviation were represented in Table 9 in the previous chapter. It is of interest that the three questions with a high standard deviation are all in one construct, gender roles, indicating great variation in opinions on these questions. The three questions are:

- Female managers are more closely scrutinised in their role as managers in the IT industry
- Women have to do more than men to prove themselves
- Women must work harder and smarter than men in a similar role

The high standard deviation may reflect a significant difference in the way these questions were answered. Table 16 below represents the means for men’s and women’s responses to these three questions:

Table 16: Questions with high standard deviation

Construct	Question	Mean Males	Mean Females
Gender Roles	1. Female managers are more closely scrutinised in their role as managers in the IT industry	3.12	5.04
	4. Women have to do more than men to prove themselves	3.28	5.56
	5. Women must work harder and smarter than men in a similar role	3.74	4.76

If Table 16 above is compared to the results of the Mann Whitney U test in Table 10, we can see that all the above show a statistically significant difference between male and female responses. It can also be seen by looking at the means represented above, that the males who responded to this question have disagreed with the statements while the women have agreed. This will be discussed further under Proposition 3 below, which focuses on the difference between men's and women's perceptions.

Mann Whitney U Test

In the results presented above, the researcher believed that there was not sufficient data available to make decisive conclusions one way or the other regarding the propositions of the research. The researcher, therefore, ran the non-parametric test, Mann Whitney U test to determine whether there was a significant difference between the variable means for the male respondents versus the mean of the same variable for female respondents. This was done to gain more insight into each of the three propositions. The results of this are discussed in the following section under each of the propositions..

Factor Analysis

The researcher also ran a factor analysis and the tables representing the inter-item correlation are represented in Appendix E. The factor analysis was run for the purpose of other researchers who may wish to use the questionnaire in future research.

5.4 Results pertaining to propositions

The purpose of this research was to explore managers' perceptions of gender role stereotypes and their perceived impact on women's career progression into senior leadership positions. The study focused only on women in the Information Technology Industry in South Africa.

5.4.1 *Results pertaining to Proposition 1: There are gender role stereotypes at play in the IT industry*

Gender stereotyping is an important concept upon which the premise of this study was based. Gender was defined in the literature review as a social attribute prescribing differentiated roles, responsibilities, expectations, norms and behaviours of males and females (Ridgeway 2001). Ridgeway (2001) goes on to say that assumptions of stereotypes come from societal expectations of entrenched gender roles. Gender roles refer to culturally or socially defined expectations of the duties and responsibilities, rights and privileges of males and females and are entrenched in generations of legacy.

The survey reflects two constructs which measure this, the first, pertaining to gender roles, was dealt with in questions 1-7, and the second, pertaining to the gender stereotypes construct, was reflected in questions 8-15.

By using the Mann Whitney U test, the researcher was able to discover the differences between what men and women believe about the gender roles and gender stereotypes in the IT industry. The results of this are reflected in Table 17 below.

Table 17: Mann Whitney Test for significance question 1-15

Cluster: Question	Mean Males	Mean Females	Mann Whitney U test significance
Gender Role			
1	3.12	5.04	*
2	2.49	4.80	*
3	3.07	3.64	
4	3.28	5.56	*
5	3.74	4.76	*
6	4.28	5.64	*
7	4.77	5.92	*
Gender Stereotype			
8	2.35	2.52	
9	3.40	3.44	
10	3.77	5.04	*
11	3.86	4.76	*
12	3.58	5.48	*
13	2.19	3.72	*
14	3.33	3.52	
15	3.23	4.28	*

Table 17 above displays the results from the Mann Whitney U test in the last column, and reflects the mean of men's and women's responses in the third and fourth columns respectively. The rows which have a ***** indicate the questions which have a statistically significant difference in the mean response between men and women at a 95% confidence interval. The table above reflects that for 11 out of the 15 questions there was a statistically significant difference between what men and women were saying in response to questions about gender roles and gender stereotypes. Albertyn (2003) says that gender stereotype and bias, refers to cases where a person or group of people may be denied opportunities for employment or engaging in certain activities on the basis of their biological sex (Albertyn 2003). Although the bias is not as extreme as women being

denied opportunities for work, the respondents do seem to believe that there is a bias against women (regarding career progression) that is still prevalent today, although to a lesser degree.

The research shows that women responded to questions about gender roles in a more affirmative way, specifically regarding the scrutiny of female managers as opposed to their male counterparts (question 1), women having to do more than men to prove themselves (question 4), the existence of an 'old boys' network in the industry (question 6), and the IT industry being male dominated (question 7) all of which have a mean of over 5.00. The research has shown that women, therefore, believe that women need to work harder, smarter, and do more, be better than their male counterparts in the IT industry.

It is also interesting to note that the sample of women 'slightly agree' (mean of 4.80) that women need a male sponsor to be successful in the IT industry (question 2), but that men do not, as is reflected in question 3's mean with a response of only 'slightly disagree'. On the other hand the literature reflects that there are few female role models in this industry. It does seem critical to have a female role model when one considers arguments from Whitehead and Kotze (2003) that women experience the highest levels of conflict between work and family life, since women are still expected to perform the bulk of house related activities. This conflict in requiring a role model who is female, and a sponsor who is male to assist women in progressing, indicates that all managers need to be involved in the progression of women. It is not just up to one or the other gender to provide support.

The second construct of gender stereotypes reflected a statistically significant difference in 5 out of the 8 questions in Table 17. According to Agars (2004), the act of stereotyping is not necessarily the result of intent, malice, or blatant prejudice. She states that gender stereotypes are common and may be applied, due to an accepted cultural, societal, or unconscious belief about women or women's roles in the workplace.

The two questions with the highest means reflected that women will end up doing the clerical tasks in meetings where there is no formal admin support (question 10), and that

it is difficult for women to be assertive without being labelled as such (question 12). These both speak to typical gender stereotypes theory of the 'think-manager-think-male' phenomenon. Schein's (2001) significant work in this area demonstrates empirically that managerial positions were and are 'sex typed' as a male occupation due to the stereotypes about what behaviours and traits a person needs to display, and which gender more typically displays these. As such, the administrative components of business functioning have generally tended to be fulfilled by women rather than men, and the perception of the women responding to this research is that they are still required to fulfil this role, even if they are at the same level as the men in the meeting. Research conducted by Meyerson and Fletcher (2000) which states that attitudes and temperaments more commonly ascribed to men in general than to women, such as being tough, aggressive, and decisive, has found that women believe that they are negatively labelled if they portray any of these masculine characteristics.

In contrast to these two questions however, the two questions that related specifically to issues of masculinity and femininity (questions 14 and 8 respectively) are both seen by respondents as not being an issue. In other words their responses 'disagree' with the statements that men have to be masculine and women cannot be feminine. Similarly, question 13, which asks about women needing to be more masculine in this industry, received a response from both men and women that they did not agree with this statement. Although this does have a statistically significant difference, it reflects that the specific issues of femininity and masculinity are not regarded as a problem.

From the evidence presented above in the statistical data as well as the literature to support the findings, there is overwhelming evidence to **support that there are in fact gender role stereotypes at play in the IT industry**, as per Proposition 1.

5.4.2 *Results pertaining to Proposition 2: The gender role stereotypes at play have a negative impact on the progression of women in this industry*

The literature presented at the beginning of this research looked specifically at the lack of women in the IT industry in the USA in leadership roles. Although there is a lack of

research in a South African context in this industry, the research into women in leadership roles generally in South Africa reflected similar results. The 11th CEE Annual Report (2010/11) as an example, cited that a total of 38.9% of people employed in organisations are women, and that only 29.3% are at a senior management level, with only 19% of the top management positions being occupied by women. Research shows that there are significant numbers of women going into business and studying in IT related fields, yet women tend to leave the organisation before making it into senior management roles (Dambrin and Lambert 2008).

The researcher therefore investigated the progression of women in the IT industry specifically within a South African context through constructs 3 and 4. Table 18 below represents the results for the Mann Whitney U Test done for construct 3 and 4 relating to the career progression of women in the IT industry.

Table 18: Mann Whitney Test for significance question 16-26

Cluster: Question	Mean Males	Mean Females	Mann Whitney U test significance
Gender Bias			
16	4.49	5.00	
17	4.53	4.56	
18	1.95	2.68	*
19	2.26	4.20	*
20	5.00	5.12	
21	2.19	3.36	*
Career Impact			
22	4.02	4.80	
23	2.91	4.56	*
24	4.09	3.84	
25	2.53	4.04	*
26	3.88	4.52	

As can be seen in Table 18 above, 3 of the 6 questions for construct 3, gender bias, reflected a statistically significant difference at a confidence level of 0.05. Gender bias is the unequal treatment of two groups, in this case based on gender differences (Flanders 1994). Yuracko (2004) stated that discrimination (bias) in today's world is more subtle in that it is not an organisations' unwillingness to hire females on the basis of their sex, but rather in the form of 'trait discrimination' which occurs when an employer is willing to hire females but not as likely to promote them into leadership roles. The belief concerning gender bias in questions 16-21 was reflected by differences in treatment of male and female employees with regard to issues such as training and development, financial reward, management engagement/ interaction.

The statistically significant differences in Table 18 above reflect a difference in opinions between the genders regarding two questions on investment in each gender for training and personal development (question 18 and 19), and female managers being excluded from important communications (question 21). However, with all three of these the female and male means were both in the 'neutral' to 'disagree' responses. This means that although they were significantly different, they were not at opposite ends of the spectrum. This is in contrast to what Schein (2001) discussed in his research on the 'think manager-think male' phenomenon. He stated that this attitude can foster bias against women in managerial selection, placement, promotion and training decisions, which are all overt which does not seem to be indicated by the response to this question. There is still, however, a discrepancy between what women and men believe about these issues and the degree to which they 'disagree' with the statements.

The researcher concludes from this that, in line with Agars's (2004) stated belief that gender discrimination remains a reality in our society, it is the culmination of biases, even small and unintentional sex biases, which cumulatively have a large impact over time on a woman's career. The sample of respondents was from two very large and progressive organisations which could explain why the questions pertaining to overt gender bias got responses of 'disagree'. According to Meyerson and Fletcher (2000), the small bits of gender discrimination are deeply embedded in organisations' cultural norms or status quo, and therefore virtually indiscernible.

Both genders ‘slightly agreed’ with the statement of there being a bias against women with regard to financial rewards. This reversed item was discussed above in the general results and, as there are no differences uncovered by the Mann Whitney U test, it will not be discussed further in this section.

The 5 questions in construct 4, on the impact of stereotypes on women’s careers, reflect two items which have statistically significant differences in the mean. These items are: female managers only progressing to a certain level (question 23), and organisations in the IT industry being serious about eliminating the ‘glass ceiling’ for women (question 25). For both of these, women’s responses tended more towards ‘slightly agree’, while the men disagreed with the statements. The women sampled therefore believe that there is a ‘glass ceiling’ that exists in the IT industry, and that there is not enough being done by their organisations to eliminate the barriers, while men are of the view that sufficient steps are being taken. The research in the literature review showed that women are under pressure not only to be economically active but also to play a multitude of roles in the home (Kotze 2003). It would, therefore, be a likely assumption that business needs to think differently about how it interacts with women in the organisation. Organisations, according to female opinion, need to be more supportive and possibly respond differently to women’s needs identified in the literature for time-saving solutions, processes, policies or products and services designed specifically for them, to support them in achieving the seemingly impossible task of balancing multiple roles.

From the evidence presented above in the statistical data as well as the literature to support the findings, there is evidence to **support that respondents believe that the gender role stereotypes at play in the IT industry do have a negative impact on women’s career progression**, as per Proposition 2.

5.4.3 *Results pertaining to Proposition 3: There is a difference between what men and women believe about gender stereotypes and their impact on women’s career progression*

The questionnaire did not specifically deal with this proposition through questions. The analysis, however, of how each gender responded to the questions has assisted the

researcher in answering this research proposition. The literature review states that it is believed that stereotypes, of any nature, will have a negative effect on an individual's performance. In research conducted by Schein (2001), men said it was women's lack of general management experience or line experience that barred their entry into top spots. However, women identified male stereotyping as the major barrier to their promotion prospects (Schein 2001). This implies that the two genders have very different views on why there are fewer women in leadership positions. Schein (2001: 684) therefore believes that "men continue to operate with blinders on when it comes to the influence of gender stereotyping on decision making". This seems to have been supported by the results of this research, as will be discussed below.

As was reflected in Table 10 containing the Mann Whitney U test results, a comparison of the mean responses found that over half the questions (16/26) had a statistically significant difference between men's and women's responses. These questions were spread over all of the identified constructs, specifically with emphasis on the identification of gender roles and gender stereotypes. Although not in all of these cases, but in the vast majority of them, the researcher found that there was not only a statistically significant difference in the response but that the two genders also responded on different ends of the spectrum, with men's responses tending more towards disagreeing with the statements, and women's tending towards agreement.

The questions, in which there was a statistically significant difference between male and female responses and where the two genders responded on different ends of the spectrum ('disagree' versus 'agree'), have been summarised in Table 19 below.

Table 19: Difference between male and female means

Cluster: Question	Mean Males	Mean Females	Mann Whitney U test significance
Gender Role			
1	3.12	5.04	*
2	2.49	4.80	*
4	3.28	5.56	*
5	3.74	4.76	*
Gender Stereotype			
10	3.77	5.04	*
11	3.86	4.76	*
12	3.58	5.48	*
15	3.23	4.28	*
Gender Bias			
19	2.26	4.20	*
Career Impact			
23	2.91	4.56	*
25	2.53	4.04	*

These have been discussed in detail under Proposition 1 and 2 above and will, therefore, not be dealt with individually. It is interesting to note that most of these differences in opinion relate to the first proposition regarding the existence of gender role stereotypes in the IT industry, where there are 8 items with a significant difference, where men responded as ‘disagree’ and women responded on average as ‘agree’. However, there are relatively fewer differences in male and female opinions in constructs 3 and 4 relating to the impact of the gender role stereotypes on women’s careers, with only a total of 3 responses reflecting this difference.

The total mean for each gender is compared in Table 20 below.

Table 20: Total mean comparison by gender

	Males	Females
Mean Score	3.40	4.42

Table 20 above, illustrates that men responded to the questions on average with a score of ‘slightly disagree’ to ‘neutral’ (3.40), whereas women responded to the same set of questions with ‘neutral’ to ‘slightly agree’ (4.42). This shows a general disparity in the perceptions of the different genders to the issues at hand.

The differences reflected in Table 19 and 20 above are not new. In 2001 Schein’s research found that compared to female managers in the 1970s, female managers in the 1990s no longer ‘sex-typed’ the managerial position as a male role (Schein 2001). They saw the two sexes as equally likely to possess characteristics necessary for managerial success and were not as strongly influenced by stereotypical thinking. These managers would be expected to treat men and women equally in work related decision making. However, in replication studies of male managers it was reflected that men in the 1990s held similar attitudes to those of male managers in the 1970s (Schein 2001). Despite all the societal, legal, and organisational changes that occurred in the almost 20 years between the studies, male managers continue to perceive that successful managerial characteristics are more likely to be held by men in general than by women in general (Schein 2001). This also seems to be reflected in the results discussed above, showing that although men are not as overt about bias as they used to be, they seem to be more unaware of existing bias and stereotypes that still exist in the workplace.

An article in the Sowetan (2010) stated that gender issues in organisations are still seen as a woman’s battle and it ignores the important role that men play in facilitating a change in gender relations. Heilman (2001), however, argues that women also need to be aware of creating a bias to the opposite end of the extreme through creating double standards, and warns that creating ways for women to receive special treatment should be considered dangerous as it is in itself a stereotype.

From the evidence presented above in the statistical data as well as the literature to support the findings, there is overwhelming proof to support the notion that **there is in fact a difference between what men and women believe about gender stereotypes and their impact on women's career progression**, as per Proposition 3.

5.5 Conclusion

The current research, as well as a review of past literature, has shown that there is overwhelming evidence to support that all three of the propositions can be reasonably accepted. This has been illustrated through a detailed analysis of each relevant question and construct from a statistical point of view, as well as looking at the relevant literature to support the results.

Generally, in the overall analysis, respondents did not seem to agree with the statements in the questionnaire. However, a detailed comparison between the responses of male respondents and female respondents, as is seen in Table 10, reflected that the two genders have divergent perceptions of the gender stereotypes in the IT industry, as well as the impact on women's career progression.

The first construct, regarding gender roles and stereotypes, found that, in support of Ridgeway (2001), it is still perceived that there is a difference in the way men's and women's roles in the workplace are perceived, where she states that males are perceived to possess mechanical skills, while domestic skills are granted to females. It therefore seems that certain societal assumptions regarding men's and women's behaviour still exists in respect of the 'think-manager-think-male' phenomenon. Based on Schein's work (2001), it a more accepted opinion that male managers continue to perceive that successful managerial characteristics are more likely to be held by men in general than by women. It was proven by the research that women believe that they need to do more, work harder and better than their male counterparts to get ahead in the corporate world.

Women respondents also strongly believe that they need more support from their organisations, and that they specifically need a male sponsor to progress in their

careers. This demonstrates that men need to be more involved in supporting and mentoring women into these leadership roles in the IT industry.

It was also discovered, however, in constructs 3 and 4 relating to career progression, that the bias present in modern organisations is not an overt one and that, as stated by Meyerson and Fletcher (2000), it is the small incremental and subversive biases, entrenched in an organisation's culture, which impact most on women's careers. These two constructs were also found by the researcher to have the least number of differences in opinion based on male and female responses.

Finally, the research has shown that there are differences in the perceptions of men and women on these issues. This was demonstrated by the fact that there were statistically significant differences in 16 of the 26 items, and more often than not men disagreed with the statements while women responded that they agreed, especially regarding the first and second constructs relating to gender roles and stereotypes.

6 CONCLUSIONS AND RECOMMENDATIONS

This chapter discusses the final conclusions and recommendations from the research conducted. Recommendations are given for organisations in the IT industry as well as to women working in this industry. The researcher has also indicated options for further research.

6.1 Introduction

The research set out to explore male and female managers' perceptions of gender role stereotypes, and their perceived impact on women's career progression into senior leadership positions within the Information Technology Industry in South Africa. The conclusions and general findings are discussed below.

6.2 Conclusions of the study

With the changing role of the female gender in society as discussed in the literature review, it is evident that women are under pressure not only to be economically active but also to play a multitude of roles in the home (Survey results, www.womenspeakworldwide.com 2011). It would, therefore, be a likely assumption that business needs to think differently about how it engages women in the organisation. Bem (1974) would have us believe that women will add value if supported into leadership roles. The current statistics on the number of women in South African industry (CEE Annual Report 2010/11), and in the IT industry in the USA (Ashcraft and Blithe 2010, www.ncwit.org), show that there is still a significant lack of women in leadership positions. There has been little research done in the field of gender role stereotypes within the South African IT industry, and this study has gone some way to uncover the perceptions of gender role stereotypes and women's career progression in this industry. This study found that women who responded to the survey believe that the IT industry is still male dominated and that there is not enough being done to support women to move into senior leadership roles.

Research has shown that the role of men in this progress is critical, as women believe they need a male sponsor to be successful. However, there is significant evidence to suggest that male respondents are unaware of the extent of the issues, as they responded that they did agree that enough was being done.

From the evidence presented in the statistical analysis and discussion, as well as literature on previous studies, it was shown by the researcher that there is evidence to support all three of the research propositions. These findings are summarised below:

6.2.1 *Proposition 1: There are gender role stereotypes at play in the IT industry*

The analysis of constructs one and two relating to gender roles and stereotypes, which were designed with this proposition in mind, shows that overwhelmingly women believe that there are gender role stereotypes present in the IT industry. Although men did respond in agreement to some of the items, it was not overwhelming. This supports the research of Ridgeway (2001) and Agars (2004) that stereotyping is still evident in organisations today. It also supports established research by Schein (2001) that the 'think-manager-think-male' phenomenon has existed, and is still prevalent as a bias against women in organisations today.

6.2.2 *Proposition 2: The gender role stereotypes at play have a negative impact on the progression of women in this industry*

Schein (2001) spoke about the impact of 'think-manager-think-male', while Fletcher (1994) discussed the impact of the 'glass ceiling', both saying that these phenomena have an influence on the progression of women in the organisation. The researcher found that, although there was evidence to agree with gender bias having an impact on women's career progression, it was not overwhelming. This may, however, be in support of Agars (2004) as well as Meyerton and Fletcher (2000), who both found that it is a culmination of small and unintentional biases that cumulatively

have an impact over time on a woman's career. The researcher designed the research questions around the more visible and significant impacts on career progression, and there was still evidence in support of this proposition.

6.2.3 *Proposition 3: There is a difference between what men and women believe about gender stereotypes and their impact on women's career progression*

The final proposition aimed to uncover whether there were differences in perception between the two genders about these issues and their impact in the IT industry. This question was based on Schein's (2001: 684) research which states that men "continue to operate with blinders on when it comes to the influence of gender stereotyping on decision making", as well as on questions around why there are still so few women in senior leadership roles in South Africa. The researcher found that there was overwhelming evidence in support of this proposition, especially when comparing the results of the Mann Whitney U test which looked at the difference in mean between men's and women's responses to the same questions.

In conclusion, the findings of the research support Dambrin and Lambert (2008) in their view that women leave the IT profession before making it into senior roles. The research in this paper has, therefore, been able to support the idea that there are gender role stereotypes present in the IT industry, and that these do have a negative impact on women's career progression. In addition, it shows that men and women have divergent views on the progress that has been made and the extent to which these are issues which currently exist in the IT industry.

6.3 Recommendations

Research has shown that women play multiple roles in modern society as they try to climb the corporate ladder but are still required to be the main home-maker. Multiple role

playing has been found to have negative and stressful effects on individuals. Whitehead and Kotze (2003) state that “women still experience the highest levels of conflict between work and family life since women are still expected to perform the bulk of family and household tasks” (77), although they also play a more dominant role in the workplace than they did historically. In the study by Kotze (2003) women identified seven roles expected of them, namely: mother, wife, worker, housekeeper, family member, community member and friend. Women have too many demands on their time and are, it seems, constantly juggling the conflicting priorities of work, home, and family (Survey results, www.womenspeakworldwide.com 2011). This constant juggling of priorities increases stress levels in women and, therefore, decreases their ability to focus their efforts on the workplace.

There is also a constant debate about the concern that gender equality is frequently seen as a woman’s battle and ignores the important role that men play in facilitating a change in gender relations (Sowetan article “Women’s freedom will benefit men, 11/08/2010: 13). If there has really been so much progress and we have come so far, can it be considered far enough and are both men and women taking the issues seriously enough for there to be sufficient and sustained change?

Women moving into leadership positions across all industries is a vital part of modern organisations in order to bridge the gap which currently exists. Most successful organisations continue to evolve their leadership team to a more representative version than they were previously. Considering the results of this research, the researcher will make recommendations to organisations in the industry as well as to women working in the IT industry. These recommendations follow below:

- **Recommendations to organisations and the IT industry as a whole:**
  These recommendations are made based on the responses and analysis from the two organisations surveyed and, therefore, should be taken into account by these two organisations. However, there is also a need for the whole industry to take note of what has been discovered through this research and also of the following recommendations:

- Organisations and specifically men in leadership in these organisations need to be aware of the real issues which are prevalent in their organisation. Having the right level of conversation with female employees will help them to understand better what the relevant issues in their particular organisations are and how to address them. It is important to remember, however, that men must be aware not to have blinkers on when they are looking internally at their companies.
- Organisations firstly need to ensure that they look at their policies and processes to ensure that these take into account some of the issues which impact on women in the workplace, such as ensuring time-saving solutions, and other services designed specifically for them to support women in achieving the seemingly impossible task of balancing multiple roles.
- In addition, developing resources and tools for women to supplement and further enhance their professional careers and aspirations, is a critical component of ensuring change. This can include forums, mentoring support, and so on, and can even be in the format of an online, industry wide project such as is prevalent in the USA.
- The image of computer science and the IT industry needs to be an area of focus. Women should see this as a lucrative and positive career choice so that more women enter the field and the pool of resources is increased.
- More public relations and communication of the success of female role models is critical. There are many women in leadership positions in IT who have done wonders in the field but they are not recognised as much as the likes of Steve Jobs, Bill Gates, and other successful men in IT. Women need women role models to show what can be achieved, and organisations should be able to celebrate the success of their own phenomenal women.

- **Recommendations to women working in the IT industry:**
  Women who work in the IT Industry may find themselves having similar responses and experiences to the women who responded to this research. It is suggested

that women who work in the IT industry take note of the following recommendations made by the researcher:

- It is critical for women who work in this industry to realise that they add value in ways that are not defined by them needing to be more like a man to succeed. Finding one's own individual recipe for success and area of contribution and not needing to act like men to succeed, is important.
- Find a role model from whom one can learn and who will support one in one's desire for success. This can be a male or female mentor, but it is important to find someone who will give advice and support.
- Be aware of stereotypes, both the ones which bias women and the ones which bias men. Work with the organisation to ensure that women are leading the way to a better, more balanced work environment for all staff.

The researcher has carefully considered the outcomes of the research and the literature presented, and in summary makes use of the model below, which has been designed by the researcher to understand what elements will support a change in the representation of women in leadership positions in the IT industry.

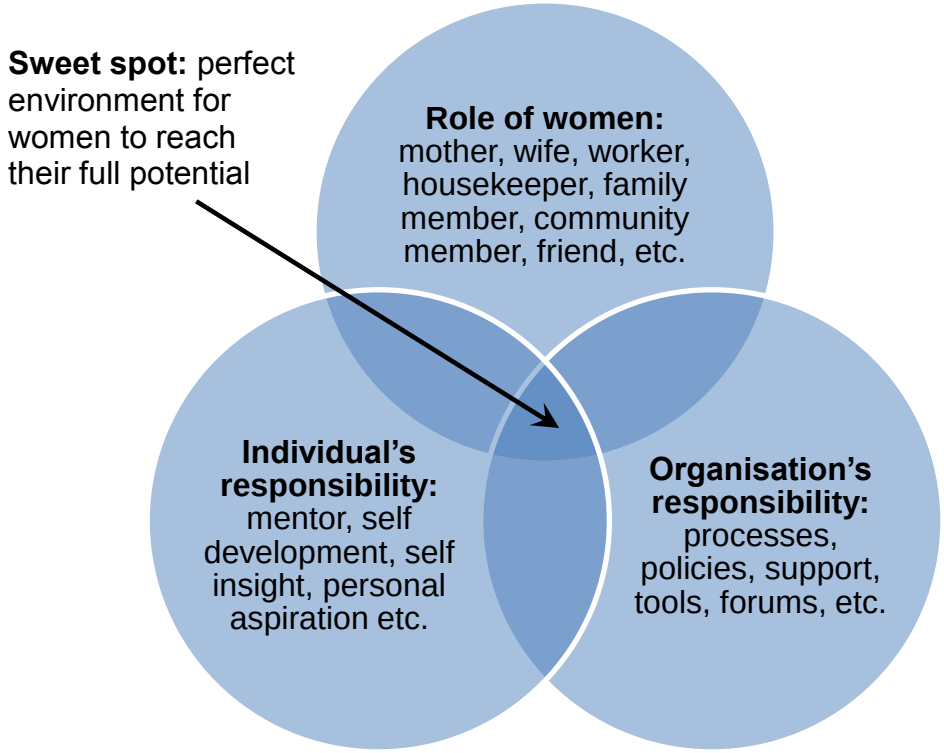

Figure 2: The 3 elements for consideration for successful gender diversity

The model above shows three elements which the researcher believes, having considered the literature and results from this research, are critical for consideration and conscious planning to ensure the progression of women into leadership roles in the IT industry.

The first element is represented by the role of women. This research has gone some way to discuss the role of women in the home and also as economically active individuals. Kotze (2003) talked about the multiple roles which women play and also how the balance between these roles can place enormous pressure on individuals (Kotze 2003). The researcher, therefore, believes that women and organisations need to be more conscious of the roles women play at home and in the workplace, in order to support them reaching their full potential. Understanding the role of women will hopefully also decrease and eventually nullify the phenomenon of think-manager-think-male and allow women to be seen as good leaders and managers for their own unique characteristics.

The second and third elements take into account the responsibility of organisations and of the individual, which have been discussed above in the recommendations section of this research. It is important to remember that there should be a balance between the organisation's and individual's responsibilities and that one should not take on more than the other. From the literature and research findings it is evident that more can and should be done by both the organisation and individual in understanding how they can shape the development and career progression of women in this industry. Understanding these roles and ensuring that there are mechanisms in place that the individual and organisation consciously can focus on will go some way to ensuring that more often than not the area of overlap or the sweet spot is achieved.

The sweet spot, or area of overlap, represents, according to the researcher, the perfect environment for women to succeed in the organisation and will enable them to reach their full potential and develop into great leaders in business. Finding the balance between the three elements presented will provide the support required by women to enable them to break through the glass ceiling in IT and become great leaders through their own uniqueness.

6.4 Suggestions for further research

There are a number of areas which have been uncovered during the course of this paper which require further research. The details of gender bias impacting on fewer women in leadership remains poorly researched and more studies are required to understand the issues better. The following topics are suggested for further research:

- A qualitative study discussing the perceived gender stereotypes and biases in the IT industry. Having a qualitative approach would allow the researcher to uncover detail regarding these issues and to dig deeper through asking questions to uncover the why's and how's.
- An analysis of the trends over time through cross-sectional research (either qualitative or quantitative) would allow the researcher to identify whether actions taken by an organisation would cause a shift in people's thinking.

- A replication study could be conducted in another industry which is typically seen as being ‘male dominated’, such as engineering, mining or manufacturing. This would allow researchers to identify whether the issues are prevalent in a number of industries and possibly understand why fewer women choose these industries for career paths.
- No research was conducted by the researcher into organisational cultural trends which may impact on the perceptions in these two organisations. Further research could do an analysis by organisation to compare the results of the two.
- This study did not look at whether there was a difference between generations, in other words further research could investigate whether generation has an impact on the way women/ men responded to the questions. Do the Baby Boomers have a different perception of gender stereotypes and their impact than Generation X or Y.
- Research should be conducted in order to understand the impact on the culture of the organisation and the propensity for women to leave organisations before reaching senior roles, based on the stereotypes which are prevalent.

6.5 Conclusion

The purpose of this research was to explore managers’ perceptions of gender role stereotypes and their perceived impact on women’s career progression into senior leadership positions. The need for this study stemmed from statistics presented that, although South African firms have been and are still focused on ensuring that there is equality regarding gender representation in the organisational structure, it seems that organisations are still struggling to ensure that this spread is representative pertaining to women in senior leadership roles.

This research explored an area where very little local research has been conducted, regarding gender role stereotypes and their perceived impact on the career progression of women into senior leadership positions within the Information Technology industry. It was questioned whether the issues of gender role stereotypes and specifically the ‘think-manager-think-male’ and ‘glass ceiling’ phenomena have an impact on this progression.

Literature on these two concepts was used in developing the web- based questionnaire. Results were analysed using the statistical package SPSS, and discussed in detail regarding the three propositions outlined for the research.

The overall conclusion was that all three of the propositions put forward by the researcher were true. There are gender role stereotypes present in the IT industry; they do have an impact on women's career progression in this industry; and finally that there is a difference in the perception of these issues by men and women working in this industry.

Given the importance of technical fields in our modern society, with all the growth in technology and, therefore, the rapid expansion of employment opportunities in the field of technology, the researcher believes that this study is critical in helping organisations in this industry understand why there are still so few females in senior positions, specifically relating to prevalent gender role stereotypes which may exist. It is hoped that the research will assist organisations in the IT industry to make changes to support the development and progression of more women into leadership roles in the future.

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APPENDIX A

Request e-mail to organisations for participation

Dear Mr/Ms._____,

I am an MBA student at Wits Business School and am currently completing my research report in order to fulfil all requirements for the Masters degree. My research topic is entitled: “The perceived impact of gender role stereotypes on women’s career progression and opportunities into senior leadership positions in the Information Technology Industry.”, and I kindly ask for your assistance in affording me an opportunity to use _____(Organisation name)_____ as part of my sample to survey. It is my intention to relate research conducted locally and abroad to a South African Information Technology Industry context.

I would like to obtain permission from you to please use men and women, in your organisation, who are (and have been for the last 12 months at least) in a middle and senior management role as part of my sample for this study.

The study involves answering a demographic questionnaire and a simple questionnaire on a secure and encrypted website. The demographic questionnaire at the beginning will be used for the sole purpose of establishing general patterns using the data, this information will not identify individuals in any way. Participation in the study is voluntary, respondents will remain completely anonymous and confidentiality of all data collected is guaranteed throughout the research study. After completing the demographic questionnaire there will be a simple questionnaire in which respondents are required to rate the truth of a statement provided as it applies to them. These questions focus on their interpretation of gender bias in the IT industry and their perceptions of the impact of this bias on women’s career progression. It should take no longer than 20 minutes in total to complete the survey.

Only my supervisor, Drikus Kriek, and I will have access to the data gathered. A report of the study may be submitted for publication, but individual participants will not be

identifiable in such a report. The data will not be used for any other purpose apart from academic research.

I will gladly provide you with a copy of the findings upon completion of my research and will also ensure that your organisation's details, as well as all details of individuals within your organisation will be kept confidential in the research report.

A half day spa voucher will be awarded as a lucky draw prize available to any person who participates in the interviews. The lucky draw winner will be chosen on 1 December 2011 and the winner will be notified via email on the same day.

I thank you in advance, and look forward to engaging with you further.

Yours faithfully,

Leigh-Ann Monk

APPENDIX B

Request e-mail to respondents

Dear Participant,

I am an MBA student at Wits Business School and am currently completing my research report in order to fulfil all requirements for the Masters degree. My research topic is entitled: “The perceived impact of gender role stereotypes on women’s career progression and opportunities into senior leadership positions in the Information Technology Industry.”, and I kindly ask for your assistance in answering the attached survey to assist me in this endeavour.

You have been randomly selected to participate in this research as part of a sample of people in middle and senior management roles working at a major IT organisation in Gauteng.

The study involves answering a demographic questionnaire and a simple questionnaire on a secure and encrypted website. The demographic questionnaire at the beginning will be used for the sole purpose of establishing general patterns using the data. This information will not identify individuals in any way. Participation in the study is completely voluntary. You will remain anonymous and confidentiality of all data collected is guaranteed throughout the research study. After completing the demographic questionnaire you will need to answer a simple questionnaire in which you would be required to rate the truth of a statement provided as it applies to you.

It should take no longer than 20 minutes in total to complete the survey. If you choose to complete the questionnaire, it implies that you have consented to participate. Should you decide to participate, please click on the link below this e-mail which will direct you to the questionnaire.

Only my supervisor, Drikus Kriek, and I will have access to the data gathered. The data will not be used for any other purpose apart from academic research. The research will not contain information specific to any organisation or individual who participates.

A half day spa voucher will be awarded as a lucky draw prize available to any person who participates. As the survey is confidential please send me an e-mail to the address you will find at the end of the survey should you wish to be entered into the draw. The lucky draw winner will be chosen on 1 December 2011 and the winner as notified via email on the same day.

I thank you in advance. Should you have any queries or concerns about the completion or submission of the questionnaire please do not hesitate to contact me via e-mail as below, alternatively you can contact my supervisor Drikus Kriek on: drikus.kriek@wits.ac.za

Yours faithfully,

Leigh-Ann Monk

APPENDIX C

On-line Survey questionnaire

Please answer the questions below as honestly as possible. The first section consists of a demographic questionnaire which is used for reporting purposes only and will not allow the researcher to identify any individual respondents. Please note that ALL responses are confidential.

Please answer the following questions as honestly as possible, your first reaction is usually the most accurate response.

Section1: Demographic Profile

Please click on the appropriate option from the list provided.

Organisation: (Dimension Data / PwC)

Gender: (Male / Female)

No. of years in the current position in the organisation:

1-3 yrs
4-6 yrs
7-10 yrs
11-15 yrs
16-19 yrs
20+

No. of years working in current organisation:

1-3 yrs
4-6 yrs
7-10 yrs
11-15 yrs
16-19 yrs
20+

Please rate each statement below as you feel the responses are appropriate to you in your current organisation, using the scale provided ('strongly disagree' – 'strongly agree').

Section 2: Questions for research

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

Cluster and Item:

Compensating for Gender/ Gender roles in the IT Industry

27. Female managers are more closely scrutinised in their roles as managers in the IT industry
28. Women need a male sponsor to be successful in the IT industry
29. Men need a male sponsor to be successful in the IT industry
30. Women have to do more than men to prove themselves

31. Women must work harder and smarter than men in a similar role
32. There is an ‘old boys’ network that exists in the IT industry
33. The IT industry is a male dominated environment

Gender Stereotypes

34. Women can be feminine and have feminine characteristics in the IT industry and will still be seen as good managers
35. Men can be seen as softer and do not need to be macho in the IT Industry and will be seen as good managers
36. Women do not usually end up doing the clerical tasks in meetings where there is no formal admin support
37. When women choose family responsibilities over work it makes upper management question their commitment to the organisation
38. It is difficult for women to be assertive without being labelled assertive
39. Women need to exhibit “masculine” characteristics in order to succeed in the IT industry
40. Men do not need to exhibit “masculine” characteristics in order to succeed in the IT industry
41. Female managers in my organisation who “make it” (into very senior leadership roles) behave more like their male counterparts than the women who don’t

Gender Bias

42. The IT industry is not seen as a ‘male dominated’ environment
43. The IT industry is well represented by men and women
44. My organisation spends as much time and money to develop women as it does to develop men (on training and personal development)
45. At my organisation, men earn more than women in the same positions and it is not explained by differences in performance, education, experience
46. At my organisation, women do earn more than men in the same positions and it is not explained by differences in performance, education, experience
47. Female managers/supervisors at my organisation are not excluded from important senior management communications

Perceived Impact on Career Progression

48. Being ‘buddies’ with more senior managers does not enable people to be considered for a promotion over others who do not have these close personal friendships with the decision makers
49. Female managers/supervisors generally progress to a certain level, then go no further
50. It is not more difficult to get promoted to top positions if you are a woman working in the IT industry
51. Organisations in the IT industry are serious about eliminating barriers that prevent women from reaching their potential
52. People who focus on family will not see a negative impact on their career, preventing them from reaching their full potential in terms of promotion

Closing remarks:

Thank the respondent for taking the time to complete this questionnaire. You will be notified on 1 December 2011 should you be the winner of the prize. If you would like to be entered into this lucky draw please e-mail me on the contact e-mail provided.

APPENDIX D

Full results of Mann Whitney U Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Gen Role 1 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
2	The distribution of Gen Role 2 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
3	The distribution of Gen Role 3 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.118	Retain the null hypothesis.
4	The distribution of Gen Role 4 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
5	The distribution of Gen Role 5 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.043	Reject the null hypothesis.
6	The distribution of Gen Role 6 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.002	Reject the null hypothesis.
7	The distribution of Gen Role 7 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.
8	The distribution of Gen Stereo 1 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.803	Retain the null hypothesis.
9	The distribution of Gen Stereo 2 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.943	Retain the null hypothesis.
10	The distribution of Gen Stereo 3 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
11	The distribution of Gen Stereo 4 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.018	Reject the null hypothesis.
12	The distribution of Gen Stereo 6 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
13	The distribution of Gen Stereo 7 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
14	The distribution of Gen Stereo 8 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.498	Retain the null hypothesis.
15	The distribution of Gen Stereo 9 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.018	Reject the null hypothesis.
16	The distribution of Gen Bias 1 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.218	Retain the null hypothesis.
17	The distribution of Gen Bias 2 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.958	Retain the null hypothesis.
18	The distribution of Gen Bias 3 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.024	Reject the null hypothesis.
19	The distribution of Gen Bias 5 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
20	The distribution of Gen Bias 6 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.978	Retain the null hypothesis.
21	The distribution of Gen Bias 7 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.002	Reject the null hypothesis.
22	The distribution of Car Impact 1 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.092	Retain the null hypothesis.
23	The distribution of Car Impact 2 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
24	The distribution of Car Impact 3 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.552	Retain the null hypothesis.
25	The distribution of Car Impact 4 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
26	The distribution of Car Impact 5 is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.110	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

APPENDIX E

Results of Factor Analysis by Construct

Construct 1: Gender Role

Inter-Item Correlation Matrix

	Gender Role 1	Gender Role 2	Gender Role 3	Gender Role 4	Gender Role 5	Gender Role 6	Gender Role 7
Gender Role 1	1.000	.626	.290	.672	.186	.447	.284
Gender Role 2	.626	1.000	.366	.762	.339	.489	.518
Gender Role 3	.290	.366	1.000	.262	.070	.271	.211
Gender Role 4	.672	.762	.262	1.000	.337	.453	.355
Gender Role 5	.186	.339	.070	.337	1.000	.131	.320
Gender Role 6	.447	.489	.271	.453	.131	1.000	.422
Gender Role 7	.284	.518	.211	.355	.320	.422	1.000

Construct 2: Gender Stereotypes

Inter-Item Correlation Matrix

	Gender Stereotype 1	Gender Stereotype 2	Gender Stereotype 3	Gender Stereotype 4	Gender Stereotype 5	Gender Stereotype 6	Gender Stereotype 7	Gender Stereotype 8
Gender Stereotype 1	1.000	.242	.087	.289	.014	.160	.085	.282
Gender Stereotype 2	.242	1.000	.108	-.133	.108	.150	.405	.086
Gender Stereotype 3	.087	.108	1.000	.194	.322	.232	.063	.243
Gender Stereotype 4	.289	-.133	.194	1.000	.366	.499	.137	.417
Gender Stereotype 6	.014	.108	.322	.366	1.000	.491	.035	.324
Gender Stereotype 7	.160	.150	.232	.499	.491	1.000	.150	.500
Gender Stereotype 8	.085	.405	.063	.137	.035	.150	1.000	.067
Gender Stereotype 9	.282	.086	.243	.417	.324	.500	.067	1.000

Construct 3: Gender Bias

Inter-Item Correlation Matrix

	Gender Bias 1	Gender Bias 2	Gender Bias 3	Gender Bias 4	Gender Bias 5	Gender Bias 6
Gender Bias 1	1.000	.638	.183	.306	.090	.112
Gender Bias 2	.638	1.000	.148	.211	-.075	-.058
Gender Bias 3	.183	.148	1.000	.398	.079	.314
Gender Bias 5	.306	.211	.398	1.000	-.107	.309
Gender Bias 6	.090	-.075	.079	-.107	1.000	-.011
Gender Bias 7	.112	-.058	.314	.309	-.011	1.000

Construct 4: Career Impact

Inter-Item Correlation Matrix

	Career Impact 1	Career Impact 2	Career Impact 3	Career Impact 4	Career Impact 5
Career Impact 1	1.000	.096	.005	.204	.260
Career Impact 2	.096	1.000	.000	.296	.366
Career Impact 3	.005	.000	1.000	-.101	.059
Career Impact 4	.204	.296	-.101	1.000	.288
Career Impact 5	.260	.366	.059	.288	1.000