



**CROP CHOICES: MOTIVATIONAL AND DECISION-MAKING FACTORS  
THAT ATTRACT AND RETAIN COTTON-GROWER EMPLOYERS  
WITHIN THE AUSTRALIAN COTTON INDUSTRY**

A Thesis submitted by

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### **Abstract**

Primary production is integral to feeding and clothing the world, and cotton is both a food and a fibre. The cotton industry's producer employers are critical to the longevity of the Australian cotton industry. Understanding their motivation and the influencers of their decision-making processes in crop choice is important. While exploring decision-making of employers is not new, this study seeks to establish what are the sources of motivation to grow cotton and what factors influence the decision-making processes in the context of cotton grower employer (CGE) crop choice.

The work is framed as exploratory and theory building, as little has been published in the academic literature about individual employer perspectives in agriculture, such as CGEs and how they are influenced from a psychological and behavioural economic perspective. There is a deficit specifically regarding individual employer experiences from this perspective in Australian agriculture broadly and in cotton growing more specifically.

Overall, this multi-disciplinary study has identified influencers that impact on the decision-making processes of CGEs. This research is important because it informs cotton industry stakeholders such as (a) growers and their supportive others, (b) industry service providers such as merchants, ginner, brokers and insurers, and (c) government policy-makers regarding the influences of CGE decision-making processes and crop choice.

### **Certification of Thesis**

This Thesis is entirely the work of Geraldine Wunsch except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

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# 1. INTRODUCTION

This research explores cotton grower employers (CGEs), their role in the Australian cotton industry, and the influencers on their work motivation and decision-making evidenced through crop choices. This is a multi-disciplinary study that will draw on and take insights from multiple fields of behavioural science, including economics and psychology.

This research is significant as future human existence is reliant on primary production, and yet little is empirically known about CGE experiences regarding their role in choosing to grow cotton and the factors that may influence crop choice. Notwithstanding advancements in scientific artificial intelligence (AI) research and the vision to autonomise many aspects of primary production operations, individual CGE input will continue to be needed in decision-making in crop choice.

## 1.1 COTTON GROWER EMPLOYER PERSPECTIVE

CGEs discuss their difficulty with crop choice and the myriad factors required in making crop choice. This includes not only whether to grow cotton or not, but also other influencing factors such as the availability of product, the variability in weather conditions, soil conditions, contracting versus using own equipment, and decisions about whether machinery is owned or leased, with all these factors related to primary producers as consumers. The many decisions required in making crop choice can lead to decision overload.

Significantly, CGEs characterise their role as a difficult balancing act of operational decisions and governance. In this instance, governance refers to sustainability decisions about economic, environmental and social aspects of a cotton-

growing business required to be made by the individual CGE. While decision-making by individual CGEs provides a sense of autonomy and independence in owning and operating their own large-scale businesses on one hand, the effects of some decisions can result in grave disappointment. When this occurs CGEs experience self-doubt and self-reflection on how they came to make those complex decisions. This study explores the influencers of those decisions, for example, various heuristics and biases, salience and social norms used to make decisions. Knowledge of decision-making influencers can help CGEs make better decisions for themselves and improve their overall health and well-being. The obligations of the entrepreneurial role of a grower in meeting self-expectations of decision-making (making the right decision) and meeting societal expectations as decision-makers of sustainability aspects, economic, environmental and social, can cause growers to feel overwhelmed as employers. This is especially the case in relation to the decision to grow or not to grow cotton and the financial cost required to enter as a grower, the time, labour and energy needed for the intensive activity of growing cotton, and the impact these decisions have on CGE business aims and CGE personal health and well-being. The rationale for this study was to establish what influences CGEs' decisions to grow or not to grow cotton and to understand what may influence their decision-making processes.

## **1.2 COTTON INDUSTRY PERSPECTIVE**

Agriculture (cotton) is still an important source of work, and worldwide 1.34 billion people seek work in agriculture, most on family farms (Human Development, 2015). Approximately 70 to 80 per cent of the world's agricultural land is managed by more than 500 million family farms, whose workers – mostly family – produce more than 80 per cent of the world's food (Human Development, 2015). The importance of cotton production as a food and fibre and the attraction and retention

of employers within the cotton-growing industry are important to the worldwide food and fibre supply. Among its many textile uses, cotton is used in fishnets, coffee filters, book-binding, archival paper and medical supplies. Among its industrial purposes, cotton is used in tarpaulins, tents, hotel sheets and army uniforms. Cotton-seed is crushed to make cotton-seed oil, which is then used to make margarine, mayonnaise, sauces, salad dressing and marinades.

Understanding the role of employers who lead crop choices within the cotton industry may help explain fluctuating cotton-grower numbers. Cotton is uniquely a food and a fibre, and cotton growers are responsible for the efficiency of producing Australia's cotton in both domestic, but mostly export, consumption, which represents a sizeable contribution to the Australian economy, rural community businesses and employment. Understanding the fluctuations in cotton-grower numbers beyond seasonal explanations is important to the cotton growers themselves, the longevity of the Australian cotton industry, and employees, ancillary businesses and communities reliant on the Australian cotton industry. As a step towards supporting Australian cotton growers, this thesis explores the employer influencers of crop choices by focusing on the context of CGEs as decision-makers and drivers of workplace change, consumers of workplace products and services, and leaders of primary production businesses. There is also the sense of attraction to choose to grow cotton described by CGEs as a crop and an industry that provides hope through innovation. Retention and intention refer to CGEs' crop choice as intention to participate and remain in the industry as a grower.

The Australian cotton industry's strategic plan (2013–2017, p. 16) identifies productivity and profitability as being the only outcomes and measures of success in terms of industry sustainability indicators. However, this study challenges this

idea and suggests that there are other measures of success that extend beyond productivity and profitability to include prosperity, i.e. prosperity in the sense of individual CGEs and their decision to grow cotton, giving consideration to their own personal goals, such as well-being, and their business decisions that can impact the broader community by improving decision-making in areas such as sustainability that have the economic, environmental and social impacts referred to in the Australian cotton industry strategic plan (2018-2023 p.28). Cotton growers themselves suggest that there are personal influencers of crop choice decisions.

Cotton growers are employers, and today's business leaders are required to provide employees with a sense of belonging and trust at work, which offers them a greater sense of purpose. The most successful businesses are led by individual employers and leaders who demonstrate a heightened interest in the quality of their own work lives and the lives of others they employ and inspire (Sinek, 2009). While cotton growers must demonstrate leadership skills in their day-to-day operations, they often do not perceive themselves as leaders because leadership is an informal role within their own businesses.

Humans have the need to link their work to a greater purpose if they are to be motivated in their careers (Suddendorf, 2013). Consistent with Maslow's Hierarchy of Needs theory (Maslow, 1943), once all survival needs have been met, man goes in search of meaning. Today, work is seen as both a source of motivation and one's role in life. While work environments are now globally competitive, and advanced technologies mean that more people are connected, there is a broader workforce view of employment and job focus. This study and others like it suggest it is the behaviour of individuals that is the driving force behind change (Morgan, 2016).

Technology is undoubtedly making significant changes in many work

environments, especially in the areas of climate change, energy efficiency and technology use. However, new generations of workers are demanding businesses be transparent on where the business stands on “social” issues, which is often the defining factor in job selection for employees. Generation Y (in 2017 they are aged between 21 and 36 years), known as the “Millennials”, have a heightened interest in the quality of human lives beyond maximising profit; they seek workplaces where reasons to work align with personal values as “people’s priorities shift from survival to self-expression values as their sense of individual agency increases...” (World Values Survey, 2015).

Cotton operations are high-risk, high-return operations where critical decisions are made daily. They are critical in the sense that many decisions have a flow-on effect that can affect the success of the season and possibly the entire operation due to large financial risk. Such decisions are made by individual employers and are influenced by various external and internal factors that impact on these employers’ crop choices. To date, there has been limited research conducted on the influencers of cotton growers as crop consumers, seed choice and the products and services required to grow cotton. In the workplace generally, there has been a strong focus on employee requirements. It is important to explore the employer perspective to support and assist cotton growers with judgements and choices.

### **1.3 CONTEXT AND RATIONALE FOR THE RESEARCH**

Within the cotton industry, workplace operational and governance decisions and outcome measures are made by the individual employer (in the sense that while others such as partners, parents and adult children may contribute to the decision, the CGE makes the final decision), with these decisions often based on economic and environmental factors rather than individual personal goals of CGEs and social

impacts. This notion is supported in the literature with growing evidence in support of prosperity as a business goal. The prosperity of a business includes workplace purpose and meaning, such as quality of life, well-being, personal security and freedom of choice (WVS, 2015). In support of this view, the World Values Survey (WVS) indicates there is evidence that the level of personal happiness rises in line with freedom of choice (WVS, 2015).

Allowing for human nature, emotions and other types of influencers of choice, behavioural economics “increases the explanatory power of economics by providing it with more realistic psychological foundations” (Camerer & Lowenstein, 2004 p.3). Traditional economics posits that people act rationally and always make optimal decisions, while behavioural economics agrees in part that people usually act rationally, but rejects that humans always make rational and logical choices. Rather, individuals use mental shortcuts (heuristics) to make decisions, and while these are sometimes helpful, they can lead to systematic errors (Kahnemann, 2010). While research in this area has resulted in a comprehensive understanding of these contextual factors, the argument of this study explains that psychological and behavioural perspectives also influence crop choices. As supported in Camerer (1999 p. 10575), “economics is the science of how resources are allocated by individuals, businesses and markets, and the psychology of individual behaviour is said to inform economics, then behavioural economics seeks to use psychology to inform economics”. CGEs are both producers and consumers, subjected to the elements of marketing, and thus this study highlights some common consumer behaviour factors that relate to choice. Aspects of behavioural economics, such as offering “two for the price of one” and “lay-bys”, have been used in the consumer behaviour literature for many years Delaying

payments are appealing because delaying the pain of a payment lessens the impact of the immediate outlay to some other time in the future and removes a barrier to buy; marketing companies and retailers understand that people have an aversion to loss. Decisions on making choices are also impacted by other behavioural factors such as “mental accounting”, a well-known common practice with CGEs when making decisions (Lockwood, 2016). Mental accounting refers to decisions that “keep things under control by a finite mind” (Kahneman, 2010 p. 343). A “mental accounting” example where individuals violate their own held basic economic principles is as follows:

Example 1: Mr W admires a new set of tools at the local merchant. The CGE declines to buy it, feeling it is too extravagant. Later that month he receives the same tools from his wife as a birthday present. He is very happy. Husband and wife have only “joint” bank accounts. (People tend to give as gift items they would not buy themselves).

Example 2: Mr and Mrs R have decided to put thirty thousand dollars toward a holiday home at the beach. They hope to buy the home in ten years. The money earns 10% in a money market account. They just bought a farm vehicle for twenty-two thousand dollars which they financed with a three-year loan at 15%. (Individuals are aware of their own self-control problems and are afraid if the luxury item, i.e. the holiday home, is drawn down it will not be repaid, while the bank will ensure the vehicle loan is paid off with regular payments).

These examples and others (Chapters 5 and 6) in this study help to provide a contextual understanding of the impact influencers have on choice and behaviour.

It is theorised in this study that a crop choice decision-making framework in a complex adaptive system could assist cotton growers in real-world production activities. This study suggests that personality factors can influence CGEs' crop choice. As well, other influencers discussed in the behavioural sciences literature and addressed in this study, such as framing, priming, defaults and choice overload, can impact CGE decisions on whether to grow or not to grow cotton. Crop choice relates to attraction and retention of CGEs within the Australian cotton-growing industry as a significant issue, and research into understanding the influencers and motivation of CGE crop choice is needed.

In the context of this study, other factors including heuristics and biases, anchoring, intuition, framing, choice overload, default options and mental accounting will be discussed and explored in the literature review in Chapter 2 and discussed again in Chapter 6 with relevance to the research question. The significance of heuristics and biases to the study argument are that human behaviour, such as in CGE decision-making, can be subjected to influencers and can be improved by appreciating how people systematically make wrong decisions (Thaler, 2008). For example, CGE decisions to grow cotton can be based on a dual process theory using "gut reaction", known as the automatic system that says "We had a failed crop last year and I can't do that again", and "conscious thought", the reflective system that says "growing cotton is a good option". The psychology literature refers to System 1 being automatic and System 2 being reflective (Thaler, 2008).

Central to the argument of this study is that individuals often make decisions with little knowledge of their own possible biases. Heuristics, known as mental shortcuts, are suggested as the basis of bias in decisions (Elstein, 1999), while others

(Tversky & Kahneman, 1974) suggest that heuristics are efficient but also lead to predictable errors. Emotions are also essential to humans in decision-making, and visceral factors (gut feelings) can create an internal conflict between what individuals want to do and what they believe is rational. Intuition is explained as a mental shortcut that focusses on one aspect of a problem and ignores others; “the mystery of knowing without knowing is not a distinctive feature of intuition: it is the norm of mental life” (Kahneman, 2010 p. 237). While choice overload is explained as the result of too many choices being available. Anchoring is explained as a cognitive bias that occurs when individuals consider a certain value for an unknown amount even before estimating that quantity (Kahneman, 2010). A framing effect happens when an individual imagines a situation and changes their opinion based on the way it is presented (Chong & Druckman, 2007), while default is defined as a pre-set option that takes effect if no other choice is made (Thaler & Sunstein, 2008). These factors, discussed in Chapter 2, can influence decision-making processes (Thaler, 2008, Tversky & Kahneman 1974, Kahneman, 2011).

Currently, there is an ongoing focus on the development of employers and the accountability of their decision-making processes. Globally, more information is geared towards making leaders’ jobs easier so that they can make better decisions based on the influencers of those decisions. An extensive mass of information is transforming how individuals work, study, bank, shop, navigate, exercise and decide in all aspects of life. In addressing this situation, it is important to understand growers’ perspectives on their current choices, decision-making processes and influencers by exploring and understanding individual behaviour in the area of judgement and choice, which includes factors such as decision regret, choice overload and default options, among other influencers discussed in Chapter 6.

The importance of this study lies in exploring the influencers from psychological and economic perspectives; it investigates CGE and stakeholder impacts on decision-making processes. Cotton industry policy-makers, industry groups and ancillary businesses are reliant on the continued longevity of the cotton industry and its contribution to the Australian economy. This study also explores CGE crop choice that relates to business and people management. Central to the argument of this study is that the CGE individually is accountable for the final decisions made in relation to crop choice. It will be argued that prosperity (in the sense of fulfilment and contentment in life) (Human Development, 2015) is of equal importance (if not greater importance) than profitability and is achieved through the behaviour and purpose of individuals who drive the economic, environmental and social gains of a business. This thesis also argues that any business requires a human decision-maker, in this context the CGE.

#### **1.4 AIMS OF THE RESEARCH**

The primary objective of this research is to explore CGEs' own work motivations, decision-making processes, experiences and influencers for selecting cotton as a crop of choice. The term, "employer", is used in this study as labour is a significant component in crop choice. Existing research has suggested that an organisation is led by an individual (such as the CGE) who makes the final decisions for the business and creates the work environment where employees are supported in their personal goals and the goals of the organisation (Comcare, 2010; Lent, 2014). Other studies that support the argument of this study suggest there are multiple goals of both CGEs and their employees beyond money, that influence motivation and decision-making behaviour (Morgan, 2016; Human Development, 2015; Schaufeli et. al., 2010; Schwartz, 2003). This study furthermore identifies the

factors that may influence CGEs' crop choices as both primary producers and consumers of products and services that relate to these choices. These influencers include emotion, intuition, framing, choice overload, default options, mental accounting, anchoring and bias. The aim of this study therefore is to establish an understanding of what may influence CGE crop choice and how these influencers may impact on those decisions:

1. Explore employers' views on and experiences of their decisions to choose to grow or not to grow cotton.
2. Investigate influencers that impact on decision-making processes in the cotton-growing workplace.
3. Explore the role of the CGE as decision-maker.
4. Contribute a unique understanding of factors that may alleviate unnecessary CGE stress such as decision overload.
5. Develop measures and models to illustrate and explain the decision-making processes of CGE crop choice.

### **1.5 RESEARCH QUESTIONS**

To fulfil the aims of the study, the research sought to answer the following questions:

1. What are the influencers of CGE crop choices (other than purely economic)?
2. How do influencers impact on CGE crop choices and decision-making processes?

The research methodology and methods selected to best answer these questions and a summary of the study design are outlined briefly below.

## 1.6 RESEARCH METHODOLOGY

This study proposes a pragmatic approach to the problem of establishing the factors that influence CGE crop choices (Robson, 1993). A pragmatic approach is considered a tool for action and in this study was guided by interviews with CGEs in relation to their experiences in their cotton-growing businesses to establish their decision-making processes (Cornish et al., 2009). In this multi-disciplinary study both qualitative and quantitative methods are used to interpret interview material and survey data respectively. The study examines the individual CGE to better understand the factors that influence work motivation and decision-making processes in crop choices in cotton production businesses, working in the pragmatic context of complex real-world problems.

Consistent with the pragmatic approach, quantitative and qualitative approaches applying behavioural economic theories to guide data collection and analysis were used for this study. The research was conducted in three stages, with initial interviews and a national survey in Part 1 of this study followed by further interviews in Part 2. The exploratory nature of the study in Part 1 led to theory building in Part 2. Preliminary data were collected through face-to-face semi-structured interviews conducted with a small sample of CGEs and industry stakeholders. Stakeholders in this context refers to agronomists and merchants who provide goods and service to grow cotton. The psychological literature was then explored to better understand the personal factors of cotton growers. The approach to use psychology was chosen as the psychology of behaviour is said to underlie and inform economics (Camerer, 1999). While economics and agricultural economics provide an understanding of how resources are allocated, behavioural economics tries to provide a pragmatism to psychological assumptions that underlie economic

theory (Camerer, 1999). A Social Cognitive Career theory (SCCT) model of grower retention was developed to explain the key factors that determine the CGE's crop choices. Measurement scales for each construct within this model were located or developed, where none was available, to compose a national survey to evaluate the Social Cognitive Career model of grower retention. This model explained part of the decision-making of CGEs but was not successful in providing a full explanation of decision-making and behaviour. A second round of interviews was therefore conducted to further explore the perspectives of CGEs in regard to influencers and factors that may impact on CGEs' crop choices. As a consequence, a second literature review was conducted to explore the overlap between the two disciplines of psychology and economics, with behavioural economics appearing to account for limitations in the SCCT model and better explain influencers of CGE decision-making processes. Based on the theories from both disciplines, the Decision Driver Model was developed. Factors that influence choices were explored using the MINDSPACE Framework (Dolan et al., 2010) and Behavioural Insights Toolkit (Chan, 2017). These were applied to this study context because this body of work is embedded in the Australia cotton industry, utilising theories from academic literature, and much of the discussion will include policy/industry-related examples and documents and literature relevant to and utilised by the Australian cotton industry.

## **1.7 THESIS STRUCTURE**

This thesis presents a mixed-method, multi-disciplinary exploratory study informed by Social Cognitive Career Theory (Lent, 2013), Maslow's Hierarchy of Needs theory (Maslow, 1943) and a behavioural economic approach in the MINDSPACE decision-making framework (Dolan et al., 2010) and the Behavioural Insights Toolkit, (Savage et. al., 2011). The thesis

framework is structured in a way to take the reader on a journey through the research process, which is detailed in Figure 1.1. The results from the study are presented in Chapter 4 and draw attention to the psychological factors of individuals in the context of their work environments. Chapter 6 comprises a second literature review applying behavioural economics to this study context, and Chapter 7 discusses the influencers on decision-making processes using an exploratory approach where findings of the study are interpreted with reference to the existing literature in relation to the theoretical framework in Chapter 3. Implications and proposed suggestions are also considered in Chapter 7, as are the limitations and strengths of this study. Concluding comments regarding the findings of this study are presented in Chapter 7.

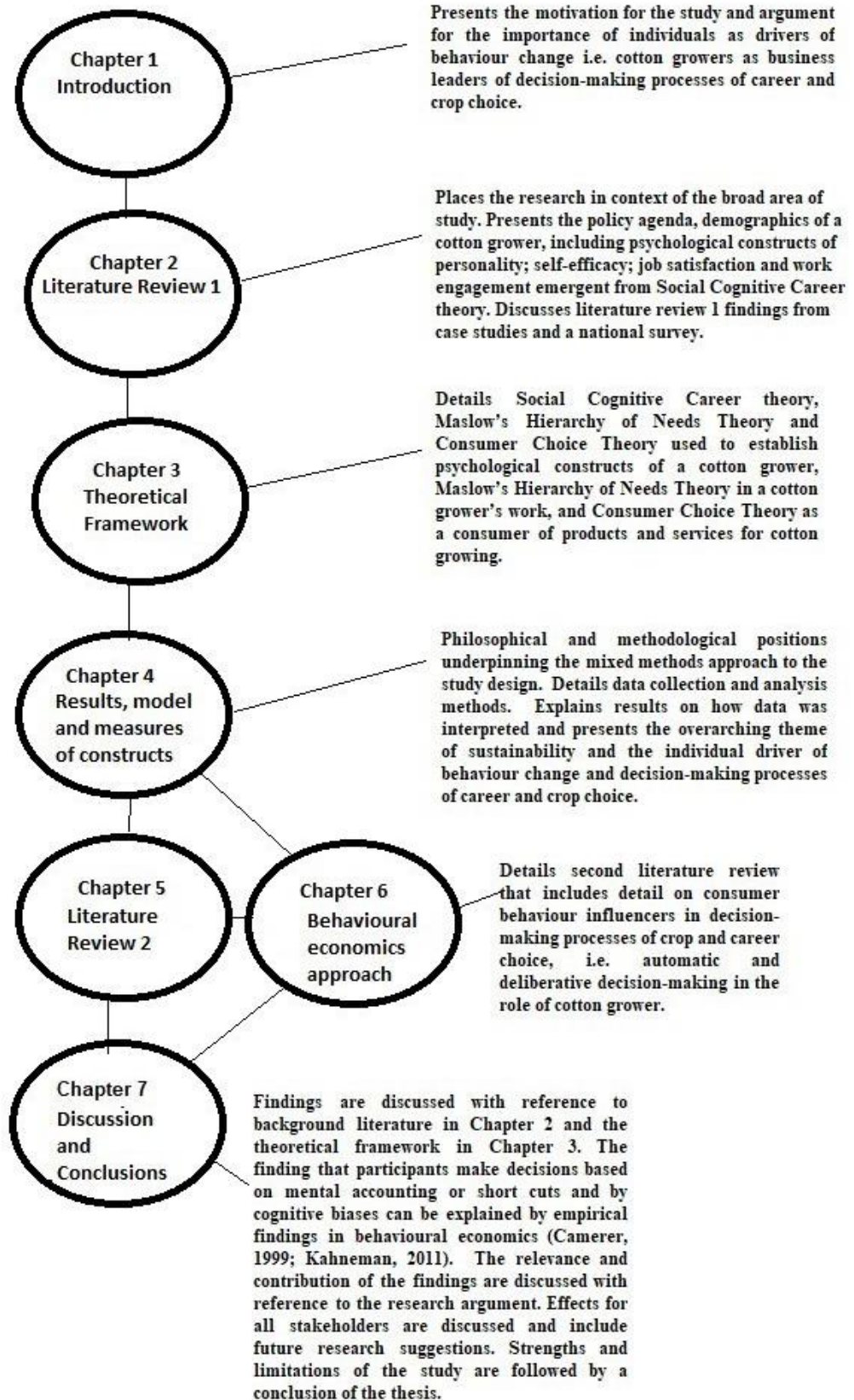


Figure 1.1. Thesis structure and outline.

## **1.8 LIMITATIONS**

At the commencement of this study, it was revealed that there is inconsistent recorded data about cotton-grower numbers over the history of cotton growing in Australia. Therefore, scant recorded data are available, hampered by several issues, one being the lack of a definitive classification of a CGE's production activity. An important factor to note is that regardless of whether CGEs are currently growing cotton, have grown cotton consistently or grow cotton spasmodically, CGEs have a strong sense of connectedness to the industry, and once growers considers themselves growers, they are perceived by themselves as always growers, despite acknowledging that they grow cotton all of the time, most of the time, or some of the time (as defined in Chapter 2).

Another limitation is lack of accessibility to collected data, which hinders the exact knowledge of grower numbers each season in some of the previous years. Although some private companies gather data for, and within, the cotton industry, these data are not necessarily shared with the industry body. While licences are required to grow cotton, private companies provide and monitor this certification. Clarification of this definition is found in Table 2.1.

## **1.9 SIGNIFICANCE AND SCOPE**

This study is largely based on a methodology of theory-building exploratory research on the influencers of the motivation and decision-making processes of crop choices from psychology/economics and biology. Traditionally, economic, environmental and social factors have been extensively studied in the cotton industry in a report, Economic, Environmental and Social Sustainability Indicators (Roth, 2010). Not surprisingly, both the agricultural and cotton industries have enjoyed the resultant scientific research and empirical evidence that has delivered significant

advancements in yields, technology, climate and other factors. Unfortunately, however, the focus on these factors has led to an oversight by the cotton industry in undervaluing the individual human contribution and CGE decision-making processes of CGEs by excluding the information provided in this study. This thesis is expected to fill a gap in the literature, using an unprecedented approach in this field of knowledge across two disciplines to deliver a richer understanding of theory and realism for the study of GCE motivation and decision-making processes.

Other agricultural studies in support of the argument of this study suggest there are multiple goals beyond money that influence motivation and decision-making behaviour (Wallace and Moss, 2005; Willock et al., 1999; Gasson, 1973; Harper and Eastman, 1980; Austin, 1999).

### **Outline of the Argument**

1. The research explores the influencers of crop choice of CGEs via a multi-disciplinary approach drawing insights from the fields of psychology and economics.
2. This study adopts a pragmatic approach drawing from theory and case studies to identify ways to better support CGE decision-making.
3. This study develops models of influencers that affect decisions in order to identify how best to assist CGE decision-making.
4. Elements of behavioural economics are identified and applied that can help CGE decision-making given the prevalent use of potentially limiting mental shortcuts (heuristics) employed by CGEs in their decision-making processes.

### **1.10 CONTRIBUTION TO KNOWLEDGE AND PRACTICE**

Work in its many forms enriches human lives. This study goes beyond economics to support the individual human contribution to agriculture and cotton production (i.e. self-driven motivation and decision-making processes) by understanding what it is like to work as an employer, a CGE, in the Australian cotton industry and what factors may influence the decisions of CGEs in their crop choices (such as understanding the influencers of unconscious decisions and using self-control, i.e. willpower, in decision-making).

The main conclusions of the Edinburgh study (Willock et al., 1998) highlighted the role of personality traits in farmers' work motivation and productivity (i.e. extroversion, openness to experience and conscientiousness). Apart from the Edinburgh study, there have been few studies researching the individual employer's crop choice behaviour in agriculture and none known to the researcher in the Australian cotton industry from this perspective (e.g. Richards, 1973); therefore, agriculture has not benefited from the advancements of research in work engagement, job satisfaction and workplace motivational behaviours, or viewed primary producers' choices of consumer behaviour. This study fills this gap through:

- Use of a multi-disciplinary approach applied to an industry context.
- Development of a self-efficacy of cotton growing measure.
- Development of a Social Cognitive Model of Grower Retention (Wunsch et al., 2014) adapted from the Social Cognitive model of work satisfaction from Lent and Brown (1996).
- Application of a behavioural economic approach to primary production.
- Application of the MINDSPACE framework and Behavioural Insights

Toolkit to this CGE study context.

- Development of a Decision Driver Model explained in Chapter 6.

Resilience and willpower are required in cotton growing as it is a labour-intensive crop that is grown in an Australian cotton-growing environment exposed to drought, flood, fire and the effects of plant and animal diseases. A study (Willock et al., 1999) has referred to risk by suggesting that farmers are risk-averse and slow to accept ideas. Wunsch (2013) found this to contrast with Australian cotton growers and discovered that further research in this area was required. Battershill and Gilg (1997) and Maybery et al. (2005) concurred with the work of Gasson (1973) that most farmers have intrinsic farming values and enjoy the independence of farming life and the chance to work outdoors. Following the work of Shucksmith (1993) and Battershill and Gilg (1997), it was found that profit was not their only motivation to farm and that other factors such as enjoyment, conservation, landscape and risk aversion were also important.

Most business owners are accountable for their decisions, whether as sole operators or in large corporations, defined as the individual employer, CEO or in this study context the CGE, and accountable and responsible for decisions of the business that include providing a healthy, safe, motivating workplace. The Australian cotton industry, like all other industries, is undergoing unprecedented change with the increased effects of international influencers on the expectations of what is provided in the work environment, as part of the individual implications in the workplace, such as how publicly exposed businesses have become through different communication methods and societal expectations of what employers offer. This study explores the influencers of GCEs' crop choice and can contribute to providing CGEs with knowledge and strategies to assist them in their businesses and

personally in their health and well-being. This study explores the application of social science and behavioural science to Australian agriculture broadly and to the Australian cotton industry's CGE members specifically. In a paper titled "Rise of the social enterprise" (Deloitte, 2018 p.2) a recent survey found that now "businesses are judged on the basis of their relationships with their workers, their customers and their communities, as well as their impact on society suggesting a trend from business enterprises to social enterprises." With this view in mind, this study explores and explains the role of the CGE as the decision-maker accountable for final decisions within a business that involves addressing issues of sustainability that includes economic, environmental and social factors. This research covers the individualism of the role of the CGE in the sense of being independent and self-reliant, as well as the need for purpose, well-being, job satisfaction and work engagement and defining characteristics fundamental to human beings (HDI, 2015). The role of the CGE as decision-maker is a factor that is pivotal to the human component of the cotton industry and has been overlooked in agricultural industries at large.

This exploratory research argues for a more comprehensive investigation of real-world social research focussing on factors that influence CGE work motivation and decision-making. This research aims to contribute a unique understanding of factors that may alleviate unnecessary CGE stress and provide developmental and practical recommendations that may be used to support work motivation and future decision-making processes. The research in this study will provide value by addressing the gap between literature and real-world concerns by contributing this study material towards future Australian cotton industry strategic development workforce plans. Central to the argument of this study is the notion that, in order for

an industry to continue to recruit both internally and externally, the existence of an industry is reliant on employer, CGE attraction and retention first and foremost.

The notion of human contribution referred to in this study refers to individual CGEs in their role in the cotton industry as decision-makers regarding crop choice. As previously mentioned, the term, sustainability, is used in the Australian cotton industry as a measure of economic, environmental and social indicators. The term, social, refers to two or more people; therefore, this study identifies that there is a distinct omission of reference to the individual human contribution in the Australian cotton industry. The line of argument of this study is that in any industry, large or small, there is a responsibility by the leader of the organisation, or in the case of this study a CGE, to guide the business and take responsibility for crop choice decision-making processes, particularly in today's work environment where businesses are no longer assessed by historical measures but rather are judged on their world views and ethics that include, yet go beyond economic, environment and social factors to how businesses and their leaders maintain relations at work, which include family life-to-life goals such as a life of prosperity (Deloitte, 2018).

Prosperity refers to human development and people's freedoms and opportunities for improving their well-being (Human Development, 2015). The Human Development Index is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and having a decent standard of living. There is evidence that human development matters in Australia; for example, Australia is positioned second out of 188 countries and territories on the Human Development Index (HDI, 2015). Australia has an HDI value in the years between 1990-2015 from 0.866 to 0.939, an increase of 8.4 per cent. This study proposes that business is driven by individual employers (CGEs) in

the Australian cotton industry with goals that go beyond current sustainability measures to include developing strategies and a connectedness with people at work for a greater intent towards prosperity, which in the Australian cotton industry is viewed by CGEs as feeding and clothing the world. Further supporting the argument of this study is the overarching United Nations' goal to end poverty, protect the planet and ensure prosperity for all, as part of a new sustainable development agenda (UN, 2015). In support of the argument of this study "society is demanding that companies, both public and private, serve a social purpose" and "...companies need to do more than make profits"; "...to prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society" (Fink, 2018 p.1, in a letter to (Sordin, 2018) directed to be sent to inform business leaders that their companies need to do more than make profits). Fink (2018, p. 1) also believed that "having social purpose is inextricably linked to a company's ability to maintain its profits."

The concept of behavioural economic from the CGE perspective in decision-making is new to the Australian cotton industry. This study investigates the individual human contribution to better understand work motivation and work engagement, deriving that individuals (CGEs) drive behaviour change, including the sustainability of economic, environmental and social contributions towards growing healthier employers in the Australian agricultural and cotton industry.

### **1.11 CHAPTER SUMMARY**

This chapter introduced the CGEs in their role in the Australian cotton industry and explored the influencers beyond economic, environmental and social factors to include both psychological and behavioural economic perspectives. The importance of the role of the CGE in leadership, motivation and decision-making

was examined. The rationale led to a statement of aims and the research question. An outline of the methodology and research design and limitations was provided, as well as the anticipated contributions the study will make to knowledge, practice and the industry, including individual CGEs. The chapter concludes with a section on thesis structure and this summary. The following chapter discusses the motivation to work that goes beyond work being a job to provide a sense of purpose, such as work for human development, health and well-being.

## **2 LITERATURE REVIEW ONE – MOTIVATION AND WORK**

### **2.1 INTRODUCTION**

Workforce planning is an area of research at the forefront of cotton industry discussions on the implementation of the Cotton Research & Development Corporation (CRDC) Strategic Plan (2013–2018). The Strategic Plan refers to human capacity contribution and the well-being of cotton growers. This study is timely as it aligns with a time where proactive, healthier workplaces are expected, and employers are required to educate and motivate change and healthier behaviours in cotton-growing businesses (Bupa, 2017; Comcare, 2009; Corporate Wellness, 2017; Healthierwork, 2016). This impetus has been significant in shaping the focus of this study, where conceptual changes relating to employer motivations can influence business productivity and profitability. The aim of this research was to investigate employer motivational leadership, decision-making processes in crop choices and the health and well-being of employers in the context of cotton growers at work. This chapter presents an overview and critical discussion of the literature on these conceptual changes that support the shift in focus from purely productivity and profitability to work life and to a business providing purpose and prosperity.

There are several theories that are relevant to the topic of this research as it is an exploratory multi-disciplinary study. Initially, this research commenced within the context of psychology to establish the motivations of the individual CGE in a work environment. While an abundance of literature was found that focussed on the employee experience and work needs in the cotton industry, there was an absence of the employers' voice in work motivation, decision-making and driving of

behaviour change in the workplace. This literature review identifies several barriers to and motivations for cotton-grower crop choices that are related to the social context of work, such as personality, value fulfilment, self-efficacy of the task of cotton growing, job satisfaction and work engagement, and influencers of decisions, such as framing, choice overload, defaults and decision regret, that may sway grower crop choices (John, Naumann & Soto, 2008; Maybery, Crase & Gullifer, 2005; Thompson & Phua, 2012; Schaufeli, Bakker & Salanova, 2006; Deci & Ryan, 2002).

## **2.2 MEANING OF WORK IN RELATION TO THE CGE CROP CHOICE CONTEXT**

Approximately one-third of the world's workforce worked in agriculture in 2010 (Human Development, 2015). Cotton growers represent a significant contribution to the Australian economy, "the average cotton farm provides jobs for 6.6 people" (Cotton Australia, 2018) with "more than \$2.3 billion in export value" (Cotton Australia, 2018). Changes in the numbers of growers who decide to grow, or not to grow, cotton in any one year has significant implications for the cotton industry, ancillary services, businesses and communities that are reliant on the cotton industry for employment, population, social networks and an enjoyable work life. Cotton is produced by approximately 800–1500 growers across Australia due to seasonal fluctuations in the number of growers.

The Farmers' Attitudes, Objectives, Behaviors, and Personality Traits: The Edinburgh Study of Decision Making on Farms (Austin, 1999; Willock et al., 1999) was a Scottish study of one thousand randomly selected farmers, which equates to one sixth of the total Scottish farming population. The primary aim of the study was to model the behaviour of farmers and examine the business, environment and stressed behaviours of farmers. The study focus was on decision-making of farmers

and describes the domains and provides taxonomies of important areas of farmers' attitudes, goals and behaviours. The study posited that farms are businesses where decisions are made and implemented largely by a single person (Groenwald, 1987). While farmers' focus is to maximise production and make profits (Gasson et. al., 1993; Aloni & Sachs, 1973), environmentally friendly farming is thought to influence production behaviours (Gasson, 1973; Potter, 1992). The Edinburgh study (Willock et. al., 1999) used the Edinburgh Farmers Attitudes Study (EFAS), the Edinburgh Farmers Objectives Study (EFOS) and the Edinburgh Farmers Intelligence Scale (EFIS) behaviour scales to develop taxonomies for each of the areas mentioned (attitudes, objectives, behaviour and personality traits) that were successful in identifying factors that related to business as well as personal aspects of farming. Basic personality traits are believed to play a part in the determination of vocational behaviours in farming. The Edinburgh study (Willock, 1999) also found that cattle and crop farmers are risk-averse and slow to accept innovative and untested ideas, and that crop and cattle farmers are loath to take on debt, which may limit their views on innovation and technology, insurance, enterprise diversification, hedging, contract selling and taking off-farm work (Willock, 1999). A key point of differentiation in this research is likely to be that what is known about cattle and crop farmers will not necessarily apply to cotton growers. In a pilot study for the current research project, Wunsch (2013) found anecdotally that cotton growers are not averse to risk, that they are quick to accept unproven ideas, that they do not abhor debt and are not limited in their views on innovation and technology, enterprise diversification, hedging, contract selling or taking off-farm work or contracting, findings which contrast with the results of the previous studies of farmers.

### 2.3 CROP CHOICE

The aim of this section of the literature review is to explore the motivation to choose to grow cotton and work as a CGE in the Australian cotton industry. Social Cognitive Career Theory (SCCT) is used to explain career development by three unified aspects: 1) how basic academic and career interests develop; 2) how career choices are made; and 3) how career success is achieved. In regard to the first aspect, career interests are influenced by several factors, such as environments, finances, gender and race, which are often entrenched in tradition, family genetics and physicality, according to SCCT (Lent, 2016). Cotton growers themselves indicate that the influence on their interest in cotton started with a connection to the industry, either by witnessing neighbours growing the crop or through an offer to participate, either through an invitation to attend a conference or an opportunity to work in the industry. This observation aligns with the theory of SCCT which posits that cognitive-person variables give people personal control over career choice and that both objective and perceived environmental factors influence career interests and choice behaviour (Lent, 2013). Some examples of objective factors included the quality of educational experiences and the financial support people had been given towards accessing certain training opportunities. Building on the work of Austin (1999) and Vondracek et al. (1986), SCCT indicated that the objective view was partially influenced by the way individuals responded to opportunities, resources and barriers (Lent, 2013; Vondracek et al., 1986). The SCCT model has suggested that while individuals can be influenced both by objective and perceived environmental factors, it is how individuals interpret the environment and themselves that guides their career development (Lent, 2013). In addition to the cognitive-person variables that influence career choice, SCCT indicates that the time

period when the environmental influences occur is relevant, such as distal and proximal contextual background factors. SCCT suggests that distal background contextual factors affect the learning experiences that relate to career-relevant self-efficacy and outcome expectations, such as the support or discouragement individuals receive when participating in the activity. SCCT posits that proximal background contextual factors are important when career decisions are made, and the goals and/or career choice actions to take are influenced by exposure to career contacts and networks and external barriers (Lent, 2013). External barriers can refer to any aspect of career progress, as defined by (Swanson & Woitke, 1997), whereas SCCT refers to barriers as developmental tasks that include career progress (Lent, 2013). Most barriers are likely to be considered pervasive, such as negative family influencers, and most also depend on developmental tasks, such as career progress, and on the specific choice options of the individual (Bandura, 1977; Rottinghaus et. al., 2003; Lent, 2013).

The second aspect relates to how a career choice is made. SCCT proposes that career choice is directly related to an individual's interests and led by the development of self-efficacy, outcome expectations (measured by people's beliefs about how fulfilling they perceive their proposed career choice and role) and other contextual factors as mentioned above (Lent, 2013; Sheu, 2009, 2010).

Aligned to this question is one of great importance to the individual decision-maker: How is career success achieved? SCCT establishes that self-efficacy and outcome expectations are often based on an individual's perception of their capabilities as judged from previous experiences. In the case of cotton growing, the belief in the ability to carry out the task of cotton growing influences the career choice. Strong self-efficacy and a positive view of outcome expectations leads to the

motivation and determination to achieve the goal, such as to grow cotton. An optimistic view of one's self-efficacy has been found to help people make the most of their abilities. Their success, of course, varies due to how they interpret and apply their skills to the career task (Williams, 2006; Lent & Brown, 2008; Lent, 2013).

### **2.3.1 Succession and Generational Factors**

The average age of a cotton grower is 39 years, and the average age of a farmer in general agriculture is 52 years (Roth, 2010). The range of people across generations as employers and employees highlights the differences in beliefs about what leadership practices are important, which in turn influences how businesses communicate policies and planning.

Succession planning supports the attraction to and retention of cotton growers in the industry. A significant barrier to entry into the industry is the initial capital outlay and potential increase in input costs, such as natural resources, for example, water and land required for cotton growing. In support of the concept of succession planning, the Family Business Survey (2015) has revealed some interesting trends shaping the future of Australian family businesses:

- Nearly 80 per cent feel optimistic about their future growth prospects.
- There are identifiable characteristics of high-performing family businesses.
- Balancing family and business issues remains the biggest challenge.
- Family businesses with an entrepreneurial culture are outperforming others.
- Governance mechanisms are evolving, allowing for greater agreement and communication.
- Although there is still work to be done in exit/succession preparation, overall family businesses are much more prepared than in 2013.

- CEOs believe their successor needs to work on their financial management, strategic planning, leadership and management skills (Family Business Australia, University of Adelaide’s Family Business Education and Research Group FBERG, Klynveld Peat Marwick Goerdeler (KPMG, 2015).

Cross-generational factors are also likely to affect growers as employers in terms of management style, staff selection, productivity, employee satisfaction and retention. As there is some conjecture in the literature regarding specific years applicable to specific generations, Table 2.1 provides an approximation of date details.

Table 2.1 *Different Generations in the Cotton Workforce*

<b>Generation</b>	<b>Date of birth</b>
Baby Boomers	1946–1964
Generation X	1965–1980
Generation Y (Millennials)	1981–2000

The topic of variations between generations is not new and has been ongoing since the first documentation of society. Australian cotton growers traverse three generations of the cotton workforce – Baby Boomers, Generation X and Generation Y – with an age range from 20 to 70 years. Baby Boomers are most likely to be either in or entering the retirement phase, and the average age of a cotton grower at 39 indicates that Generation X is most likely to be the employer/manager who is employing mostly Generation Y.

While “it is important to remember that the characteristics, habits and traits

attributed to individuals in this cohort are mere generalisations” (Lankard, 1995, p.3), others question if stereotypes exist at all (Pfau, 2016), and some suggest that as the literature supports that generations differ in their work values (Twenge et al., 2010) management and development within companies should develop strategies to attract and retain generations of workers (Twenge et al., 2010). Nonetheless, it is important to provide an awareness of specific or general variations that exist between generations as this can assist cotton growers to inter-generationally understand themselves and their employees in the areas of motivation, succession planning, management and labour hire. Millennials judge the performance of a business on what it does and how it treats people (Deloitte, 2016).

A summary of some generational differences follows:

**Baby Boomers:** The term, Baby Boomers, arose at the end of World War II in 1945 when servicemen and women returned home after six years. More than 4 million Australians were born between 1946 and 1961. Baby Boomers are described as “materialist workaholics who desire self-fulfilment and place high value on work and acquisition of things, sometimes at the expense of family” (Gentry et al., 2011 p. 40). As Baby Boomers are now reaching retirement there is a changing landscape of ownership in Australian agriculture with a new generation of work attitudes, values and management heralded by Generation X.

**Generation X:** This generation displays significant differences from the previous generation of Baby Boomers. Generation X does not tend to expect recognition, nor do they give recognition freely, unless it is deserved. They are self-driven, and money is a strong motivator. Some researchers suggest Generation X require “a sense of autonomy, trust and entrepreneurialism to be productive and

fulfilled” (Muchnick, 1996, p. 410). What is important to them is “quality of life ... they place little faith in job security ... see their career strength in their ability to solve problems and do jobs that others are not able to do” (Lankard, 1995, p. 4). The Generation X cohort possess a strong desire for success in a challenging environment and suggest reward is based on tangible improvements. They are considered empathetic and interested in managers’ perspectives although the expectation is that results are provided concisely and directly (Muchnick, 1996).

**Generation Y:** This generation is exposed to technology in many forms, including entertainment, education, banking, health and sport; they are undeniably digitally shrewd. Although they appear to be familiar with many social forms of technology and have a strong social interaction that constantly connects them with others, they communicate in groups much of the time. This level of communication means they can opt in and out of conversations, and they tend to be slower to form deeper relationships. They are overloaded with access to information, and as a result, information sources are not considered important, and credibility of data is blurred (Devine, 2010).

Some researchers suggest Generation Y are a highly confident generation (Heany & Gleeson, 2008), although when placed under pressure, with lack of “real” world experiences and sheltering from overprotective parents, they appear to struggle. Generation Y “have been exposed to sophisticated environments, are well travelled and are familiar with eating at restaurants early in their lives” and “they consider themselves special; they have spent their childhood receiving prizes for just turning up” (Devine, 2010, p. 138). In fact, many find it difficult to ask basic questions when needing to problem-solve situations (Tresize-Brown, 2004), which is a dangerous situation for employers in an industry with high risk management and

machinery costs.

### **2.3.2 Gender**

Gender is considered a factor in many career development theories and career decisions. Agriculture, among other industries such as engineering, computer science and mathematics, has experienced gender stereotyping for some time. Characteristics recognised as specific to men and women define types of occupations as masculine or feminine and influence individuals towards certain jobs (Cejka & Eagly, 1999). A broad perspective on human behaviour in career choice is that gender progress, including developing socially and learning how to reason, varies over time. Cognitive theories such as SCCT support the concept that people's environments affect the career choice process in two ways: through "distal, background influencers" such as types of role models; and through "proximal environmental influencers" such as choice of goals, actions and perceived abilities in certain fields (Lent, 2013). Currently, cotton growers in the industry consist of both male and female participants, and while most growers are male, 60 per cent of females hold key positions in the industry (Cotton Australia, 2014, p. 4). In addition, cotton growers are more educated than those in the other agricultural sectors. Fifty per cent of growers in 2011 possessed a diploma or above (Cotton Australia, 2014, p. 4).

### **2.3.3 Family Businesses**

Many of the most successful Australian businesses are family-run businesses, such as Visy, Linfox, Inghams and Manildra (FBERG, 2015). In Australia, family-run businesses represent approximately two-thirds of the overall Australian business community (KPMG, 2016). Some key findings demonstrate the characteristics of high-performing family businesses:

- Having a CEO who is between 51 and 60 years of age.
- Utilising governance mechanisms that facilitate agreement and communication of family, business and shareholder expectations.
- Having an entrepreneurial culture.
- Having diversity in their leadership/governance team.
- Adopting business management practices that focus on what is happening outside the business.
- Accessing the financial resources necessary to implement their strategies.
- Over 80 per cent indicate they had experienced conflict/tension between family members over the last 12 months, and the sources of conflict are: vision, goals and strategy; balancing the needs of the business vs family; lack of family communication.
- 78 per cent feel optimistic about their future growth prospects.
- 51 per cent believe technological change is creating disruptions in the way business is done, but has an overwhelmingly a positive impact.
- 76 per cent expect to appoint a new CEO in the next five years.
- 60 percent intend to pass on leadership to a family member.
- 55 per cent of those passing on leadership in the next two to three years do not believe their successor is ready.
- 72 per cent expect to have some transfer of ownership in the next five years.
- 64 per cent of these firms intend to pass ownership solely to family members (Family Business Survey, Family Business Australia, University of Adelaide's Family Business Education and Research

Group (FBERG, 2015).

According to the report, family businesses appear to be ill-prepared for exit/succession, although there was an improvement in this area from 2013 to 2015 (FBERG, 2015). While the current three indicators of sustainability (economic, environmental and social) are important to most businesses, including cotton-growing operations, this study argues that there are several reasons to include individual behaviour and psychology as a sustainability indicator on its own merits. One such reason is that a large age group defined as Generation X/Millennials (Buckley et al., 2016) occupy most positions in the Australian cotton industry, and globally they “have inched past the other generations to corner the largest share of the US labour market” (Buckley et al., 2016, p.4). The research on this generation suggests that views of this cohort “cite a strong alignment of values and feel that most businesses have no ambition beyond profit” (Buckley et al, 2016, p.8). This generation tend to put their personal values ahead of organisational goals, and individuals are reported to have shunned assignments (and potential employers) that conflict with their beliefs (Buckley et al., 2016; Deloitte, 2016). There is an obvious shift in the workplace, some suggesting that businesses’ focus on profit and business success should be measured in more ethical and society-focused ways (Buckley et al., 2016; Deloitte, 2016).

## **2.4 MOTIVATION TO WORK**

An examination of a range of motivation theories and models is included in this section, as well as the development of SCCT (Lent at al., 1994, 2013) with reference to Bandura’s Social Cognitive theory (1977, 1982, 1986) and other theories of work motivation and entrepreneurship motivation. The literature review examines work in the context of human progress and development and reviews the

literature surrounding the impact of cotton-grower leadership in the role of employers of cotton-growing businesses and the implications for employees.

Broadly, the focus of this section is on human motivation, particularly motivation to work in the context of CGEs and their role in employing people. There are various interpretations of what work means to each individual on a personal level and in a work environment. The definition of work (as defined by the Human Development Report, 2015) enables people to earn a living and achieve economic security. From a human development perspective, work also allows people to enhance their proficiencies by providing them with skills, knowledge, opportunities and choices in their economic and social lives. The sustainability of work as defined by the Australian cotton industry is currently measured by economic, environmental and social indicators and is currently missing a focus on the individual, the employer.

This study will fill this gap, by extending the concept of sustainability to include the CGE as the driver of behaviour change impacting sustainability. Individual CGEs are responsible in their roles as employers and leaders of cotton-growing operations for providing work opportunities for themselves, their employees, and others in the agribusiness sector that are reliant on agricultural production and development. This section of the literature review will focus on motivation to work. In this context, motivation means to direct one's behaviour towards specific goals, and these goals govern the reasons for certain behaviours (Guay, 2010; Locke, 1990). Work is defined as "any activity that not only leads to the production and consumption of goods or services, but also goes beyond production for economic value. Work thus includes activities that may result in broader human well-being, both for the present and for the future" (Human

Development Report, 2015, p.30). Each of the areas covered in this section provides insight into the motivational factors that influence the work environment of an Australian cotton grower in a cotton-growing business within the topic areas of entrepreneurship motivation, employee motivation and employer/leader motivation. Today, most employers understand the importance of creating a culture of motivated employees. There is also a societal expectation that today's employers are required to lead and motivate employees and create a culture that inspires others (Sinek, 2009). This view is shared by the Enterprise Research Centre (ERC, 2015), which suggests that the focus of future research into the motivation profiles and differences between individual goals is important to the personal success of the business employer and an organisation's overall success.

#### **2.4.1 Employer Motivation**

Employers are leaders in a cotton-grower context and termed CGE in this study. There is an extensive array of leadership literature, and as expressed by Bass and Bass (2008), defining leadership should depend on the definition used and the purpose of analysis. Yukl (2013) argues that defining leadership should be according to individual perspectives relative to aspects of interest. While the definition of leadership remains to some extent fluid, most modern definitions of leadership include assumptions of intentional influencers (Yukl, 2006) such as influence that can be exercised by the leader, followers, peers and/or teams. The trading of favours among peers is a form of influencer commonly used in organisations to achieve task objectives, and research suggests this is important for the success of middle-level managers (Yukl, 2006). Behaviour theories emphasise what leaders do, and behaviour research falls into two general categories: how managers spend their time; and effective leadership behaviour (Yukl, 2006). In the context of this study, the

focus of employer motivation refers to the concept of employers as leaders. In addition to the academic literature, the argument that employers are perceived as leaders is supported by information sources that impact on the views of industry and business, and they will therefore be included in the discussion. Current research in this area has been presented through the medium of Technology, Entertainment and Design presentations, more commonly known as TED talks. In 2017, the second most popular presentation accessed was *Why Leaders Eat Last* (Sinek, 2013), which was viewed by 2 million people, demonstrating the significance of the level of interest in this topic. Sinek suggests in this book that “when leaders inspire those they lead, people dream of a better future, invest time and effort in learning more, do more for their organisations and along the way become leaders themselves” (Flynn, G. cited in Sinek, 2013, p. xi).

More recently, in the areas of leadership and employee motivation, “leaders inspire and motivate followers rather than control and direct” (Bass, 1990; Yukl, 2002). The term, “inspire”, is used in this study interchangeably with “empower”, in the sense of experiencing the feeling of being effective. It has become apparent that successful businesses across various industries share a common notion that the focus on employees is to find those who are motivated and inspired in their work and then provide the skills required for the job, rather than the reverse (Levin, 2017; Vidyarthi et al., 2014; Sinek, 2008, p. 7).

The study of motivation in the behavioural psychology literature has progressed over time, moving from a performance focus to a leadership and organisation management focus (Kanfer et al., 2008). The progressive research literature on motivation theories suggests that parallel to the areas of study, over time individual behaviour and psychology factors have evolved, such that the

importance of individual motivation and the role an individual has in the leadership and management of an organisation have become increasingly important to the success and culture of a business. The concept of individual cotton growers as employers, business leaders and drivers of sustainability supports the argument that the role of a cotton grower is one that drives businesses and behaviour change. This study also argues that the individual CGE drives other areas of change, including sustainability.

#### **2.4.2 Employee Motivation**

Cotton growers discuss managing employees as one of the most difficult tasks in cotton-growing operations. Bakker et al. (2008) found that one of the least costly ways to achieve competitive advantage is through the management of human capital. Competitive advantage is no longer the only consideration to successful business operations, nor is money the only focus of employee work engagement. As the world of work looks beyond economic values, this has led the researcher to ponder whether the focus of work engagement has been skewed for too long, with little understanding or consideration given to the individual leader as the employer of an organisation. This section therefore looks at employer engagement and employee motivation. Positive characteristics such as job satisfaction, company loyalty and turnover intention towards work, employers and businesses also relate to work engagement (Demerouti et al., 2001; Salanova et al., 2000).

An extensive literature review has revealed that employee motivation accounts for much of the literature on motivation (Chamorro-Premuzic & Garrard 2017; Lui, 2016). Recent literature (Levin, 2017; Vidyarthi et al., 2014) suggests that while employee motivation is important to business operations, it is the motivation of the employer, or the leader of the business, who creates, supports and

encourages employee motivation. The leader creates the business philosophy, selecting people with like-minded values and views to help drive the business and strengthen the philosophy, as the employee becomes passionate about their role to take pride in what they do. This focus on the individual at work is supported by Pew Research's (2014) finding that Millennials wanted businesses to focus more on the individual human factor and a global purpose (Deloitte, 2015).

The concept of human needs relating to job attitudes and work motivation commenced with Maslow's Hierarchy of Needs Motivation theory (McLeod, 2007). There are also other needs theories such as McClelland's Three Needs theory (Harrell, 1981) and Self-determination Theory (SDT) (Ryan, 2000) that posit that individuals have innate psychological needs. These theories are discussed in detail later in this chapter and applied in Chapter 6.

In the more current research, it is widely known that well-performing organisations do so because the employer inspires their employees to work together for something larger than themselves (Ariely, 2008; Sinek, 2009). While there are some individuals who still believe that money is their measure, and others believe it to be fame, awards or power, monetary incentives are known to work for mechanistic activities, while critical thinking and problem-solving roles for intrinsic rewards are more often the drivers of motivation (Pink, 2008). Motivation varies among individuals, and it is both ability and environmental factors that influence behaviour and work motivation as well as an individual's desire to initiate work-related activities.

Further understanding of the concept of empowering employees has shown that in current business systems, extrinsic rewards used as motivators can have a negative effect and promote narrow thinking (Pink, 2008). Research reveals that

rewarding people with money can be an expensive motivator, and that social norms are far more effective (Ariely, 2008). Similar to the critical thinking and problem-solving activities mentioned, intrinsic motivation is found to be more effective than extrinsic. The concepts of autonomy (the desire to direct one's own life), mastery (the desire to progress and improve) and purpose (the longing to work for something larger than oneself) are shown to be more effective than extrinsic motivators such as money (Pink, 2008). Instilling a sense of purpose, mission and pride in people for the work they do, that is, to be motivated by social norms, is found to produce better results than market norms (Ariely, 2008).

The term, "social" norms, applies to a sense of pride, purpose, loyalty and trust (Ariely, 2008), whereas the term, "market" norms, applies to receiving money in exchange for goods and services. Examples of these are wide and varied in everyday life, but one relevant example occurred when cotton growers were offered a small sum for tarpaulins that were to be shipped to the first tsunami-affected area of Papua New Guinea. The cotton growers refused to take money. They were then asked if they would donate their tarpaulins, and they agreed. The money created a "market" norm, while cotton growers offering tarpaulins for charity made it a "social" norm. The research of Ariely (2008) on the cost of social norms suggested that social and market norms do not mix, and individuals can only be in one world at a time. An individual's behaviour is influenced, for example, if in a social norm situation there is the likelihood of offering and or asking for assistance, while in a market norm situation, individuals appear more independent, self-focussed and less likely to ask for or offer assistance. Therefore, when money is involved, such as in market norms, individuals function as explained by traditional economics.

### 2.4.3 Entrepreneurial Motivation

Employers today, including CGEs, focus not only on financial, environmental and social factors but also on strengthening the business potential of people, innovation and technology. Literature in behavioural economics can provide an insight into the influencers of how and why people do what they do. Similarly, Drucker (1999) and Ebert and Freibichler (2017) have suggested that an important contribution to business is “knowledge work” and “knowledge workers”, stating, “...the most important contribution management needs to make in the 21<sup>st</sup> century is similarly to increase the productivity of knowledge work and knowledge workers” (Drucker, 1999), and thus individuals are attracted to entrepreneurial activities.

According to the ERC (2015) Understanding Motivations for Entrepreneurship report, individual drivers (factors related to the entrepreneur and his/her business) of entrepreneurial motivation are defined as gender, opportunity-necessity motivation, multidimensional motivations and growth ambitions. In a recent empirical study on entrepreneurial motivation, seven dimensions of entrepreneurial motivation were consistently identified:

- Achievement, challenge and learning – a desire for personal development through entrepreneurship;
- Independence and autonomy – ability to control one’s work, make independent decisions and have the flexibility to combine work with one’s personal life;
- Income security and financial success – the importance of financial returns;
- Recognition and status – aspects related to social status such as the desire to receive recognition and respect from friends, family and the

wider community for one's work as an entrepreneur;

- Family and roles – the desire to continue a family tradition as well as follow other role models;
- Dissatisfaction – with prior work arrangements; and
- Community and social motivations – the desire to contribute back to the community. The entrepreneur lives either through philanthropy or the business itself (United Kingdom (2008–2013) the Enterprise Research Centre (ERC), 2015, p. 38).

The 2015 ERC framework report found that “in contrast to the large number of studies investigating types of entrepreneurial motivation, research into individual and contextual drivers of entrepreneurial motivation and its consequences is relatively scarce” (ERC, 2015, p. 39), providing evidence of the gap in this literature. Further support for the need for studies such as this thesis, is recent research that has shown that “personal financial success is separate from firm growth and as such it is suggested that future research into motivation profiles and differences of individual goals from firm-level goals is important” (ERC, 2015, p. 39). Research on individual psychological and behavioural influencers of motivation is the focus of this study. Cotton growers are entrepreneurs as they are owners of large- and small-scale cotton-growing operations. Entrepreneurship motivation is explored in this study as cotton-grower operations are considered to be owned and operated by CGE entrepreneurs (Shane, Lock, & Collins, 2003, 2012). In addition to CGE work pressures, family businesses can require a difficult balancing act between both work and family life.

#### **2.4.4 Work to Family Conflict**

A further gap in the literature noted in the ERC (2015) framework was that family roles and community and social motivations were less often included in research, suggesting an oversight of motivations relating to specific populations of entrepreneurs, such as female or minority entrepreneurs. In addition to the conflicts in balancing the demands of family with the pressures of being a cotton entrepreneur, there is also the complexity of dealing with employees across generations, as noted in section 2.3.1. Some jobs more than others necessitate coping with constant pressure, because of either the home or the workplace environment. Cotton growing is one such job where the work is demanding physically and mentally in terms of the enormity and frequency of decisions that often have flow-on effects that may create work or family conflict (Frone et al., 1992). Both decision types, family and work, are influenced by the pressures of time.

#### **2.5 THEORIES OF WORK MOTIVATION**

There is extensive literature available in the field of motivation, and the consensus is that motivation is goal-directed (Locke & Latham, 1990, 2002) and environmentally dependent (Bandura, 1986; Lent, 2013). Motivation theories can be categorised into either needs-based (content) or process theories. Content theories concentrate on “what” motivates, while process theories address issues relating to “how the process of motivation works” and view motivation as a rational process. Similarly, some researchers (Leonard et al., 1999) have suggested that traditional motivation models assume that individuals act in ways to maximise the value of exchange with the organisation, while others suggest personality and choice may influence motivation (Kanfer, 1990, p. 222). Theories included in this literature review include seminal theories in the area as they have had sustained impact on

current thinking and theories.

Hackman and Oldham's Job Characteristics theory (1976) identified five characteristics that affect the three critical psychological states (personal, affective and behavioural responses) of employee job satisfaction, while Naylor, Pritchard, and Ilgen's Theory of Behaviour in Organisations (1980) have identified motivational processes in the workplace. More recent theories such as Social Cognitive theory (SCT) (Bandura, 1986), Locke and Latham's Goal-Setting Theory of Motivation (1990) and Social Cognitive Career Theory (SCCT) (Lent, 1994, 2013) about individual's motivational processes extend to culture, gender, skill development, interests, goal choices and actions. SCCT is used in this study for understanding career development aspects of career-relevant interests, career choice and performance, and persistence in career interests (Lent et al., 1994). It is particularly suitable for this study as there is a focus on self-efficacy, expected outcomes and goal setting and how they relate to gender, support systems and experiential learning factors (Lent et al., 1994). SCCT is derived from SCT (Bandura, 1986).

The process theories of motivation focus on cognitive processes and posit that while most people have similar needs, those needs vary according to each individual; however, these needs are subjective. Process theories include reinforcement, expectancy, equity and goal-setting theories. Reinforcement theory (Skinner, 1938), one of the oldest theories of motivation, determined that behaviour is a function of its consequences and that by linking rewards to positive behaviours and removing rewards after negative behaviours, leaders can increase the amount of preferred behaviours. Expectancy Motivation theory (Vroom, 1964) posited that employees are motivated when they believe that their efforts will lead to high performance

(expectancy), outcomes (instrumentality) and suitable post-performance outcomes (valence); that is, giving people choice over rewards.

Several theories provide different views on what factors drive individual behavioural processes at work. Leonard et al. (1999, p. 971) identified five sources of motivation and links with SCCT in its motivational processes:

1. Intrinsic processes, where motivation comes from the work itself;
  2. Extrinsic/instrumental rewards and internalised values, whereby Kahn (1990) suggested business goals become part of what individual's value;
  3. External self-concept;
  4. Internal self-concept; and
- Goal internalisation.

Kahn (1990), suggested that individuals may be dominant in one or more types of motivation and that these differences mean that individuals will react differently to the same situation. SCT (Bandura, 1982, 1986) and SCCT (Lent and Brown, 2013) have supported the view that individuals are motivated to behave based on their perceptions of their abilities at specific tasks, with their behaviour and environments equally influencing one another. Bandura (1986, 1991) and Brown and Lent (2006, 2013) used self-efficacy as a view of self-measure in terms of competencies, viewing an individual's ability as an achievable attribute rather than a fixed, inborn characteristic (Lent, 2013). These theories are therefore particularly relevant for this study because, for example, in order for CGEs to participate in the task of growing cotton, self-efficacy is important and can influence cotton as a crop of choice. More detail is provided below.

### **2.5.1 Social Cognitive Career Theory**

The tenets of SCCT are based on Bandura's (1986) SCT, which was developed to explain how people, their behaviour and their environments mutually influence one another. This theory has been selected as the most relevant for this study, and a model of constructs and factors impacting on the work satisfaction of cotton growers will be proposed in Chapter 3 based on SCCT. SCCT has argued that the three social cognitive variables of self-efficacy, outcome expectations and goal choice have been found to have strong effects on SCCT (Lent et al., 1994). Both SCCT and SCT have identified that performance is based on a measure of success and a level of persistence in overcoming obstacles. An individual who is strong in self-efficacy and high in positive outcome expectations is more likely to establish ambitious goals that assist with work persistence and function (Lent, 2013). An individual's self-efficacy beliefs influence their ability to produce an anticipated belief through personal exertion (Bandura, 1997). Self-efficacy and outcome expectations determine goals, and motivation and goals are developed to explain the extent and the commitment of an activity. An individual's level of motivation is based more on confidence than on what is actually the case (Bandura, 1997).

Personal goals clarify an individual's purpose to participate in an activity (Bandura, 1986). SCCT defines goals as either choice or performance goals, positing that choice goals are an activity or career path that an individual chooses to pursue, while performance goals determine the drive and direction that an individual plans to reach the goal (Lent, 2013). SCCT suggests that individual perceptions of achievement have important emotional significance for future decisions, and self-efficacy relates to the question: Can I do this? For example, the more confident cotton growers are in their ability to grow cotton and believe that the related

outcomes are worthwhile, the more likely they are to persist even in the face of adversity.

SCCT proposes that self-efficacy beliefs and outcome expectations are important intermediaries between personal characteristics, and contextual background such as family support, experience and crop choices. Contextual factors that closely align with the knowledge of how to carry out an activity and crop experiences, such as social supports and barriers, are important in achieving goals (Lent & Brown, 1996). Within SCCT, Lent (2013) has written that contextual factors are viewed as environmental variables namely socioeconomic status, social support and financial barriers. Individual and contextual factors such as tradition, interests, self-efficacy and outcome expectations can influence career goal direction (Lent, 2013). According to SCCT, outcome expectations influence the performance goals that people establish for themselves, such as reaching a particular level. The social cognitive career model of grower retention model adapted from the SCCT for this study (Section 3.1) considers outcome expectations are measured in terms of value fulfilment in economic, conservation and lifestyle factors (Lent, 2013).

SCCT divides choices into three components: 1) expression; 2) taking action; and 3) performance (Lent, 2013). According to Lent (2013), career choice is linked between the environment and the individual. The outcomes individuals derive from their capabilities are related to features of their environments, such as peer and parental supports and family norms (Lent, 2013; Lent & Scheu, 2010). SCCT suggests that a person's interests direct them towards certain choices, and with support, they choose activities that attract them to others, resonating with the "birds of a feather flock together" analogy (Lent, 2013). It is now well-known that individuals work well in environments that "feel" comfortable, Sinek (2009). SCCT

also theorises that background influencers, such as culture and gender support, help shape self-efficacy, outcome expectations and interests (Lent, 2013). According to SCCT, an individual's career interests eventuate into goals when support is strong and barriers are weak (Lent, 2013). Practical contextual factors other than interests also influence choice; for example, what works for the cropping schedule? What do my family want me to do? Was last season a success? Were the payoffs worth it? In other words, is the choice "good enough" to justify the doing? (Lent, 2013).

### ***2.5.1.1 Significant personality research***

The most significant study for this thesis regarding psychosocial diversity in farming is the Edinburgh study on the decision-making of farmers which found that personality factors were important in farmers' decisions (Austin et al., 1999; Willock et al., 1999a, b) as discussed in section 3.1. This was significant, as in the field of psychology prior the early 1980s, researchers "concluded that personality did not matter" (Barrick, Mount and Judge, 2001; Goldberg, 1993) as a factor in decision-making. In this current study, the Five Factor Model (FFM) (McCrae & Costa, 1987) was used to measure the personality traits of cotton growers. The FFM identifies five traits that are considered broad in definition although they were established as specific personality characteristics. These five major traits that motivate personality are openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (John, Naumann & Soto, 2008). Details of these traits are elaborated in section 4.1.4. The FFM research proposed several changes regarding views on personality including:

- "most people are able to self-reflect and are basically rational;
- people's personality experiences change later in life;
- genetics influence personality;

- personality traits are not culture specific;
- personality strongly influences many aspects of people's lives such as work and coping capacity" (McCrae, 2011).

#### *2.5.1.2 Cross-generational*

An added factor to work-life conflict can be working with employees in ages ranging across several generations. Managing employees of varying ages can increase the pressures on CGEs as it can be challenging for an employer to understand individual age expectations and variances across age groups. For example, recent research suggests that Millennials show little loyalty to those who do not have a social, community focus. This lack of loyalty is often highlighted by reference to Millennials alone, but it can also be considered as a generic thought across all the generations of today's workforce (Buckley et al., 2016). However, with the increase of Millennials in the workforce (in an age range at 2017 from 21 to 36 years) now in employer leadership roles, understanding cross-generational factors is important for CGEs to consider.

To engage a workforce across generations requires employers' abilities to identify individual needs and goals to match education and extension programs for personal and work development across these generations. To better understand how to engage a workforce, individual business leaders require new knowledge on how to develop cotton- growing operation leadership skills. This view is also shared in what is called "transformational leadership" (Gomes, 2014) whereby leaders and followers (across generations) work together to progress to a higher level of self-confidence and inspiration by understanding the goals and aspirations of employees and challenging them to work towards meeting and possibly exceeding individual

outcome expectations (Burns, 1978). Transformational leaders lead by example; they are visionaries who share vigour and foresight, as well as challenging goals.

Positive levels of vigour and commitment suggest that engagement crosses over from one partner to the other and engagement focuses on human strengths and optimal functioning, according to Seligman and Csikszentmihalyi (2000). Other personal drivers of work engagement include optimism and resilience. Personal resources are linked to resilience through an individual's sense of ability to impact upon their environment successfully, Hobfoll et al. (2003). This study makes reference to the Resilience Assessment of the Australian cotton industry multiple scales report (Andreoni et al., 2016 p. 17) where industry scale drivers are listed as demand, climate change and policy, and drivers at the farm level are listed as weeds, pests and disease. While acknowledging that these factors are important at industry and farm levels, this study argues that there is a gap in the report in that the measures do not include influencers of individuals as drivers of resilience. The psychological definition of resilience is an individual's ability to successfully cope with adversity; the industry is made up of individuals who are primary producers. If the cotton industry wants to act on sustainability and resilience in the future, it needs to determine what motivates people at work, to understand not just the logical view of profitability and productivity, but also know to how and why people make decisions.

Maslach & Leiter (1997) proposed that engagement is characterised by energy, involvement and efficacy, which are considered the direct opposites of the three burnout dimensions of exhaustion, cynicism and lack of professional efficacy (Maslach & Leiter, 1997). People who are engaged in their work are presumed to have a sense of enthusiasm and bond with their work activities, and they see

themselves as able to deal fully with the demands of work (Green et al., 1991). In regard to engagement, work can be an advantage in home life through up-skilling across different environments, and home can be an advantage in work through social support (Montgomery et al., 2003). Development support suggests sources of self-efficacy (discussed in section 3.4.1.5) are also found to apply to work engagement in the forms of social support, performance feedback and vicarious experiences (Bakker & Demouriti, 2008). A meta-analysis on the relationship between dispositional variables and of work-family conflict (Allen et al., 2011, p.1) found that "...positive effect and self-efficacy appear to protect individuals from work-family conflict", which is discussed in more detail below. Work engagement is related to performance and commitment to both work environment and activity, and individuals who are engaged in their work are connected to their work in various ways such as by a physical, emotional and intellectual connectedness at work (Kahn, 1990).

### ***2.5.1.3 Job satisfaction***

When people are supported in their work, they gain a sense of autonomy, belonging and competence and feel energy in their jobs (Van den Broeck et al., 2008). This study supports the notion that income gained through work is not the only thing that matters. Blustein (2006) found that there is a much greater likelihood of being satisfied at work when people are intrinsically interested in what they do. Intrinsic motivation usually means that when people participate in an activity of interest, they are satisfied (Gagne & Deci, 2005). Lent et al. (2002) found that contextual factors may influence a person's ability to find work consistent with their interests, while some suggest that people reveal their interests and their characters in their jobs (Nuata, 2013; Lent, Brown & Hackett, 2002). In the work of Kahneman (2011) it was found that an

individual's' income can affect life satisfaction, and conversely a low income can affect emotional well-being. Job satisfaction varies from job to job and person to person and depends on the nature of the work, attitude and behaviour of the work environment, like the four sources of self-efficacy – mastery experiences, vicarious experiences, verbal persuasion and emotional and physiological states (Bandura, 1997) – whereby prior performance accomplishments have the greatest influence on self-efficacy and individual engagement. This mean that social support from managers and colleagues in the workplace is essential to creating a satisfying work environment (Knight et al., 2016).

#### *2.5.1.4 Sense of purpose at work*

When individuals have a sense of purpose, they feel like they belong. Belonging is a basic need identified in Maslow's Hierarchy of Needs theory (1943). Recent research shows that money is believed to attract individuals to a job, but it does not motivate them to be passionate about what they do (Ariely, 2017). Being passionate or inspired about meaningfulness or purpose of a job has been shown to positively impact on performance (Martin, et al., 2015).

Individuals who have a sense of purpose in life reduce their risk of mortality and cardiovascular events (Lippincott, Williams & Wilkins, 2015) and are considered more industrious and committed to their jobs (Sinek, 2009). There is a societal expectation that an employer provide a sense of purpose in the workplace in order to attract and retain employees, as perceived by CGEs. In this respect, empowerment research can provide some explanation in offering two perspectives: organisational (leader-empowering behaviours) and individual (employee state of empowerment). The organisational and individual perspectives are defined as different, although there is a perception that for employees to feel empowered they

require the leadership-empowering behaviours of the employer (Lorinkova, Pearsall & Sims, 2013; Srivastava, Bartol & Locke, 2017).

As with most relationships, the strength of relationships (between employers and employees) develops over time, with the quality of the relationship dependent upon the leader's capacity to create an environment where the employee feels supported, trusted and confident in their ability through leadership empowerment (Spreitzer, 1995; Zhang & Zhou, 2014). This notion aligns with the literature on both competence and self-efficacy whereby individual beliefs about personal capabilities are responsive to environmental conditions and task-specific learning experiences, such as personal performance accomplishments, vicarious learning, social persuasion and physiological affective states (Bandura, 1997; Lent, 2013).

#### ***2.5.1.5 Job satisfaction and subjective well-being***

Job satisfaction can be described as an emotional state, usually determined as how satisfied (like) or dissatisfied (dislike) an employee is with their job (Locke, 1976). Job satisfaction overlaps with theories of human motivation such as Maslow's Hierarchy of Needs theory (1943), which is referenced in this study (3.3.5.1). The theory suggests that the essential human needs of physiological development and safety are first met before the more complex needs of belonging and esteem. The theory explains human motivation generally, and in a work setting, is used to explain job satisfaction whereby work provides financial and health care benefits to meet physiological needs. Individual CGEs drive the motivation of a business, thus understanding that the factors that surround happiness and well-being can assist them in developing a desirable work environment.

Subjective well-being (SWB), used to explain a person's emotional and cognitive evaluations of their lives (Diener et al., 2003; 2004), is also called

happiness, peace and fulfilment, while some describe it in terms of a “happy or good life” (Carruthers & Hood, 2004). In the pursuit of understanding happiness, there are two theoretical perspectives: 1) hedonic (subjective) well-being; and 2) eudaimonic well-being (Deiner et al. 2016). Some suggest an individual experiences happiness when positive affect and satisfaction with life are both high (Kansky & Deiner, 2017). Others (Vella-Brodrick et al., 2009) identified three pathways to happiness: 1) pleasure; 2) engagement; and 3) meaning; suggesting that all three elements constitute happiness (Vella-Brodrick et al., 2009). Factors of hedonic (subjective well-being) include: presence of positive mood; absence of negative mood; satisfaction with various domains of life (e.g. work, leisure); and global life satisfaction. Eudaimonic (psychological well-being) factors include: sense of control or autonomy; feeling of meaning and purpose; personal expressiveness; feelings of belongingness; social contribution; competence; personal growth; and self-acceptance (Vella-Brodrick et al., 2009). Both subjective well-being and eudaimonic well-being are relevant to CGEs as growing cotton is high in risk and physically and cognitively demanding, while also providing a sense of autonomy and a feeling of belonging and connectedness.

As technological advancements have changed the way individuals communicate socially and at work, there is a blurring of the line between home, work-life and work-life satisfaction that is being impacted by work (Erdogan, Bauer, Truxillo & Mansfield, 2012). As individuals evaluate their lives through reasoning and emotional responses, psychological well-being is the broadest term used in the literature to include subjective well-being (SWB) (Diener et al., 2016; Diener, Oishi and Lucas, 2017). There is an increased focus in the literature on “eudaimonic” well-being and people looking to work to provide

meaning and purpose in life. The appeal of money and material possessions, fun and pride are usually because individuals believe these goods will bring a sense of happiness, although happiness is seen as a result (Deiner et al., 2016). Supporting this view, Deiner and Oishi (2004, p. 2) found that “people rank happiness and satisfaction ahead of money as a life goal”. The study found that when simple needs are met and affordability increases, there is often a levelling-out phase in life satisfaction, suggesting that rising income creates escalating material desires, although the same level of income becomes less appealing and therefore less satisfying (Frey & Stutzer, 2002). Graham and Pettinato (2002) found that happiness does not increase as societies grow wealthier over time, and there is no strong evidence to suggest that wealthier people are any happier than others.

Subjective well-being is important to this study, as supported by Lyubomirsky, King, & Diener (2005), who found that valuing an individual’s life influences and increases the likelihood of outcomes felt beyond money, such as health, community, a long happy life, productivity, fun at work and social responsibility, and these factors contributed to SWB. In further support of this and the study’s argument, there is a focus on broader issues beyond money, such as human development and prosperity, well-being and the importance of individuals as employers and leaders.

There are several measures used to establish the determinants of SWB and life choices, such as the OECD Better Life initiative and Human Development Index (HDI) (Human Development report, 2015), with a focus of development not only on incomes but on maximising human choices. Cotton growers feel a connectedness to cotton with a focus beyond money that until now has not been addressed or articulated. Other reasons that support the view that the work motivation and job satisfaction of the individual go beyond money is that while people may experience

a rise in finances this does not equate to an increase in life satisfaction, and as societal growth rises the focus is less on money and more on personal factors such as relationships and enjoyment in the work that they do (Diener & Seligman, 2004).

## **2.6 MASLOW'S HIERARCHY OF NEEDS**

At the individual level, it is important to determine what drives behaviour. Basic human needs relate to job attitudes and work motivation, as identified by Maslow's Hierarchy of Needs theory (1943). As each need is met, the individual reaches the top of the pyramid and moves closer to a sense of overall well-being. The basic tenet of motivation theory is that needs are constantly changing, and as one need is met, the next level of need is pursued until ultimately there is a feeling of fulfilment. Other needs theories, such as McClelland's Three Needs theory (1977), suggest that the three needs all people possess are the need for achievement, affiliation and power, and these align with different characteristics of an individual. The theory suggests that there are three motivating drivers that are not bound by age, culture or gender, although they are dependent on culture and life experiences, with one dominating motivator for each individual. There is a defining difference between these theories and the theory of self-determination (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000) and the definition of "needs". The importance of the term, "needs", is that a need is essential for survival (Ryan, Sheldon, Kasser, & Deci, 1996).

Until the early 1970s, Skinner (1953) and the theory of operant conditioning speculated that extrinsic rewards can control behaviour. At this time Deci (1971) devised the notion of "intrinsic" rewards and theorised that at times certain tasks can be the reward (Deci, 2000). Also, (Deci & Ryan, 1985) noted that intrinsically motivated behaviour was thought to be instinctive and driven by the task itself, while extrinsic motivation was driven by reward such as money, rules, laws and the

physical environment. In this line of enquiry, Cameron et al. (2001) found negative effects of reward on intrinsic motivation, and Eisenberger et al. (1999) discovered that rewards offered for doing, completing or meeting a performance criterion often increased people's perceived freedom and autonomy.

Cameron et al. (2001) also suggested that there is no evidence to suggest why people show a loss of intrinsic motivation for expected tangible rewards, indicating that this view aligns more with the social cognitive perspective of SCT and SCCT (Bandura, 1986; Lent & Brown, 2013). SCT has predicted that rewards are tied to performance, and the greater the self-efficacy, the higher the interest in the task.

### 2.6.1 Work Motivation and Hierarchy of Needs Theory

The need to belong is a basic human motivation, and a sense of belonging influences emotional patterns and cognitive processes (Baumeister & Leary, 1995). Maslow (1954) introduced the Hierarchy of Needs theory, which is a theory about how people satisfy personal needs in the context of their work.

Table 2.2 *Maslow's Hierarchy of Needs*

Level	Type of Need	Examples
1	Physiological	Thirst, sex, hunger
2	Safety	Security, stability, protection
3	Love and belongingness	To escape loneliness, love and be loved, and gain a sense of belonging
4	Esteem	Self-respect, the respect of others
5	Self-actualisation	To fulfil one's potentialities

Maslow (1968) in his studies on basic human needs found that a sense of belongingness was felt after other needs, such as food and safety, were met. In relation to a sense of belonging as a motivation to work, Baumeister (1995) observed that psychological theories identified some associated trends in different forms and that much of the motivation literature focussed on the needs of power, achievement, intimacy and approval, and less on affiliation. Baumeister (1995) noted, however, that the need for power may be driven by the need to belong. As a basic motivation, the need to belong should stimulate goal-directed activity to achieve satisfaction. Herzberg's theory (1959) suggests there are two groups of factors: hygiene and motivation. In Herzberg's theory, a two-dimensional paradigm of factors affects people's attitudes about work. The hygiene factors include policy, supervision, interpersonal relations, working conditions and salary. The theory suggests the absence of these hygiene factors can create job dissatisfaction but their presence does not motivate or create satisfaction. Job satisfaction involves an individual's emotional response to a job, and motivation is the driving force to pursue and satisfy one's needs. Maslow's and Herzberg's theories are applied to the cotton-growing workplace by CGEs can help individuals achieve job satisfaction, which together with an individual's motivation, can improve job performance. Baumeister also suggested some possible links between people's sense of achievement and their need for recognition from others, other than self. Moreover, Baumeister (1995) found that the need for approval and intimacy links to social connectedness, and a sense of recognition from others is important. Baumeister (1995) suggested that much of human beings' motivation is achieved through a sense of belongingness. People have a need for regular social contact with those to whom they feel connected

(Baumeister, 1995).

Happiness in life is strongly correlated with having some close personal relationships, and it is a common salutation to wish one health and happiness. Myers (1992) suggested that happy people recognise the world as safer, feel more confident and more decisive, and cooperate more easily. He suggests that happy people rate job applicants more favourably and are more socially connected (Myers, 1992). Research has suggested that relationship type is not deemed important, but “the absence of close social bonds is strongly linked to unhappiness, depression and other woes” (Myers, 1992 p. 479). Human beings are universally motivated by a need to belong, that is, by a strong desire to form and maintain lasting relational attachments. People seek frequent, positive emotional interactions within the context of long-term, caring relationships. Baumeister (1995) suggested that the need for social attachment may be vital in more fully understanding human nature, and a need to belong is a universal motivation.

## **2.7 CHAPTER SUMMARY**

This chapter has outlined the constructs of motivation, self-efficacy, values, work engagement and job satisfaction. These cognitive variables form part of a framework within SCCT and guide people’s lives. Interests motivate individuals towards certain career choices, although SCCT suggests that self-efficacy and outcome expectations can override such interest. Therefore, support in guiding grower self-efficacy is important for grower retention in the industry. Outcome expectations can be supported by providing accurate information to growers to help them learn about choice options that can satisfy their values. Choices and goals are important for grower motivation in the options they choose and the performance and persistence they exhibit. SCCT suggests individually developed goals and objectives are

important in creating positive feelings towards work satisfaction (Lent, 2013).

This chapter has outlined the concepts of job satisfaction, life satisfaction, eudaimonic well-being and SWB. Also discussed were some contextual issues associated with work motivation and job satisfaction and a sense of purpose at work. While the theories mentioned in this chapter go a long way to understanding and providing detail to employers about motivation in the workplace, there is no particular motivation theory that can be applied to every person or every situation. The argument of this study is that the only way to truly motivate someone is to simply treat each person as an individual, and value the contribution of individuals in their work. When individuals have a sense of purpose, they feel like they belong. The need to belong is a basic human motivation, and a sense of belonging influences emotional patterns and cognitive processes (Baumeister & Leary, 1995). Individuals who have a sense of purpose in life reduce their risk of mortality and cardiovascular events (Lippincott, Williams & Wilkins, 2015) and are considered more industrious and committed to their jobs (Sinek, 2009). The methodology now follows in Chapter 3.

## **3. RESEARCH METHODOLOGY AND DESIGN**

### **3.1 INTRODUCTION**

The background literature presented in the previous chapter guides this research towards exploring the influencers of crop choice and the work motivation of the cotton grower employer (CGE). This chapter presents the methodology that informs the theoretical framework, the research design and the methods used for collecting and interpreting the data.

There are various farming philosophical ontologies: agrarianism, which values rural society as superior to urban society and sees the independent farmer as superior to the paid worker and sees farming as a way of life that can shape ideal social values (Thompson, 1990, 2018); libertarianism, relating to land rights that uphold liberty as a core principle, maximising political freedom and autonomy, and emphasising freedom of choice, individual judgement and self-ownership (Hospers, 1971, 2013); and an egalitarian philosophy, based on the principle that all people are equal and deserve equal rights and opportunities, linking land and water with the right to food (Rawls, 1971, 1993, 1999). While this study supports the notion of individual choice, it is based within the ontology of egalitarianism because within the cotton-growing industry in Australia there is a commonly held view that world food shortages are a shared global concern (Anderson, 1999; Arneson, 2002; Ozdowski, 2012).

Aligned with this ontology, agricultural epistemological assumptions have historically been based on a utilitarianism approach. This ethical theory states that

the best action is the one that maximises utility, where utility is defined in terms of well-being (Benjamin, 2015), with the view that agriculture increases benefits for humans, such as plentiful food and lower food prices. Paradigms or worldviews are often paralleled to specific research approaches, such as positivist to quantitative and relativist to qualitative research. However, Crotty (1998) proposed that a research approach determined by an individual's worldview is either objective or subjective or a combination of both. Similarly, Creswell (2009) proposed the view that a pragmatist philosophy focusses on the outcomes of the research and is not committed to "any one system of philosophy" (p. 10).

### **3.1.1 Industry Insight Researcher Perspective**

Based on positioning myself as a CGE and a researcher has impacted on my choice of research paradigm, as explained below. Although as pointed out by (Creswell, 2009), there are requirements that define a mixed-methods approach, such as procedures of data collection and analysis, structure and presentation, and the researcher's role (Creswell, 2009). The narrative below situates the researcher within the study and demonstrates how any bias in approach and any potential bias can be avoided (Creswell, 2003; 2009).

#### **Reason for this research**

There is a moment in time that is etched in our minds – the day CGEx ran into the Australian bushland and said, "I can't do this anymore." It came from nowhere, and we didn't really understand why, how or what had happened to reach this point. And worse, neither of us had pre-empted it. That moment was the turning point. I can still recall thinking, *Nothing matters to me, more than he and us, and our two boys. No money, no farm, nothing else.*

You see, we are not generational farmers, those who have been gifted with generations and generations of funds and experience. Our farming

father took ill young. He gave everything to CGEx, while he could. He granted him with many other assets, the kind you can't see, the intangible ones, although these are the ones that we cherish.

Buying the property and developing it together is an adventurous time for anyone, to reduce the risk against the dry was securing a future for us. There are so many variables to farming and trying to lessen the effects of one main variable – water – was our vision. After all, Australia is a dry continent and centuries of farming have become its victim, even for those bequeathed with many tangible assets.

Our idea was to store overflow water from the nearby mountains, and not from a named watercourse, creek or tributary but rather water that usually spread out across the landscape. The construction took several weeks to build, 180,000 cubic metres of soil with several massive 657 Cat scrapers. It took gathering the expertise of surveyors and engineers and applying for all appropriate licences even before we began. The farm was a hive of activity, there was a sense of hope, and it seemed prudent (to contend the dry). After all, we were a new generation of farmers.

Before long, the dam/tank/crow's nest was done. That night the tank (now almost the size of Sydney Harbour) was complete. That night it rained and rained, inches and inches fell, and upon daybreak there was water as far as your eye could see. It was a sight for sore eyes. We couldn't believe it. We couldn't stop looking at it. It was almost indescribable.

It took courage to buy the land, courage to embark on having a vision and make it happen ... and to have it fill in one night, that first night, really was like living a dream.

What followed was a "bumper" crop and a "bumper" year, and we thought we were invincible. We thought we had beaten the odds, for a future in farming.

This same sense of achievement came the next year when another tank was built. This time the land was levelled with almost every piece of dirt directed to a central holding point that allowed us time to pump the water into the second storage as part of the devised "whole farm" reticulation system.

Again, the sense of securing a future of hope was overwhelming. Life was a buzz, and even the bank had interviewed us for their national internal marketing campaign, “Surviving the drought”.

Two tanks, two boys; time had passed so quickly.

Then came another year, and another. As each year passed with no rain to speak of, our hearts kept sinking. The second dam didn't bring the same success. In fact, very little rain fell again and in the tenth year, CGEx went to a climate workshop to understand more about weather patterns. The news at the workshop was – we are heading into (another) dry period on the back of a ten-year drought! Securing water was prudent to lessening one of the many uncertainties in farming, which was one way we could combat the dry, but even these dams couldn't shield us from drought. When you lose your sense of hope it's crippling.

we sold our farm, and just two weeks before the contract had settled, again inches and inches of rain fell, eight (8) inches of rain in one night. The boys were frightened, as in all these years, they'd never known the sound of rain; they'd never even heard rain on the roof.

The truth is we didn't “have” to sell but decided to go in search of a more “secure” water source. In search of hope. We had known drought enough to know that you need water and soil for crops to grow. We loved the life we lived, really loved it. We liked to be independent in a grown-up responsible way, being part of a farming community that owned a small part of Australia, self-motivated and passionate towards making a contribution to what we thought was something bigger, feeding and clothing us and the world (cotton is a food and a fibre). Growing cotton gave us our sense of purpose.

The day that CGEx ran into the bushland he thought he'd failed. We were talking to him, but he wasn't hearing us. He became really withdrawn and down about everything. He even looked like he was hurting. Like many in such situations, he didn't want to talk to anyone, even mates, as “What would they know about his life?” he'd say. “They wouldn't know how it felt. They just don't get it. Don't you see? They have been ‘given’ everything and they just don't see it.”

Some time later, we had a chat with a friend, our GP, whom we had come to know. He suggested that he was also a high achiever and that CGEx should not be so hard on himself. It was hard to comprehend, CGEx thinking he'd failed. He was a strong confident man, a high achiever, qualified in two professions with drive, grit and determination, and fun-loving, and there he was, brought to his knees. *Failed at what*, I wondered? How, when you sell and walk away with a sizeable profit, can you "*feel* like you've failed?"

He had achieved, the sale brought sizeable profit, but in his eyes he didn't "*feel*" successful. The difference between achievement and success, we have learned, is that to achieve is to reach a goal. Success is a feeling (Sinek, 2008). Cognitive overload, decision regret, self-image, heuristics and biases can influence decisions.

It took three years to re-enter the cotton industry, with support of others in the same game. Those around us could see and feel his pain. It seemed like they too had felt such heartache, but they just never said. It's the unsaid in farming.

They knew the only way to get him back was to get him back into farming. They knew that he needed to feel needed, and he needed to get back to doing what he loved to do.

This time we tread carefully. We leased a place with the option to buy after three years. This time in a different region. This time we managed to experience the "other" natural disasters of frost and floods – a one-in-thirty-year frost and two one-in-one-hundred-year floods. This time now, though, CGEx had three years to restore his energy, to restore new hope, a new vision and his own value was restored.

There were a couple of 'good' things that resulted from this really tough time: with the support of a great friend, he invested in some off-farm businesses, practices that linked him back to his original qualification. This off-farm interest allowed him to channel his intellect and energy into something removed from the influencers of the environment. During this time he also managed to secure us back into a rural property, allowing him to continue his attachment to the land – his great love. He had come to realise that owning rural land really did "ground" him, in his thoughts and in his

pursuit of purpose. He loved growing cotton, the excitement of it, the sense of belonging to a cotton community, with a pursuit greater than just him, to support others in this world.

It took years to fully understand what had happened back then, and several similar conversations with other cotton growers later, that regardless of these extreme events we, and others, are drawn to farming and to cotton for a greater good. It's high in risk, and it's really hard work that takes persistence and resilience, and more persistence and resilience. It means getting battered and bent along the way but like no other agricultural industry cotton provides a connectedness to others high in hope. Cotton growers go first into the unknown and it can be lonely, but with support of others of a like mind, everything is possible.

“When life forces you to stop and think about your purpose, and you realise that what you do really does bring happiness and hope to others, your work is inspiring.” We get this now; it's intangible but this is what really makes us tick. “Your motivation to work gives you a sense of reason and contribution to a cause bigger than yourself, and if you value and love what you do, then others do, too.”

## **3.2 METHODOLOGY, DESIGN AND METHODS**

### **3.2.1 Pragmatism**

My experience and role as a CGE influence my philosophical view of research and as such this background detail provided places the researcher, also a CGE, in the context of this study.

In the context of addressing the influencers of work motivation and decision-making processes of CGEs in the Australian cotton industry, this study began by exploring participant responses within the industry as the starting point. A pragmatic approach was applied to the research. As this pragmatic approach considers that knowledge is a tool for action (Cornish et al., 2009), the research was first guided by interviews with CGEs whose experiences were a practical activity to test their

knowledge and determine the consequences. Unlike Plato and Socrates in their traditional view of philosophy that truth is found in logic and mathematics, this research aligns with the view of Rorty (2001) that people are not moved by rational argument but by stories of other humans. This study's epistemology stems from the view that individuals construct their own reality and explores the individual employer's contribution to cotton production. In the pragmatism theory developed by Dewey (1905) pragmatic views have suggested that freedom is held in the view of the individual and their willingness to reflect on one's goals aims and projects. Dewey proposed that freedom is social, and all take part in shaping the conditions of common life.

This research used SCCT and Maslow's Hierarchy of Needs theory to explain the psychological factors that influence motivation (Cornish et al., 2009). Both theories and a pragmatic philosophical standpoint are aligned. As pragmatism suggests, there is a focus on what people have in common and that human development is achieved through working together as people are motivated by other people and communities (Human development, 2015). While this study supports the notion of individual choice, it is based within the ontology of egalitarianism because within the cotton-growing industry in Australia there is a commonly held view that world food shortages are a shared global concern.

Aligned with this ontology, agricultural epistemological assumptions have historically been based on a utilitarianism approach. This ethical theory of utilitarianism states that the best action is the one that maximises utility, where utility is defined in terms of well-being (Benjamin, 2015; Benjamin et al., 2014), with the view that agriculture increases benefits for humans, such as plentiful food and lower food prices. Paradigms or worldviews are often paralleled to specific research

approaches, such as positivist to quantitative and relativist to qualitative research. However, Crotty (1998) proposed that a research approach determined by an individual's worldview is either objective or subjective or a combination of both. Similarly, Cresswell (2009) proposed the view that a pragmatist philosophy focusses on the outcomes of the research and is not committed to "any one system of philosophy" (p. 10).

### **3.2.2 Design and Methods**

Determining which methodological approach to take was established by its suitability and relevance to answer the research question. Fundamental to the design process is the selection of methods of data collection and analysis relevant to the methodology to achieve the study aim. The research topic to be studied dictated the choice of method, and the subject of interest arose from the researcher being immersed in the industry and identifying a knowledge gap. This gap was discussed with the research arm of the industry body, and a funded research scholarship was established to address the topic area. Although a research design had not been established other than the nature of the topic, this gave a broad scope to study the subject of interest, utilising methods most appropriate to meet the aims of the research as identified from the CGE interviews. The pragmatic approach allowed a design to be established that included both qualitative and quantitative methods to address the aims of the research. Quantitative and qualitative approaches informed by a range of theoretical models to guide data collection and analysis were therefore carried out for this exploratory study. Semi-structured interviews were conducted in Part 1 with a convenience, purposefully selected small sample of CGEs and other industry participants, including agronomists, merchants and researchers. A national survey was also conducted in Part 1, and the self-efficacy measure was tested on

the population of cotton growers across Australia. Data were collected and analysed in relation to SCCT constructs, including self-efficacy in the task of cotton growing, outcome expectations, job satisfaction and work engagement, and used in the development of the Social Cognitive career model of grower retention. In Part 2 a behavioural economics approach was used to establish the influencers of crop choices of CGEs. Another extensive literature review was carried out and a Decision Driver Model was developed. Each of these studies is clarified briefly below.

The research was conducted in two stages.

### **Part 1**

First, cotton growers were interviewed. This process helped provide a starting point to the research to establish what motivates CGEs at work and how they make decisions on crop choices. Face-to-face interviews were deemed the most appropriate research method for clarifying CGE experiences to develop a “cotton-growing self-efficacy measure” for identifying the personality traits of participants. Due to the nature of the CGE role and to gain access to them, a limited interview time of 30 minutes was considered optimal. The face validity of the measures impacting on motivation of CGEs are provided, as well as personality traits of the participants and measures of job satisfaction and work engagement in the context of the study participants. The measures in the survey include self-efficacy of cotton growing, personality, economic conservation and lifestyle as outcome expectations, job satisfaction, and work engagement. The following section clarifies the methods taken in Part 1 and Part 2 and explains the structure of the thesis methods more fully.

### **First Literature Review**

Literary research was explored in psychology to understand the personal factors and motivations of cotton growers, self-efficacy, careers, growers as

entrepreneurs, work engagement, job satisfaction, retention and attraction, and generational factors of employees. The theories used in this study include Social Cognitive Career theory (SCCT), Maslow's Hierarchy of Needs theory and Prospect Theory. These theories were chosen to explain what motivates CGEs to grow cotton and what influences their decision-making processes. As theories are usually expressed in the form of "models" with the aim to account for key factors that determine behaviour (Chen, 2014), the Social cognitive career model of grower retention (Figure 3.1) was developed (Wunsch et al., 2014). Measurement scales were located through the literature for each construct except the self-efficacy of cotton growing as it was developed for this study.

A national population survey was also developed. The broad scope to include responses across all cotton-growing districts across Australia was intended to allow for generic themes and shared experiences to emerge. The survey was designed to test the cotton-grower self-efficacy measure and validate the model. The results of the survey are discussed in section 4.

## **Part 2**

As there were not enough responses to the survey, discussions with the industry research manager and the academic supervisory team led to an agreement to explore the influencer of behavioural economics, and this then required the second literature review. A second round of unstructured interviews with CGEs and stakeholders was held to answer the research question more fully.

### **Second Literature Review**

An extensive literature review was carried out to explore the research question more fully. From these interviews and the literature, a behavioural economic approach was selected to explore other influencers that may impact on CGE work

motivation and crop choices. A second model, the Decision Driver Model, was developed and presented in Chapter 6.

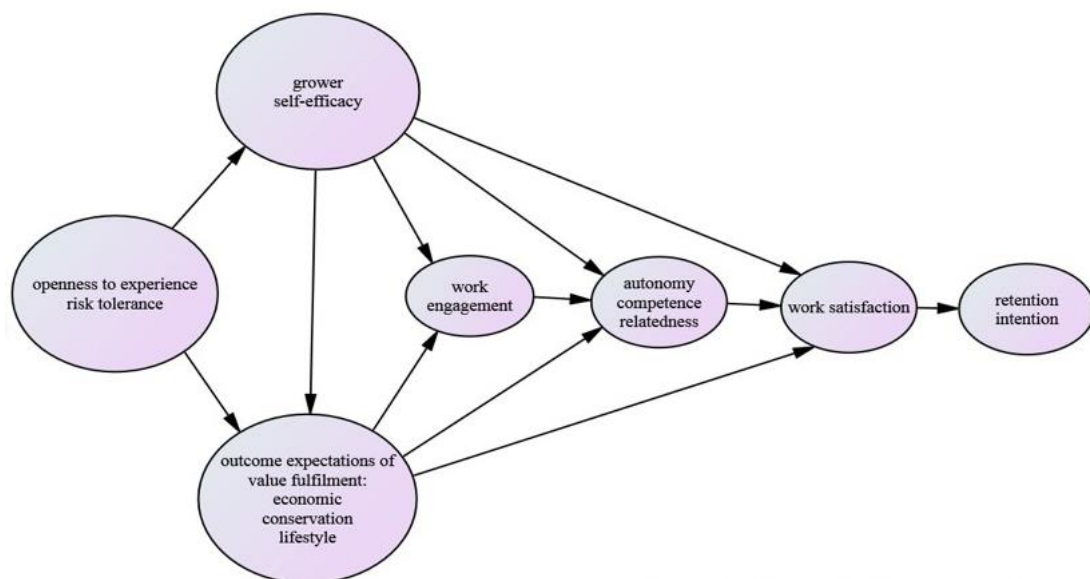
Quantitative and qualitative methods were used to address the research questions and support the aims of this study. Firstly, employing a qualitative approach explored how people experience things in the context of a “real-world” setting by capturing participant views and perceptions about their experiences in the everyday setting. Qualitative research seeks to look at aspects that are deep and complex and gives voice to experiences that are not quantifiable. Such is the case in this study where interviews provided a rich source of information. Quantitative research included questionnaires of six measures and the developed cotton-growing self-efficacy measure. The materials, measures and variable computations are explained in Chapter 4. The exploratory qualitative part of this study was used to generate the theory and model, which was then verified in the quantitative section. The qualitative and quantitative material was used to complement each other as each type of data provided advantages to extend an understanding of the research problem. The following section draws together the CGE interviews, survey responses and literature to develop the model and explore the constructs of the model towards answering the research question.

### **3.3 SOCIAL COGNITIVE CAREER MODEL OF GROWER RETENTION AND MEASURES OF CONSTRUCTS**

A social cognitive career model of grower retention and measures of constructs were developed from the constructs discussed in the literature review, and then the measures were developed to test this model. The face validity of the measures impacting on motivation of CGEs are provided, as well as personality traits of the participants and measures of job satisfaction and work engagement in

the context of the study participants. Part 1 also provides results and data from testing the Social cognitive career retention model of CGEs through the nationally delivered survey to Australian CGEs. The measures in the survey include: self-efficacy of cotton growing; personality; economic conservation and lifestyle as outcome expectations; job satisfaction; and work engagement.

In Part 1 of this study a model for Social cognitive career retention (Figure 3.1) was developed from the constructs discussed in the literature review. Measurement scales were located through the literature or developed for each construct. A national population survey was then conducted to validate the developed scale and to test this model. The results of the survey are discussed in section 4.



*Figure 3.1.* Social cognitive career retention model (Wunsch, McDonald, McIlveen, 2014) adapted from A Social cognitive model of work satisfaction (Lent and Brown, 2006).

The remainder of this section provides detail about the constructs of this model. The measurement scales for each of these constructs and the development of the scale for self-efficacy are described in Chapter 4.

### 3.3.1 Personality

The literature review explores the influencer of personality on the motivation to run and operate a cotton-growing business. Certain personality theories view people and careers as being based on personal characteristics such as interests, abilities, values and personality, which are innately based on inheritances and early-learning experiences. SCCT aligns with Holland's theory of vocational choice and adjustment (Nuata, 2013), which is built on empirical evidence that supports the concept that individuals gravitate towards jobs and work environments that align with their personalities. However, importantly, SCCT suggests that environments are not always supportive, and choice may be constrained for several reasons, such as family input, financial reasons or previous academic experiences (Lent, 2013). SCCT further explains career development by three unified aspects:

- 1) how basic academic and career interests develop;
- 2) how career choices are made; and
- 3) how career success is achieved.

Each of these aspects is considered individually below.

#### *How are basic academic and career interests developed?*

As suggested by SCCT, career interests are influenced by several factors, such as environments, finances, gender and race, which are often entrenched in tradition, family genetics and physicality. These choices change over time by the influencers mentioned. SCCT proposes that initial choice can be expressed in three parts: a) a goal; b) action towards achieving the goal, for example, by enrolling in study to gain a qualification in that career interest; and c) previous successes and failure experiences. These together refine proposed career choices (Lent, 2013). SCCT also suggests that environments and individual ability to meet academic requirements for

a proposed career establish the career outcomes (Lent, 2013; Lent & Sheu, 2010).

*How is career choice made?*

SCCT proposes that career choice is directly related to interests and is led by the development of self-efficacy, outcome expectations (measured by people's beliefs about how fulfilling they perceive their proposed career choice and role) and other contextual factors as mentioned in point 1 above (Lent, 2013; Schuh et al., 2010). Work choices are often linked to interests although influencers can override these interests.

*How is career success achieved?*

SCCT establishes that self-efficacy and outcome expectations are often based on an individual's perception of their capabilities or ability to achieve based on previous experiences. Strong self-efficacy and a positive view of outcome expectations leads to motivation and determination in achieving goals. An optimistic view of one's self-efficacy has been found to help people make the most of their abilities. Their success, of course, varies due to how individuals interpret and apply their skills to the career task (Lent, 2013). The study of personality is not a purely empirical discipline as it uses parts of art, science and philosophy to draw conclusions. There are, however, some fundamentals that theorists disagree on in relation to personality across disciplines, such as whether people have control over their own behaviour and understand their motives or whether behaviour is determined by forces beyond an individual's control (Engler, 2008); or whether personality is thought to be determined by genetics and biology or by environment and experiences. Some research suggests a combination of both (Lent, 2013), while others believe individuals have a more active role (Engler, 2008).

This study uses SCCT (2013) for three reasons set out in the literature, firstly, it maintains that individuals can be self-directed, although factors, such as supports and barriers, strengthen, weaken or override their self-direction. Secondly, it suggests that people's career choices guide them to certain choices and similar work personalities. Thirdly, SCCT stresses the importance of self-efficacy, outcome expectations and personal goals and the domain-specific features of both people and their environments, which are constantly adapting to change (Lent, 2013).

In addition, SCCT proposes that most of what drives people's career behaviour is based on personal qualities like interests, abilities and values. However, a limitation of this theory in relation to cotton growers was identified during the conduct of this study in that it could not fully explain crop choices of CGEs. Other factors also influence motivation and decision-making processes about crop choices, such as defaults, framing, timing and heuristics, which are discussed in Chapter 5.

### ***3.3.1.1 Significant research relevant to this study***

The most significant study for this thesis regarding the psychosocial diversity in farming is the Edinburgh study, discussed earlier in Chapter 2, on the decision-making of farmers. It found personality factors were important in farmers' decisions (Willock et al., 1999a, b; Austin et al., 1999), as discussed in Chapter 2, section 2.1. In this CGE study, the Five Factor Model (FFM) (McCrae & Costa, 1988) was used to measure the personality traits of cotton growers. The FFM identifies five traits that are considered broad in definition although they were established as specific personality characteristics. These five major traits that motivate personality are openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (McCrae & Costa, 1988). Details of these traits are elaborated in section 4.1.4.

### 3.3.2 Values and Work Motivation

Values are significant, and the notion of values has relevance to all fields of science that relate to individual performance (Rokeach, 1973). Human values define goals and provide measures that allow people to compare and contrast their own and others' attitudes and behaviour (Gregitus, 2015; Lent, 2013) and are considered fundamentally important because they bring a cause to life. Values are the measures that individuals use as perceptions to guide their beliefs and influence their interpretation of the actions and values of others.

Values as defined in this thesis refer to beliefs about the potential outcomes of specific activities such as career and work, and their impact on the motivation of the grower to grow cotton.

People choose work that resonates with those they trust and who support them to achieve their goals (Sinek, 2008). As mentioned in section 2.3.1, the research suggests those who trust their employers will work hard because they “feel” like they are working for a cause larger than themselves (Sinek, 2009; Ariely, 2008; Pink, 2008). This applies to CGEs and can be observed in the various reasons growers remain attracted to cotton. These reasons include the feeling of being part of a cotton community that supports innovation through continuous research and development (funded partly by growers themselves); being part of a dynamic agricultural industry that offers events and activities where growers “feel” like they belong; the feeling of being part of a product that is globally in demand; and being part of a community that supports a greater purpose in helping to feed and clothe the world.

A sense of belonging is a basic need, and in the context of this study is extended to “place” and “a community of CGE people”, and the strength of this need is amplified in the growers' views collected and heard through this study. Humans

desire to make connections with others, as they are social beings, and this is evident in many work and personal situations. It is very apparent in an agricultural setting such as cotton production due to the location of most crops being some distance from major city centres. It is common for people to begin conversations with those already known, for example when we sit at events next to a familiar face and we converse with those who are connected to someone we know, have an interest in our work or are socially familiar. This occurs because of the basic need of humans to “feel” safe and secure (Maslow, 1943).

People are attracted to what a product or company represents, and these products or companies become symbols of perceived shared values and beliefs (Sinek, 2009). People also choose activities and products that emulate their lifestyle. These products and activities make people feel like they belong, and they feel an affinity with others who buy and do the same things (Sinek, 2009). Growers often choose to grow cotton to feel like they belong and to have an affinity with others who do the same. Cotton growers have a loyalty to cotton (which can be explained by direct motivators because what they do stimulates them and sparks their creativity that constitutes play, and when purpose and potential are added, performance is increased (Doshi & McGregor, 2015)); they are drawn to others who share likings for similar products, and they enjoy spending time with like-minded people as they share a fundamental connection (Sinek, 2009, p. 55; Lockwood, 2016). Studies have also found that people have a “gut feeling” for what values seem relevant to a decision but find this hard to articulate (Keeney, 1992, p. 24).

The psychology of values can be viewed either through personality psychology or social psychology, where values are viewed from the perspective of culture and influencers on individuals (Cieciuch et al., 2015). Rokeach (1973)

developed a theory of values describing differences in attitudes and behaviour and identified beliefs to describe values, and values to describe personality, as well as developing an instrument for measuring personal and social values (Rokeach Value Survey), useful because it was psychometrically more sound than other instruments and is still used today (Debats, 1996). Other work in this area specific to farming, such as the work of Gasson (1973), identified farmers on the basis of values that are “Instrumental (making a satisfying income), Intrinsic (enjoyment of work tasks), Social (continuing the family tradition) and Expressive (farming as a way of self-expression)” (Gasson, 1973, p. 10). Some of these values remain relevant to cotton farmers today.

Other theories, such as Value theory (Schwarz, 1992), define values as goals that guide principles. The distinguishing feature among values is the type of motivational goal. There are ten types of values developed to express a distinct motivation goal: universalism; power; achievement (considered to be universal); hedonism (the pursuit of pleasure); self-direction; security; stimulation; benevolence (kindness); conformity; and tradition (Schwartz, 1992, p. 6). The work motivation goals of cotton growing within the cotton industry can be expressed for each type of value, and one possible example has been indicated for each value below:

- Universalism: The Australian cotton industry has a goal to become the producer and supplier of the most environmentally and socially responsible cotton in the world and has joined two international sustainability partnerships: the Cotton LEADS program and the Better Cotton initiative.
- Power: Australia produces 3 per cent of the world’s cotton but is the third largest exporter, behind the US and India. More than 90 per cent

of Australia's cotton is exported. Australian cotton growers are innovative and rapidly adopt new technologies, with 82 per cent now using new round bale pickers. The cotton industry has achieved an 89 per cent reduction in insecticide use (Cotton Australia, 2016).

- **Achievement:** Australia's cotton farmers produce enough cotton to clothe 500 million people. There are up to 1500 Australian cotton farms (Cotton Australia, 2016).
- **Hedonism:** The Australian cotton conference is one of the largest conferences of any agricultural industry in Australia and is attended by more than 1800 delegates.
- **Self-direction:** The number of cotton growers with a qualification of diploma level or above has risen from 30 per cent in 1990 to 50 per cent in 2011. These qualification levels are higher than other agricultural sectors and above the Australian population average.
- **Security:** Cotton growers suggest they feel a "sense of belonging" and express their interest in remaining connected to the industry long after exiting/retiring.
- **Stimulation:** Cotton growers suggest they are drawn to the innovation of the industry.
- **Benevolence:** The industry is committed to delivering independent, evidence-based assessments of its sustainability and environmental performance and communicating this with a common voice. Over the past 24 years, the CRDC has invested \$200 million in research and development on behalf of Australian cotton growers and the Australian government, delivering an estimated minimum \$1.4 billion benefit back

to growers on their farms, and twice that value to the wider community.

- **Conformity:** The industry has a voluntary farm and environmental management system for growers to improve on-farm production; it ensures that the Australian cotton industry produces economically, socially and environmentally sustainable cotton using the My BMP (Best Management Practice) initiative.
- **Tradition:** The Australian cotton industry is steeped in tradition, and many of those who have been CGEs continue to be involved long after they have stopped growing the crop. According to CGEs, there is a dynamism attached to the industry because of CGEs' innovation and adaptability to new technology and change (Cotton Australia, 2014; CRDC, 2014; Schwartz, 1992, p. 6 for more on motivational goals and their sources).

The discussion between motivation and goals essentially affects all people at one time or another (Schwartz, 1987). Many businesses develop corporate values and frame them as their mantra that identifies a set of values. However, the reality around those values is in the outcome expectation. This leads to the questions: What is the purpose in establishing values and why is it important that people choose activities that identify with their beliefs and expected outcomes? (Sinek, 2009). The literature suggests the answer is in the purpose. The reason people make certain choices is that they are happy to contribute to a purpose or to work towards something larger than their own personal interests as this provides work fulfilment. Some researchers suggest that without purpose, no other metric or goal seems to completely satisfy (Ariely, 2008; Pink, 2008; Sinek, 2009).

### 3.3.3 Self-efficacy

The aim of this section is to identify the influence self-efficacy has on cotton-grower work motivation. Several studies on self-efficacy and its influence on motivation have been based on the tenets of SCT (Bandura, 1977) and SCCT, which both focus on the relationship between self-efficacy beliefs, outcome expectations and personal goals. Self-efficacy beliefs influence how people feel and refer to “people’s judgements of their capabilities to organize and execute courses of action required to attain designated types of performances” (Bandura, 1986, p.391). Therefore, self-efficacy exists at the individual level.

While self-efficacy is not a global trait like self-esteem, which refers to self-worth, self-efficacy is linked to performance areas and pursuits (Lent, 2013). An individual may hold strong self-efficacy beliefs regarding his or her ability to grow cotton but be less competent at leadership or management tasks. People’s beliefs about personal capabilities are subject to change based on future experiences and are responsive to environmental conditions (e.g. how supportive is the agronomist; how tough is the season looking) and are modified via types of learning experiences. SCT and SCCT perceive four learning experiences:

1. Mastery/performance accomplishments are important; however, if people experience only success it is then harder to recover from setbacks as resilience is required to overcome adversities through effort and learning how to manage difficulties;
2. Vicarious experiences, such as seeing others succeed in similar situations through perseverance, increases the belief in one’s own capabilities;
3. Social persuasion suggests that if people are persuaded to believe in themselves then they are more likely to handle difficulties; and

4. While the impact that physiological and emotional states have on self-efficacy varies, prior performance achievements are considered to have the greatest influencer on self-efficacy, with successes strengthening beliefs and repeated failures weakening these beliefs (Lent, 2013). Tenacity increases the chance of success, and people are encouraged to measure success by self-improvement rather than by triumphs over others (Bandura, 1977).

While social cognitive theorists suggest that self-efficacy has a positive impact on performance (Bandura, 1997), some suggest that domain-linked self-efficacy is debilitating (Yeo & Neal, 2006). Their research found that task-specific self-efficacy at the within-person level showed a weak negative association with task performance and a stronger positive correlation at the between-persons level (Yeo & Neal, 2006). In the context of cotton growing, for example, the top-ranked cotton grower of the year may have higher task-specific self-efficacy than someone who is new to growing cotton. Thus, researchers expect to see a positive correlation between task-specific self-efficacy and performance at the between-persons level. However, even the top-ranked cotton grower in Australia will be subject to fluctuations in self-efficacy over time. If he/she grows high-yielding cotton at the beginning of the season, they may become overconfident and subsequently be beaten by a new grower to the industry by the end of the season. Thus, self-efficacy may be negatively associated with performance at the within-person level (Yeo & Neal, 2006). In a previous study by Wunsch (2013), growers who are verbally encouraged by their partners, financial advisers or agronomists to set their own goals improved not only their efficacy and achievement but also their commitment to attaining goals. Growers who were able to attribute their feedback to effort and

commitment perceived greater progress, maintained higher motivation and reported greater efficacy for further industry involvement (Wunsch, 2013). This is consistent with Bandura's (1997) notions on the sources of self-efficacy.

### **3.3.4 Work Engagement**

Work is an integral part of human lives, and work engagement is defined by some as a work-related attitude (Schaufeli et al., 2002). The focus of work engagement has mostly been defined in terms of what employers need to achieve economic value. What has evolved over recent times, with the advancements in technology blurring the lines between work and personal life, is a global pool of talented and experienced people seeking employment that offers engagement through freedom in work-life balance, leadership and purpose. There is a new focus on the meaning of work to meet the needs of individuals beyond competitive advantage, which includes the purpose of work, defined by various types of work other than those traditionally studied (Human Development Report, 2015). As technology fosters global connectivity, organisations are becoming more transparent, and there is a shift in work environments from profit to prosperity (Morgan, 2014). Prosperity is defined as wealth, welfare and well-being, and work providing a sense of fulfilment. There are two varying positions in the literature in relation to work engagement. Some researchers refer to work engagement as any point on a continuum ranging between burnout and very high work engagement (Maslach & Leiter, 1997), whereas others suggest the concept of work engagement is the opposite of burnout whereby it is defined as "a positive, fulfilling, work-related state of mind that is characterised by vigour, dedication and absorption" (Bakker et al., 2008). Vigour is typified by vitality and mental toughness, effort and determination at work, while dedication is defined as being strongly involved in

one's work and experiencing a sense of excitement and motivation. Absorption is defined as being extremely focused and absorbed in work (Schaufeli, Salanova, González-Romá, & Bakker, 2002, p. 74). The measure used in this study relates to the latter definition of work engagement, although where CGE work engagement sits on the scale described by Maslach & Leiter (1997) would be worthy of further investigation.

According to Bakker et al. (2008) both job and personal resources influence engagement and the work demands on the individual. Job resources are like those identified as the sources of self-efficacy and include social support and performance feedback while personal resources include self-efficacy, optimism and resilience. Research suggests that engaged workers are more interested in their work and as such are more industrious and committed (Bakker et al., 2008), and people who are engaged in their work are considered to have more energy and self-belief to accomplish work tasks (Schaufeli et al., 2002). Those high in self-efficacy can influence the positive effect situations have over their lives; they are self-driven in attitude and activity (Bakker et al., 2008; Lent, 2013). Those who are engaged at work possess a positive attitude that influences views about work and the resulting physical effects work has on them and others, which in turn can inspire those around them within their work environment.

The future of business depends on global workforce issues, with technology now providing easy accessibility to a worldwide audience that are interested in global issues (Hay Group, 2014). The new workforce generational influencers are demanding that businesses be more accountable for global issues such as climate change and the depletion of natural resources, as well as providing support for an ageing population. The new meaning of work includes increasing the retirement age,

and in some businesses removing it entirely, so that more people may enjoy the purpose that work brings.

An ageing population means that employers are required to engage a workforce comprising many generations. To engage a workforce across generations requires employers' abilities to identify individual needs and goals to match education, and extension programs for personal and work development across these generations. To better understand how to engage a workforce, individual business leaders require new knowledge on how to develop cotton-growing operation leadership skills. This view is also shared in what is called "transformational leadership" (Gomes, 2014) whereby leaders and followers (across generations) work together to progress to a higher level of self-confidence and inspiration by understanding the goals and aspirations of employees and challenging them to work towards meeting and possibly exceeding individual outcome expectations (Burns, 1978). Transformational leaders lead by example; they are visionaries who share vigour and foresight as well as challenge goals.

Positive levels of vigour and commitment suggest that engagement crosses over from one partner to the other, and engagement focusses on human strengths and optimal functioning, according to Seligman and Csikszentmihalyi (2000). Other personal drivers of work engagement include optimism and resilience. Personal resources are linked to resilience through an individual's sense of ability to impact upon their environment successfully, Hobfoll et al. (2003). This study refers to the Resilience assessment of the Australian cotton industry at multiple scales report (Andreoni et al., 2016 p. 17) where industry scale drivers are listed as demand, climate change and policy, and drivers at the farm level are weeds, pests and disease. While acknowledging that these factors are important at industry and farm levels,

this study argues that there is a gap in the report in that the measures do not include influencers of individuals as drivers of resilience. The psychological definition of resilience is an individual's ability to successfully cope with adversity. The industry is made up of individuals who are primary producers. If the cotton industry wants to act on sustainability and resilience in the future, it needs to determine what motivates people at work, to understand not just the logical view of profitability and productivity, but also to know how and why people make decisions.

Maslach and Leiter (1997) concurred with Seligman and Csikszentmihalyi (2000) and proposed that engagement is characterised by energy, involvement and efficacy, which are considered the direct opposites of the three burnout dimensions of exhaustion, cynicism and lack of professional efficacy (Maslach and Leiter, 1997). People who are engaged in their work are presumed to have a sense of enthusiasm and bond with their work activities and see themselves as able to deal fully with the demands of work (Green et al., 1991). In regard to engagement, work can be an advantage in home life through up-skilling across different environments, and home can be an advantage in work through social support (Montgomery et al., 2003). Development support suggests sources of self-efficacy (discussed in section 2.4.2) are also found to apply to work engagement in the forms of social support, performance feedback and vicarious experiences (Demouriti et al., 2008). A meta-analysis on the relationship between dispositional variables and work-family conflict (Allen et al., 2012, p. 1) found that "... positive effect and self-efficacy appear to protect individuals from work-family conflict"; this issue is discussed in more detail below. Work engagement is related to performance and commitment to both work environment and activity, and individuals who are engaged in their work are intellectually, physically and emotionally connected with their work roles (Kahn,

1990).

### **3.3.5 Job Satisfaction of Employers**

The aim of this section of this study is to identify some influencers of work motivation and job satisfaction. There are contextual issues associated with work motivation and job satisfaction that need to be considered, given that most people's adult life is spent at work. Work is described as an activity to make a living; it can be challenging, engaging, stimulating and fun while providing a sense of purpose. Work is described as vital for human development and as having financial and nonfinancial benefits that are both quantifiable and unquantifiable (Human Development, 2015). "Work" and "job" are two words that have similar yet different meanings. Although they are used interchangeably, their meanings may differ according to how they are used. As agreed at the Labour Statisticians International Conference (2016, p. 13), the international classification of status in employment classifies jobs as "the set of tasks and duties performed, or meant to be performed, by one person for a single economic unit". For the purpose of this study, "job" relates to a specific occupation while "work" refers to general activities to accomplish a goal. Satisfaction is defined as a happy or pleased feeling as a result of an event or activity. Having fun at work has been identified as what makes individuals more motivated, productive and creative (Gostick & Christopher, 2017). Creativity is needed in divergent (lateral) thinking, as thinking laterally is a way of solving problems. Divergent thinking and creativity are considered by many as important to humans in terms of progress, suggesting that without creativity there is no progress (deBono, 2016). Reason, on the other hand, is what makes people human and individual (Sinek, 2009).

In most industries and disciplines, people want to exercise their creativity at

work, and research suggests that empowered employees are more productive (Gostick & Christopher, 2017). This study argues that to empower others, individual employers need to better understand leadership and other factors such as support of global issues and purpose and meaning of one's work that are established as important in today's world of work. Traditionally, leaders were thought to control and establish their role as one of power. These types of leaders still exist; however, research now suggests a more effective leader has empathy and builds trust among employees (Sinek, 2009). This view has proven that it is apparent that an increase in trust in management by a third is equal to a 31% income increase with respect to business (Human Development, 2015). There are many leadership styles such as ethical leadership. It is based on five principles: respect, service, justice, honesty and community. Leaders are not infallible and should be willing to be open and honest, owning up to mistakes and learning from them, and accepting that societal accountability is especially important (Heres, 2010). This study supports the view that leadership roles have changed from one of power to one of empowerment, and while it may feel like technology is taking over the individual work of humans, it is human behaviour that provides the capacity to drive technology (Morgan, 2016). This view is supported in the self-efficacy literature (Bandura, 1986; Lent, 2013) and the work engagement literature (Kahn, 1990).

### **3.3.6 Work Motivation and Job Satisfaction**

When people are supported in their work, they gain a sense of autonomy, belonging and competence and feel energy in their jobs (Van den Broeck et al., 2008). This study supports the notion that income gained through work is not the only thing that matters. Blustein (2006) found that there is a much greater likelihood of being satisfied at work when people are intrinsically interested in what they do.

Intrinsic motivation usually means that when people participate in an activity of interest, they are satisfied (Gagne & Deci, 2005). Lent et al. (2002) found that contextual factors may influence a person's ability to find work consistent with their interests, while some suggest that people reveal their interests and their characters in their jobs (Holland, 1997; Lent, Brown & Hackett, 2002). In the work of Kahneman (2011) it was found that "high income buys life satisfaction but not happiness, and that low income is associated both with low life evaluation and low emotional well-being (p. 397)". Job satisfaction varies from job to job and person to person and depends on the nature of the work, and attitudes and behaviour of the work environment. Like the four sources of self-efficacy – mastery experiences, vicarious experiences, verbal persuasion and emotional and physiological states (Bandura, 1997) whereby prior performance accomplishments have the greatest influence on self-efficacy and individual engagement – social support from managers and colleagues in the workplace is essential to creating a satisfying work environment (Knight et al., 2016).

#### ***3.3.6.1 Sense of purpose at work. What makes individuals want to work?***

When individuals have a sense of purpose, they feel like they belong. Belonging is a basic need identified in Maslow's Hierarchy of Needs theory. Recent research shows that money is believed to attract individuals to a job, but it does not motivate them to be passionate about what they do (Ariely, 2017). Being passionate or inspired about meaningfulness or purpose of a job has been shown to positively impact on performance (Martin, et al., 2015).

Individuals who have a sense of purpose in life reduce the risk of mortality and cardiovascular events (Lippincott, Williams & Wilkins, 2015) and are considered more industrious and committed to their jobs (Sinek, 2009). There is a

societal expectation that an employer provides a sense of purpose in the workplace in order to attract and retain employees, as perceived by CGEs. In this respect, empowerment research can provide some explanation in offering two perspectives: organisational (leader-empowering behaviours) and individual (employee state of empowerment). The organisational and individual perspectives are defined as different, although there is a perception that for employees to feel empowered they require the leadership-empowering behaviours of the employer (Lorinkova et al., 2013; Srivastava, et al., 2006).

As with most relationships, the strength of relationships (between employers and employees) develops over time, with the quality of the relationship dependent upon the leader's capacity to create an environment where the employee feels supported, trusted and confident in their ability through leadership empowerment (Zhang & Zhou, 2014; Spreitzer, 1995). This notion aligns with the literature on both competence and self-efficacy whereby individual beliefs about personal capabilities are responsive to environmental conditions and task-specific learning experiences, such as personal performance accomplishments, vicarious learning, social persuasion and physiological affective states (Bandura, 1997; Lent, 2013).

#### ***3.3.6.2 Job Satisfaction and Subjective Well-being***

Job satisfaction can be described as an emotional state, usually determined with regard to how satisfied (like) or dissatisfied (dislike) an employee is with their job (Locke, 1976). Job satisfaction overlaps with theories of human motivation such as Maslow's Hierarchy of Needs theory, which is referenced in this study (3.3.6). The theory suggests that essential human needs (physiological and safety) are first met before more complex needs (belonging and esteem). The theory explains human motivation generally, and in a work setting is used to explain job satisfaction

whereby work provides financial and health care benefits to meet physiological needs. To gauge the emotional and cognitive assessments of individual lives, a subjective well-being measure is used (Diener et al., 2003) to establish how happy or fulfilled people are (Caruthers & Hood, 2004). This is relative to CGEs' work motivation and crop choices. As in the pursuit of understanding happiness, there are two theoretical perspectives: 1) hedonic (subjective) well-being; and 2) eudaimonic well-being (Deiner et al. 2016), and some suggest an individual experiences happiness when positive affect and satisfaction with life are both high (Kansky & Deiner, 2017). Others (Peterson et al., 2009) identified three pathways to happiness: 1) pleasure; 2) engagement; and 3) meaning, suggesting all three elements constitute happiness (Vella-Brodrick, Park & Peterson, 2009).

Factors of hedonic (subjective well-being) include:

1. presence of positive mood;
2. absence of negative mood;
3. satisfaction with various domains of life (e.g. work, leisure); and
4. global life satisfaction.

Eudaimonic (psychological well-being) includes variables of:

1. sense of control or autonomy;
2. feeling of meaning and purpose;
3. personal expressiveness;
4. feelings of belongingness;
5. social contribution;
6. competence;
7. personal growth; and
8. self-acceptance (Vella-Brodrick, Park, & Peterson, 2009).

There is a blurring of the line between home and work-life, and work-life satisfaction is being impacted by work as technological advancements have changed the way individuals communicate socially and at work, (Erdogan, Bauer, Truxillo & Mansfield, 2012). As individuals evaluate their lives through reasoning and emotional evaluations, psychological well-being is the broadest term used in the literature to include subjective well-being (SWB) (Diener et al., 2016).

There is an increased focus in the literature on “eudaimonic” well-being as people look to work to provide meaning and purpose in life. The appeal of money and material possessions, fun and pride are usually because individuals believe these goods will bring a sense of happiness, although happiness is seen as a result (Deiner et al., 2016). Supporting this view, Deiner and Oishi (2004, p. 2) found that “people rank happiness and satisfaction ahead of money as a life goal”. The study found that when simple needs are met and affordability increases, there is often a levelling-out phase in life satisfaction, suggesting that rising income creates escalating material desires, although the same level of income becomes less appealing and therefore less satisfying (Frey & Stutzer, 2002). Graham and Pettinato (2001 p.22) found that happiness does not increase as societies grow wealthier over time, and there is no strong evidence to suggest that wealthier people are any happier than others.

Subjective well-being is important to this study, as supported by Lyubomirsky, King, & Diener (2005), who found that valuing an individual’s life, influencers and increases in the likelihood of outcomes felt beyond money, such as health, community, a long happy life, productivity, fun at work and social responsibility, contributed to subjective well-being (SWB). In further support of this and the study’s argument, there is a focus on broader issues beyond money, such as human development and prosperity, well-being and the importance of individuals as

employers and leaders.

There are several measures used to establish the determinants of SWB and life choices, such as the OECD Better Life initiative and Human Development Index (HDI) (Human Development report, 2015), with a focus of development not only on incomes but on maximising human choices. Cotton growers feel a connectedness to cotton, with a focus beyond money that until now has not been addressed or articulated. Other reasons that support the view that the work motivation and job satisfaction of the individual goes beyond money is that “economic output has risen steeply yet there has been no rise in life satisfaction and a substantial increase in depression and distrust; as societies grow wealthy, differences in well-being are less frequently due to income, and are more frequently due to factors such as social relationships and enjoyment at work” (Diener & Seligman, 2004).

### **3.4 SUMMARY**

The chapter guided this research towards exploring the work motivation of the cotton grower employer (CGE) and the individual human contribution of a CGE in a work context. This chapter presented the methodology that informs the theoretical framework, the research design, and methods used for collecting and interpreting the data. Chapter 4 includes an outline of the measurement scales, including the development of a self-efficacy measure and the analysis of the results.

## 4. ANALYSIS AND RESULTS

This chapter provides an outline of the measurement scales for each of the constructs in the Social cognitive career model of grower retention discussed in Chapter 3. It then outlines Part 1, including the development of an Australian cotton grower self-efficacy measure based on interviews with CGEs. Following this, the nationally delivered survey to Australian CGEs is discussed, and data analysis and results from testing the Australian cotton grower self-efficacy measure are presented. Part 2 provides results and data from testing the Social cognitive career model of grower retention through the nationally delivered survey to Australian CGEs.

### 4.1 SELF-EFFICACY MEASURE, MOTIVATION MODEL AND MEASURES OF CONSTRUCTS

Measurement scales were established for each of the constructs of the developed social cognitive career retention model (Wunsch et al., 2014) in Figure 3.1. Six established measures were employed, and one measure was developed specifically for the study. A thorough search of the literature failed to locate an existing scale to measure cotton-growing self-efficacy. The first aim of the study was therefore to develop a cotton-growing self-efficacy measure. To develop this new measure, growers were presented, in a face-to-face interview, with a list of various tasks established by Cotton Australia (2013), which included aspects of cotton growing, such as scheduling irrigations, management of pests, weeds and diseases, workplace health and safety procedures and updates. The full listing of tasks can be found in Appendix C.

In the face-to-face interviews, participants were also asked about the wording

used in a pilot questionnaire based on the scales for each construct to confirm that the items made sense with respect to their context as an Australian cotton grower. This validation of the scales as a measure of the construct is important as these six measurement scales were not developed specifically for an Australian agricultural audience. In such instances, some terminology may not be relevant and cause confusion for participants. The constructs of the model developed and measures used in the interviews included: self-efficacy developed from the job task list (Cotton Australia, 2013); the Big Five Inventory (John, Naumann, & Soto, 2008); the Economic, Conservation Lifestyle Questionnaire (Maybery, Crase, & Gullifer, 2005); The Brief Affective Index of Job Satisfaction (Thompson & Phua, 2012); Utrecht Work Engagement Scale-17 (Schaufelil, Bakker, & Salanova, 2006); Finametrica Personal Financial Risk Tolerance (Faff, Mulino, & Chai, 2008); and the Basic Psychological Needs Satisfaction at Work (Deci & Ryan, 2002).

#### **4.1.1 Participants**

The participants were a convenience purposeful sample (Palinkas et. al., 2016) of six Australian cotton growers located on properties across the inner Darling Downs cotton-growing region in south-east Queensland. All participants were owners of mixed farming operations, consisting of cotton and other summer crops (such as sorghum) as well as winter crops (such as wheat). The participants owned rain-grown, irrigated or a mix of both irrigated and rain-grown properties. All six cotton growers interviewed were male, and the small sample size was considered a pilot, concept-checking exercise. One participant was joined by his wife part-way through the interview. No demographic data were collected.

#### **4.1.2 Measures of the Model Constructs**

The case study measures below were used as part of the pilot, concept-checking exercise before the implementation of the national survey. The interviews were semi-structured, and the following items of the job task list and constructs such as Personality measured by the Big Five Inventory were used as topics for discussion in response to open-ended questions.

##### ***4.1.2.1 Job task list***

A number of cotton-growing tasks provided by Cotton Australia (2013) was discussed with the growers during the interviews. Participants were asked to indicate how relevant the tasks were to their cotton-growing operation.

##### ***4.1.2.2 Personality – Big Five Inventory***

The Big Five Inventory (BFI) is a 44-item measure of personality traits. The BFI was used in this research as its short-phrase items provide detailed examples, such as “I am someone who is original, comes up with new ideas” to avoid misinterpretation, and allows fast administration, a benefit for time-pressure participants (Benet-Martinez & John, 1998, p. 730). The BFI has five subscales: extraversion, agreeableness, conscientiousness, neuroticism and openness.

Agreeableness is described as being altruistic, gentle-minded, trustworthy and modest (John, Naumann, & Soto, 2008). An example item is “I am someone who is generally trusting.” The agreeableness subscale has nine items of which four are reverse-scored.

Conscientiousness is described as having the ability to carry out goal-directed behaviour, such as thinking before acting, following norms and rules, and planning, organising and prioritising tasks (McCrae & Crae, 1988). An example item is “I am someone who does a thorough job”.

According to McCrae & Costa (1988), neuroticism is defined as in contrast to emotional stability and even-temperedness, with negative emotionality such as feeling anxious, nervous, sad and tense. Traditionally, it is the opposite of being stable and even-tempered. An example item is “I am someone who can be tense”. Openness describes the breadth, depth, originality and complexity of an individual (John, Naumann, & Soto, 2008). An example item is “I am someone who is original and comes up with new ideas”.

Extraversion is defined as an energetic approach to work and life situations, with sociable, active, assertive and positive characteristics (John, Naumann, & Soto, 2008). An example item is “I am someone who is talkative”.

The BFI–10 item version was considered for the study; however, as the concept of social science is new to this industry, it was decided that the BFI–44 item with short phrases was clearer for the participants to understand each question in context. The BFI does not use single adjectives as items because items are answered less consistently than when they are accompanied by definitions or phrases (Goldberg & Kilkowski, 1985). While there is a trend for shorter and shorter personality instruments, Rammstedt et al. (2007) also found that abbreviated scales come at a cost.

#### ***4.1.2.3 Outcome Expectations***

This economic, conservation and lifestyle measure was developed to determine if empirical evidence could support distinct economic, conservation and lifestyle values within Australian landholders.

#### ***4.1.2.4 Brief Index of Affective Job Satisfaction***

The Brief Affective Index of Job Satisfaction (BAIJS) is derived from Brayfield and Rothe’s (1951) Job Satisfaction Index and provides a broad

assessment of job satisfaction as an affective, rather than cognitive, construct across differing populations (Thompson & Phua, 2012). There has been much criticism regarding measurement problems in the history of job satisfaction research, as job satisfaction has generally been interpreted in affective terms and measured by cognitive features (Brief & Weiss, 2002). Whether job satisfaction is measured as an affective or cognitive construct influences how it relates to other variables. Affective job satisfaction refers to general satisfaction and is measured on how subjectively and emotively people like their job. (Thompson & Phua, 2012).

#### ***4.1.2.5 Utrecht Work Engagement Scale (UWES)***

This scale measures work engagement as a positive work-related state of fulfilment that is characterised by vigour, dedication and absorption. The UWES was developed in recent times in the context of positive psychology and the positive aspects of work engagement. This includes the three constituent dimensions of work engagement: vigour, dedication and absorption. Originally, the UWES included 24 items, but after psychometric evaluation, seven unsound items were eliminated so that three scales totalling 17 items remained (Schaufeli, Salanova, et al., 2002). Vigour is characterised by high levels of energy and mental resilience while working, the willingness to invest effort in one's work and persistence even in the face of adversity. Dedication is characterised by being strongly involved in work and experiencing a sense of significance, enthusiasm, inspiration, pride and challenge. Absorption is characterised by being fully concentrated and happily engrossed in one's work, whereby time passes quickly, and one has difficulties with detaching oneself from work.

#### ***4.1.2.6 Finametrica Risk Tolerance Questionnaire***

The Finametrica Risk Tolerance Questionnaire (FRTQ) was designed to

measure a participant's comfort level with financial and investment risk. Risk tolerance reflects an individual's values, beliefs and personal goals and overlaps with feelings of confidence and control (Young & O'Neill, 1992).

#### ***4.1.2.7 Basic Psychological Need Satisfaction at Work***

The Basic Psychological Needs Scale measures the extent to which employees experience satisfaction of three intrinsic needs – autonomy, competence and relatedness – in a job. (Deci & Ryan et al., 2001). The Basic Psychological Needs Scale is a family of scales addressing need satisfaction in general and others that refer to specific domains such as work.

### **4.2 PART 1: RESULTS OF CASE STUDY INTERVIEWS**

#### ***4.2.1 Analysis***

The qualitative data were analysed using thematic analysis (Braun & Clarke, 2006) as detailed below. The identified themes informed the modification of the proposed items of the Australian Cotton Grower Self-efficacy measure to successfully grow cotton.

#### ***4.2.2 Aims***

##### *Aim 1. Develop Self-efficacy of Cotton Growing Measure*

All the participants agreed that the task list of cotton-growing activities (Cotton Australia, 2013) (please refer to Appendix C) represented the relevant activities of their cotton-growing operation. The tasks and topics covered include: agronomy; economics; environment; and the social factors listed above. Some example items are “developing a cropping schedule with consultant agronomist”, “energy costs”, “sustainability” and “time for family”.

##### *Aim 2 Face validity of the measures*

Participants indicated that the task list represented the relevant cotton-growing

activities of cotton growing evidenced by a response. However, there were some limitations evident in one of the questionnaires. In the Risk Tolerance questionnaire specifically for self-employed entrepreneurs such as cotton growers, some questions were ambiguous, i.e. Risk Tolerance questionnaire questions 5 and 8 referred to job security. As cotton growers are self-employed, these questions proved to be a challenge. Question 11 asked if growers borrowed money to make an investment. As cotton growing requires large capital investment, the question seemed to be rather obvious.

Congruent with the purpose of face validity, all other questions appeared to measure what was intended as participants had a common understanding of what was being asked, evidenced by a response.

*Aim 3: Personality*

Growers scored higher in extraversion, agreeableness and conscientiousness.

These results are derived from the personality description measure by scoring items from 1) disagree strongly to 5) agree strongly.

Cotton growers scored highest on conscientiousness, with grower 1 to grower 6 scoring in a range from 34 to 54.

Cotton growers scored high on agreeableness, with grower 1 to grower 6 scoring in a range from 33 to 44.

Cotton growers scored high on openness, with growers 1 to 6 scoring 31 to 41.

Cotton growers scored high on extraversion, with growers 1 to 6 scoring high on a range from 23 to 31.

Cotton growers scored low on neuroticism, with growers 1 to 6 scoring in a range from 12 to 24.

The CGEs seemed to be engaged in discussions about each of the items as they

could easily relate to them. Although at first the CGEs were slow to want to discuss how they felt, they seemed very clear about wanting to be able to learn about their decision-making processes and understand their impacts on them and their businesses.

The research was concerned with addressing specific research questions, and the data were analysed with this in mind. For this reason a theoretical thematic analysis was used to establish codes that captured something interesting about the research questions. Open coding was used, meaning that codes could be developed and modified during the coding process. There were initial ideas about codes following the re-reading of transcripts. For example, CGEs were wanting to discuss their own motivation to work and talk about how they felt when making decisions, e.g. these decisions and indecisions were centred around contract planting or owning the latest up-to-date equipment. CGEs' indecision can hinder their work engagement and well-being, issues very relevant to the research questions. These themes were discussed with supervisors, and some preliminary ideas about codes were developed. Following an iterative process of working through each of the transcripts manually, themes were characterised by their significance. Due to the small sample size of participants, there was considerable overlap between the coding stage and identification of themes. The codes were re-examined, and some of them fit into a theme, e.g. several codes related to perceptions of influencers of crop choices and what CGEs wanted to know about what impacts on their decisions. These themes were coded into a theme called purpose of knowing influencers. At the completion of the coding of data into broad themes, it was found that the themes were mostly descriptive of patterns relevant to the research questions.

The final process in the analysis involved gathering all the data for each theme,

and reviewing and modifying them where required. In the analysis process, each theme was inspected to see whether the data could support it and whether the themes worked in the context of the whole dataset, taking into consideration how the themes worked across all six interviews. The themes were then refined to define what each theme explained (Braun & Clarke, 2006 p.92). Each theme was explored to see if themes related to each other and how they related to the main theme. In this analysis, CGEs were interested in exploring what influences their decision-making processes.

The research explored what and how influencers impact on CGE decision-making about crop choice and other general discussions on factors relevant to in-season growing of cotton as they relate to the job task list. General discussion was held around model construct topics of discussion, such as whether CGEs perceive personality and attitude as influencers in their attraction to the industry, how decisions were made in relation to economic, conservation and lifestyle, and CGEs' job satisfaction and work engagement in relation to CGEs choosing to grow cotton.

Table 4.1 *Coding and themes (with examples of CGE comments).*

Theme: Cotton grower employer (CGE) work context during the season of cotton growing  Sub-theme: CGE general discussion relating to influencers of decision-making processes such as heuristics	Theme: Understanding crop choices  Sub-theme: Reasons for understanding more about decision-making processes of crop choice	Theme: Value of the crop choice decision  Sub-theme: The various types of activities that require decisions in the operation of the cotton growing season	Theme: What CGEs want to know about what influences their decision-making processes  Sub-theme: CGEs want to understand how to improve their decision-making processes
“CGEs often base judgement on memory retrieval of the success or failures of past seasons. They don’t seem to see the bias in what actually happened last season” (CA1)	“Overconfidence is usually fuelled by emotion and habit. Many (not all) CGEs are willing to gain a broader view with external consultants” (CA1)	“We love our work so much it can be to our own detriment” (CGE3)	“We know we are biased in our decisions to grow cotton because we seem to still grow it where water is insufficient. Knowing why would be helpful” (CGE1)

### 4.2.3 Results of Job Task List Analysis by Heading

#### *Equipment and maintenance*

Three of the six participants rated equipment and maintenance as “relevant” to their operation. Three of the six participants rated equipment and maintenance as “very relevant”.

#### *Scheduling irrigations*

Four of the six participants rated scheduling irrigations, pests, weeds and diseases check and application as “very relevant”. Two of the six participants rated irrigations, pests, weeds and diseases check and application as “relevant”.

*My BMP (Best Management Practice)*

Two of the six participants rated My BMP as “somewhat relevant”, two of the six participants rated My BMP as “slightly relevant” and two of the six participants rated My BMP as “not relevant”.

*Commodity markets*

Two of the six participants rated commodity markets as “very relevant”, two of the six participants rated commodity markets as “relevant”, one of the six participants rated commodity markets as “somewhat relevant”, one of the six participants rated commodity markets as “slightly relevant” and one of the six participants rated commodity markets as “not relevant”.

*Crop selection and rotation*

One of the six participants rated crop selection and rotation as “very relevant”, and this participant stated that “I do use a consultant actually; he lives around the corner ... he gives you all the upfront details. Nothing’s disguised and hidden. He’s trying to put a [parcel, install] together, and he tells me how much he’s putting together. Whereas no one else does that. The last thing they want to do is tell you. Whereas he just says, ‘That’s what I’m doing’... you’re confident, you think ... yeah, you would trust him, yeah.” Five of the six participants rated crop selection and rotation as “relevant”.

*Developing a cropping schedule with a consultant agronomist*

Two of the six participants rated developing a cropping schedule with a consultant agronomist as “very relevant”. One of the six participants rated developing a cropping schedule with a consultant agronomist as “relevant”, one of the six participants rated developing a cropping schedule with a consultant as “somewhat relevant”, one of the six participants rated developing a cropping schedule with a

consultant as “slightly relevant” and one of the six participants rated developing a cropping schedule with a consultant agronomist as “not relevant” and stated, “Well, we don’t really do one with him. We just do it ourselves, so ... we tell him what we’re going to grow [laughs]”

#### *Government regulations*

Three of the six participants rated government regulations as “somewhat relevant”. Two of the six participants rated government regulations as “slightly relevant” and one participant rated government regulations as “not relevant”.

#### *Droughts, floods*

One of the six participants rated droughts and floods as “very relevant” to his cotton- growing operation. Two of the six participants rated droughts and floods as “somewhat relevant”, two of the six participants rated droughts and floods as “slightly relevant”, and one of the six participants rated droughts and floods as “not relevant”. The variance in this scoring may be a result of the likelihood of droughts and floods. This score may vary for each participant relative to the type of operation, i.e. irrigated would mean the likelihood of flood would be high compared to rain-grown operations where cotton is not grown near water courses or storage.

#### *Time for family*

Four of the six participants rated time for family as “relevant”, with one of these participants suggesting, “Yeah, probably not as much as it should be,” and another “Well, I want to buy another farm, but I can’t let myself do it because I’d see less of my kids. It’s a bad financial decision but I just figure, seen too many people get stuck in that run and then ... the next thing they know, Oh gee, the kid’s 18. It’s too late then ... I’m there; I’ve got flood-free, dry land country just to my southern boundary. It makes brilliant financial sense. But I just think, well, I just can’t do it.

It's not just the workload, it's the ... not that I get stressed but if everything ... if I had another drought or another flood in the next 12 months, I'd be all right the way I am. So, if I got a drought and a flood, I'd lose my flood-prone stuff and I wouldn't have any crop on the drought stuff. I'd be too stressed out." Another one of the six participants rated time for family as "it should be 'very relevant' but it never was; it was 'somewhat relevant'." One participant stated that time for family has changed. "It's probably now 'relevant', but it used to be 'slightly relevant'." Family influence changed participants' relevance regarding time for family.

#### *Insurance*

One of the six participants rated insurance as "relevant", two of the six participants rated insurance as "somewhat relevant", two of the participants rated insurance as "slightly relevant" and another one of the six participants rated insurance as "not relevant".

#### *New varieties*

One of the six participants rated new varieties as "relevant", four of the six participants rated new varieties as "somewhat relevant" and one of the six participants rated new varieties as "not relevant". This participant stated, "No, I'm happy with what I've got. So, if something ... they'd be really impressive for me to change. So probably don't even bother looking at it, yeah."

#### *High quality crops*

One of the six participants rated "high quality crops" as "very relevant", while five of the six participants rated "high quality crops" as "relevant".

#### *Energy costs*

One of the participants rated "energy costs" as "very relevant", and three of the six participants rated "energy costs" as "relevant". One of the six participants rated

“energy costs” as “somewhat relevant” and stated, “I spent \$100,000 on power last year. So, trying to change that. I’m arguing with [Perth Energy] and the solar companies. I’m trying to ... yeah. You can put in small systems at every site, but I just want to put in one system at one site and there’s no legislation that allows that, there’s no ... they basically ... it doesn’t fit the box. Well so I’d get ... I just want to have credits that are closer to what my charge is. Because the transmission costs will be next to nothing and it’s just more practical to have it in one location for theft and everything else. Yeah, they all just go, ‘Oh yeah, no it would be good if we could do that’. I say, ‘Yeah, I know, it would be really, really good if we could do that.’ But it just doesn’t happen.”

#### *Interest rates and finance*

One of the six participants rated interest rates and finance as “relevant”, one of the six participants rated interest rates and finance as “somewhat relevant”, three of the six participants rated interest rates and finance as “slightly relevant” and one participant rated interest rates and finance as “not relevant”.

#### *Sustainability*

Two of the six participants rated sustainability as “very relevant”, three of the six participants rated sustainability as “relevant”, and one participant rated sustainability as “somewhat relevant”.

#### *Finding workers*

One of the six participants rated finding workers as “very relevant”, two of the participants rated finding workers as “somewhat relevant”, three of the six participants rated finding workers as “slightly relevant” and one of the six participants rated finding workers as “not relevant”.

*Ginning contracts*

One of the six participants rated ginning contracts as “relevant”, one of the six participants rated ginning contracts as “somewhat relevant”, three of the six participants rated ginning contracts as “slightly relevant” and one of the six participants rated ginning contracts as “not relevant”.

*Yields*

Four of the six participants rated yields as “very relevant”, one of these four participants suggesting, “Yes, we all want yield, five”. One of the six participants rated yield as “relevant” and the other of the six participants yield as “somewhat relevant”.

*Weather*

One of the six participants rated weather as “very relevant”, two of the six participants rated weather as “relevant”, two of the six participants rated weather as “somewhat relevant” and one of the six participants rated weather as “slightly relevant”.

*Profitability*

Four of the six participants rated profitability as “very relevant”, while two of the six participants rated profitability as “relevant” and “somewhat relevant”.

*Transporting the crop*

One of the six participants rated transporting the crop as “somewhat relevant”, three of the six participants rated transporting the crop as “slightly relevant” and two of the six participants rated transporting the crop as “not relevant”. One of the two participants that rated “not relevant” stated, “I don’t really worry about it; we’ve got all the farm storage for the grain crops and I’ve ... the cotton stuff is pretty well sorted. So, I don’t really ... I don’t even waste any time thinking about it because it’s pretty

well taken care of. So, I don't know whether that's a ... we sell all our grain ex-farm and our cotton is just very reliably picked up by a local freight company. So, I don't spend time thinking about it because I'm surrounded by people who do a good job of it for me. So, if any of them let me down it'd probably be 'very relevant'. But in the circumstances, I'm in it's not really an issue. So, wherever that relates."

#### *Health and mental health*

One of the six participants rated health and mental health as "very relevant", one of the six participants rated health and mental health as "somewhat relevant" and four of the six participants rated health and mental health as "slightly relevant".

#### *Consumer demand*

One of the six participants rated consumer demand as "relevant", three of the six participants rated consumer demand as "somewhat relevant", one of the six participants rated consumer demand as "slightly relevant" and one of the six participants rated consumer demand as "not relevant".

#### *Weeds and diseases*

Two of the six participants rated weeds and diseases as "very relevant", two of the six participants rated weeds and diseases as "relevant" and two of the six participants rated weeds and diseases as "somewhat relevant". This section provides an indication of what CGEs find most relevant.

### **4.3 RESULTS OF PART 1: NATIONAL SURVEY METHOD**

#### **4.3.1 Aim**

To test the Australian Cotton Grower Motivation Model by developing a survey that included questionnaires of six established measures and one developed measure of cotton-growing self-efficacy. The measures in the survey included Self-efficacy of cotton growing questionnaire, Personality questionnaire, Economic,

lifestyle and conservation questionnaire, Job satisfaction questionnaire, Work engagement questionnaire, Risk tolerance questionnaire and Basic needs satisfaction questionnaire.

### **4.3.2 Participants**

All Australian CGEs were sent the national survey online. Thirty-four CGEs responded, and while this may be considered a small number this response rate is considered 'normal' as an industry standard. Participants were Australian cotton growers located on properties across all cotton-growing regions in Australia. The age of participants ranged from thirty-nine to sixty-two years. All participants were owners of mixed farming operations consisting of cotton and other summer crops (such as sorghum) as well as winter crops (such as wheat). The participants owned rain-grown, irrigated or a mix of both irrigated and rain-grown properties. Demographic data were collected for each participant. In some farming operations, males and/or females responded to the survey.

### **4.3.3 Measures**

Seven measures were administered in the national online survey: Self-efficacy of cotton growing; the Big Five Inventory (John, Naumann, & Soto, 2008); the Economic, Conservation Lifestyle Questionnaire (Maybery, Crase, & Gullifer, 2005); The Brief Affective Index of Job Satisfaction (Thompson & Phua, 2012); Utrecht Work Engagement Scale-17 (Schaufelil, Bakker, & Salanova, 2006); Finametrica Personal Financial Risk Tolerance (Faff, Mulino, & Chai, 2008); and the Basic Psychological Needs Satisfaction at Work (Deci & Ryan, 2002).

### ***4.3.3.1 Personality measured by the Big Five Inventory (as described in detail above)***

#### 4.3.3.1.1 Psychometric Properties

**Reliability and Internal Consistency:** Internal Consistency scores were extraversion .85, agreeableness .79, conscientiousness .82, neuroticism .87 and openness .83. The Big Five traits are assumed to be largely independent of one another, although an association between one personality trait and an outcome often depends on other personality traits.

Reliability is the consistency of a measurement process and is important as the indicators specify the extent to which scores are repeatable (John & Martinez, 2000, p. 342). In other words, measuring something several times and having similar or the same results each time with weighty variations indicates that the measure lacks reliability. Reliability is also known to be the ratio of true to observed variance. However, different reliability estimates interpret different sources of variance as “error” variance, e.g. the coefficient of stability, referred to as test-retest reliability, interprets variance specific to time as error variance. The coefficient of stability is an important estimate in personality assessment because high estimates of stability are needed to support the contention that what is being assessed is stable (Thompson, 2003, p. 247/248).

The FFM categorises personality into five broad theoretically and operationally defined dimensions of neuroticism, extroversion, openness, agreeableness and conscientiousness. As such, the reliability of each subscale needs to be considered individually.

**Convergent validity** (the overlap of a construct measure) establishes

measures that are related, and there is the assumption from the pattern of correlations that the items converge on the same thing. The cross-instrument validity correlations were substantial, ranging from .75 to .90. The BFI-TDA (BFI-Big Five Inventory – TDA - Trait Descriptive Adjectives (Goldberg, 1993)) is the most commonly used measure consisting of single adjectives; it has 100 items of personality trait descriptions that measure the Big Five personality traits. Goldberg (1993) developed and refined the TDA to represent adjectives that uniquely defined each of the Big Five factors. The 44-item BFI was developed to create a brief inventory to assess the five factor dimensions without measurement of individual facets. The BFI is used in research where participant time is important, as in the current study, and its short-phrase format provides more context than the TDA single-adjective items. How does it overlap with the BFI? The BFI-TDA convergent validity ranges from .84 to .99 for the five subscales, thus demonstrating strong convergence. The Big Five are independent dimensions that can be measured with convergent and discriminant validity (John et al., 1999).

What is the NEO-FFI (Five Factor Inventory)? In the NEO-FFI, the NEO measures three broad personality dimensions: neuroticism, extraversion and openness to experience (Oliver and Srivastava, 1999), and the FFI-Five Factor Inventory includes the 12 items that loaded most highly on each of the Big Five factors in the development of the 60-item NEO-FFI. The NEO-FFI is a 60-item shortened measure of personality developed from the NEO Personality Inventory (Costa and McCrae, 1995). The measure has five subscales each with 12 items that represent the key elements of each Big Five Factor. Both the NEO-FFI and the BFI were designed to assess the group of traits defined by the Big Five Factor theory of personality; however, there is some variance between the instruments. The first three

of the Big Five (extraversion, agreeableness and conscientiousness) exceed .90, suggesting virtual equivalence among instruments. However, neuroticism was at .88 and openness at .83, theoretically suggesting that these factors are not fully equivalent. NEO-FFI showed greater convergence with the BFI than the TDA, but extraversion and openness are defined differently for these two instruments.

**Reliability and Internal Consistency:** The alpha reliabilities of the BFI scales range from .79 to .88, which is relatively impressive for these short scales. Extraversion, conscientiousness and neuroticism were measured most reliably, whereas agreeableness and openness tended to be less reliable (Oliver and Srivastava, 1999).

**Discriminant Validity:** It is important to know that the variables being measured overlap but are not identical, as a degree of variation is required to give purpose to measuring another variable, not one that is the same. The degree of the relationship between the variables is low across the three instruments (BFI, NEO, TDA, and Goldberg, 1993; John, 1990; Saucier & Ostendorf, 1999). Trait adjectives related to warmth correlate more highly with agreeableness than with extraversion (John, Naumann, & Soto, 2008), and openness is interpreted by Goldberg (1992) as intellect or imagination (Saucier, 1992). The degree of the relationship between agreeableness and conscientiousness is .26, for agreeableness and neuroticism is .26, for conscientiousness and neuroticism is .26, and for extraversion and neuroticism is .25; therefore, these findings do not support Eysencks' (1992) contention that agreeableness and conscientiousness are highly correlated "primary" traits that should be combined into a broader dimension (Oliver & Srivastava, 1999). The Big Five dimensions scale inter-correlations of .31 are statistically significant (John, Naumann, & Soto, 2008). The BFI and NEO-FFI

measured at .20 and the TDA at .16 respectively. The largest correlations for the BFI were .31, for NEO-FFI .34 and for the TDA .30.

In the US and Canadian samples, the alpha reliabilities range from .75 to .90. The three-month test-retest reliabilities range from .80 to .90 (Oliver & Srivastava, 1999).

#### *4.3.3.2 Outcome Expectations (as described in detail above)*

This economic, conservation and lifestyle measure was developed to determine if empirical evidence could support distinct economic, conservation and lifestyle values within Australian landholders. The measure comprised 15 items with subscales of economics, lifestyle and conservation. The subscale for economics consisted of four items (one was removed due to ambiguity). It was decided in the development of the survey that the question, “Money and profit are not the most important things about farming”, was ambiguous as it showed a much lower loading than the other four items. There were five items for each of the subscales, conservation and lifestyle. The response scale is a five-point Likert scale ranging from (1) disagree strongly to (5) agree strongly. An example of an item is “I view my farm as first and foremost a business enterprise”.

##### 4.3.3.2.1 Psychometric Properties

**Reliability and internal consistency:** The Cronbach alpha reliabilities are .65, .78 and .80 for conservation, economics and lifestyle subscales respectively. While the Cronbach’s alpha showed the internal reliabilities of both economic and lifestyle measures to be very good, the reliability of the conservation factor being lower at .65 is acceptable, showing that the independence of the conservation factor was less clear. Only two of the five conservation items had loadings that were distinct from the lifestyle factor. Of the remaining 3 items, one had a lower cross-loading, and the

remaining 2 items had their highest loading on the lifestyle factor. These cross-loadings were also indicated by a moderate to stronger correlation between the two factors; taken together, these findings suggest some conceptual overlap of conservation with lifestyle values (Maybery et al., 2005).

### ***Overall***

While landholders' conservation views are separate from economic values, there is overlap with lifestyle values. Landholder values for farms regarding economic and lifestyle are found to be mostly independent of other objectives landholders may hold. This research supports the previous psychology and sociology literature that indicates farmers' values can be classified into distinct entities. Identifying these basic values gives clarity to policy approaches for understanding landholder decision-making.

### ***Limitations***

Future research is required to examine the construct validity and other types of reliability and validity; however, caution is needed when measuring values versus attitudes, intentions and behaviours (Maybery et al., 2005). For example, construct validity is unable to be assessed as there is no discriminant validity. Convergent and divergent validity cannot be reported as no other scales are available for comparison.

#### ***4.3.3.3 Brief Index of Affective Job Satisfaction (as described in detail above)***

The Brief Affective Index of Job Satisfaction (BAIJS) is a measure derived from Brayfield and Rothe's (1951) 18-item Job Satisfaction Index and provides a broad assessment of job satisfaction as an affective, rather than cognitive, construct across differing populations (Thompson & Phua, 2012). There has been much criticism regarding measurement problems in the history of job satisfaction research as job satisfaction has generally been interpreted in affective terms and measured by

cognitive features (Brief & Weiss, 2002). Whether job satisfaction is measured as an affective or cognitive construct influences how it relates to other variables. Affective job satisfaction refers to general satisfaction and is measured on how subjectively and emotively people like their jobs. The 7-item measure has four affective job satisfaction items with three distracter items (e.g. “My job needs me to be fit”) (Thompson & Phua, 2012).

Items are measured with a five-point Likert scale ranging from (1) disagree strongly to (5) agree strongly. An example item is “I find real enjoyment in my job”. There are no reverse-scored items in this measure.

#### 4.3.3.3.1 Psychometric Properties

**Reliability and Internal Consistency:** As Staw (1984) found, the assumption that everyone desires what some deem an interesting job is entirely normative, i.e. some may find a job boring but be quite satisfied with it because it offers little challenge, change or need for effort. The 4-item scale’s internal consistency was .85 for the whole sample and respectively .80 for Hong Kong and .86 for Australian subsamples.

#### ***Validity***

When developing a maximally affective, minimally cognitive brief job satisfaction measure, Thompson and Phua (2012) began with an analysis of the psychometric performance of Price and Muellers’ (1981) job satisfaction measure. During this analysis, the removal of non-IJS-derived items added substantially to internal consistency reliability. The item, “I would not consider taking another kind of job”, was dropped as it was statistically and theoretically distinct from affective job satisfaction, resulting in the remaining four items improving Cronbach’s alpha for Australia to .85. To further increase both content validity and internal

consistency reliability, the item, “I am seldom bored with my job”, was revealed to weaken the Cronbach’s alpha and did not reduce content validity. However, the item conceptually referred to cognitive interest rather than purely tapping affective satisfaction, and therefore it was decided that this item also be removed. The remaining four items have strong face validity, each directly addressing affective job satisfaction and each contributing independently to internal consistency reliability, suggesting that each item has strong content validity and uniquely captures different elements of affective job satisfaction content.

#### ***Test-retest***

A retest instrument was sent three months after the test-study to ensure that sufficient time had lapsed for participants not to remember their initial response and to ensure that the nature and circumstances of respondents’ jobs were similar. A single administration produced returns that could with certainty be matched to specific individual’s initial responses. The correlation between test and retest scores was .57 with strong temporal stability.

#### ***Limitations***

The Index of Job Satisfaction measure was developed sampling managers and rank- and-file workers; validation could be extended across other populations (Thompson & Phua, 2012, p. 300).

#### ***4.3.3.4 Utrecht Work Engagement Scale (UWES) (as described in detail above)***

This scale measures work engagement as a positive work-related state of fulfilment that is characterised by vigour, dedication and absorption. The UWES was developed in recent times in the context of positive psychology and the positive aspects of work engagement. This includes the three constituting dimensions of work engagement: vigour, dedication and absorption. Originally, the UWES

included 24 items, but after psychometric evaluation, seven unsound items were eliminated so that three scales totalling 17 items remained (Schaufeli, Salanova, et al., 2002). Vigour included six items characterised by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of adversity. Dedication included five items characterised by being strongly involved in work and experiencing a sense of significance, enthusiasm, inspiration, pride and challenge. Absorption included six items characterised by being fully concentrated and happily engrossed in one's work, whereby time passes quickly, and one has difficulties with detaching oneself from work.

The UWES is a 17-point scale, and all items are scored on a 7-point rating scale ranging from 0) never, 1) almost never to 6) always (every day). Participants were asked if they had never had this feeling to indicate with a zero (0), and if they did have this feeling to indicate how often they felt this way by indicating how frequently they felt that way. An example item is "At work I feel bursting with energy". Scoring is calculated by three subscale groups of vigour, dedication and absorption. Each item is classified under these headings. These subscales reflect the underlying dimensions of engagement: vigour=VI (6 items), dedication=DE (5 items) and absorption=AB (6 items).

#### 4.3.3.4.1 Psychometric Properties

**Reliability and Internal Consistency:** The internal consistency of the UWES is high, with Cronbach's alpha values of .80–.90, with vigour .75–.83, dedication .86–.90 and absorption .82–.88. The Cronbach's alpha ranges for vigour, dedication and absorption refer to ten different international populations (P. Sepala et al., 2008, Schaufeli & Bakker, 2004). Work engagement can be used both as a one-

dimensional and a three-dimensional construct. High correlations between the three factors (.83 to .97) indicate a substantial overlap between them and restrict their use as separate dimensions, suggesting a one-dimensional structure. However, the better fit with the three-factor correlated data suggests otherwise. Therefore, if the research interest is in work engagement in general, then a combined one-dimensional variable would be used. In the study of work engagement factors, then three separate dimensions would be used.

Interestingly, however, men score significantly higher than women on dedication and absorption, and yet there were no gender differences in levels of vigour. In professional groups, managers, executives and farmers score relatively high on engagement, suggesting that these jobs are more challenging, with complex job resources (job resources are known to be positively related to work engagement) compared to others (Schaufeli & Bakker, 2004).

#### ***Test-retest reliability***

Two aspects of reliability are considered: internal consistency and test-retest reliability, also called stability. The UWES was administered twice, with an interval of one year. As a result of two longitudinal studies in Australian and Norwegian samples, there were no large differences in stability, except for vigour being slightly more stable across time (Schaufeli & Bakker, 2004).

#### ***Discriminant validity***

Several studies using confirmatory factor analysis (CFA) have provided evidence on the three-factor structure of the UWES and have supported the theoretically based three-factor structure of the UWES17 (Hallberg & Schaufeli, 2006; Schaufeli et al., 2002b, 2006). These studies showed that the three factors of work engagement are highly interrelated, and because of these high correlations, an

alternative one-factor structure UWES-9 was also tested. In all these studies the theoretically based correlated UWES-17 three-factor structure has shown a significantly better fit with the data than the one-factor structure.

#### ***4.3.3.5 Finametrica Risk Tolerance Questionnaire (as described in detail above)***

The Finametrica Risk Tolerance Questionnaire (FRTQ) was designed to measure a participant's comfort level with financial and investment risk. Risk tolerance reflects an individual's values, beliefs and personal goals, and overlaps with feelings of confidence and control (Young & O'Neill, 1992).

The FRTQ was developed in the late 1990s based on 4000 participants from Australia and New Zealand and has been administered in 14 different countries, with the database consisting of over 400,000 cases. However, only five countries – Australia, New Zealand, the US, UK and Canada – had sufficient data for analysis (Earl et al., 2015).

The FRTQ measures risk tolerance with 25 multiple choice questions. An example item is “Compared to others, how do you rate your willingness to take financial risks?” There are different scores used to measure risk: raw scores, which are the number of actual answers chosen; Z scores (the rescaled score that allows comparison across questions); and the sum of the Z scores, which gives a score that combines the Z scores excluding the “covariance factor”. The algorithm-based score is the sum of Z scores divided by the “covariance factor” (this way all 25 questions are weighted equally) (Earl, J et al., 2015). The Z scores can then be calculated to produce a final score mapped between 0 and 100 with a mean risk score of 50 and a standard deviation of ten. The final score calculated provides a measure of risk tolerance i.e., scores above 50 mean above average risk tolerance, and scores below

50 mean below average risk tolerance.

#### 4.3.3.5.1 Psychometric Properties

**Reliability and Internal Consistency:** Reliability determines whether a person gets the same score under the same circumstances (the questionnaire measures risk tolerance consistently). In general, the reliability of the measure remains excellent at .90 in terms of international benchmarks for reliability set at .80 when Cronbach's alpha is calculated using standardised scores with all variables, with a mean of zero and a standard deviation of 1. Cronbach's alpha coefficients close to one indicate a high degree of correspondence between items and an internally consistent scale (Earl et al., 2015). To test the reliability of the FRTQ, analyses were performed on the total dataset, removing Question 24 (reverse-scored) and the dichotomous variable Question 11. Question 24 appeared inconsistent in the data during testing, possibly because some people may not have noticed that the direction of the responses were in the opposite direction to other questions. Also, as this question pertains to how much insurance a person has to cover a wide variety of life's major risks such as theft, fire, accident, illness and death, it may be that what is being evaluated is knowledge about own insurance rather than risk tolerance. The results of the reliability analyses indicate that the removal of Question 24 slightly increases the reliability of the measure, and Question 11 was also not included in the final reliability analyses. The measure maintains excellent reliability (exceeding all benchmarks) and includes both Question 24 and Question 11.

#### *Test-retest reliability*

Test-retest reliability identifies that when a person completes the test once and then again, the results are not significantly different (they score similarly on the first and second test). The test-retest reliability (the correlations of tests taken by the same set of subjects

over a period) points to the high stability of the FRTQ measure. The time frame for analyses was 2010 and 2011, and the dataset consisted of 79,602 cases overall with reference to 12 different countries (Earl et al., 2015).

#### ***Discriminant validity***

A valid questionnaire measures what it claims to measure. Construct validity of the scale can be measured using Principal Component Analysis. The results of the Principle Component Analysis indicate that the FRTQ measures one very dominant factor: Risk Tolerance (Earl, J et al., 2015). Inter-correlation compares two items in the scale, showing the similarity between the two items.

#### ***4.3.3.6 Basic Psychological Need Satisfaction at Work (as described in detail above)***

The Basic Psychological Needs Scale measures the extent to which employees experience satisfaction of three intrinsic needs – autonomy, competence and relatedness – in a job. (Deci & Ryan et al., 2001). The Basic Psychological Needs Scale is a family of scales addressing need satisfaction in general and others that refer to specific domains such as work.

The original scale had 21 items concerning the three needs for competence, autonomy and relatedness. The response scale includes a seven-point Likert scale: 1) not at all true to 7) very true. An example is “I feel like I can make a lot of input to deciding how my job gets done”. Three subscale scores are averaged, and each reverse-scored item should be reversed by subtracting the person’s response from 8, and the subscales are Autonomy 1, 5, 8, 11, 13, 17, 20; Competence 3, 4, 10, 12, 14, 19; and Relatedness 2, 6, 7, 9, 15, 16, 18, 21.

##### **4.3.3.6.1 Psychometric Properties**

**Reliability and Internal Consistency:** The reliability of autonomy, competence and relatedness satisfaction scales measure is good, with scores of .81, .85 and .82

respectively.

#### *4.3.3.7 Self-efficacy of cotton growing*

The cotton-grower self-efficacy measure defined 14 tasks of cotton growers required to grow cotton in a season. Participants were asked to indicate their level of confidence in each activity by using a five-point Likert scale ranging from (1) not confident to (5) very confident.

#### *4.3.3.8 Big Five Inventory*

The BFI is a 44-item measure of personality traits. The BFI was used in this research as its short-phrase items provide detail. An example is “I am someone who is original and comes up with new ideas”. This avoids misinterpretation and allows fast administration, a benefit for time-pressured participants (Benet-Martinez & John, 1998, p. 730). Items are measured with a five-point Likert scale ranging from (1) disagree strongly to (5) agree. The BFI has five subscales: extraversion, agreeableness, conscientiousness, neuroticism and openness.

Agreeableness is described as being altruistic, gentle-minded, trustworthy and modest (John, Naumann, & Soto, 2008). An example item is “I am someone who is generally trusting”. The agreeableness subscale has nine items; four are reverse-scored.

Conscientiousness is described as having the ability to carry out goal-directed behaviour, such as thinking before acting, following norms and rules, and planning, organising and prioritising tasks (John, Naumann, & Soto, 2008). An example item is “I am someone who does a thorough job”. The conscientiousness subscale has nine items; four are reverse-scored.

According to John et al. (2008), neuroticism is defined as contrasting with emotional stability and even-temperedness, with negative emotionality such as

feeling anxious, nervous, sad and tense. Traditionally, it is the opposite of being stable and even-tempered. An example item is “I am someone who can be tense”. The neuroticism subscale has eight items; three are reverse-scored.

Openness describes the breadth, depth, originality and complexity of an individual (John, Naumann, & Soto, 2008). An example item is “I am someone who is original, comes up with new ideas.” The openness subscale has ten items; two are reverse-scored.

Extraversion is defined as an energetic approach to work and life situations, with sociable, active, assertive and positive characteristics (John, Naumann, & Soto, 2008). An example item is “I am someone who is talkative”. The extraversion subscale has eight items; two are reverse-scored.

The BFI-10 item version was considered as a measure for the study; however, as the concept of social science is new to this industry, it was decided that the BFI-44 item with short phrases was clearer for the participants to understand each question in context. The BFI does not use single adjectives as items because items are answered less consistently than when they are accompanied by definitions or phrases (Goldberg & Kilkowski, 1985). While there is a trend for shorter and shorter personality instruments, Rammstedt et al., (2007) found that abbreviated scales come at a cost. The BFI-10 possesses acceptable psychometric properties; however, there are substantial losses in comparison to the full-scale BFI. (Rammstedt et al., 2007; Gosling et al., 2003).

#### 4.3.3.8.1 Variable computation

Data from the BFI were used to compute variables measuring the Big Five dimensions of personality: extraversion, agreeableness, conscientiousness, neuroticism and openness. Prior to the computation of the Big Five, reverse-scoring

was performed on items as required.

Groups identified in the Maybery et al. questionnaire were used to compute the variables categorising farming values as economic, lifestyle and conservation.

Overall job satisfaction was computed from four items as per the Brief Index of Affective Job Satisfaction (BIAJS).

The three aspects of work engagement as assessed by the UWES were used to compute variables measuring vigour, dedication and absorption. The Finametrica risk profiling system was used to compute a score of each individual's personal financial risk tolerance. One item in the risk tolerance section of the questionnaire (RT40\_Insurance) had no responses. This was a survey data collection error. To calculate a risk tolerance score for each respondent, it was necessary to input a value to RT40\_Insurance for each respondent. To negate bias, a fixed value (1="low") was input.

The Basic Psychological Needs (BPNS) at work scale was used to compute the variables, competence, autonomy and relatedness. Items worded in the negative direction were reverse-scored prior to computation of the variables.

## **4.4 RESULTS OF SURVEY**

### **4.4.1 Results and data preparation**

The survey was emailed to 400 cotton growers, and a total of 38 responses were received (response rate = 9.5%). Cases were excluded for not being a "grower" ( $n=1$ ), not answering any of the questionnaire ( $n=1$ ) or answering the questionnaire twice ( $n=2$ ). Cases were also removed for having substantial (> 80%) missing data across the questionnaire ( $n=10$ ). For some cases, this appeared to be dependent upon where the larger questions were placed in the survey, as well as the possibility of lack of continued interest, as only the first parts of the questionnaire had been completed. This left the dataset with a total of 24 cases

( $n=24$ ).

#### ***4.4.1.1 Missing data***

Little's Missing Completely at Random (MCAR) test was not significant (Chi-Square = 134.306, DF = 1456, Sig. = 1.000), indicating that data were randomly missing. As mentioned, 10 cases were removed for substantial missing data; re-running Little's MCAR after removal of these cases continued to be nonsignificant (Chi-Square = .000, DF = 1249, Sig. = 1.000).

To maximise the number of cases available for analysis, two cases were retained that had not completed whole sections. These cases were managed with pairwise deletion for all analyses outside the Exploratory Principal Components Analysis (PCA).

All other missing data comprised small amounts (see Table 4.2); given the small proportion (.2%) and randomness of the missing values, mean replacement was used to manage this.

One item in the Risk Tolerance (RT) section of the questionnaire (RT40\_Insurance) had no responses. This was a survey data collection error. To calculate a Risk Tolerance score for each respondent it was necessary to input a value to RT40\_Insurance, for each respondent. To negate bias, a fixed value (1= "low") was input.

Table 4.2 *Sample Size and Missing Values*

	<b>Participant Data</b>	<b>SE</b>	<b>BFI</b>	<b>Values</b>	<b>JS</b>	<b>WE</b>	<b>RT</b>	<b>BPNS</b>
Sample size used for analysis	24	24	24	24	24	23	22	22
No. of items within section	9	15	44	17	7	17	24	21
No. of cells within section replaced with mean	0	1	2	0	2	1	2	1

#### ***4.4.1.2 Outlying data***

To assess outliers, Z scores were calculated for each variable included in the analysis. All Z scores were within three standard deviations of the mean; therefore, no outlying responses were found.

#### ***4.4.1.3 Normality***

No computed variables violated the assumption of normality.

#### ***4.4.1.4 Multi-collinearity and singularity***

Bivariate Pearson's Correlations revealed no relationships among the computed variables at .9 or higher, indicating that multi-collinearity and singularity were not present.

Bivariate Pearson's Correlations across the 15 Self-efficacy items (please refer to Appendix A for item descriptions) revealed multi-collinearity ( $r=.97$ ) between Item 12 (Bounce back) and Item 13 (Recover from Setbacks). Multi-collinearity ( $r=.91$ ) was also identified between Item 9, "Interpret Tools", and Item 10, "Carry out tasks". The Self- efficacy (SE) items are used in PCA, at which point the decision regarding which item from each pair to be removed was made. The steps for this

decision are described in the PCA section below.

#### **4.4.2 Descriptive statistics**

##### ***4.4.2.1 Years of experience***

Of the 24 cases, 63% ( $n=15$ ) had 20+ years of experience in the industry as a grower. This group are older on average ( $M=54.7$ ,  $SD=6.8$ ) than those who have been in the industry less than 20 years ( $M=37.9$ ,  $SD=2.9$ ,  $n=9$ ).

##### ***4.4.2.2 Retention***

For the purposes of the current study, retention was measured by the question “How long do you plan to stay in the cotton industry?” The responses were 1–4 years ( $n=1$ ), 5–9 years ( $n=4$ ), 10–19 years ( $n=5$ ) and 20+ years ( $n=14$ ). Due to the small sample sizes for 1–4 years, 5–9 years and 10–19 years, it was decided that to enable comparison between the groups the respondents need to be grouped as less than 20 years ( $n=10$ ) and 20 or more years ( $n=14$ ).

Of the 24 cases, 58.3% ( $n=14$ ) reported that they were planning to stay in the cotton industry for 20 or more years. This group are younger on average ( $M=44.3$ ,  $SD=8.9$ ) than those who were planning to stay in the industry for less than 20 years ( $M=54.1$ ,  $SD=8.8$ ,  $n=10$ ). The small number of respondents planning to leave in the short term (less than 5 years) limited any further analysis with respect to retention. Of those who have been in the industry less than 20 years ( $n=9$ ), 8 (89%) were planning to stay longer than 20 years.

##### ***4.4.2.3 Self-efficacy***

Of the total sample, respondents are most confident with Item 9, “Interpreting tools to understand environmental conditions” ( $M=3.3$ ,  $SD=.9$ ,  $Mode=4$ ,  $Range=3$ ), and least confident with Item 4, “Accessing external marketing assistance to achieve the best financial outcome” ( $M=2.6$ ,  $SD=1.1$ ,  $Mode=3$ ,  $Range=3$ ). This indicates that

cotton growers have highest self-efficacy in a physical aspect of cotton growing.

#### 4.4.2.4 Big Five Inventory

The participants (N=24) are high in computed “agreeableness” (M=4.1, SD=.4) and low in computed “neuroticism” (M=2.5, SD=.5). This sample of cotton growers are more agreeable, i.e. kind, co-operative, polite and trustful and less neurotic. Please refer to Figure 4.1 for a graphical representation of the computed BFI subscales.

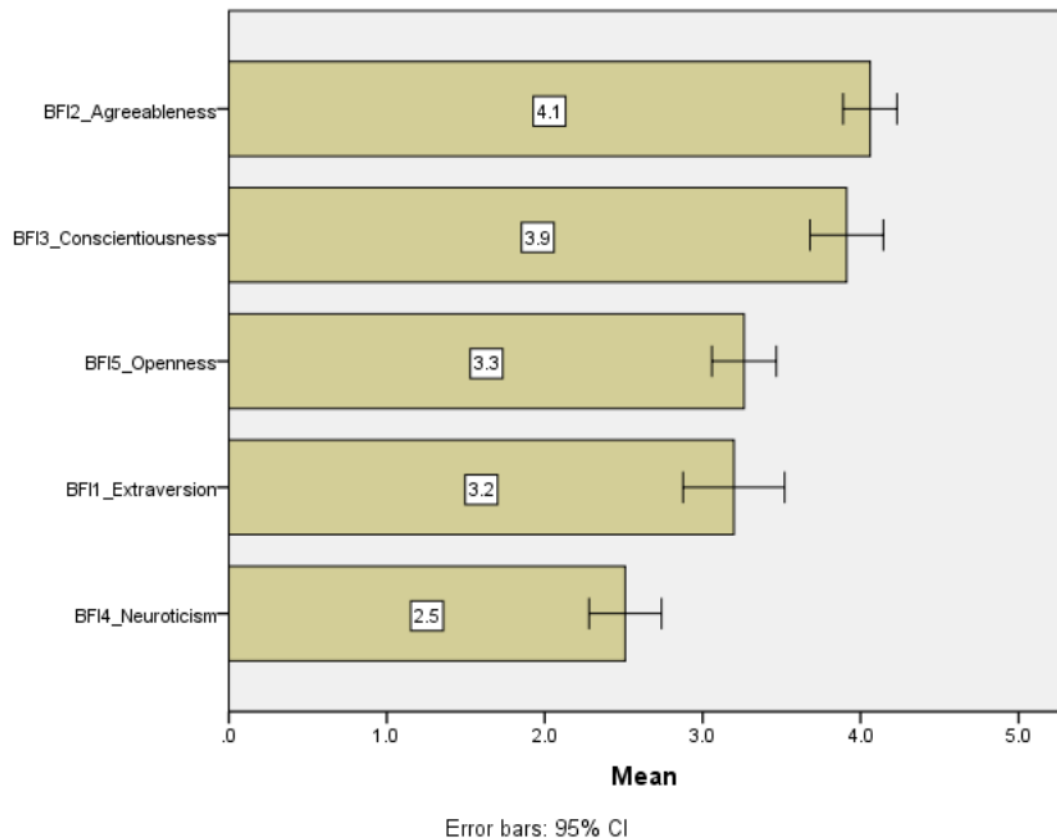


Figure 4.1. Error Bar chart of the computed Big Five Inventory subscales.

#### 4.4.2.5 Values

The participants agreed most strongly with the environmental value item, “I like to look after my land, making it work for me, without destroying it”. The responses to this item ranged from (3) neither agree nor disagree to (5) agree strongly; therefore, no participants disagreed with the statement (M=4.7, SD=.6).

*Mode=5*).

The participants least agreed with the lifestyle value item, “We do not make a fortune from farming, but the lifestyle is great”. The responses to this item ranged from (1) disagree strongly to (5) agree strongly ( $M=3.2$ ,  $SD=1.0$ ,  $Mode=4$ ). This sample of cotton growers indicated most agreement with an environmental value and least agreement with a lifestyle value. Further research in this area could determine evidence to support significant differences in the values of cotton growers.

#### ***4.4.2.6 Job Satisfaction***

Participant responses ( $N=24$ ) on the computed overall “job satisfaction” scale were shown to range from (3) neither agree nor disagree, to (5) agree strongly; therefore, no participants were dissatisfied with their job ( $M=4.1$ ,  $SD=.6$ ). This indicated that this sample of cotton growers was reasonably satisfied with their job.

#### ***4.4.2.7 Work Engagement (WE)***

Of the three WE subscales (vigour, dedication and absorption), the participants had the highest mean score on the dedication subscale ( $M=4.7$ ,  $SD=.9$ ,  $N=23$ ). This subscale was made up of five items, “I find the work that I do full of meaning and purpose”, “I am enthusiastic about my job”, “My job inspires me”, “I’m proud of the work that I do” and “To me my job is challenging”. This indicated that this sample of cotton growers is higher in dedication than in vigour and absorption.

#### ***4.4.2.8 Risk Tolerance***

The average risk tolerance score for the cotton growers in the sample is ( $M=54.9$ ,  $SD=7.9$ ,  $N=22$ ). The distribution of risk tolerance is normal (see Figure 4.2). This would indicate that the number of growers who are less risk-tolerant than average equals the number of growers who are more risk-tolerant than average.

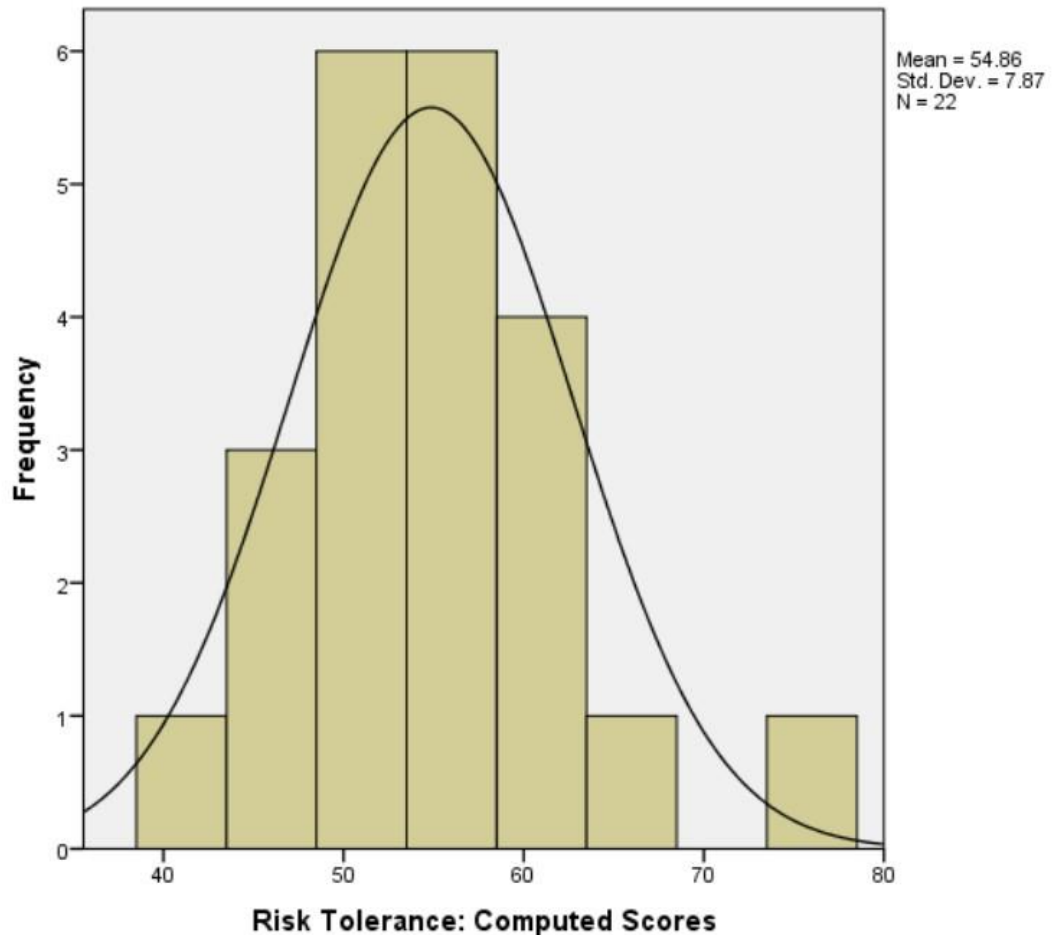


Figure 4.2. Histogram of the computed risk tolerance.

#### 4.4.2.9 Basic Psychological Needs Satisfaction (BPNS)

Participants had the highest mean score on the BPNS Autonomy item, “There is opportunity for me to decide how to go about my work” ( $M=6.4$ ,  $SD=.8$ ,  $N=22$ ). The minimum value for the BPNS subscales (autonomy, competence and relatedness) was (4) somewhat true, and the mean scores were all similar and high (autonomy:  $M=5.7$ ,  $SD=.9$ , competence:  $M=5.6$ ,  $SD=.7$ , relatedness:  $M=5.8$ ,  $SD=.8$ ). This indicated that this sample of cotton growers display a high degree of satisfaction in all areas of autonomy, competence and relatedness.

#### 4.4.3 Principal Components Analysis (PCA)

The self-efficacy items were entered into PCA to reduce the correlated items into a smaller subset of variables that best explained SE. The sample size ( $n=24$ ) is small for PCA, (Lin, L, 2018; Parinet et al., 2004); however, it was decided to explore the solution and interpret the results with caution.

Initially, the factorability of the 15 SE items was examined. Several criteria for the factorability of a correlation matrix were used. First, it was observed that all items correlated at least .4 with one other item (refer to Table 4.3). However, two pairs of correlations were  $> .9$  indicating multi-collinearity, and therefore a decision needed to be made to remove one item from each pair. The decision regarding which variables to remove was guided by the Kaiser-Meyer-Olkin (KMO) with the aim to achieve the highest possible value above the “acceptable” .60 (Tabachnick & Fidell, 2001).

Removing items 10 and 12 resulted in a KMO of .60, removing items 10 and 13 resulted in a KMO of .52, removing items 9 and 13 resulted in a KMO of .61 and removing items 9 and 12 resulted in a KMO of .64. Therefore, item 9 (Interpret tools) and item 12 (Bounce back crop) were removed from the PCA.

With the removal of items 9 and 12, Bartlett’s test of sphericity was significant ( $\chi^2(78) = 233.29, p < .01$ ), providing a further indicator that the data were suitable for PCA (Parinet, B et al., 2004).

Finally, the communalities were all above .5 (refer to Table 4.4), confirming that each item shared some common variance with other items. The high communalities and high loadings support the case for “strong data”, and so PCA was deemed to be suitable with 12 items although results are treated with caution.

Table 4.3 *Correlation Matrix of the 15 SE Items (Please also refer to Item Descriptions in Appendix A)*

	<b>Item 1</b>	<b>Item 2</b>	<b>Item 3</b>	<b>Item 4</b>	<b>Item 5</b>	<b>Item 6</b>	<b>Item 7</b>	<b>Item 8</b>	<b>Item 9</b>	<b>Item 10</b>
Item1	1	0.56	0.53	0.16	0.22	0.47	0.18	0.09	0.37	0.25
Item2	.56	1	0.87	0.48	0.22	0.27	0.15	0.47	0.25	0.10
Item3	0.53	0.87	1	0.45	0.28	0.35	0.14	0.48	0.29	0.25
Item4	0.16	0.48	0.45	1	0.31	0.30	0.35	0.43	0.44	0.37
Item5	0.22	0.22	0.28	0.31	1	0.68	0.72	0.14	0.78	0.78
Item6	0.47	0.27	0.35	0.30	0.68	1	0.51	0.16	0.75	0.80
Item7	0.18	0.15	0.14	0.35	0.72	0.51	1	0.41	0.71	0.68
Item8	0.09	0.47	0.48	0.43	0.14	0.16	0.41	1	0.18	0.13
Item9	0.37	0.25	0.29	0.44	0.78	0.75	0.71	0.18	1	0.91
Item 10	0.25	0.10	0.25	0.37	0.78	0.80	0.68	0.13	0.91	1
Item 11	0.72	0.57	0.54	0.26	0.33	0.46	0.36	0.13	0.54	0.46
Item 12	0.60	0.22	0.26	0.24	0.48	0.35	0.63	0.13	0.49	0.49

	<b>Item 1</b>	<b>Item 2</b>	<b>Item 3</b>	<b>Item 4</b>	<b>Item 5</b>	<b>Item 6</b>	<b>Item 7</b>	<b>Item 8</b>	<b>Item 9</b>	<b>Item 10</b>
Item 13	0.63	0.29	0.27	0.27	0.56	0.43	0.65	0.13	0.56	0.50
Item 14	0.67	0.32	0.27	0.29	0.38	0.32	0.49	0.15	0.43	0.33
Item 15	0.55	0.38	0.34	0.28	0.16	0.41	0.34	0.24	0.40	0.35

Table 4.4 *Pattern Matrix Based on a PCA with Oblimin Rotation for 13 Items from the Self-efficacy Scale (N=24)*

	<b>Component 1</b>	<b>Component 2</b>	<b>Component 3</b>	<b>Communalities</b>
SE11_ManageStaff	0.88	-0.06	0.10	.88
SE14_BounceBackPersonal	0.87	-0.15	-0.11	.82
SE1_ProduceForProfit	0.87	0.11	0.11	.76
SE15_MaintainLoyalty	0.77	-0.03	0.07	.64
SE13_RecoverFromSetbacks	0.71	-0.40	-0.14	.80
SE10_CarryOutTasks	0.05	-0.90	-0.01	.84
SE5_HandleOwnMktg	-0.01	-0.90	0.04	.81

	<b>Component 1</b>	<b>Component 2</b>	<b>Component 3</b>	<b>Communalities</b>
SE7_TrustGut	.06	.84	.04	.75
SE6_ManageCrops	.18	.70	.10	.65
SE3_ClarifyExternal	.27	.10	.82	.82
SE2_ConsultFinancial	.35	.20	.81	.87
SE8_FollowAdvice	.18	.13	.78	.60
SE4_AccessAssistance	.08	.30	.64	.54

PCA was used because the primary purpose was to reduce the multiple SE variables into fewer components and compute mean scores to be used in correlation analysis. Initially, a varimax rotation was used as this is considered a good general approach that simplifies the interpretation of the factors. Following the varimax rotation, an oblimin rotation was conducted as it was expected that the components would be correlated. The oblimin rotation confirmed there was correlation between the components (refer to Table 4.5) and therefore all further analysis was carried out using the oblimin rotation.

Three components were extracted with eigenvalues  $> 1$ . Item 13 (Recover from setbacks) was eliminated because it did not contribute to a “simple” component structure in particular with high cross-loadings of .71 and -.40 on components 1 and 2 of the three-factor oblimin solution, respectively (See Table 4.5).

Table 4.5 *Component Correlation Matrix Based on PCA with Oblimin Rotation for 13 SE Items*

Component	1	2	3
1	1.00	-.35	.30
2	-.35	1.00	-.23
3	.30	-.23	1.00

For the final stage, a PCA of the remaining 12 items using oblimin rotation was conducted. A three-factor solution was examined based on eigenvalues  $> 1$  (refer to Table 4.6). The scree plot, however, levelled off after four factors (refer to Figure 4.3), and so a four-factor solution was also examined (refer to Table 4.6).

Table 4.6 *Pattern Matrix and Communalities Based on a PCA with Oblimin Rotation for 12 Items from the Self-efficacy Scale (N=24). 3 Components Extracted*

	<b>Self-evaluative</b>	<b>Physical</b>	<b>Social</b>	<b>Communalities</b>
SE11_ManageStaff	0.88	-0.10	0.06	.88
SE1_ProduceForProfit	0.87	0.07	0.07	.77
SE14_BounceBackPersonal	0.82	-0.19	-0.10	.76
SE15_MaintainLoyalty	0.79	-0.08	0.02	.68
SE10_CarryOutTasks	0.08	-0.92	-0.05	.87
SE5_HandleOwnMktg	-0.02	-0.89	0.04	.80
SE7_TrustGut	0.01	-0.83	0.08	.73
SE6_ManageCrops	0.23	-0.72	0.03	.69
SE8_FollowAdvice	-0.20	-0.09	0.81	.63
SE2_ConsultFinancial	0.37	0.20	0.79	.86
SE3_ClarifyExternal	0.30	0.10	0.79	.81
SE4_AccessAssistance	-0.08	-0.28	0.65	.56

Table 4.7 *Pattern Matrix Based on a PCA with Oblimin Rotation for 12 Items from the Self-efficacy Scale (N=24). 4 Components Extracted*

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
SE14_BounceBackPersonal	0.96	-0.01	0.05	0.15
SE15_MaintainLoyalty	0.90	0.07	0.10	0.04
SE11_ManageStaff	0.79	-0.13	-0.10	-0.25
SE1_ProduceForProfit	0.64	-0.08	-0.27	-0.45
SE10_CarryOutTasks	0.03	-0.94	0.00	0.07
SE5_HandleOwnMktg	-0.08	-0.93	0.05	0.01

	1	2	3	4
SE6_ManageCrops	0.04	-0.87	-0.14	-0.21
SE7_TrustGut	0.26	-0.59	0.42	0.37
SE8_FollowAdvice	0.03	0.11	0.88	-0.14
SE4_AccessAssistance	0.01	-0.19	0.62	-0.22
SE3_ClarifyExternal	0.03	-0.12	0.25	-0.84
SE2_ConsultFinancial	0.15	0.03	0.30	-0.80

The three-factor solution, which explained 75% of the variance, was preferred due to the insufficient number of primary loadings and difficulty of interpreting the fourth factor. The three-factor solution revealed a component structure with all item primary loadings over 0.7 (refer to Figure 4.5).

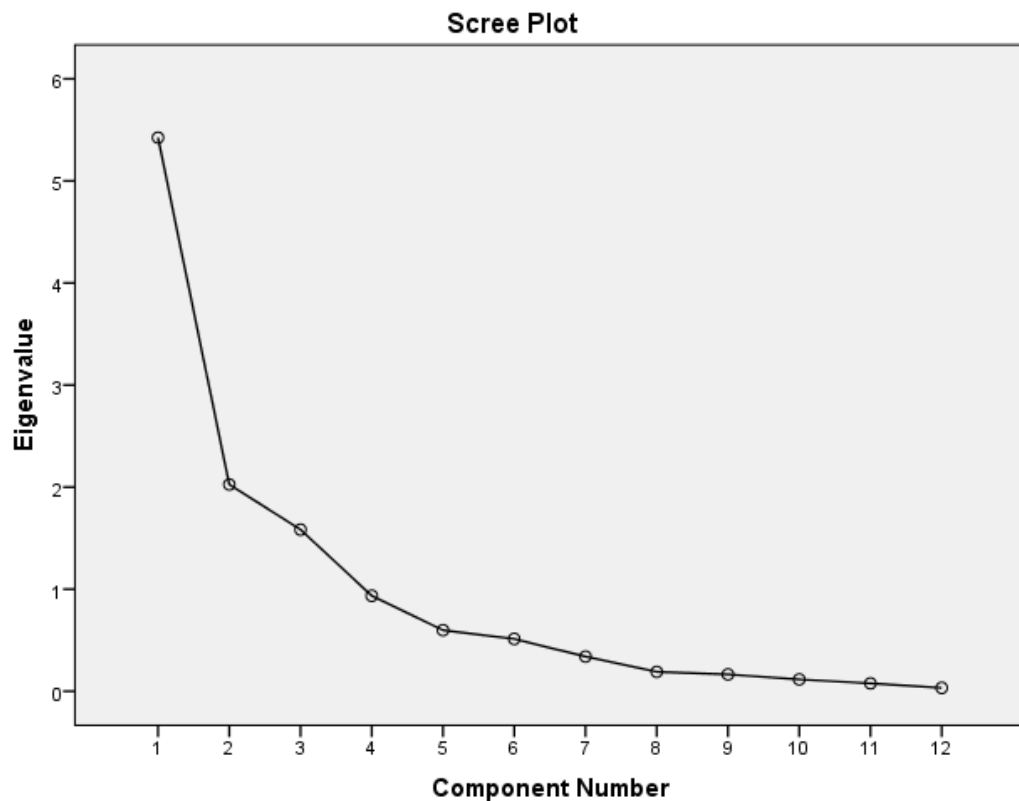


Figure 4.3. Scree plot of PCA with 12 items from the Self-efficacy scale.

Following assessment of the items with primary loadings on each component a decision was made to label the components: Self-evaluative, Physical and Social, respectively (refer to Figure 4.5). These labels are defined in SCCT and are apparent in this exploratory PCA.

Review of the component correlation matrix showed correlations between these factors (Self-evaluative with Physical and with Social .31 and Physical with Social .26), indicating that the components have some degree of interrelation.

To assess the correlations between SE and JS, composite scores were computed for each of the three components based on the mean of the items that had their primary loadings on each component. Higher scores indicated greater confidence with each component. The participants' average level of confidence and average spread of values around the mean were similar for each component. However, the spread of the middle 50% (inter-quartile range) for SE\_Self-evaluative and SE\_Social is greater than that of SE\_Physical, which has outliers (low confidence in SE) dragging down the mean score. If outliers are removed, the participants have greater confidence with SE\_Physical than SE\_Self-evaluative or SE\_Social (refer to Figure 4.4). The components, for this sample of cotton growers, have a negatively skewed distribution that indicates higher SE (see Figures 4.5, 4.6 and 4.7).

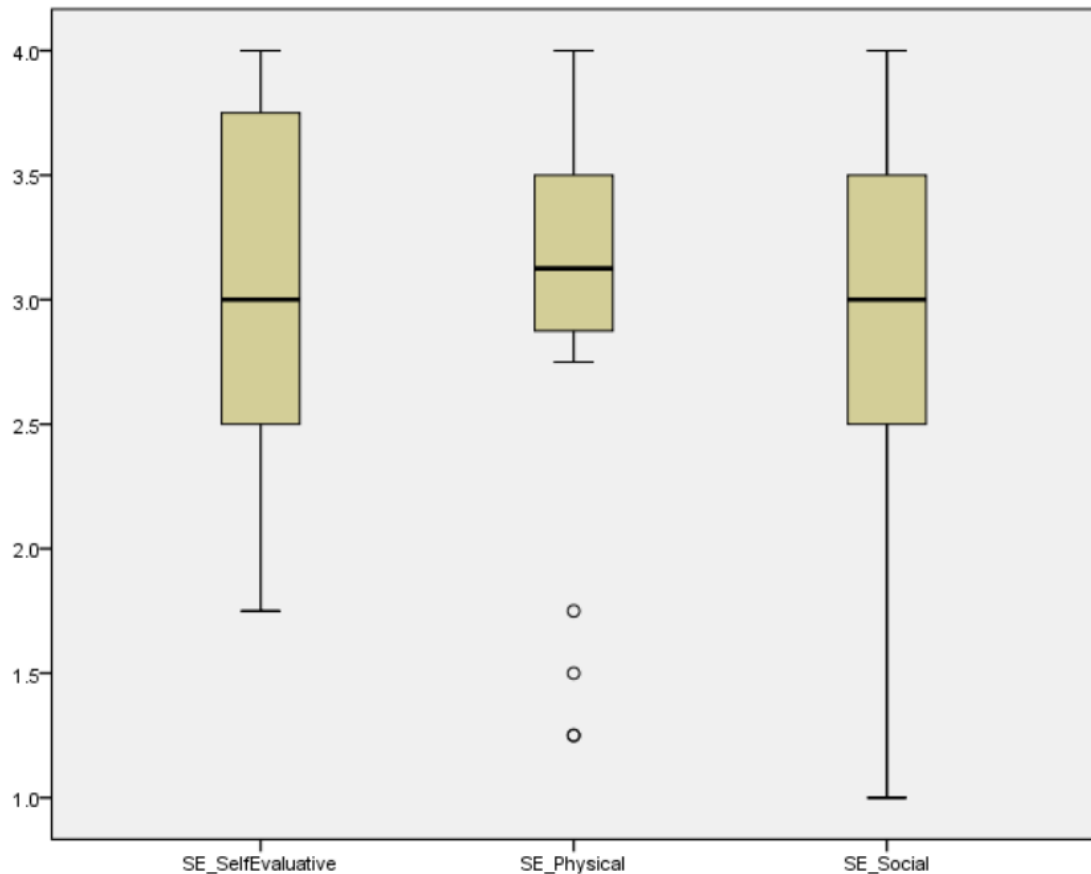


Figure 4.4. Boxplot of the participant responses to the composite SE scales.

Overall, these analyses indicated that three components were underlying cotton growers' responses to the SE items and that these components were internally consistent. Three of the 15 items were eliminated, and an approximately normal distribution was apparent for the composite scores, enabling further statistical analysis with the components.

Table 4.8 *Descriptive Statistics for the Three Self-efficacy Composite Scales*

	<b>No. of Items</b>	<b>M(SD)</b>	<b>Skewness</b>	<b>Kurtosis</b>	<b>Cronbach's <math>\alpha</math></b>
SE_Self-evaluative	4	3.05(.74)	-0.16	-1.15	0.90
SE_Physical	4	2.99(.79)	-1.17	0.67	0.89
SE_Social	4	2.93(.74)	-0.94	0.46	0.81

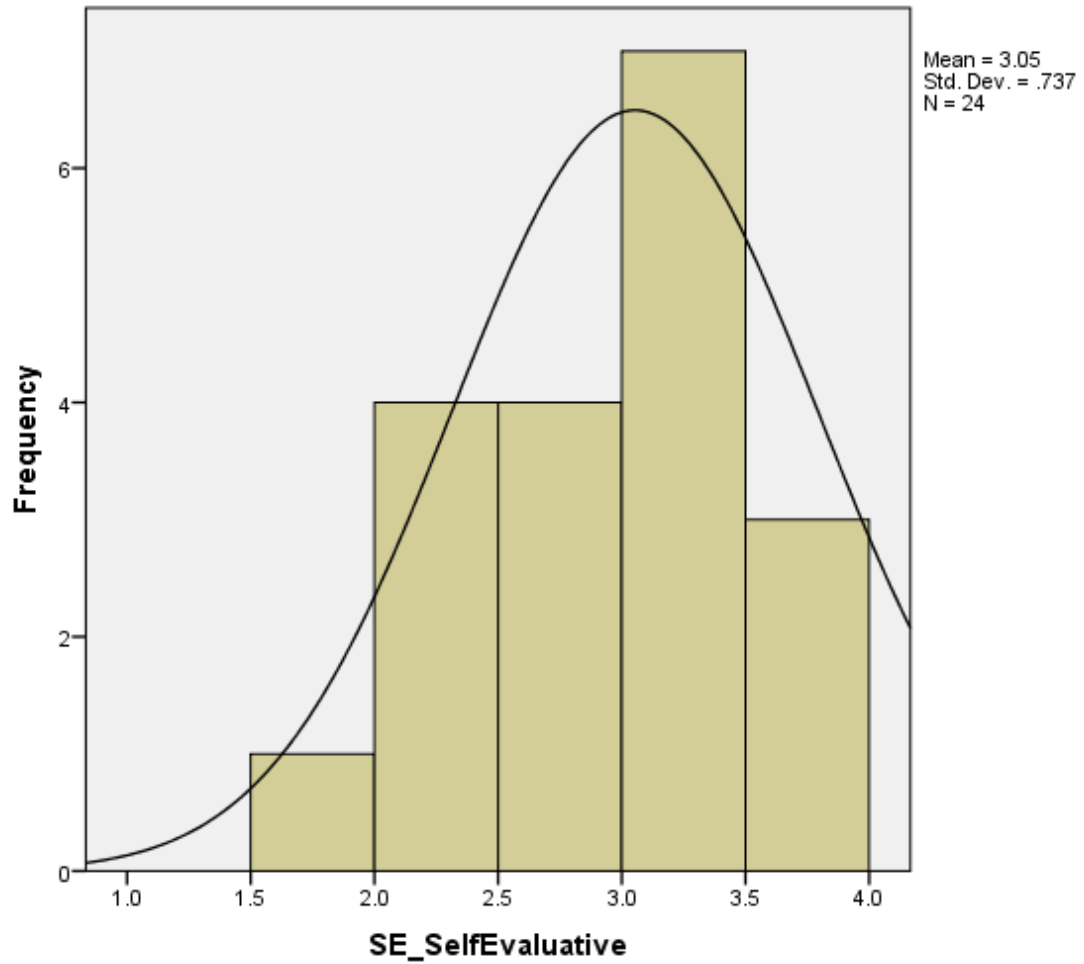


Figure 4.5. Histogram of the participant responses to the composite SE scale: Self-evaluative.

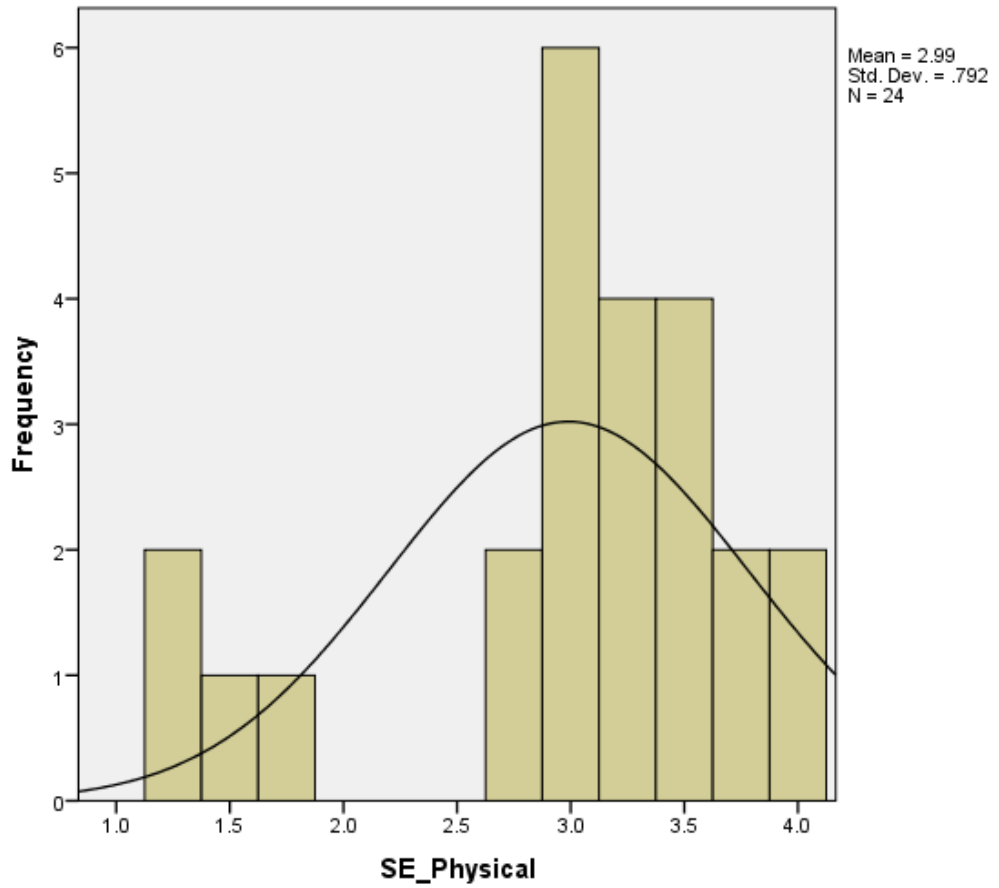


Figure 4.6. Histogram of the participant responses to the composite SE scale: Physical.

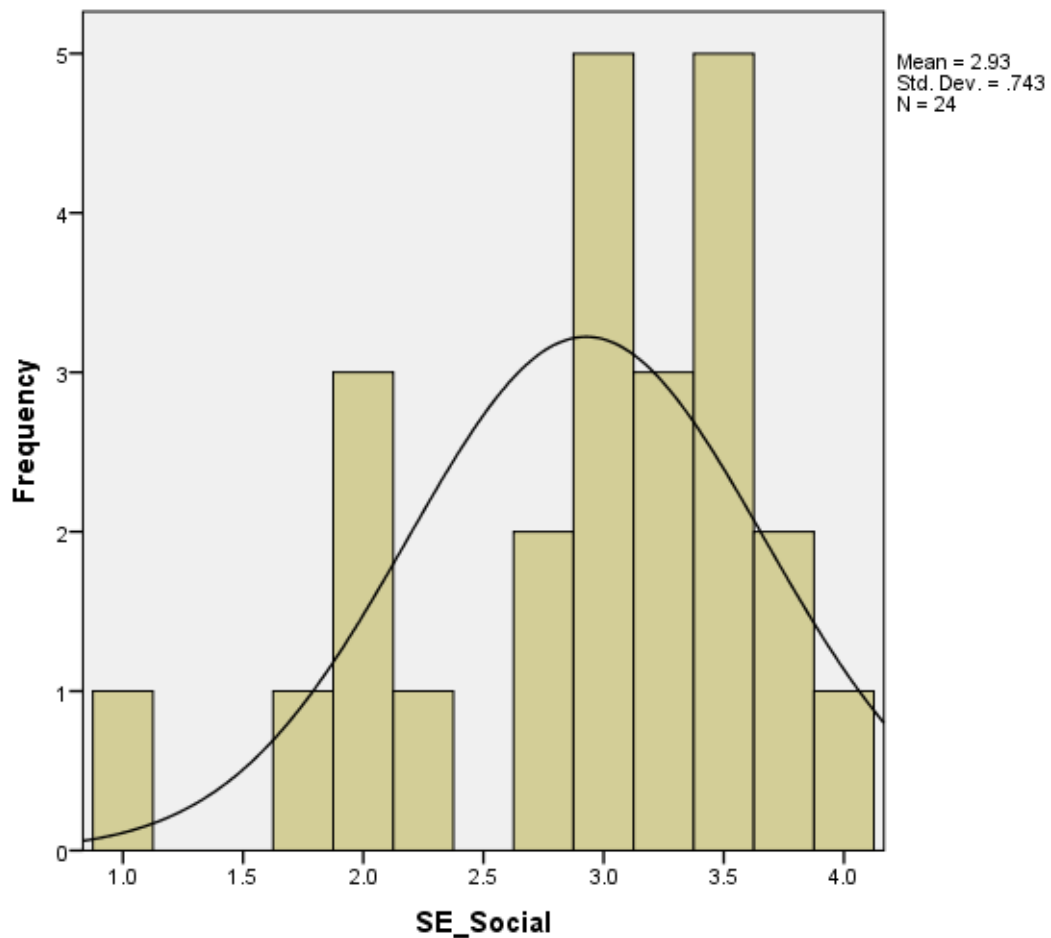


Figure 4.7. Histogram of the participant responses to the composite SE scale: Social.

#### 4.4.4 Pearson correlations

One-tailed Pearson product-moment correlations were used to evaluate the following hypotheses:

1. Job satisfaction will positively correlate with all WE items: Vigour, Dedication and Absorption.
2. Job satisfaction will positively correlate with Risk Tolerance.
3. Job satisfaction will positively correlate with Basic Psychological Needs Satisfaction (BPNS): Autonomy, Competence and Relatedness.
4. Job satisfaction will positively correlate with Self-efficacy.

*Hypothesis 1*

Pearson correlations between Job Satisfaction and Work Engagement (WE) are presented in Table 4.9. Job satisfaction was significantly positively correlated with “Work Engagement-Vigour”. Job satisfaction was also significantly positively correlated with “Work Engagement-Dedication”. In other words, higher (WE), Vigour and Dedication corresponds to higher job satisfaction. As can be seen in Table 4.10, there is not sufficient evidence to state that “Work Engagement-Absorption” is positively related to job satisfaction. Therefore Hypothesis 1 was partially supported.

Table 4.9 *One-tailed Pearson Correlations between the Work Engagement Measure and Job Satisfaction*

Category	Job Satisfaction Variable
Work Engagement	
Vigour	.57**
Dedication	.44*
Absorption	.35

Note.; \* =  $p < .05$ ; \*\* =  $p < .01$ .

*Hypothesis 2*

Risk tolerance was positively and significantly correlated with Job Satisfaction  $r(20) = .43$ ,  $p < .05$ ; therefore Hypothesis 2 was supported. There was evidence to suggest that higher risk tolerance in cotton growers correlates with higher job satisfaction and vice versa.

*Hypothesis 3*

Job Satisfaction was not significantly positively correlated with any BPNS items; Job Satisfaction with “BPNS Autonomy”  $r(20) = .33$ ,  $p = .07$ ; Job Satisfaction

with “BPNS Competence”  $r(20) = .23, p = .16$ ; Job Satisfaction with “BPNS Relatedness”  $r(20) = .22, p = .16$ . Therefore, Hypothesis 3 was not supported. There was not enough evidence to suggest the BPNS of cotton growers is related to job satisfaction.

#### *Hypothesis 4*

Pearson correlations between job satisfaction and SE are presented in Table 4.10. Job satisfaction was significantly positively correlated with “SE\_Physical” and with “SE\_Self-evaluative”. In other words, higher SE Physical and Self-evaluative items correspond to higher job satisfaction. As can be seen in Table 4.10, there was not sufficient evidence to state that “SE\_Social” is positively related to job satisfaction. Therefore Hypothesis 4 was partially supported.

Table 4.10 *One-tailed Pearson Correlations between the SE Measures and Job Satisfaction*

<b>Category</b>	<b>Job Satisfaction Variable</b>
Self-Efficacy	
Self-evaluative	.45*
Physical	.64**
Social	.33

Note.; \* =  $p < .05$ ; \*\* =  $p < .01$ .

## Career and Crop Choice

Table 4.11 *Correlation Matrix of Job Satisfaction (JS) with Computed Variables used in Hypotheses 1 to 4 (Please refer to Appendix B for item descriptions)*

	JS	WE1	WE2	WE3	RT	BPNS1	BPNS2	BPNS3	SE1	SE2	SE3
JS	1	0.57	0.44	0.35	0.43	0.33	0.23	0.22	0.45	0.64	0.33
WE1	0.57	1	0.88	0.89	0.33	0.40	0.12	0.10	0.41	0.22	0.25
WE2	0.44	0.88	1	0.88	0.29	0.29	-0.08	-0.02	0.24	0.11	0.20
WE3	0.35	0.89	0.88	1	0.29	0.39	0.01	0.10	0.20	0.04	0.11
RT	0.43	0.33	0.29	0.29	1	0.39	0.05	0.25	0.40	0.34	0.37
BPN1	0.33	0.40	0.29	0.39	0.39	1	0.57	0.68	0.25	0.23	0.07
BPN2	0.23	0.12	-0.08	0.01	0.05	0.57	1	0.71	0.24	0.17	-0.08
BPN3	0.22	0.10	-0.02	0.10	0.25	0.68	0.71	1	0.01	0.12	-0.17
SE1	0.45	0.41	0.24	0.20	0.40	0.25	0.24	0.01	1	0.45	0.47
SE2	0.64	0.22	0.11	0.04	0.34	0.23	0.17	0.12	0.45	1	0.35
SE3	0.33	0.25	0.20	0.11	0.37	0.07	-0.08	-0.17	0.47	0.35	1

#### **4.5 SECOND ROUND OF STAKEHOLDER INTERVIEWS**

Following analysis of Part 1 it was evident that the findings contributed to, but did not fully address the research questions. The researcher's insider knowledge also provided ad hoc understanding that a key piece of the puzzle to understanding the influencers of CGE crop choices was missing.

A second round of interviews were held with CGEs and CGE stakeholders to discuss influencers that might impact on their work motivation and decision-making processes. The participants were three CGEs, and an agronomist located across three different cotton-growing regions. All participants including the agronomist were owners of mixed farming operations. Interviews of approximately one hour's duration were conducted with this convenience sample at locations chosen by the interviewee. The unstructured interviews comprised general discussions around influencers that participants indicated can impact on crop choices.

The qualitative data collected from these additional interviews were analysed using thematic analysis (Braun & Clarke, 2006 p. 77–101). The transcriptions of the interviews were firstly read through to establish broad themes. The identified themes and views of these CGEs and stakeholders provided rich data to inform discussion in section 5.7 on types of influencer and behaviour and section 6.6 on other relevant influencers. These conversations also confirmed that a different perspective and approach was needed to address the research question that would fill the gap in understanding around decision-making and crop choice that did not align with traditional psychological approaches and the SCCT model used in Part 1.

Table 4.12 *Coding and Themes (with Examples of CGE Comments).*

<p>Theme: Cotton grower employer (CGE) work context during the season of cotton growing</p> <p>Sub-theme: CGE perceptions of relevance of job task items to decision-making processes</p>	<p>Theme: Understanding crop choices that relate to job task items in the pilot questionnaire</p> <p>Sub-theme: Reasons for understanding more about decision-making processes of crop choice that relate to items in the pilot questionnaire</p>	<p>Theme: Value of the decision as relevant to items in the pilot questionnaire</p> <p>Sub-theme: The various types of activities that require decisions in the operation of the season in relation to items in the pilot questionnaire</p>	<p>Theme: What CGEs want to know about decision-making processes in relation to items in the pilot questionnaire</p> <p>Sub-theme: Desire to understand how to improve decision-making processes as they relate to items in the pilot questionnaire</p>
<p>“The job task list is relevant to our operation. Crop choice isn’t an easy decision. There are several variables to the decision, many relate to those in the job task list here” (CGE2)</p>	<p>“All of these items relate to crop choice. What we have difficulty with is reflecting on making good decisions within these task items” (CGE4)</p>	<p>“Our motivation or our goal is to know we’ve made good decisions under pressure – these items of course describe “what” we do at an operational level, but it’s more about ‘what influences’ our decisions at the time” (CGE1)</p>	<p>“What we do is more than just on this list. It’s more than just production. We often choose to grow cotton based on emotion, for example because we like being part of the cotton community” (CGE6)</p>

#### 4.6 SUMMARY

The results of Part 1 of this study reported in this chapter showed the development of a self-efficacy cotton growing model. The face validity of the measures for constructs impacting on motivation of cotton growers were explored and personality traits of the CGE participants identified. This study found that CGEs are higher in agreeableness (kind, co-operative, polite and trustful), conscientiousness and extraversion. This sample of CGEs indicated most agreement with an environmental value and least agreement with a lifestyle value. Further research in this area could determine evidence to support significant differences in the values of CGEs in comparison to other careers and industry areas. In this sample of CGEs, no CGEs were dissatisfied with their jobs in terms of job satisfaction, and they displayed a high degree of satisfaction in all areas of autonomy, competence and relatedness. The CGEs also displayed a higher sense of work engagement in the areas of vigour and dedication that correspond with job satisfaction.

These factors contribute to answering the research questions 1) What are the influencers of CGE decisions in crop choices? and 2) How do influencers impact on CGE decisions? Following second interviews with some participants it was established that there are other behavioural influencers not explained by the SCCT model or the Australian cotton grower motivation model. Therefore, the researcher proceeded to explore additional theories to provide another dimension to understand CGE decision-making and behaviour and address the research question more fully.

Behavioural economics is considered to overlap between the two disciplines of psychology and economics (Darnton, 2008) and thus provides the basis for the second component of this multi-disciplinary study. Exploring the influencers that impact on CGE motivation and decisions in this way will provide valuable

knowledge and understanding of this topic to answer the research question. The next chapter is therefore a second literature review that outlines the role of behavioural economics and seeks to explain the cognitive biases of individuals, theories and models in the context of this study. Chapter 6 includes details on the CGE second interviews and the application of the material to the context of this study.

## 5. LITERATURE REVIEW 2

### 5.1 INTRODUCTION

A second literature review was required to further explore some of the cognitive biases of individuals, theories and models in the context of the study to gain a better understanding and address the research problem. Literature Review 1 provided detail about using Social Cognitive Career Theory (SCCT) to understand CGEs' motivation for decision-making in the workplace. Literature Review 2 was undertaken to better understand how influencers, such as emotion and other forms of human nature that play out in decision-making, may influence CGE crop choices. Exploring the emotional engagement of decisions through both tangible and intangible rewards and incentives explains more fully how decision-making processes of CGEs' crop choices are influenced. In being provided with the knowledge of decision-making processes in this way, CGEs can become more aware of terms such as framing of choices and understanding CGEs' possible aversion to loss that can influence decisions, for example. From this knowledge, CGEs can also become more aware of their motivations and actions.

Industry performance has traditionally been explained and measured through economics as it is considered the science of how individuals allocate resources. The psychology of individual behaviour is expected to prompt and guide economics (Camerer, 1999). It is therefore appropriate to consider a behavioural economics approach in this real-world situation where CGEs indicate they do not always act in their own best interest. Research indicates that people have limited cognitive ability and difficulty exercising self-control (Baumeister, 2007). CGEs, like many

individuals, often make choices, set goals and then defy them, preferring immediate satisfaction/gratification and foregoing long-term benefits because of self-control problems. In the world of traditional economics, it is expected that a “rational” person knows their own preferences and does not entertain conflicting needs. However, Kahneman claims “it seems that traditional economics and behavioural economics are describing two different species” (2011, p. 5).

Behavioural economics seeks to explain how individuals do not always act in rational ways but are influenced by both conscious and (automatic) unconscious responses. The role of behavioural economics and decision-making theory is used in this study to explore how CGEs make decisions with piecemeal information, limited reasoning and decision biases. Cognitive biases are characteristic biases in human information processing with a tendency to interpret new information to confirm an existing belief.

Empirical findings in behavioural economics, judgement and decision-making reveal that people repeatedly act in ways that are economically not optimal (Kahneman, 2011; Slovic, 2010). The sections below seek to explore the cognitive biases of individuals, theories and models in the context of this study. Topics discussed, including framing, defaults, reasoning and choice architecture, can help industry, policy and individual cotton growers understand factors beyond economic ones that may affect individual judgement and choices. Some limitations to crop choices occurrence are addressed under the sustainability headings of Economic, Environment and Social which are used as sustainability indicators for the Australian cotton industry.

**Economic and Environment** – While people often deny being influenced by others, individuals are social beings and are programmed to care about what others

think (Metcalfe, 2018, p.4). Human behaviour is motivated by the influence of people and societal norms to gain social approval that is linked to an individual's personal norms and self-esteem (Schultz et al, 2007; Cialdini, 2004). People are looking for social evidence in situations that they are not familiar with (Cialdini, 1998, p.1243). While CGEs may support cotton industry sustainability indicators, the understanding and rationale behind the decisions is often found by looking to what others are doing and other influencers. Reference is made to influencers of decisions in this chapter and in Chapter 6 to follow.

Economics of rotational crop decisions around three- to five-year programs, are relevant to the crop health of individual farms but also for the landscape at large. In the Australian cotton industry, sustainability of the environment considerations are discussed in terms of crop selection and rotation. One of the six participants rated crop selection and rotations as very relevant, and five of the six participants rated crop selection and rotation as relevant, stating that trust is important in the relationship of the agronomist. "I use a consultant actually, he lives around the corner...he gives you all the upfront details, nothing is disguised or hidden". Adopting behaviour change to support the sustainability of economic, environment and social aspects, for example, can be due to prevailing standards and practices of consultants and other growers.

**Social** – Social influencers comes in varying forms. One example is through developing relationships with others. The more individuals like and/or respect someone, the more likely they are to cultivate positive relationships with them and comply with their requests (Cialdini & Trost, 1998; Cialdini, 2004). This is exemplified in the likelihood of giving and receiving tips (Lynn & Simons, 2000). However, Burger et al. (2001) found that when heuristics, usually used by individuals in decision-making, are applied to human relations with strangers, the social

influencers are applied automatically in an ad hoc way. The study found that familiarity (such as a brief encounter by facial recognition with an individual) leads to a compliance request. This notion also applied to individuals showing compliance based upon superficial connections, such as similar birth dates, names and places of residence (Burger et al, 2007), where they were more likely to adhere to requests. In order to provide people with evidence that sustainable behaviour is possible, this study starts with the individual and the social responsibility to explain in everyday terms how to go about making sustainability and other behaviour changes attractive as they are not usually used in primary production. A set of sustainability indicators has been developed by and for the Australian cotton industry. The indicators provide guidance to CGEs on each of the environmental, economic and social aspects applicable to cotton-growing businesses. However, the broader adoption may lie in the motivation of such behaviour change.

## **5.2 INDUSTRY INSIGHT**

The research described in this thesis was motivated by the realisation that CGEs are entering and exiting the cotton industry regularly by way of crop choice, and the cotton industry is currently unaware of what influencers may contribute to a CGE's work motivation and decision-making processes regarding crop choice. This research concept arose after I, a cotton grower, identified that understanding the influencers that impact on CGE work motivation and decision-making processes could support growers and their well-being. Health and well-being in the workplace is important, and recent key findings (Grawitch, 2006) highlight that workplace stress and psychological distress are becoming increasingly important. As explained (Safework Australia, 2018), "6 per cent of all serious workers compensation claims were for work-related mental disorders; 7020 Australians were compensated for

work-related mental disorders; 92% of serious work-related mental disorder claims were attributed to mental stress; 42% of serious work-related mental disorder claims made by males; 50% by females”.

In exploring the CGE workplace, CGEs refer to their health and well-being on the job and the decisions they make that influence how they feel in their work environments. The importance of stress has become both an economic and a social issue as “the burden of workplace stress on employers is significant and represents an area in which preventative measures may produce strong economic and productivity gains for the employer and the broader economy” (Medibank Private, 2008). In Australian workplaces (APA, 2014) elements of a psychologically healthy workplace are supportive leadership; employee engagement; role clarity; learning development and growth opportunities; appraisal and recognition; and work-life balance (APA, 2014). The cotton industry’s focus is on “human capacity” in the current 2013–2018 strategic plan, which addresses this issue and also supports the need for this study. There is evidence in recent research (Seppala, 2015) that positive work cultures “are more productive; health care expenditures at high-pressure companies are nearly 50% greater than in other organisations; 60%–80% of workplace accidents are attributed to stress; more than 80% of doctor visits are due to stress; and workplace stress has been linked to health problems ranging from metabolic syndrome to cardiovascular disease and mortality” (<https://hbr.org/2015/12/proof-that-positive-work-cultures-are-more-productive>).

Unstructured interviews with cotton growers and industry experts revealed that work motivation and decision-making processes regarding crop choice were based on a combination of external and internal influencers of the CGE. To the researcher’s knowledge, no previous research on this topic, viewed from a

behavioural economic perspective with grower insight, has been considered by the Australian cotton industry. Scant social scientific research, such as the application of behavioural economic frameworks and models, have been applied to the cotton industry or agricultural sectors to date. Following the results of the semi-structured interviews and a national survey, discussions were held with key stakeholders in the industry. Knowledge of an industry can be invaluable from both researcher and entrepreneurial perspectives as “it is difficult if not impossible to understand motivation without understanding the contexts they are experiencing” (Eccles & Wigfield, 2002, p. 128). Psychological factors alone cannot fully answer the research question, and a second literature review exploring other powerful forces in decision-making ensued. It is a common human desire to avoid embarrassment, feel pride and fit in, and understanding these traits and other factors of decision-making, such as framing, heuristics, and inertia, were investigated.

This study examined CGEs’ perceptions of support with regard to cotton career development and decision-making processes. Even though participants indicated that the corporation and industry body had exposed them to support activities in the economic and environmental factors related to crop growing and management, the participants suggested that this was limited to occasional training for employers and little if any mentoring within the industry, or externally, to assist them with career development and business management in the areas of professional and self-development, motivation and decision-making. The researcher hopes that identifying the factors influencing cotton crop choices will assist individuals with their decision-making processes.

Additional factors that influence a CGE’s work motivation and decision-making processes on crop choices are found in the behavioural economics literature

and explain how unconscious elements affect everyday choices and why individuals do what they do. Good decisions are vital for effective planning, and planning is vital for the success of growing cotton. This notion is supported in the cotton industry literature (Australian Cotton Production Manual, 2017) and by CGEs themselves. The aim of this chapter is to explore the literature on the influencers of the crop choices of CGEs.

### **5.3 RESEARCHING THE PROBLEM**

The social cognitive career theory did not provide all the answers to address the research questions. Therefore, the purpose of this second literature review is to build on the psychological factors examined in Literature Review 1 and develop additional understanding of the research problem by including behavioural theories that focus on explaining behaviour. This second literature review explores the behavioural economics literature in the overlap between psychology and economic disciplines and tackles the research problem from a new perspective. This review includes an examination of work concerning decision-making processes, choice and cognitive biases, commencing with an examination of a range of relevant theories. Literature Review 1 in Chapter 2 focussed on psychological factors that influence individual motivation. Literature Review 2 reviews the decision-making influencers that cotton growers confront when making crop choices. The answer to this question is complex and multifaceted because there are significant individual economic, environmental and social consequences of cotton growing. To enter the industry as a grower, several fundamental factors exist that impact on the decision. Chapter 2 included some of those factors that influence work motivation, such as personality, outcomes of value fulfilment, self-efficacy, work engagement and job satisfaction, but these do not tell the whole story to explain CGE decisions.

#### **5.4 A BRIEF HISTORY ON PSYCHOLOGY AND ECONOMICS: A SECOND LITERATURE REVIEW EXPLAINED**

As behavioural economics helps explain the critical role that emotions and other forms of human nature play on decision-making, a brief history of both psychology and economics is provided here to support the decision for a second literature review. In this study, theories of human behaviour from the disciplines of psychology and economics will be applied to cotton growers in the field of agriculture. The study of human behaviour is understood and utilised in many other fields such as sociology, political science, anthropology, science, technology and environmental sciences. Traditional economics assumes that individuals make the best decisions with complete knowledge and capacity to evaluate risks and costs. Rationality is considered a psychological interpretation of observed behaviour; therefore, there is a natural connection between economics and psychology. Despite some unity between the two sciences, however, historically there have been distinctions. In the early studies of economics during the industrial revolution, people were experiencing changes in society, resulting in questions regarding individual financial gain that turned to psychology to explain individual behaviour (Drakopoulos et al., 2017). Over time, economics developed mathematically and become part of the discipline of natural sciences, moving away from psychology, towards developing the concept of “homo economicus”, describing humans as consistently rational, self-interested individuals whose biases remain unchanged (Kahneman, 2011).

Psychology, too, was interested in the natural sciences, but used experiments rather than mathematics and physics, which led to cognitive psychologists discovering the capacity of the brain to process information. This differed from what

had previously been predicted by behaviourist models which assumed individuals were passive and responded to their environment. Cognitive psychologists identified that humans are not fully rational in their behaviour, and they described errors in human beings' reasoning based on observations and empirical evidence (Drakopoulos et al., 2017).

Within the domain of psychology, three types of psychological theories were identified to understand the way humans think, feel and behave (Strack et al., 2018).

These three psychological theories include:

- Internal and external cues fundamental to behaviour that are explained by identifying links between incentives and rewards as defined by Skinner (1948) in operant conditioning, and theories on judgement and decision-making with a focus on cues that drive people's decisions;
- Theories that focus on psychological processes with an emphasis on internal processes such as memory; and
- A type of information-processing theory such as the dual process theories that account for a broad range of judgements and behaviours (Strack et al., 2018).

The paragraph below explains the difference:

The only way in which the economist can keep his studies from duplicating the psychologist's work is by taking his psychology from those who have specialised in that field. The economist may attempt to ignore psychology, but it is a sheer impossibility for him to ignore human nature, for his science is a science of human behaviour ("Economics and Modern Psychology, Part 1", J. M. Clark, *Journal of Political Economy* 1918; also cited Alos-Ferreer, et al., 2014).

### **5.5 DECISION-MAKING PROCESSES AND DEFINITIONS IN CONTEXT**

Behavioural economics pulls together aspects of both psychology and economics and in this study includes the effects of psychological, social, cognitive and emotional factors on the economic decisions of individuals and businesses. Cognitive psychology is a modern approach to human behaviour that focusses on how individuals think. Advancements in this area include neuroimaging highlighting mental processes and how they influence behaviour and emotion, and the brain's capacity to respond to environmental factors (Henson, 2006; Pratte, 2016). Understanding behaviour is important for everyday actions and decisions, and for understanding the choices people make (Ariely, 2008, p. xix).

While Literature Review 1 highlighted the psychological factors of individuals, the aim of Literature Review 2 is to investigate the factors that influence the decision-making processes of cotton growers. The overall focus of this study has been to explore the work motivation of CGEs and their crop decision-making processes and to understand the attraction and retention of cotton-grower employers to the Australian cotton industry. Both literature reviews contribute to this focus to answer the research question from different perspectives.

### **5.6 DECISION-MAKING AND THE INDIVIDUAL**

Decision-making is one of the basic cognitive processes of human behaviour; the process of decision-making involves making choices by gathering information and assessing alternative solutions. Several significant factors influence decision-making, and these include: individual differences of age; social and economic factors; a belief in personal significance; past experiences and a variety of cognitive biases. Cognitive biases in decision-making are considered to be a mistake in reasoning or a systematic error in thinking that occurs when individuals hold on to

views without considering other perspectives while negating evidence that proves to the contrary, and these views affect decisions and judgements (Kahneman, 2011; Sinek, 2009; Pink, 2008; Restak, 2001).

Life is filled with decisions, and in the work life of a cotton grower in a cotton-growing environment, decisions are made every day, which are many and varied. Such decisions are made regularly in activities that apply to the current day as well as to the pending season in the areas of staff, equipment, contracts, areas, weather and crop choice. CGEs make judgements each day, such as the likelihood of a good crop choice, a good plant, the likelihood of breakdowns and whether maintenance has been effective. Uncertainty is also part of their daily activities: the uncertainty of not finishing the planting before the pending rain; the uncertainty of machinery breakdowns – technical and mechanical; the uncertainty about whether to plant or not to plant; the uncertainty of a good plant. Decisions in uncertain situations are everyday occurrences in cotton-growing operations. Making choices is part of human activity; and it is a part of growth, skill and knowledge. However, every situation is different and there are many ways of managing decisions.

Decision-making or problem-solving in this study are acknowledged as important skills for cotton-growing businesses and rural life. Problem-solving involves decision-making, and decision-making is important for management and leadership in cotton-growing operations. Some of the skills required for effective results in these operations include analytical ability in the sense of being able to visualise and articulate ways to solve complex and complicated problems; lateral thinking in the sense of solving problems by an indirect and creative ways; initiative in the sense of having the ability to assess and initiate things independently; and logical reasoning in the sense of using a rational systematic way to reach a

conclusion. There are processes and techniques to improve decision-making, and the quality of such decisions are discussed in the sections below. Intuitive decisions often result in judgements that are right; however, bias in those decisions is also evident. These cognitive biases have been studied extensively in recent years by several researchers (Kahneman, 2011; Ariely, 2009; Sinek, 2009; Thaler & Sunstein, 2008; Restak, 2001), and some of these are explored in the following sections.

## **5.7 THEORIES AND INFLUENCERS ON BEHAVIOUR**

### **5.7.1 Behaviours of Interest**

Refining what this study was aiming to achieve started by addressing the study objective to explore CGE motivations and decision-making processes in crop choices. Motivation involves the biological, emotional, social and cognitive forces that activate behaviour. In other words, the why of behaviour, the needs or wants that drive behaviour and explain what humans do. Standard economic theory posits what people should do based on the allocation and distribution of goods and services. Microeconomics focusses on how individuals and businesses make decisions to allocate limited resources (Savage et al., 2011, p.44). Behavioural economics uses psychology and economics “to explain why the economic decisions of individuals and organisations can deviate from purely ‘rational’ decision-making” (Savage et al., 2011 p. 48). Several relevant theories are explored in this Literature Review 2 to answer the research question. Following exploration of those theories that most closely link to the data collected from CGEs, a model based on these theories is developed in Chapter 6.

### **5.7.2 Choice Theories**

Traditional economic or rational choice theories posits three assumptions: “individuals maximise utility and companies maximise profits; individuals have

‘rational’ preferences; individuals act independently on the basis of full and relevant information, seeking the most favourable well-being possible” (Savage et al., 2011, p. 44). Psychological theories that aim to understand individuals or businesses posit that “...if someone intends to do something they usually do it” (Savage et al, 2011). In this review, choice theories are explored in the context of cotton-grower choice behaviours, and “choice architecture” (a term coined by Thaler and Sunstein, 2008), and these factors are explored in the context of grower decision-making processes with respect to crop choices.

Cotton growers are consumers of many products, and in each product area there is an increase in choices for seed, fertiliser, insurance, equipment, water, fuel and so on. The idea that more choice is considered better is a common notion; however, research has found that less choice can sometimes mean more sales, which is known as the Paradox of Choice or Choice Overload, explained in the well-known “jam experiment” studied by psychologists Sheena Iyengar and Mark Lepper (2000). In the study, consumers were found to be ten times more likely to purchase jam on display when the number of jams was reduced from 24 to six. In this example, there is an “optimal” number of choices and an inverse U-curve, in the sense that the more options given to individuals, the more time and effort they must invest in making choices, and often individuals are not prepared to give the level of time commitment to extensive choice.

In the cotton-grower work environment, as is commonly the case within most businesses, time constraints are a factor, coupled with the increase in choices for seed type and variety such as crop choice, and for each of the variables like fertiliser, equipment, fuel, water and so on. This gives rise to a multiple increase in decisions relating to economic, environmental and individual factors that affect crop choice,

thus increasing the complexity of each of these decisions. In such cases, choice theories suggest that individuals tend to rely on simple heuristics (or rules of thumb) for many complex decisions (Iyengar & Lepper, 2000). In the behavioural economic literature, there are many concepts that can be applied to address the business objectives of a cotton grower. For the cotton grower and researcher, these concepts are extensive, and one way to address the behavioural aspects that affect each objective could be to develop a taxonomy of choice of the various products associated with the growing of cotton. This is discussed in more detail in Chapter 7. Alternative theories of rational choice under uncertainty, discussed next, give insight into further understanding of human behaviour in this context.

#### ***5.7.2.1 Regret Theory***

Regret theory posits that learning about the outcome of an alternative action creates the possibility of experiencing regret (Bell, 1982; Tsiros & Mittal, 2000). The theory predicts that individuals are more likely to choose a certain outcome when they believe they will not learn as a result of the risk when they expect they will find out about the alternative outcome (Larrick & Boles, 1995). Accordingly, individuals continuously compare the results of their decisions, and upon realisation that a different course of action could have led to a better outcome, the individual experiences regret. In researching the decisions and feedback of those decisions, Larrick & Boles (1995) found that the difference between two feedback situations is determined as a measure of regret aversion (Larrick & Boles, 1995). Consistent with regret theory, Larrick & Boles (1995) found that individuals were more risk-averse in their negotiation decisions when they did not expect feedback on a predetermined risky alternative than when they did. As a result of this line of enquiry, regret was found to influence the motivational factors of decision-making processes, coined

regret avoidance, in both decision and negotiation theories (Larrick & Boles, 1995).

In a meta-analysis study on regret, researchers found that the greater the expectation within aspects of an individual's life, the greater the regret (Rose & Summerville, 2004). Post-decisional dissonance is a form of regret, following a decision when an individual feels they may not have made the best choice. According to CGEs, the sentiment of "could have, would have or should have" is often felt in daily activities, and as such there is a factor of regret, according to cotton growers. Much of the literature focus is on the effects of regret on decision-making, although some researchers have viewed regrets that follow life domains (Rose & Summerville, 2004). In a life domains study, researchers found that individuals have the "most regrets in education, career, romance, parenting and self" and that "opportunity breeds regret" (Rose & Summerville, 2004, p. 1274). The study found that feelings of displeasure can direct people towards modified decision-making that may bring improvement in decisions on life situations. Expanding on the notion of unpleasantness, Zeelenberg (2007) found that individuals are regret-averse and make choices because of their dislike of the feeling of regret and suggest that the feeling of anticipated regret in some situations can push individuals towards risk-seeking behaviour.

An example based on Zeelenberg (2007) and adjusted for the context of the cotton-growing environment is as follows:

Imagine that a CGE is considering whether to grow cotton or grain: the lesser return grain crop is the safer option, whereas the cotton crop which has more initial outlay is the riskier option. These are the only summer planting options. The CGEs leaning towards grain when Phil who is the visiting neighbour, says, "If you don't plant cotton this season I will".

Phil is not interested in growing grain. Suddenly, the CGE worries that they will spend money on growing grain and then find out that Phil harvested a bumper crop of cotton and will regret their decision. The CGE realises that if they plant grain, they will never know what would happen if they had planted cotton. Thus, the cotton, the riskier option, also turns out to be the regret minimising option. Anticipated regret in some situations can push individuals towards risk-seeking behaviour, as people feel more responsible for their actions, rather than inaction (Sandberg & Conner, 2008). As demonstrated in this scenario, research in this area warrants investigation in relation to the CGE context.

#### ***5.7.2.2 Dual Process Theories of Decision-making***

Dual process theory has suggested there are two different types of processing that influence human behaviour: an implicit (automatic) unconscious process and an explicit (controlled) conscious process (Mega et al., 2014; Strack & Deutsch, 2004; Kahneman, 2011; Evans & Stanovich, 2013). Dual process theory has also posited that thoughts, behaviours and feelings result from the connection between exogenous (external) and endogenous (internal) forms of attention (Evans & Stanovich, 2013). The dual processes of System 1 and System 2 originate from the work of Keith Stanovich and Richard West, and the extensive work of Daniel Kahneman (2011). Effective problem-solving, good judgement and well-attuned decision-making are considered to be essential for the success of cotton growing<sup>1</sup>.

Similarly, work in cognitive science has determined that the brain utilises

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<sup>1</sup> A note on terminology: Stanovich (1999) used the term, “system”, to label the two sets of properties of dual process theory, although what is being implied and referred to is a single system and, according to Stanovich (1999), the term should be plural referring to a set of systems in the brain and as such reference should be made to “type”, meaning that dual process theory is not a two-system theory (Stanovich and Toplak, 2012).

two sub-systems for thinking, knowing and processing information, and these are defined as System 1 (intuitive) and System 2 (analytical) processing, although System 1 processes are not always responsible for cognitive bias and Systems 2 processing is not always responsible for correct responses (Evans & Stanovich, 2013). A defining notion in the literature is that the System 1 process (intuitive) refers to a decision approach that is ruled by mental shortcuts and rules of thumb, widely known as “heuristics”, which refer to mental shortcuts often used in decision-making that can lead to faulty reasoning, and in some situations, usually under conditions of uncertainty, individuals believe in their intuitive feelings (Croskerry, 2009).

In discussions with CGEs the following appears to occur in crop choice:

- System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control;
- System 2 allocates attention to the effortful mental activities that demand it, including complex computations. The operations of System 2 are often associated with the subjective experience of agency, choice and concentration;
- System 2 has some ability to change the way System 1 works, by programming the normally automatic functions of attention and memory

Kahneman (2011, p. 20)<sup>2</sup>

The defining feature of Type 1 processing, according to Stanovich (2004), is its autonomy. Further work by Stanovich and Toplak (2013) established that

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<sup>2</sup> Some examples of System 1 include: detect that one object is more distant than another; orient to the source of a sudden sound; read words on large billboards; and understand simple sentences. Some examples of System 2 (Kahneman, 2011, p. 22) include: focus on the voice of a particular person in a crowded and noisy room; search memory to identify a surprising sound; monitor the appropriateness of your behaviour in a social situation; and check the validity of a complex logical argument (Kahneman, 2011, p. 21).

autonomous processing is the defining feature of Type 1 processing, while the key feature of Type 2 processing is the ability to sustain the decoupling of secondary representations, considered a cognitive requirement for hypothetical thinking. Decoupling processes have been found to be the ability to distance oneself from representations of the world so that they can be reflected upon or improved (Stanovich & Toplak, 2012). This line of inquiry is supported by Klein (1999, p.21) in his work in the fields of firefighting and nursing as he understands “how people handle all of the typical confusions and pressures of their environment, such as missing information, time constraints, vague goals and changing conditions”. Klein (1999, p.21) proposed that “years of experience are not beneficial if we cannot make meaning of and apply the experience” and suggests that building a meaningful experience base is essential.

Klein (1999) advised that recording more detail at specific intervals throughout a project (cotton season) increases the likelihood of more accurate information and increased amount of data collected. Knowledge is gained by seeing possible prior cases with known outcomes, and a semi-known set of causes can provide more applicable training based on case studies (Klein, 1999). Case-based training together with experience (Klein, 1999) assists in reducing the real-world delay between event and feedback, and that experience is a greater factor in bad decisions than faulty reasoning or a function of familiarity with the situation. This also supports why case-based training is used in medicine and law, providing a way to simulate experience in a shorter period.

For CGEs, post-harvest reflection does occur, but at this time much of what has happened over the season has been lost, even though it could be a beneficial way to gather information and knowledge for future use. Cotton growing is different in

many ways from numerous other agricultural pursuits, other than financial barriers to entry. An example is the importance of time pressure on activities and events during an irrigated cotton season that do not allow for Type 2 processing.

During a cotton-picking event with pending rain and the pressure to meet forward sale contract commitments, decisions do not need effortful controlled Type 2 processing. Similarly, a cotton grower would not rely on Type 2 thinking to attend to GPS fallout during cotton picking prior to a forecast rain event. On the contrary, over-analysing or overthinking could effectively cost the grower financially on a large scale (Kraster, 2016; Kurien, 2014).

### ***5.7.2.3 Default-interventionist Framework***

Dual process theory explains how thought can be explained in two different ways or processes: implicit (automatic) and explicit (controlled). Explicit processes are actions or attitudes that can change with education or persuasion (nudges), while implicit (automatic) processes or attitudes take time to change with the forming of new habits. Generally, dual process models can be classified into three groups: pre-emptive models, parallel-competitive models and default-interventionist models.

Default-interventionist theories suggest that reasoning and decision-making can require an override of the default intuition of Type 1 and a replacement by Type 2, reflective reasoning (Evans & Stanovich, 2013). There are several factors that cause an individual to override intuition such as the “feeling of rightness” based on an implicit feeling of awareness (Thompson, 2013, p. 255). Default-interventionist models accept that Type 1 processing is the default mode, which is always activated when confronted with a given situation (such as driving a cotton picker) or encountering a problem (such as being asked whether to forward-sell cotton) (Evans

& Stanovich, 2013). Type 2 processing is only activated when Type 1 processing casts doubt on the original solution (such as a warning sign on the cotton picker console). Most dual process models and default-interventionist approaches suppose that most real-world behaviours will depend on more than one type of processing, usually a mixture of both (Kahneman, 2011; Strack & Deutsch, 2004). The two types of processing are often referred to as intuition and reasoning (Kahneman, 2003). The variance in behaviour is the extent to which Type 2 processing is involved (Evans & Stanovich, 2013), and individual thoughts and behaviours can rely on autonomous or on controlled processes. There is evidence to suggest that confidence level influences decision doubt (Thompson et al., 2011), which links to self-efficacy in a specific task. Individuals are said to act intuitively in situations where there is a lack of relevant experience. Intuitive answers are prompted rapidly with little effort, ending with sometimes undesired results. In some situations, such as evaluating risks, individuals do not want to substitute the obvious for careful thought. In such situations, individuals want to use Type 2 override processing to block the intuitive decision (Kahneman & Frederick, 2002). Dual process theory is linked to behavioural economics theory and prospect theory, which are discussed next.

#### ***5.7.2.4 Prospect Theory***

Prospect Theory is considered a psychology-based behavioural economics approach using preferences to understand human behaviour in decision-making. The theory proposes that individuals behave differently in different types of contexts dependent upon an evaluation of risk and its associated gain or loss. Kahneman and Tversky (1979) established a behavioural model explaining how people decide between alternatives of risk and uncertainty. In choice situations, individuals make decisions based on the expected utility relative to a reference point (termed framing.)

such as their current affordability, and the risk associated with each outcome (Kahneman & Tversky, 1979; 2011). Prospect Theory identified through framing of risky choices that individuals dislike losses more than they like making similar gains and are more willing to take risks to avoid losses. In other words, people experience a greater sense of sadness for losses than happiness from gains (Kahnemann & Tversky 1979; 2011). This has particular relevance to CGE cotton crop choice influencers discussed in more detail in Chapter 6.

The relevance of Prospect Theory to this study is that the basis of the theory refers to an individual's behaviour in evaluating risk, such as in the context of the cotton-grower crop choice environment. Its practical application is useful for explaining evidenced irrational behaviour through notions of risk and loss aversion when individuals make decisions based on probabilities, often based on subjectivity. Beyond expected utility theory, prospect theory shows what people actually do instead of what people should do. Below is a cotton-growing real-world example.

Australian cotton industry accountants recommend that CGEs focus on maximising yields and minimising costs, the two areas that impact profit (Boyce 2016, p. 7). Industry concerns regarding productivity and profitability are based on increase in total expenses and growth of cost per hectare continuing to rise. While the value per bale continues to increase slightly there is no real growth, and it is believed that increased profits can be a result of efficiency and increased yield (Boyce, 2016, p.7).

Throughout this study a number of human shortcomings are apparent in so far as CGEs do not always make optimal decisions, because of the role their emotions play in their decisions, how procrastination influences behaviour, and how heuristics

are often used in decision-making processes. Discussions with CGEs in response to these questions highlighted why individuals may fail to reason. These stories and findings have provided interesting and rich data about CGE decision-making processes. What has also emerged is a misconception that when important decisions are made, individuals believe that rationality always prevails. The basic ideas of economics, maximising returns and rationality, are what most of the CGEs interviewed believe are the basis of making optimal decisions. This misconception regarding decisions suggests that individuals always assess all options and choose the best possible choice, whereas CGEs indicated that upon discussion the reality is that individuals don't always make the best decisions for themselves. Similarly, there are many incidences in everyday lives that we all experience as individuals that show human irrationality. It is well-known that human minds are susceptible to systematic errors (Kahneman, 2011 p.10)

#### ***5.7.2.5 Cumulative Prospect Theory***

Cumulative Prospect Theory (CPT) is a model developed to describe decision-making process under risk and uncertainty (Tversky & Kahneman, 1992; Kahneman & Tversky, 1979). A central part of CPT and the point of difference from Prospect theory is that cumulative probabilities are considered, rather than the probabilities themselves. This leads to an overweighting of extreme events, which occur with small probability, rather than to an overweighting of all small probability events (Tversky & Kahnemann, 1992). Therefore, understanding of influencers can provide some explanation. For instance, the availability heuristic provides examples of the process of judging frequency by “the ease with which instances come to mind” (Kahneman, 2011 p.130). There are many examples: “personal experiences, pictures, and vivid examples are more available than incidents that happened to

others, or mere words or statistics”. Kahneman (2011, p.130) suggested that “the availability heuristic substitutes one question for another”. Primary producers, specifically cotton growers in this context, often tend to apply both a statistic and an event concurrently. A cotton example is provided below.

A non-forecast 1-in-100-year frost event that affects a CGE will undermine their faith in the weather forecasting system more than a similar incident read about in a newspaper.

This theory relates to a range of decision-making situations that appear inconsistent with standard economic rationality, and there are several examples of inconsistencies such as status quo bias, gambling and betting puzzles, inter-temporal consumption, framing and endowment effect, some of which are addressed later in this section. It is well-known (Kahnemann, 2011) in the decision-making process that individuals think of possible outcomes relative to a reference point (usually the status quo) and do not weigh probabilities directly (Kahneman, 2011). CPT establishes that individuals have different risk attitudes towards gains (outcomes above the reference point) and losses (outcomes below the reference point) and are more interested in potential losses than potential gains, and this is known as loss aversion. People tend to over-emphasise extreme but unlikely events and seem to underweight “average” events (Kahnemann, 2011).

CPT differs from the standard Prospect Theory (that dictates how people choose to spend or invest their money) as CPT suggests that people think of possible outcomes based on points of reference instead of an outcome, which creates a framing effect (Kahneman, 2011). The average person will place more weight on the most favourable outcome and then ignore the risks that come with that decision

(Tversky & Kahneman, 1992; 2011).

#### *5.7.2.6 Cognitive Dissonance Theory*

Cognitive Dissonance Theory, known as Festinger's theory (1957), is the discomfort experienced when an individual's beliefs (attitudes) are not in line with their actions (behaviours) or when individuals have two conflicting attitudes. The theory postulates that this feeling of uneasiness causes individuals to have an inner drive to adjust actions or beliefs or rationalise behaviour to avoid disharmony (dissonance). The theory contains some fundamental assumptions:

1. Humans are sensitive to inconsistencies between actions and beliefs and are motivated to reduce or eliminate them to achieve consonance (agreement);
2. Recognition of inconsistency will cause dissonance and motivate individuals to resolve their personal conflict;
3. Dissonance will be resolved in one of three ways:
  - a) change beliefs (it is well-known that basic beliefs and attitudes are relatively stable);
  - b) change actions (not known to be an easy task to train oneself "not" to feel a certain way, i.e. give up smoking); and
  - c) change perception of action (to rationalise or justify behaviour, i.e. it is better to "live for today" than to "save for tomorrow") (Festinger, 1957).

Brehm (1956) found a link between dissonance and decision-making, positing that individuals with high dissonance are more likely to increase the attractiveness of the chosen alternative and to decrease the attractiveness of the unchosen alternative.

### *5.7.2.7 Nudge Theory*

The concept of Nudge theory is for practical application to psychological principles that influence decision-making. Sunstein (2014, p.1) suggests “policies influence in that various forms such as mandates and bans, economic incentives (including disincentives) such as subsidies for renewable fuels, fees for engaging in certain activities and taxes and other ‘liberty preserving approaches’ such as nudges”. Nudge theory is designed to help people improve individuals’ thinking and decisions that are in their broad self-interest. In daily life, and that of a CGE, examples of a nudge include a GPS, a text message as a reminder, an alarm clock and the default settings on computers and mobile phones (Sunstein, 2014, p.1; Thaler & Sunstein, 2008). The theory posits that nudges maintain freedom of choice by making life simpler and easier to navigate. While nudges are considered a “soft paternalism” because they guide people in a specific way, the theory maintains that nudges are designed to maintain individuals’ freedom of choice. Using the example of GPS guidance, people may still choose their own route (Sunstein, 2014; Thaler & Sunstein, 2008). Sunstein (2014, p2) suggests that “some kind of social environment (or ‘choice architecture’) influencing people’s choices, is always in place” and that nudging should be transparent and rely on evidence using empirical tests and randomised control tests.

Social nudges act as choice architecture. (Thaler & Sunstein, 2009) explain that informing people about what other people are doing may nudge people’s behaviour.

For a cotton example of a “social norm” – the problem of growing cotton every year regardless of significant factors and not weighing up all the information available, can prove to increase risk, sometimes beyond CGEs’ self-assessed acceptable levels. Discussions with CGEs found that misperceptions result in part from the availability heuristic. At the time of pre-planting discussions (on the back of a current season), incidents of a productive season are mostly recalled, and the consequence is to inflate perceptions. CGEs are influenced by their beliefs about what other CGEs do, and hence inflated “yields” and “efficiencies” will inevitably increase if CGEs have an exaggerated sense of how much other CGEs are planting and growing.

#### ***5.7.2.8 Theory of Deliberate Ignorance***

Research in deliberate ignorance and regret theory can be used to shed further light on the decision-making processes involved in cotton growers’ crop choices. The research looks beyond the previous studies that suggested individuals do not want to know the answers to questions of personal relevance when defining other motives (Gigerenzer et al., 2017). The term, deliberate ignorance, theorised that “two conditions hold: 1. Choice of ignorance even when information is free and 2. Choice of ignorance notwithstanding personal interest” (Gigerenzer, 2017, p. 193). In the study, Gigerenzer et al. (2017) found there are four motives that establish why people may not always want to know the answer to specific questions: “to avoid negative emotions that may arise from foreknowledge of negative events; to maintain the positive emotions of surprise and suspense; to gain a strategic advantage; and to implement fairness and impartiality”. Results in the study established that most people behaved consistently with the regret theory of deliberate ignorance, whereby people do not want to know if the option of knowing is associated with the maximum regret

(Gigerenzer et al., 2017, p. 193).

This theory could explain in a crop choice context why growers consistently choose to grow particular crops such as cotton. In the work of Gigerenzer et al., (2017, p. 193), building on the work of Luce and Raiffa (1957), the proposed theory of deliberate ignorance shows that for negative events such as lack of enough water for the growing season, deliberate ignorance avoids the anticipated regret if the work outcome proved to be true. In other words, deliberate ignorance is the refusal to consider logic or evidence such as in the context of a cotton-growing season with the lack of forecast rainfall and water accessibility proposing less than optimal conditions for the crop, and planting regardless.

### **5.7.3 Theory and Cognitive Biases in Decision-making**

Cognitive biases in decision-making are a result of people making quick decisions, often relying on mental shortcuts. While mental shortcuts are necessary in some aspects of decision-making they can lead to predictable cognitive biases. Most people do not take the time to think and analyse all decisions and therefore use “rules of thumb” heuristics to make decisions. Some of the most common cognitive biases included in the literature are heuristics, anchoring, representativeness, halo effect and overconfidence (Thaler, & Sunstein, 2008). Examples of such biases applied to this study context are listed below and form parts of the following discussion.

Table 5.1 *Theory and how it applies to the context*

<b>Theory</b>	<b>Theory relevance</b>	<b>Relevance to study</b>
Regret theory	The link between theory and the research question is explained in terms of feelings of regret-aversion, making choices because of individuals' dislike of feelings of regret. Emotions of regret and disappointment are real and can influence choices.	It is understood that CGEs experience regret when making crop choices and may experience regret-aversion. The experience of an option depends on a choice you could have made but did not.
Dual Process Theories of Decision-making	Dual Process Theories refer to implicit and explicit processes that influence human behaviour such as decision-making.	Crop choices may be influenced by both unconscious and conscious processes.
Default-interventionist Framework	This model suggests that there are two types of reasoning – type 1 intuition and type 2 reasoning. Type 1 processing is the default mode which is always activated when confronted with a given situation (such as crop choice). Type 2 processing is only activated when type 1 processing casts doubt on the original solution (confidence levels can influence doubt) which links to self-efficacy in tasks such as crop choice.	Crop choices may be influenced by intuition and self-efficacy.
Prospect theory	The basis of this theory refers to individuals' behavior in evaluating risk that are guided by the immediate emotional impact of gains and losses, not by long-term prospects of wealth.	Choice of crop requires CGEs to make decisions of probabilities often based on subjectivity. This has relevance to the research questions in relation to decision-making in the way that people choose between probabilistic alternatives that

		involve risk, where the probabilities of outcomes are unknown.
Cumulative Prospect theory	A central part of this theory refers to cumulative probabilities being considered, rather than the probabilities of individual outcomes. People tend to think of possible outcomes relative to a particular reference point (status quo) rather than to the framing effect.	CGEs may care more about potential losses than potential gains.
Cognitive Dissonance theory	This theory explains the mental stress experienced by people who hold two or more contradictory beliefs or values.	CGEs who have a higher need for consistency and certainty in their lives usually feel the effects more than those who have the need for less certainty. This may relate to the status quo of crop choices.
Nudge theory	Proposes positive reinforcement and suggestions to influence behaviour and decision-making.	Choosers usually notice incentives they face in free markets, although in important cases such as in crop choices, this is not always the case.
Theory of Deliberate Ignorance	Refusing to consider logic or evidence disproving ideologically motivated positions or decisions.	Crop choices may relate to this theory in some of the seasons where choices may not be in the CGEs' own best interests.
Theory and Cognitive Biases in making	A type of error in thinking that occurs when people are processing and interpreting information - often resulting from past preferences and beliefs.	CGEs may make ill-informed decisions influenced by non-economic factors such as emotion and invested opinion.

<b>Theory</b>	<b>How it applies to a CGE context</b>
<b>Bounded Rationality and Heuristics</b> (Rules of thumb)	CGEs choose to grow or not to grow cotton based on conscious and unconscious influencers as explored and explained in section 6.3, 6.4 and 6.5 and summarised in section 6.5.9.

<p><b>Loss Aversion</b> People dislike losses more than they like gains of an equivalent amount</p>	<p>Communicating the cost to individuals or organisations by not adopting a new behaviour (i.e. exploring what influencers led to the initial decision)</p>
<p><b>Discounting</b> Short-term costs and benefits dominate decision-making</p>	<p>Any initial investment necessary to adopt a new harvesting or fertilising behaviour (for example, buying a new round bale cotton picker or weed-it camera sprayer) is likely to act as a strong deterrent, even if it is beneficial to the individual or organisation in the long term.</p>
<p><b>Procrastination</b> People put off decisions involving complexity, self-doubt or inconvenience</p>	<p>Using a new technological equipment may be more efficient but if instructional help is not provided people are unlikely to invest the time or effort in finding this out for themselves.</p>
<p><b>Over-weighting</b> small probabilities Tendency to over-estimate the probability of rare, vivid events</p>	<p>For example, people commonly express fears about droughts in Australia, despite floods causing the most damage. Similarly, people can overestimate the extent to which they are likely to install the latest technology on-the farm.</p>

Table 5.2 shows theories and biases applicable to the context. Further detail is provided below.

### **5.7.3.1 Heuristics**

Elstein (1999) refers to heuristics as mental shortcuts, suggesting they are the basis of bias in decisions. Others suggest that heuristics are efficient but also lead to predictable errors (Tversky & Kahneman, 1974). How individuals can address this and other difficult decision-making processes in cotton is central to the topic of this thesis. Why heuristics work, some suggest, is that they rely on fast and frugal decision-making that is built around three rules: “search rule; stopping rule; decision

rule ... and are characterised by the limited exits they have ... but they will always lead to a decision” (Maraewski & Gigerenzer, 2012, p. 82). There are several heuristics approaches that have been used to develop decision frameworks, and the “heuristics and biases” perspective still leads today (Croskerry, 2009). Extensive work in heuristics and judgement under uncertainty, most notably in the literature (Tversky & Kahneman, 1974), refer to three most prominent heuristics: representativeness, availability, anchoring and adjustment, which are summarised below in Table 5.2.

Table 5.2 *Overview and Illustrations of Most Prominent Heuristics*

<b>Heuristic</b>	<b>Field of Application</b>	<b>Illustration/Example</b>
Availability	Memory-based judgements of frequency or probability	Overestimation of risks that are easily available in memory
Representativeness	Judgements or likelihood of instances belonging to a category	Birth order son-daughter-son-daughter more representative of random outcome than son-son- son-
Anchoring and adjustment	Quantitative estimates on unidimensional scale	Costs calculations biased towards starting value

In the works of Tversky & Kahneman (1974), reference to availability suggests that frequencies are determined by how easily they are remembered, although it can lead to biases due to familiarity and salience because they come to mind more easily. Representativeness and probabilities are calculated by how much one thing is representative of or resembles another, and this can lead to errors. Representativeness is insensitive to prior probability of outcomes, to sample size, and to misconceptions of chance, as people rely on favourable descriptions rather

than relevant information. People pick outcomes that most represent input. Adjustment and Anchoring refer to people estimating based on initial values that do in fact bias estimates.

### ***5.7.3.2 Bias or intuition?***

Various approaches to decision-making have two purposes: to explain an individual's thinking and to apply a practical approach. The intuitive approach relies on the experience of the decision-maker using reasoning that depends on inductive logic. The analytic approach relates to normative reasoning and rationality more closely. Both these approaches to reasoning have become widely recognised in the literature as dual process theory or System 1 and System 2 reasoning, discussed earlier in this chapter.

Research by Kahnemann and Tversky established that intuitions are useful but can lead to methodical errors. Klein (2010) considered that individuals should never trust their gut but use it as a data point to evaluate their initial feelings to make sense of a specific context. Kahneman (2011) found that there are some situations, such as under the pressure of time, where individuals trust their intuition, and yet he warns that "overconfidence" can cause information bias problems while also making individuals feel confident about their judgements with no strong basis for the judgements. A survey (McKinseyquarterly.com, 2009) found that of 463 answers to the question, "Does management admit mistakes and kill unsuccessful initiatives in a timely manner?", 80% of C-level executives said yes and 49% of non-C-level executives agreed that ... management does admit mistakes and kill unsuccessful initiatives in a timely manner". Kahneman (2010) and Klein (2010) have agreed on experience being an important factor in decision-making processes and that hindsight reinforces leaders' gut feelings expressed as experience and wisdom.

Accordingly, Kahneman (2011, p. 185) believes that many judgements, especially in work situations, are influenced by a combination of analysis and intuition. The question then is: When do individuals trust their intuition? As explained previously, Kahneman (2011 p.240), and his colleague Klein established that it is possible to distinguish intuitions “if the environment is sufficiently regular to be predictable and an opportunity to learn these regularities through prolonged practice”.

## **5.8 SUMMARY**

This chapter explains some of the cognitive biases of individuals, and theories and models in the context of this study, how individuals are influenced by both conscious and (automatic) unconscious responses, and how human behaviour is motivated by the influence of others and societal norms to gain social approval. The importance of health and well-being in the workplace and identifying the burden of workplace stress on employers is viewed. The elements of a psychologically healthy workplace are addressed through leadership, appraisal, recognition and work-life balance. Psychology posits that behaviour is driven by internal, conscious motivations, the external environment and unconscious influencers. While behavioural economics acknowledges the effect of time and emotion on choices and the systematic irrational choices individuals make, individuals and organisations sometimes take actions that appear to undermine their own well-being. Life is filled with decisions, and many decisions are made by mental accounting or short cuts and some by “intuitive” feel. Intuitive decisions often result in judgements that are right; however, bias in those decisions is also evident. Reference is made to work in cognitive science and two sub-systems for thinking, knowing and processing information, defined as System 1 (intuitive) and System 2 (analytical) thinking, and the link to CGE crop choices. Cumulative Prospect theory (CTP) covers decision-making situations that appear

inconsistent with standard economic rationality and examples of inconsistencies such as status quo bias, framing and endowment effect. CTP also explains the difference in risk attitudes towards gains and losses and how people tend to over-emphasise extreme but unlikely events and seem to underweight “average” events. Nudge theory relates to the practical application, with examples of influencers designed to help people improve thinking and decisions that are in their broad self-interest.

The relevance of behavioural economics generally is illustrated in this chapter. In Chapter 6 reference is made to two specific behavioural economic frameworks, MINDSPACE (Dolan et al., 2010) and the Behavioural Insights Toolkit (Savage et al., 2011), that have been applied to other areas, for example, public policy and health, and in this study to the Australian cotton industry. The chapter shows the influencers of both conscious and mostly unconscious decision-making processes, and are presented and defined as individual, environment and social concepts, drawing on these aforementioned existing frameworks to include a model developed for this study in the Australian cotton industry and CGE context. Understanding when and why these decision-making processes occur will provide guidance on how to make more effective decisions in this context.

## **6. APPLICATION OF FRAMEWORK AND DEVELOPMENT OF MODEL**

### **6.1 INTRODUCTION**

As illustrated in the previous chapter, theories have been explored that relate to the research problem in the behavioural economics literature. As the work environment of employers such as CGEs becomes increasingly demanding, with more choice, variability and innovation associated with technological advances, more variations to climate change, CGEs' project management skills and capabilities are under pressure. The more demanding the intellectual work in management, the more difficult it is to motivate even the most dynamic employers, such as CGEs. Although this study applies to employers such as CGEs, what is learned will also pertain to other stakeholders in the cotton industry supply chain, such as agribusinesses, banks and agronomists. In this study, in Chapter 2 psychology referred to the individual, and their behaviours and motivations, while in Chapter 5 economics referred to the market environment. Behavioural economics in this context explores the influencers and incentives for CGE crop choices and investigates the influencers, both conscious and unconscious, that relate to CGE management decisions about growing cotton. Within this chapter, the effects of incentives and the role of influencers of choices are presented and defined as individual, environment and social, drawing on existing frameworks, to include a model developed for this study.

In Part 2 of this study in the previous chapter, Chapter 5 provides the basis for the model in this chapter, Chapter 6. While Part 1 provided some insight into

influencers of CGE decision-making, such as personality, self-efficacy in the task of growing cotton, job satisfaction and work engagement, it was unable to fully answer the research question. A psychological perspective did not include influencers considered in behavioural economics. In the CGE crop choice context, each heading in this chapter highlights the influencers as individual, economic or social. This chapter augments the analysis in Part 1 of this study in Chapters 1 to Chapter 4 and the quantitative results provided in Chapter 4. Chapter 5 introduced the literature related to behavioural economic theories, which combined with the SCCT (in Chapter 2) and the developed Australian cotton grower motivation model (here in Chapter 6) more fully explain the influencers and decision-making behaviour of CGEs.

In Part 2, commencing with the behavioural economics literature presented in Chapter 5, a behavioural approach is used to apply evidence from psychology to economic models of decision-making, recognising that people are sometimes seemingly irrational and inconsistent in their choices, often because of the influence of individual, environment and social factors (Ariely, 2008; Dolan et al., 2012; Thaler & Sunstein, 2008).

There are two ways of thinking about individual behaviour and how decisions are influenced; these are defined as conscious and automatic decision processes. The first is based on what people consciously think about, commonly known as the “cognitive model”. Individuals analyse the incentives offered and act in ways that reflect their own best interests and influence behaviour by “changing minds” through consciously considering the surrounding environment (Dolan et al., 2010). A second contrasting model focusses on the automatic unconscious process of judgement, and influences the way individuals respond to the environment, the

context in which people act (Dolan, et al., 2010). This study makes reference to two behavioural economic frameworks that include influencers that impact choices, and these are discussed in more detail. Firstly, the mnemonic MINDSPACE framework (Dolan et al., 2010) was developed by a collaboration of academics and government policy executives in London to shape and influence behaviour central to public policy. As explained in the framework preface, behavioural theory establishes two reasons to use “softer” instruments as in the MINDSPACE framework rather than “hard” instruments such as legislation and regulation to compel individuals to act in certain ways. While these types of influencers are effective they are considered costly and not always appropriate in many instances, leading government to include factors that influence behaviour in mostly automatic ways. Tools such as incentives can be used to change behaviour by “changing minds”, but as people do not always respond in this “perfectly rational” way, approaches based on changing context and the environment where decisions and cues are made can bring about change in behaviour (Dolan, et al., 2010).

It is the objective of this study to explore the behavioural economics literature and frameworks and build on this and academic literature and apply the CGE responses and cotton industry knowledge to develop a model. This chapter discusses the MINDSPACE framework (Dolan et al., 2010) as applied to cotton in this context. As there is increasing evidence to suggest that “changing contexts” by influencing the environments within which people act (in automatic ways) can have important effects on behaviour, MINDSPACE (Dolan et al., 2010) taps into people’s natural tendencies. For example, when cotton merchants call and tell CGEs to hurry on a decision to sell cotton (often during cotton-picking) as the market may move either way (dependent upon the strategy of the merchant), individuals with a natural

aversion toward loss (the “I” – incentives in MINDSPACE) and little time to think through the decisions, buy into making quick decisions that may result in decision regret or choice overload, or generally not achieve CGEs’ expected decision outcomes. This example provides a common marketing strategy where MINDSPACE is applied in many instances such as “Stocks are limited, hurry”. Another example is in the understanding of norms (the “N” – norms in MINDSPACE) where businesses applaud certain behaviours; as individuals are influenced by what others do, the behaviour is then enforced as a “norm”.

The application of theory and frameworks began with the behavioural economic literature in Chapter 5 and data collected through interviews with CGEs to establish how CGEs currently make decisions about crop choices. Experiments and hypothetical scenarios are beyond the scope of this study; however, details have been provided through interviews with CGEs throughout this chapter, to establish influencers on CGE judgements, choices and decision-making processes in the cotton-growing context. These influencers identified through the application of the MINDSPACE framework are used to develop the “Employer self-driven choice model of automaticity and willpower behaviour”. As already mentioned in this section, as individuals do not always act in rational ways but rather are influenced by unconscious, automatic responses often fail to achieve an individual’s expected outcomes, thus identifying a gap in the literature and the application of this knowledge to the Australian cotton industry and influencers that impact on CGEs’ crop choices. This chapter applies this theory and framework by uncovering unconscious priming cues to CGE choices, advancing knowledge of how unconscious influencers occur in a cotton-growing business in the Australian cotton industry, and moving towards the development of the model discussed at the end of

this chapter. The chapter develops a model informed by the academic literature and the MINDSPACE framework (Dolan et al., 2010). This study refers to both frameworks, the MINDSPACE and the Behavioural Insights toolkit (Savage et al., 2011) (to be discussed later), the industry survey and CGE interviews.

### **6.1.1. Building on Behavioural Economics Frameworks – the Mindspace Framework and the Behavioural Insights Toolkit**

The second behavioural economic framework that includes influencers that impact on choice is the Behavioural Insights (BI) Toolkit (Savage et al., 2011). The BI toolkit was developed by the Internal Revenue Service in England (IRS) as a practical policy resource to understand how individuals learn and manage information and how policy-makers apply this to design policies and interventions for behaviour change. While the Behavioural Insights Toolkit was designed as a guide for incorporating behavioural approaches into tax administration and is therefore not a comprehensive review of behavioural science, it does, however, aim to point readers to behavioural insights, materials, principles and methods. This framework is used in this study for its applicability to factors that influence behaviour and covers those topics not covered in the MINDSPACE framework but relevant to crop choices. This behavioural insights framework is used in this context as it covers factors that influence the CGEs. Individual factors such as decision-making based on both deliberate and automatic modes of information processing can provide CGEs with an awareness of influencers of decisions. Factors covered include: cognitive load; self-image; System 1 and System 2 thinking; heuristics and biases; intention and commitment; social factors such as social norms and social concepts relating to the messenger and how information is received and returned, such as reciprocity; environmental and design factors because behaviour is shaped

by contextual factors and cues in the environment as most information processing is automatic (Kahneman, 2011); and environment and design concepts such as choice architecture, feedback and reminders, framing and priming, salience, implication and timing.

When applying behavioural insights, two objectives are suggested. The first refers to the work in this study such as building an understanding of behaviours with the goal of designing an appropriate intervention or alternative treatment, and the second refers to testing the effectiveness of the intervention. The framework suggests a four-step process from problem definition to final evaluation. This study provides the exploratory research that meets the first objective and step, and the second step of diagnosing behaviours that apply to crop choices. In Chapter 7 are the recommendation for steps 3 and 4, and recommendations for further study to design and implement interventions or treatments, and test and evaluate them (BI toolkit, 2011 p.37).

As mentioned previously, there is some overlap in topics covered in both the frameworks, and in such cases the MINDSPACE framework remains intact and the Behavioural Insights Toolkit is used to add any other topics not yet covered that are applicable to the CGE context. It is also worth noting that as this study comprises an exploratory approach to behavioural economics in the CGE context.

## **6.2 CROP CHOICE BEHAVIOUR**

The most significant decisions facing any CGE are related to crop choice. The specific problem to be addressed is found by asking the questions: What are the influencers of crop choices? Why is this a problem? Until now, traditional economic theory explains that all people are rational, and individual choices align with expected utility theory as people correctly revise their opinions and beliefs based on all new information received. Yet

behavioural economics explains that people make systematic errors, and the context of the decision has a large effect on the decision (Dolan, et al., 2010). From the perspective of a cotton grower, application of what was learned from the literature in reviews 1 and 2 raises the questions: Is there a level of “overconfidence” in-crop choice? Are heuristics and other such influencers impacting on crop choice?

This study explores behavioural economic influencers such as overconfidence and heuristics that go beyond economic terms. Until now, two economic factors are viewed as impacting profit, and thus crop choices: “maximize yields and minimize costs” (Boyce, 2016, p. 7), suggesting there is a desire to reduce costs per hectare as profits are expected to come from improved efficiencies and increased yield. While value per bale continues to increase slightly, an anomaly exists in that CGEs remain increasingly optimistic about choosing to grow cotton, sometimes regardless of current and future forecasts. If industry profits come from efficiency (less quantity of inputs) and increased yield (Boyce, 2016), the projection is that these factors may eventually reach a “ceiling” limit. CGE motivation and decision-making processes of crop choices go beyond economic, environmental and social influencers to include an understanding of behavioural economic factors such as overconfidence, heuristics and biases, defaults and so on.

The key stakeholders are the CGEs themselves, policy-makers, cotton industry governing bodies, cotton-grower associations, and ancillary providers of cotton products and services to the cotton industry, such as the agribusiness sector consultants, merchants, brokers and banks and other businesses supplying consumer goods to this sector. The views and actions of all these stakeholders can assist in furthering an understanding of the CGE attraction to cotton as a crop of choice and their participation and retention within the Australian cotton industry. The focus of

understanding CGEs' crop choices is new to the cotton industry agriculture literature, as until now the common view of CGE attraction and retention is understood to be (at first glance by CGEs themselves) influenced by economic factors alone.

However, there is a view emerging that there is more to work motivation than money, that work is a fundamental dynamic driver for enhancing human development based on the notion of work being broader and deeper than a job (Human Development, 2015, p. 3). This view is supported by interview discussions with CGEs themselves, who also perceive influencers of crop choices to provide a sense of belonging (to a cotton community), relatedness/kinship and lifestyle as discussed in Literature Review 1 (Maslow, 1943; 1954). Further influencers identified in the results section in Chapter 4 and again in Literature Review 2 in the behavioural economics literature were explored. In the second round of unstructured interviews an agronomist stated that CGEs have a sense of confidence, usually based on years of experience in the industry:

Overconfidence can be fuelled by emotion and habit and may influence how CGEs think about crop choice. Many (not all) CGEs know the importance of collaboration and are willing to talk things through for a broader view. [Cotton Agronomist 1 (CA1)]

Growers often base judgement on memory retrieval; they don't seem to see the bias in what actually happened last season. [CA1]

CGEs indicated that they rely on price changes and information-based details delivered by a consultant agronomist to make crop and career choices.

Successful CGEs know what needs to be done because they are motivated by what they do, enjoy the work and continually want to improve what they're doing. It's that simple. They are willing to hold back on a cotton season if the fundamentals aren't right [CA1]

Trouble is, we love work so much and are so immersed in it we sometimes forget to take a break. We can be physically and mentally exhausted, mostly without realising it, and our decision-making is no doubt swayed [CGE3]

The quotes from CGEs suggest they rely on price changes and information-based detail delivered through several media, although they believe one of the strongest sources is a consultant agronomist on crop choices. This is in line with the literature on trust and relationships that state that social closeness and like-mindedness play a role in influencing trust. The behavioural economics literature has established that an influencer known as priming can change a person's behaviour in everyday life using unconscious impulses (Thaler, 2008; 2009). Unconscious impulses influence CGEs' behaviour, judgement, emotion and motivation with respect to crop choices, as evidenced by the interview quote below.

We are very biased towards growing cotton and sometimes fail to explore any alternative crops even when we should as in situations where water is insufficient to get us through the season, This of course may result in a less favourable outcome than expected ... it's like a commitment to the notion of a cotton crop and we feel we are geared mostly for cotton (G1)

Research (Dolan et al., 2010) tells us that human behaviour is not guided by logic but rather is influenced by the environment or context (as applied to CGEs). Heuristics (rules of thumb) are found to work in many situations but can also lead to cognitive biases and predictable errors that mislead “rational” decision-making processes (Kahneman, 2011). Several heuristics and cognitive biases are based on the availability of information and the influencers of emotion and feelings, which when supported by System 2 become views and attitudes (Kahneman, 2011). Slovic (2004) found that people consult their emotions when making judgements and decisions. Known as the affect heuristic, a mental shortcut allows people to make decisions and solve problems quickly and is based on emotion, such as surprise, enjoyment or fear, which then influences those decisions. One CGE indicated:

We often rely on emotion when making decisions, for sure, it's automatic, often there's no time to think things through ... say, for example, if there's an alarm going off in the cotton picker, you have to act quickly. Cotton is very flammable so jumping into action to clear a blockage is critical (CG3).

The concept of systematic biases was developed by Kahneman & Tversky (1974) who advocated that people rely on a limited number of heuristics that can be useful but sometimes lead to methodical errors. As mentioned in Chapter 6 in the heuristics section, there are three most prominent heuristics, known as representativeness, availability, and anchoring and adjustment. A representative heuristic is used when making judgements about the probability of an event under uncertainty or used when making assessments about people. For example, the probability that Bob is a cattle farmer is assessed by the degree to which he is representative of, or similar to, the stereotype of a cattle farmer. The availability

heuristic is a mental shortcut that relies on immediate examples that come to mind and is influenced by familiarity and salience. The anchoring and adjustment heuristic describes situations where people use specific numbers or values as a starting point (such as an anchor) and adjust it to reach an estimate (Tversky & Kahneman, 1974).

There's a lot going on on farm. You can be trying to pick cotton and making sure things are going right and the merchant calls and says, "There's a chance to sell cotton but the price won't last so I need to know ASAP." You're trying to address the immediate and at the same time make decisions about the future (e.g. price) ... there's all sorts of emotions to this... for example, you're feeling enjoyment (and frustration all at the same time) at getting the crop off but also fear about selling it at the right price ... Yeah, we make decisions on the run all the time, we have to ... how reliable this is, I don't know? (CG2)

Source: Savage et al. (2011), p.4

Table 6.1 *Crop Choice Factors*

<p><b>Collective objective</b> factors: Facts that relate to factors bigger than the individual e.g. climate, seed, availability of seed, chemical, machinery, fuel prices, commodity prices and so on</p>	<p><b>Collective subjective</b> factors: Perceptions at a group level, e.g. social and cultural norms, cultural values, trust</p>
<p><b>Individual objective</b> factors: Facts that relate to the individual such as personal abilities, experience, awareness and habit</p>	<p><b>Individual subjective</b> factors: Perceptions which relate to an individual, e.g. personal norms, self and identity, status, perceptions of costs and safety, risk</p>

Source: Developed for this study based on Savage et al. (2011), p.4

Within the cotton industry, crop choices for CGEs are complex and influenced by a wide range of factors. Crop choice factors are dependent on both objective and subjective factors. Some examples are provided below.

Table 6.1 explains that any variations will result in individuals and groups (collectively) responding differently. For example, in the context of CGEs, behavioural responses to commodity prices may be different among CGEs more heavily financially geared, compared with CGEs who owe less. Similarly, a heavily financially geared, financially supported CGE may respond differently to decreases in commodity prices than a CGE who has little or no debt and the financial support of experienced family members. Not only do different individuals vary, but the same individual can vary at different times depending on the particular hat they are wearing, for example, grower, contractor, truck driver, tractor operator. This relates to different factors influencing behaviours at any one time.

Two types of evidence help understand an individual's behaviour: objective evidence and attitudinal evidence. Objective evidence refers to information based on facts that can be proved by analysis, measurement, and observation, and thus can be examined and evaluated, and directly relates to objective factors, both individual and collective, which determine CGE crop choices behaviour. Examples include data on areas and varieties to be grown, agronomics, climate forecasts and commodity price. On the other hand, attitudinal evidence explains what matters most to individuals and why it matters. It directly relates to the subjective factors, both individual and collective, which determine the crop choices behaviour. Examples include views on which varieties are best suited to the current agronomic conditions, whether new driverless tractors are safe, and whether buying a new round bale picker is appropriate for that person.

This evidence is used to understand the real-world barriers to choices and highlight factors likely to motivate them. Both types of evidence are understood to be a representation of each other, but in the CGE context an individual's attitudes may appear to contradict the behaviour, referred to as an Attitude-Behaviour gap or Value-action gap. Multiple factors influence CGEs' crop choices behaviour, and therefore varied measures are necessary to enable different behavioural choices. For example, an initiative aimed at encouraging crop choice relative to the water availability may be more likely to succeed if it tackles both attitudes to water availability and objective factors such as variations to planting areas, and varieties.

### **6.2.1 Perspective on Crop Choices**

To date there is no research and no industry documents that consider these issues from this perspective in the Australian cotton industry. Behaviour change has increasingly been applied across government (Dolan et al., 2010) but less so in industry so far, recognising that individuals need to change their own behaviour in order for industry's and government's wider goals to be achieved (Dolan et al., 2010). The Australian cotton industry goal is to be a global leader in sustainable agriculture and "cotton is profitable and consistently farmers crop of choice" (Australian Cotton Industry Strategic Plan, 2012-2018, p. 16). The industry is striving to achieve a vision of being Differentiated, Responsible, Tough, Successful, Respected and Capable by 2029 (Australian Cotton Industry Strategic Plan, 2018-2023). In order to achieve the industry vision of "responsible" people, it is essential to better understand the influencers of work motivation and crop choices of individual CGEs.

### **6.3 AN EXPLORATORY STUDY APPROACH ACROSS TWO DISCIPLINES**

This study draws from disciplines in psychology and economics in a behavioural economics approach examining human behaviours to enhance understanding of individual motivation and behavioural choices of CGEs in the Australian cotton industry context. By investigating the human and social factors which influence decisions in the CGE context, behavioural economics is able to model human behaviour in understanding that individuals are not perfectly rational but are subject to biases, care about what others think of decisions they make, use mental shortcuts to make decisions, make different choices based on context and are emotional in decision-making (Gigerenzer, 2017). The chapter highlights unconscious judgements and behaviours to assist in better understanding how unconscious influencers operate in a CGE business context. Each of the headings and sub-headings in this chapter include the specific context that applies to the influencer, for example, individual, environment or social factors. The chapter explores the CGE environment and influencers such as biases (individual), heuristics (individual) and framing (environment) and makes reference to principles of behavioural economics in individuals, such that individuals make systematic errors and human behaviour is guided by logic and influenced by the environment or context (Ariely, 2009). Based within the research approach, the Behavioural Insights Toolkit (referred to as the BI toolkit) was developed to identify what influences how people think and behave. The BI toolkit is referred to throughout this study and is applied in this chapter (Savage et al., 2011). The MINDSPACE framework (Dolan et al., 2010) is also used in conjunction with the BI toolkit to extend the knowledge base on what influences how people think and behave in the Australian cotton industry

context.

In support of the argument of this study, businesses, large and small, are led by individuals, and “as organisations are made up of individuals, it is likely that many of the same broad principles relating to individuals’ behaviour also apply to the behaviour of organisations” (Savage et al., 2011, p.3). The behavioural literature states there is a lack of evidence on how and why organisations make the behavioural choices they do. There are several influencers and behaviours within decision-making processes, although Kahnemann & Tversky (1974) suggest there are two different ways to change behaviour, based on two different processing systems operating in the brain of individuals: System 1, changing the more automatic processes of judgement and influence; and System 2, affecting what people consciously think about (Kahneman & Tversky, 1974). They found that there is evidence to suggest that “automatic” processing in decision-making is important, but that rational choice theory has ignored automatic processes. Although many policy interventions have targeted “reflective” thought processes, behavioural economics tries to address such automatic processes in the following two ways.

1. To minimise decision-making under the automatic system by using strategies that try to lead decision-makers away from biases and shortcuts.
2. To try to make the biases in-built in automatic processes work in the favour of the decision-maker to obtain results that align with wanted goals.

### **6.3.1 Application of the Behavioural Insights Toolkit**

The BI Toolkit (Savage et al., 2011) provides headings in Table 6.2. Included are some of the influencers in the CGE context.

Table 6.2 *BI Toolkit Applied: Types of Influencer and Behaviour*

Type of Influencers	Behaviours		
	Grow cotton every season	Grow cotton most of the time	Grow cotton some of
<b>Structural factors (environment)</b> (i.e. physical/cultural constraints)	Availability of water; water licence/s; storage; seed varieties; fertiliser; machinery; fuel; labour.	Availability of water; water licence/s; storage; seed varieties; fertiliser; machinery; labour.	No water availability ; no available water/water licence/s; no storage; less than ideal long-
<b>Attitudes (individual)</b>	Whether CGE likes growing cotton	Whether CGE likes the idea of growing cotton	Whether CGE likes the idea of
<b>Norms (social)</b>	Whether growing cotton every season is “normal” for someone like me	Whether growing cotton most of the time is “normal” for someone like me	Whether growing cotton some of the time is “normal” for someone like me
<b>Cost (environment)</b>	Cost of growing cotton every season;	Cost of growing cotton most of the	Cost of growing cotton some
	licences-water, seed; fertiliser; machinery; fuel; labour.	time – cost of cotton specific machinery; maintenance; supply of seed and fertiliser; fuel; sourcing experienced labour.	time – cost of cotton specific machinery; maintenance; supply of seed and fertiliser; fuel; sourcing experienced labour.

<b>Type of Influencers</b>	<b>Behaviours</b>		
	<b>Grow cotton every season</b>	<b>Grow cotton most of the time</b>	<b>Grow cotton some of</b>
<b>Habit (individual)</b>	Whether growing cotton every season is done regularly and has therefore	Whether growing cotton is done often enough to become a habit.	Whether growing cotton is done often enough to become a habit.
<b>Capability and Self- efficacy (individual)</b>	Whether CGE has the capacity and confidence to grow cotton every season.	Whether CGE has the capacity and confidence to grow cotton most of the time.	Whether CGE has the capacity and confidence to grow cotton some of the time.

Source: Developed for this study based on Savage et al. (2011)

The headings in Table 6.2 are used in section 6.3.1.1 below and provide an application to the cotton industry and give examples of influencers on CGE behaviours. Each type of influencer is discussed in further detail.

### ***6.3.1.1 Addressing structural factors (environment and social concepts)***

Physical and cultural factors can influence or be a barrier to individuals' behaviour. Such factors are considered "external conditions" referred to in behaviour models (Chan et al., 2017). External conditions in the cotton industry include: climate, climate change and natural disasters beyond the control of the individual or organisation; water; seed; labour availability; accessibility and location of infrastructure from the water policies; and cotton supplier merchant product supplies. Costs associated with infrastructure of the land may include laser levelling,

finance, farm budgeting, insurance, costs of production, marketing and so on. The extent or limit to which CGEs can “choose” how to behave is also affected by the level of physical resources required to grow cotton, water availability, licence/s, forecasts, climate data and soil moisture. Information regarding all of these structural factors is needed for CGEs to base decisions on when choosing to grow cotton.

Designing behavioural economic interventions requires collaboration of policy-makers, individuals who are employers of businesses, and messengers of information that influences crop choices. CGEs work with consultant agronomists who collaborate with CGEs on crop choices and farm-specific factors such as crop rotations, weed and pest management practices. Such collaborative discussions may lead to decisions that increase the practicality of behaviours (Savage et al., 2011) such as investment in new or upgraded infrastructure. Application of the BI toolkit to CGEs provides a link back to the elements discussed in the social cognitive career model on personality and self-efficacy in Chapter 2. Both perspectives indicate that, when considering structural factors, understanding and accounting for attitudinal factors is equally important for the adoption and implementation of any behaviour change initiative.

#### ***6.3.1.2 Attitudes (individual concept)***

The importance of attitudes is that they reflect deeply held values or beliefs that influence behaviour. Individuals make up a society, and individual attitudes equate to public acceptability that can determine the success of an initiative (Savage et al., 2011). The aspects of social norms (patterns of attitudes and behaviours people generally experience from others in a group) can affect the attitude-behaviour connection in decision-making (Ajzen & Fisher, 1977) and also link back to research

covered in in Chapter 2 on personality measured by the Big Five factors of personality: OCEAN (openness to experience, conscientiousness, extraversion, and neuroticism). Attitudes also discussed in Chapter 2 are a reflection of individual concepts (Savage et al., 2011). For example, if CGEs express an attitude that cotton is difficult to grow when the weather is wet, this may be a result of living in a higher than average rainfall zone, rather than an innate opinion held by the individual regardless of where they live. If the area experienced unseasonably dry conditions, the individuals' attitudes would also change.

Attitudes are defined in psychology as emotions or beliefs understood to be a result of experience or upbringing described in terms of three components (McLeod, 2009, 2014):

1. Affective, this involves a person's feelings/emotions about the attitude object, for example, "I am scared of growing cotton".
2. Behavioural: the attitude individuals have influences how they act or behave, for example, "I will avoid growing cotton and run if I have to talk to other cotton growers".

Cognitive: this involves a person's belief/knowledge about an attitude object, for example, "I believe growing cotton is riskier than other crops" (McLeod, 2009, 2014).

Attitudes that people hold are a main influencer on behaviour, and emotions can influence attitudes such as in "I am scared of growing cotton". Emotions can also influence behaviour independent of thought such as "head versus heart"; "I will avoid growing cotton and run if I have to talk to other cotton growers (GSR, 2011 p. 9)." Individuals can be strongly influenced by others around them and thus may not grow cotton if it means going against what others think. This notion is in line

with behavioural economic theory.

### ***6.3.1.3 Messenger knowledge and awareness (social concept)***

The way information is presented and interpreted is important to the acceptance of the information (Dolan et al., 2010). The degree of influence is governed not only by the status of who presents the information but also the trust in the deliverer by the individual receiving the information. The MINDSPACE framework applied to student choice (Dolan et al., 2010) explains that print- and web-based media may also act as messengers and influence information and behaviours. This is applicable more broadly, and any source of information may influence decision-making processes. However, people are also more likely to act on information and advice tailored to them rather than to broad blanket programs. Real-time information also increases the likelihood of people acting on the information (Diamond et al., 2012). For example, when CGEs are considering information about the upcoming season on planting, ordering seed, and developing weed and pest management plans, prompts such as email or text reminders with checklists could be an effective way of assisting CGEs in their decision-making (Savage et al., 2011). Language and concepts (from someone who has both technical knowledge of the crop and empathy to the difficulties of growing it) to convey information can also influence whether the material has an impact on behaviour. For example, a cotton grower discussing gross margins per hectare as opposed to bales per hectare could provide CGEs with a clearer indication of profitability. People are also influenced by different individuals at different times during the decision-making process. For example, career choices are influenced by family and friends, academics, government and celebrities (Dolan et al, 2010 p. 64). Conversely, lack of knowledge of influencers of choice, such as misconceptions about the behaviour of others, over- or under-estimates of the extent of structural barriers

and inaccurate assessments of relative costs of behaviours, can distort the CGE view.

#### ***6.3.1.4 Skills, capability and self-efficacy (individual factor)***

Networks and forums, case studies and testimonials all provide effective means for building confidence in an individual's ability to adopt a behaviour (Savage et al., 2011). Self-efficacy was discussed in Chapter 2, and the application of the BI Toolkit similarly explains that practical tools and guidance to support confidence are important. However, as explained in Chapter 2, section 2.4.1.5 on self-efficacy, individuals will not tackle a new behaviour if they do not believe they have the capability to carry out the task. This concept is explained further in this chapter in relation to norms and ego (Table 6.3). The power of social norms may also come into play whereby for a norm to exist, some level of consensus among a group of people is necessary, such as in cotton-growing communities or non-cotton-growing communities.

#### ***6.3.1.5 Emotions (individual factor)***

Emotions are considered to be the dominant driver of most meaningful decisions (Loewenstein et al., 2001) when life outcomes matter (Lerner et al., 2015), such as in crop choices of CGEs in this context. Emotions guide choices, usually either to avoid feelings of regret or increase feelings of elation. Most behavioural decision research has focussed on identifying only cognitive processes, and research of emotion in all fields of psychology has been scant (Gilovich & Griffin, 2010 p. 559), although there has been a new revolution inspired by advances in neuroscience and techniques for studying the human brain. Cognitive neuroscience has informed increased understanding of the interaction of emotion and cognition (Lerner et al., 2015), finding that emotion can influence behaviour in powerful ways (Lerner et al., 2015; Loewenstein et al., 2001; Phelps, 2006). Emotions play a part in crop choice because

people struggle with behavioural problems at some points. This may include procrastination or impulse crop choice, buying, or planting. Kahneman (2010) explains that many plans are made in a “cool” state or by System 2 slow conscious thinking. However, emotions can overrule as human brains are wired to short-term gains (Ariely, 2008). For CGEs wanting to grow a crop regardless of less than ideal conditions, a short-term choice may outweigh the long-term gain.

#### 6.3.1.5.1 Visceral factors, emotion (individual factor)

Important decisions prompt powerful emotions in decision-making influenced by visceral factors (passion) (Lowenstein, 2001). Visceral factors influence all areas of behaviour (Lowenstein, 2001). Visceral factors have a role in bargaining power; for example, behaviour is influenced by the emotions of anger, fear and embarrassment (Lowenstein, 2001 p. 429). Visceral factors also have a critical role in intertemporal choice, and individuals often behave in ways that are not in their own self-interest, as displayed in such situations as road rage or showing feelings and anxiety about the future, both of which can lead to far-sighted behaviours (Lowenstein, 2001). Visceral factors in intertemporal choice both in short-term and far-sighted behaviours may have relevance to cotton crop choice because visceral factors often drive people to behave in ways that they view as going against their own self-interest, and people tend to underestimate the impact of visceral factors on their own current and future behaviour. Immediate emotions experienced while decision-making can be related to the dispositional effect of the person, which is a personality trait or overall tendency to respond to situations in stable, predictable ways. Although unrelated to the decision, this type of emotion can still impact the decision-making process as an incidental influencer (Han & Lerner, 2009). Economists focus their attention on anticipated emotions such as regret and

disappointment (Loomes & Sugden, 1982), discussed in regret theory in Chapter 5. Both these emotion types, immediate emotions and anticipated emotions, can relate to CGEs and their decisions on crop choices.

#### ***6.3.1.6 Habit and conscious level***

Habit in the context of crop choices can be a barrier to influencing behaviour, as the very nature of habit prevents individuals from considering alternatives. Changing habits is challenging and therefore requires ongoing initiatives for any behaviour change to be possible. Habit in relation to behaviour change is discussed in more detail at the end of this chapter. While interventions are beyond the scope of this study, some recommendations for further research in this area relative to the research problem are found in Chapter 7 in relation to habit and behaviour change. Identifying reasons for developing a habit can bring the habit to a conscious level so that inconsistencies in thinking can be identified (Savage et al., 2011). At a conscious level, inconsistencies, timing and social image are important to individuals. Timing is a central factor to habitual behaviours, with people being most open to change during certain events in their own lives, called “moments of change”, such as changing jobs, moving house and so on (Savage et al., 2011). Social image is also of importance to individuals; therefore, when individuals make public commitments to a specific behaviour they are more likely to adopt the behaviour.

Behaviours can be divided into habitual behaviour or non-habitual behaviour. Habit is a vital aspect of human behaviour (noted in the BI toolkit (Savage et al., 2011, p.6)), and the literature on habit provides two different perspectives from the academic disciplines of psychology and sociology. In psychology, habit is referred to as a psychological construct and a factor influencing behaviour (Defra, 2011 p.2), while in sociology habits are referred to as routine practices (Defra, 2011 p.2).

Habits can be a barrier to choice, as the nature of habit is such that thought is automatic, and therefore reasons for the behaviour or alternative behaviours are often not considered. Habit requires frequency, automaticity and a stable context (Savage et al., 2011, p.6), and many individuals experience the actions of an unconscious mind. Neurobiologists and cognitive psychologists support that the unconscious mind controls as much as 95% of human behaviour (Lakoff & Johnson, 1999). In that body of work (Martin, 2008) found that the habitual mind of customers and potential customers must go through a physiological change to use a new concept and a new brand. In his works, reference is made to the executive mind (conscious cognitive processing) and the habitual mind (the region of the brain responsible for unconscious processing) (Martin, 2008). It is therefore important that habit is considered in the design of policies and interventions that involve human behaviour such as crop choices, because cotton growing is a yearly activity; thus habit is an influencer on crop choices, as habit requires frequency, automaticity and a stable context. As habit requires frequency, it relates to cotton grown year in and year out, and automaticity is such that crop choices are driven by the absence of conscious thought processes. Decisions are also thought to be made unconsciously, and in a stable context. Therefore, habits are formed because all three of these factors exist in this CGE context. Following are examples of habits in the role of a CGE.

Season to season cotton is considered in crop choice selection and thus can become habitual year after year. Repeated behaviour becomes automatic, which leads people to routinely stick with the status quo and not take the time each season to weigh the positives and negatives of crop choice. As habits become more entrenched, the challenge to change is strongly resisted, with people often reverting

to an old habit.

#### **6.4 APPLICATION OF THE MINDSPACE FRAMEWORK**

Using a holistic view of what happens in crop decision-making processes in the cotton industry from a CGE perspective, this study now turns to the individual as self-driven in crop choices as an employer and driver of behaviour change such as sustainability. This chapter now uses self-driven thinking to develop a Decision Driver Model for CGEs, addressing factors under each of the sustainability indicators of economic, environments and social, but still driven by the individual human contribution of CGEs. This study uses a behavioural economics approach by applying the MINSPLACE framework (Dolan et al., 2010), which has been adjusted and adapted for the Australian cotton industry CGEs. MINDSPACE is based on letter combinations to make an acronym. Each letter is laid out as: M-messenger; I-incentives; N-norms; D-defaults; S-saliience; P-priming; A-affect; C-commitments; E-Ego. Details of each element are provided in Table 6.3 under each heading. More detail in relation to application to CGEs is provided following the table.

Table 6.3 A Synthesis of Cotton Industry Sustainability Indicators and the Behavioural Influencers of CGE Crop Choice

<p><b>Messenger (social factor)</b> Individuals are heavily influenced by who communicates information</p>	<p>The way information is disseminated and who is delivering the information has a direct effect on how individuals react. CGEs rely on consultant agronomists as a trusted source and perceived expert.</p>
<p><b>Incentives (Individual factor)</b> Individuals responses to incentives are shaped by predictable mental shortcuts</p>	<p>However imperfectly, people calculate reward for effort. They work where they receive the greatest overall reward both monetary and intangible, recognising the importance of both intrinsic and extrinsic motivation. As people cannot process all the information for all choices all the time, they “satisfice”. In other words they don’t expect to make the best decision possible because there’s simply too much information and too little time. Most people use mental shortcuts (heuristics) that usually lead to rational thinking, but heuristics sometimes fail to achieved the desired outcome.</p>
<p><b>Norms (social factor)</b> Individuals are strongly influenced by what others do – descriptive norms and the perceived behaviour of others’ approval – injunctive norms about what an individual should do</p>	<p>Providing people or organisations with information about their peers can exert a strong influence on them to modify their behaviour accordingly. Evidence from the cotton industry suggests that providing CGEs with previous seasonal growing costs and yields for others in their region can be effective in lowering levels of consumption.</p>
<p><b>Defaults (environment)</b> Individuals go with the flow of pre-set options</p>	<p>For example, the default mode, as in pre-selected material from last year’s crop provided by a regular agronomy consultant, is likely to mean CGEs only consider using this information on crop choice, even if they have the option of requesting information about how other factors may impact on the current season.</p>
<p><b>Salience (environment)</b> Individuals attention is drawn to</p>	<p>People are more likely to act on information that they can easily relate</p>

is novel and seems relevant to them	to their personal experiences, e.g. information on what relates specifically to their cotton-growing business they are familiar with rather than the same information at an aggregate or national level.
<b>Priming (environment)</b> Our acts are often influenced by sub-conscious cues (sights, words or sensations)	Physical features of seed varieties and cotton-growing infrastructure may subconsciously trigger certain behaviours, e.g. more water availability or higher levels of positive weather event indicators.
<b>Affect (individual)</b> Emotional associations can shape individuals' actions	For example, images on previous and current natural disasters have sought to reinforce the emotional consequences of "tough times" for those affected.
<b>Commitments (individual)</b> Individual seek to be consistent with public promises, and reciprocate acts	Individuals and organisations who make a public commitment to change their fertiliser application behaviour in some way (e.g. using fewer aerial applications) are more likely to sustain their change in behaviour, particularly if they have the support of others trying to do the same.
<b>Ego (individual)</b> Individuals act in ways that make them feel better about themselves	Some individuals and organisations may want to project an image of themselves as adventurous and at the cutting edge of new technology and be willing to consider changes in how they grow cotton which helps reinforce this, particularly if it is visible to others.

Source: Developed for this study (Wunsch, 2018).

These headings below correspond with the headings in Table 6.3 and provide more detail under each of the same headings used in the table.

#### **6.4.1 Messenger (social factor)**

As explained by Dolan et al. (2010), individuals are influenced by the source of information through reaction to those who deliver the message, and more

attention is given to information that is delivered by people that are trusted and have authority, or by people with whom the receiver of the information feels they have a connection. This notion is commonly used in advertising and real estate. In contrast, people are known to disregard advice from sources that do not resonate with them. The area of concern with this notion is when the messenger, perceived to have credibility in one area, may not have credibility in another. For example, it is well-known in advertising that those with “celebrity status” can influence potential buyers, and yet individuals often find themselves unknowingly believing what is communicated, even when the information may not align with them (Dolan et al., 2010).

There are ways that behavioural change can be applied using the “messenger effect” in the context of CGEs. For example, in the case of CGEs’ crop choices, linking CGEs with others, such as early adopters of innovation looking at capital cost and the benefits of technology and cost minimisation and yield maximisation of the proposed crop, will help them make better decisions about if and when to plant cotton prior to each season. Information sources for CGEs, such as agronomic consultants, defined as experts in the field, together with recommended other early adopters, utilise the fundamental notion that people are more likely to trust others whom they perceive as trustworthy (Capra, 2017).

#### **6.4.2 Incentives (individual factor)**

Economic theory is used to explain the economics of policies that create markets or offer incentives. However, individuals do not always act in predictable ways. Markets are full of incentive conflicts, and heuristics and cognitive biases often influence responses. An example in the cotton industry is when the CGE receives the cotton agronomic services that are chosen by the consultant agronomist with

intermediaries such as ancillary service providers – suppliers of seed, fertiliser, chemicals, contractors and labour – extracting part of the original cost. Different intermediaries offering different incentives and benefits may not be ideal for either the CGE or the consultant agronomist. This notion is explored by Thaler (2008), who found that it is obvious to those who think about such issues, and yet individuals often mindlessly do not pay attention to price increases, suggesting that “the most important modification that must be made to a standard analysis of incentives is salience. Do the choosers actually notice the incentives they face?” (Thaler, 2008, 2009, p. 100). Choice architects, a term coined by Thaler (2008, 2009), create the context in which people make decisions, often without realising, and good architects are familiar with directing people’s attention to incentives (Thaler, 2008, 2009).

In Prospect Theory two aspects important to crop choice are that people perceive outcomes as gains and losses rather than financial wealth, and are usually loss-averse (Kahneman, 2011). In traditional economics, utility theory explains that the utility of a gain is assessed by comparing the utilities of two states of wealth. Thinking in terms of losses and gains as opposed to final states of wealth impacts on how alternatives are evaluated and how outcomes are compared with certain reference points, demonstrating that individuals make comparative rather than complete judgements (Kahneman, 2011). In the CGE context, losses such as outcomes lower than the reference point, appear larger than gains (outcomes above the reference point) (Chengwei, 2017). Other reference points may be endowment effect, framing effects, saliency and anchoring, as discussed in the following sections. Incentive schemes often use rewards to motivate, and yet CGEs suggest that a sense of loss, having failed to meet an expected outcome, is more likely to be a motivator, as indicated by the following interview comment.

We are economically and environmentally geared for cotton; to want to do well is a motivator (CGE2).

### **643 Norms (social factor)**

People are influenced by what others do socially and culturally, and individuals are unconsciously driven by the societal pressures of others, sometimes by way of membership or exclusion. People establish dependence on social cues where they believe others have more experience and know better (Caldwell & Halonen, 2014). Social and cultural norms frame behavioural expectations within groups, as rules of individuals are usually considered as idiosyncrasies.

The concept of norms in this study is used in the sense that rules are enforced through social supports by social groups such as cotton clusters made up of cotton-growing areas within known locations. Powerful social forces encourage people to conform, as most do not want to be singled out. They therefore conform to the majority opinion, even when it may not align with theirs (Asch, 1958). Some successful behavioural changes have been identified using the tendency to conform, such as planting within area-specific planting windows. The application of norms in behavioural economics is understood to induce change that is good for both the individual and society. Norms in connection to CGEs [CG2] relate to status attainment in which CGEs choose crops according to what is perceived to be expected of them; they are heavily influenced by a given set of norms and values determined by their CGE area group. Individuals are strongly influenced by family, friends and experienced work colleagues, often relying on their input rather than on their own judgement to stay in favour with the behaviours of those around them.

**644 Defaults (environment factor)**

Much of the existing research in the behavioural decision-making literature on framing and default options has found that decisions depend on a reference point and defaults that influence an individual's choice (Park et al., 2000; Tversky & Kahneman, 1981). The term, default, is defined as a pre-set option that takes effect if no other choice is made (Thaler & Sunstein, 2008). Defaults can guide individuals towards products and services and can be strong influencers of choice, and mostly pre-set options are not changed by individuals. It is for these reasons that some suggest defaults influence consumer processing limitations unfairly (Brown & Krishna, 2004). One such example in a study on car purchasing and optional extras is that when individuals are provided with a fully optioned vehicle and can remove optional features as a cost saving, it results in a more expensive set of features than those presented with a basic model and given the option of adding features, costing more money. In cotton the same scenario can be applied to a new piece of equipment such as a planter.

This consumer-processing limitation relates to the endowment effect (the endowment effect explains the human irrational tendency to overvalue a good that is owned, whatever its market value) or loss aversion (positing that when an alternative is used as a reference or anchor, losses carry more impact than gains) (Thaler, 1985; Kahneman et al., 1991). The study also found defaults cause consumers to make changes from their original choices, and when preferences are uncertain, individuals look to defaults to guide them on the comparative value of the alternatives (Brown & Krishna, 2004, p.188). Below is an adjusted example from Brown & Krishna (2004, p. 529) related to cotton.

A grower is deciding to purchase a GPS system for summer planting. There are two options for GPS tracking: sub 10cm or sub 2cm. The more standard

comes at sub10cm (the less accurate the cheaper the system) but if the grower wants they can buy the sub 2cm (the more accurate, the more expensive).

#### **645 Status Quo (individual factor)**

In negotiations (Kahneman, 2011) the general motive is to avoid losses and to achieve gains. The existing terms of trade on both sides define reference points and thus any proposed change is viewed as a concession that one side makes to the other. Much of the negotiation exchange is about reference points that provide an anchor to the other side. For example, negotiations often pretend to be attached to something although the attachment may be a bargaining tool used in the negotiation. Because negotiators are influenced by a social norm of reciprocity (responding to a positive action with another positive action) an allowance given by one negotiator calls for an equal allowance given by the other. Loss aversion is a powerful conservative force that favours minimal changes from the status quo in the lives of individuals (Kahneman, 2011 p. 305).

#### **646 Salience (environment factor)**

Salience can be explained as the form of behaviour where the most recent or most novel information or information that seems more relevant stays longer in an individual's memory; in other words, behaviour is driven by what individuals pay attention to (Dolan et al., 2010). It is the external equivalent of availability and affect in the following conditions in which people "go with the flow" and are affected more by ease of retrieval than by the content they retrieved:

- “when they are engaged in another effortful task at the same time;
- when they are in a good mood because they just thought of a happy episode in their life; if they score low on a depression scale; if they are knowledgeable novices on the top of the task, in contrast to true experts; when they score high on a scale of faith of intuition and if they are (or are made to feel) powerful” (Kahneman, 2011 p. 135)).

Salience is explained as giving more weight to something to command attention, e.g. rearranging the physical environment by moving healthier drinks closer to paying stations is shown to increase the salience and convenience of the item (Thorndike et al., 2012). The relevance of salience to crop choices is in the physical environment and how choices may be manipulated, for example, how current framing may influence choice, as “there is no such thing as a ‘neutral’ design” (Thaler, 2008, p. 3).

#### **647 Priming (environment factor)**

Individuals are influenced by psychological unconscious cues that prime them to behave or choose in certain ways (Dolan et al., 2010). For example, the aroma of baking for a sale can influence potential buyers; playing certain types of music in shopping centres can influence how long people spend on the activity; showing pictures of elderly people may cause participants to walk more slowly; and providing people with larger plates or food- related advertising may lead people to eat more.

In cotton: the view of the many tightly packed cotton bales in the field provides a visual when making decisions about next season’s crop choice” [CGE1].

An awareness of priming provides a better understanding of behavioural influencers and encourages better choices because actions and emotions can be primed by events of which individuals are not even aware (Kahneman, 2011 p. 53).

#### **648 Affect (individual factor)**

Emotional reactions can influence decisions. Until now the choice of what to plant in agricultural production has seemingly followed traditional economics, understood to be based on information, cost-benefit analysis, strategy and risk. Decision-making processes, however, are complex and involve other factors explored in the domains of psychology (Ariely & Loewenstein, 2006), behavioural economics (Kahneman, 2011) and neuroscience (Restak, 2002). Psychologists have explored and found issues relating to emotions in decision-making, these being immediate emotions that are experienced at the time of decision-making (Bechara, 2000). In contrast, economics and behavioural economics have focussed on anticipated emotions (not experienced at the time of decision-making), such as regret and disappointment (Looms & Sugden, 1982). Regret and disappointment emotions are felt as a result of a decision when the consequence of an alternative decision would provide a different scenario. Disappointment is felt when the decision result could not have been changed, and the disappointment relates to the outcome rather than the decision (Zeelenberg et al., 1998b; 2007).

From the literature, immediate emotions and passions as well as visceral factors (Loewenstein, 1996), such as the negative emotions of anger and fear, have been viewed as a destructive force in human behaviour, and yet are also found to serve a basic purpose: “people who do not experience hunger do not eat ... and even subtle emotional deficits can have dramatically negative consequences for functioning” (Baumeister et al., 1997; Loewenstein, 2000, p. 427; Wilson et al., 1999; Damasio,

1994). According to Lowenstein (2000), it is important to include visceral factors and their influence on behaviours into economic models, as affect can act as information at the moment of judgement and choice, and serve as a common currency in judgements and decisions (Peters et al., 2006).

In regard to CGE, crop choice and its effect on an individual's emotions can influence decisions. Emotional reactions are often quick and automatic and a response to powerful unconscious forces that can shape decision-making (King et al., 2013; Chengwei et al., 2017). CGEs suggested in interviews that they often rely on gut feeling as it provides a fast way to make decisions in many and varied complicated situations. Most on-farm CGE decisions involve affective states such as strong emotions (for example, the decision to cease watering prior to a rain event that may or may not result in a change to water levels, or the increase in the feeling of being overwhelmed when the grower receives several calls from a broker asking for a decision on how much cotton the grower would like to forward sell). Lowenstein (2000) suggested that in situations where preferences vary dramatically, time should be taken to make the decision to allow for a range of affective states that result in lasting consequences. In relation to crop choice, CGEs' emotional reactions to certain situations and visuals can have a significant impact on decision-making, such as the result for the previous crop and/or the results for neighbouring cotton properties. Lowenstein (2000) refers to the hot-cold empathy gap when visceral factors influence decision-making and behaviour, wherein a hot state of mind tends to ignore all other goals, and with dependence on a person's memory or visceral experience, it is common to underestimate a visceral state due to restrictive memory.

#### **6.49 Commitment (individual factor)**

Many people are aware that a lack of willpower can be an internal constant

battle polarised at certain times or in certain contexts by individuals setting short-term targets such as New Year's resolutions, and the intention to diet or to commit to some other self-control action after celebrating certain activities or events such as a new week, after the holidays or after Christmas or Easter. Self-control problems arise when preferences are inconsistent across time or context (Lowenstein, 1996).

When contending with a lack of willpower, people often develop self-imposed strategies such as by paying for memberships and increasing the cost of failure to not carry out the activity. CGEs are provided opportunities for self-imposed strategies such as the self-regulated best management practices which are accomplished through best management practice (BMP) self-assessed online toolkits. Research suggests that publicly committing to personal goals and memberships has shown some success in the short term to encourage long-term behavioural changes (Dolan et al., 2010; Chengwei, 2013). Public commitment also lessens indecision and is achieved by increasing the cost of failure, usually through reputation, but also through financial costs, which were found to be more effective as the costs of failure increase (King et al., 2013; Chengwei, 2013).

Before growing a cotton crop, the task to pick the crop appears magnified, and the costs may seem small. Subsequently, CGEs take on such tasks and as the season unravels and the time to pick the crop draws closer, the relevance of the costs and benefits changes. CGEs become aware of the costs, such as the time needed to complete the task, and the benefits become less clear. Once the season has ended, their view of the season may again vary.

While in some situations time-inconsistent preferences may form serious obstacles to following a planned course of action, they can be overcome (Ariely et al., 2001). In addition to exercising willpower to resist an attraction (Loewenstein, 1991), people can bind, or pre-commit, their own behaviour or minimise the in-the-moment experience by manipulating the circumstance to their advantage (Duckworth et al., 2016). There is an awareness, too, that continuous self-control efforts, such as vigilance, also erode over time (Muraven & Baumeister, 2000).

#### **6.4.10 Ego (individual factor)**

Ego is a person's sense of self-esteem and refers to the part of the mind that mediates between the conscious and the unconscious. Ego is responsible for reality testing and a sense of personal identity. It is commonly known that a sense of belonging is a basic need, and people act in ways that make them feel better about themselves and their identities (Maslow, 1943). People are motivated to gain acceptance, and being accepted feels good. Social status is important to individuals, and the desire for a positive self-image and decisions contributes to a person's self-importance. The contribution to self-esteem often comes from self-serving credits, and if behaviour and self-image (beliefs) are inconsistent, individuals are more likely to change their self-image. Self-esteem is strongly linked to happiness across many different life aspects and across multiple cultures (Baumeister, 2005).

One approach to combat ego involves asking how likely the success is to happen without an individual's contribution. It is suggested (Chengwei et al., 2017) that such an approach can weaken self-serving credit biases, and a practice to weaken self-service credit biases is to include such questions into performance reviews (Chengwei et al., 2017). Little is known, however, about the ego effects in the role of a CGE's crop choice, but the ego effect may have relevance to various areas. For

example, CGEs suggested in interviews that they are responsive to improvement to meet what others are doing, wanting to be more profitable and to expand to possibly keep up with those around them.

What has been learned from applying the MINDSPACE framework (Dolan et al., 2010) to the CGE context? The source of information as in the messenger is important in crop choices, as trusted sources weigh heavily on information provided in the CGE context. Markets are full of incentive conflicts, and heuristics and cognitive biases often influence responses. The question for CGEs in relation to incentives is whether they actually notice the incentives they face, as people make decisions often without realising, and on-sellers are familiar with directing people's attention. People are influenced by what others do socially and culturally, and individuals are also unconsciously driven by the societal pressures of others. People establish dependence on social cues where they believe others have more experience and know better.

Cotton crop choice is believed to be influenced strongly by social cues, as suggested in CGE interviews. Defaults can guide individuals towards products and services and can be strong influencers of choice. Mostly, pre-set options are not changed by individuals. The salience of options can be manipulated by rearranging the physical environment. Are CGEs aware of such situations when making crop choices? Individuals are influenced by psychological unconscious cues that prime them to behave or choose in certain ways. An awareness of priming provides a better understanding of behavioural influencers and encourages better choices. However, emotional reactions can influence decisions. Until now the choice of what to plant in agricultural production has seemingly followed traditional economics, and often unknowingly, is influenced by several factors. When contending with a lack of

willpower, people often develop self-imposed strategies by increasing the cost of failure to carry out the activity. Ego is responsible for reality testing and a sense of personal identity and people act in ways that make them feel better about themselves and their identity. People are motivated to gain acceptance and in such cases as crop choice, being accepted feels good.

## **6.5 OTHER RELEVANT INFLUENCERS: INDIVIDUAL, ENVIRONMENT, SOCIAL**

This section refers to other relevant influencers that impact on motivation and decision-making of CGEs in the context of their role in the Australian cotton industry, not covered in either the framework or toolkit referred to throughout. The other relevant influencers in this section refer to CGEs as consumers of goods and services that influence efficiency, effectiveness and adoption of technology applied to their cotton production. The perspective of CGEs as consumers is important in relation to crop choices because as producers they are not usually considered as consumers, and yet the influencers below may also impact on crop choices. For this reason, the influencers discussed below are included in this study. While there appears to be overlap in some of the topics covered, such as Ego appearing in the MINDSPACE framework (Dolan et al., 2010) above. However, Ego depletion not mentioned in the framework is mentioned below for its relevance to the model in terms of the exertion of ego as it applies to decision-making. Similarly, other topics considered worthy of mention appear below.

### **6.5.1 Ego Depletion, Building on What Is Discussed in Section 6.4.10 Ego (individual factor)**

Ego depletion is a concept related to but not included in the MINDSPACE Framework. Ego depletion refers to the idea that self-control or willpower draws upon limited mental resources that can be exhausted (Baumeister et al., 2008). When

energy for mental activity is low, self-control is typically impaired, and this is considered to be a state of ego depletion. Although research suggests that “people can exert self-control despite ego depletion if the stakes are high enough. Offering cash incentives or other motives for good performance counteracts the effects of ego depletion” (Muraven & Slessareva, 2003). In Baumeister’s research (2018, p. 253) he found that “mildly tired athletes indeed manage to summon the strength for a major exertion at decisive moments, but after a certain point fatigue becomes insurmountable.” This research on muscle provides an analogy for CGEs’ motivation and fatigue, who similarly summon strength at decisive moments but likewise can face insurmountable fatigue. There are several suppositions regarding ego depletion that may apply to CGEs and require further exploration. One relates to the importance of self-control, which has been found to be related to ego depletion and planning aversion (Halliger, 2018) and in this area may be worthy of exploring. Self-control, for example, is required every day, with many trying to control wants and needs. It is also required for logical reasoning, extrapolation and other controlled processes, and performance in these tasks varies when people are depleted (Vohs et al., 2008). Self-control is responsible for being more successful and is a resistance to depletion (Halliger 2018).

### **6.5.2 Cost (environment factor)**

Many decisions pose either a risk of loss or an opportunity of gain. Loss aversion and discounting the future in developing incentives are key messages from behavioural economics in determining behavioural change objectives. Using simple pricing structures can assist people in their decision-making processes and can reinforce rather than negate behavioural influencers. For example, different classes of licence and various limitations of those licences require considerable deliberation.

When making decisions about behaviour the advice is to make “good” choices easier for individuals to consider by explaining the “long-term” costs and benefits (Savage et al., 2011). In the CGE context the costs of different behaviours influence season-to-season crop choices of individuals as cotton is strongly led by global market forces. Individuals may prioritise short-term costs over longer-term gains. In a cotton-growing context, which is also similar to other consumer-purchasing environments, as choice and uncertainty increase, so too will an individual’s expectations (Schwartz, 2014). Research also suggests that as choices increase, individuals put off making decisions, search for new replacements, choose default options or opt not to choose at all (Iyengar & Lepper, 2000; Shafir et al., 1993; Tversky & Shafir, 1992). The literature in this line of enquiry is extensive, and investigating it all is well beyond the scope of this study. Therefore, the concepts explored for this research have been limited to and include the most relevant to the cotton industry CGEs, as discussed below:

### 6.5.3 *Framing (environment factor)*

Framing consists of concepts and theoretical perspectives that explain how individuals communicate about reality. Individuals make decisions with little knowledge of possible bias, although Johnson et al. (2012) assert that the reality is that there is no unbiased architecture, and any way a choice is presented will influence how the decision-maker chooses. Evidence to support that individuals make choices on subjective information and/or influential persuasions is provided by Druckman (2001).

As most managerial decisions require some level of risk, researchers have been interested in how risk influences decisions. Research on frames and framing has origins in many fields: in media and in how stories are framed; in general conversation; in consumer

behaviour; in politics and how policy is framed; in medical scenarios; and in agriculture product and crop choice. Framing of decisions are the decision-maker's perceptions of the outcomes of a particular choice (Tversky & Kahneman, 1981). The frame that a decision-maker adopts "is controlled by the way the problem is presented and by the standards, behaviours and personal characteristics of the decision-maker" (Tversky & Kahneman, 1981, p. 453). It is argued by Tversky and Kahneman (1981) that different wording of an identical problem influences the outcomes of identical choices, either as gains or losses relative to a reference point. The following simulation example is used to show that people are risk-averse under gains and risk-seeking under losses. For example, a cotton-growing region in Australia is preparing for the outbreak of an unusual fungal disease, which is expected to destroy 60,000 hectares of cotton crops. Two alternative programs to combat the disease have been proposed. Assume that exact agricultural estimates of the consequences of the programs are as follows:

If Program A is adopted, 200 crops will be saved [72 per cent]

If Program B is adopted, there is 1/3 probability that 600 crops will be saved, and 2/3 probability that no crops will be saved [28 per cent].

Which of the two programs would you favour?

The major choice in this problem is risk-averse: the prospect of certainly saving 200 crops is more attractive than risky prospect of equal expected value, that is, a one-in-three chance of saving 600 crops.

Source: Developed for this study based on Tversky & Kahneman, 1981

The difference between these two programs is the wording only. However, the decisions are influenced by the framing. In this example, framing can be viewed either optimistically or pessimistically. It can therefore be interpreted to influence or mislead

individuals (Chong & Druckman, 2007). Other possible influencers of framing and decision-making processes are credible sources, cultural values and the strength of a frame that may change opinions (Chong & Druckman, 2007 p. 112). Researchers have established some conditions whereby framing effects may be diminished in certain situations (Chong & Druckman, 2007). Other possible influencers are credible sources, cultural values and the strength of a frame that may change opinions (Chong & Druckman, 2007 p. 112).

In the context of crop choice, the decision to grow cotton is expected to be influenced by framing for each of the components impacting on a crop which then influences the overall decision of crop choice. Iyengar and Scheufele (2000) found that psychological approaches to framing are based on two assumptions. One assumption is that the way information is framed influences how the information is interpreted, also known as equivalence framing. The second assumption is that individuals interpret framing as information that focusses on the relevant aspects of a situation or issue, known as emphasis framing. Either way, framing is considered effective as it is regarded as a heuristic (rule of thumb) and provides individuals with an easy way to process information (heuristics is discussed in section 6.2).

#### ***6.5.3.1 How framing effects work (environment factors)***

A framing effect happens when an individual imagines a situation and changes their opinion based on the way it is presented (Chong & Druckman, 2007). Framing literature refers to “frames in thought” and “frames in communication”, asserting that a frame in thought can influence an overall view, as frames in thought are interpretations of reality, and frames in communication exist between individuals (Chong & Druckman, 2007, p. 106).

The literature provides an extensive range of models and views on framing and

framing effects and the psychological processes of awareness, knowledge and recollection (Brewer, 2002; Chong & Druckman, 2007; Iyengar, 1991). Further work in this area (Entman, 1993) suggests that “frames work by elevating particular pieces of information in salience”, in line with many early researchers’ views on the psychological underpinnings of framing effects. More recently, Iyengar and Schaufele (2000) proposed that framing effects refer to behavioural outcomes on “how” information is presented, not on “what” is being communicated. For example, Chong and Druckman (2007) suggested that individuals create their views from a set of established beliefs stored in memory, and only some beliefs become accessible at a given moment and only some are strong enough to be considered relevant to the topic. Extensive work in this area (Chong & Druckman, 2007) found that framing works on three levels: 1) making new beliefs available about an issue; 2) accessibility of beliefs; and 3) making beliefs applicable or “strong” in individual assessments. An individual’s frame effect depends on a mixture of reasons, as suggested by Chong and Druckman (2007): 1) vigour and recurrence of the frame; 2) the structure of the situation; and 3) an individual’s drive. In particular situations, the total impression of a combination of frames may differ from the amount of their separate impacts.

While Chong and Druckman (2007) posited that some studies indicate stronger framing effects on individuals who are less knowledgeable in a particular area, this notion was supported by Haider-Market & Joslyn (2001), but others have disagreed (Slothuus, 2005). Chong & Druckman (2007, p. 111) suggested that “after controlling for prior attitudes, knowledge enhances framing effects because it increases the likelihood that the considerations emphasized in a frame will be available or comprehensible to the individual.” The importance of any reference to the framing of

crop choice (or other cotton-growing components) has not previously been considered and thus is a new line of enquiry for this industry.

#### **6.5.4 The Halo Effect (individual factor)**

The halo effect is a cognitive bias that refers to an individual's overall impression of a person where it is assumed that because people are good at a specific activity then they will be good at other unrelated tasks; or conversely, because they are bad at a specific activity they will be bad at other unrelated activities. The halo effect applies in advertising where, for example, an elite sports person is recognised as talented in their field and is believed by consumers when promoting totally unrelated products (The Economist, 2009). The halo effect is also found to be influenced by "first impressions". Individuals are often found to base views and judgements on inconsistent stories of the past in the belief that they are true, leading individuals also to believe that if the past is understood, the future should also be knowable (Kahneman, 2011; Taleb, 2007). The halo effect flows on to top level managers and how decisions about staff are based on distorted information. This leads to inconsistencies that can occur in the role of an employer and decision-making processes when CGEs are considering cotton as a crop of choice and are influenced by a source in so far as to either decide to choose or not to choose cotton based on that influencer.

#### **6.5.5 Anchoring (individual factor)**

The term, anchoring, is defined as a cognitive bias that occurs when individuals consider a certain value for an unknown amount even before estimating that quantity (Kahneman, 2011). This value "serves as a type of reference point or benchmark that anchors expectations about the item's actual value" (Orr & Guthrie, 2006, p. 597; Kahneman, 2011). Tversky & Kahneman (1974) found that individuals do not follow

rules when making choices but rather “rely on a limited number of heuristic principles”, including anchoring. Anchoring is believed to be a strong known occurrence, very common in everyday activities, and is believed to occur in both System 1 and System 2. A measured process, anchoring is considered an adjustment of System 2 that also occurs by a priming effect (Kahneman, 2011; Tversky & Kahneman, 1974).

The anchoring and adjustment heuristic proposed by Tversky (1974), used for estimating uncertain quantities, involves choosing a number and adjusting this number by “mentally” moving higher or lower from the anchor number (Kahneman, 2011, p. 120). Shafir & LeBeouf (2002) found that estimates of physical quantities to physical anchors prove sensitive and provide an example. This example is adjusted to apply to cotton, with parties disputing over some physical entity such as land or water, where any attempt to compromise will fail to reach agreement if each side insufficiently adjusts its anchor. The study suggests that insufficient adjustment can have implications where each side must adjust its expectations away from an unreachable ideal to achieve successful negotiation.

Epley & Gilovich (2001) established that negotiations form a crucial part of lives, and “that individuals rely on a limited number of heuristic principles such as anchoring that have a powerful impact on negotiation outcomes” (Kahneman & Tversky, 1974; Orr & Guthrie, 2006, p. 598). Gigerenzer & Todd (1998) established that anchoring is adaptive although problems arise in situations where individuals “over-rely on an anchor” and when individuals “rely on irrelevant or uninformative anchors” (Orr & Guthrie, 2006, p. 601). An adjusted (Orr & Guthrie, 2006, p. 601) example of “over-relying on an anchor” in cotton is when cotton growers are at risk of over-paying for water if they are unable to adjust sufficiently away from its list

price. An adjusted example of “relying on irrelevant or uninformative anchors” in cotton is when a daily report on drought in India influences the amount one is willing to pay for a secured water licence in Australia. Many decision-makers will trust their own intuitions because they think they see a situation clearly.

#### **6.5.6 Cognitive Overload (individual factor)**

Too many choices can lead to choice overload or decision fatigue. Choice is considered to improve individual lives as it allows people to have what they desire – a sense of freedom of choice – and choice is important to an individual’s independence and happiness and allows individuals to manage their own lives (Schwartz, 2003). However, choice overload is the result of too many choices being available, and this is found to contribute to “bad decisions, to anxiety, stress and dissatisfaction – even clinical depression” (Schwartz, 2003, p. 3). An increase in the number of decisions and the complexity of decision choice sees individuals increasingly applying heuristics. Research in this area has found that choice overload is associated with unhappiness (Schwartz, 2003) and other factors such as decision exhaustion, choosing the default option or avoiding a decision altogether (Iyengar & Lepper, 2000). This is significant for CGEs as they may experience impacts on their health and well-being, make crop choices that are financially unviable, or leave the industry entirely. Each of these potential outcomes is within the scope of concerns for this study.

Choice architecture, as mentioned earlier, a term coined by Thaler and Sunstein (2008) and further studied by Johnson, et al. (2012), identified tools to assist with decision-making and divided them loosely into two categories: tools for structuring choice, such as what to present, and tools for describing choice, such as how to present. The way choices are presented, the order in which they are presented,

any alternatives offered, and the selection of default options all can influence decision-making (Johnson et al., 2012). Whatever way a choice is portrayed, even if the status quo remains, will affect how decisions are made, as “there is no neutral architecture” (Johnson et al., 2012 p. 488). In the first part of this study it was found that CGEs are higher in agreeableness, in other words, trust and conscientiousness, both individual CGE characteristics that in the context of choice architecture may influence decisions (see section 4.5).

As the amount of choice in the marketplace increases, Iyengar & Lepper (2000) suggest that if there are too many choices to consider, people should ignore some of the options. Schwartz (2017, p. 21) has suggested that ignoring advertising is an impossibility, that individuals also develop a sense of “want” from viewing others around them and from a “leaving a no stone unturned approach” (Schwartz, 2017 p. 21), making choices a more arduous task. Despite extensive research in this area, there is no optimal number of alternatives that have been found to work, due to varying objectives; however, (Johnson, et al. (2012, p. 490) suggested “four or five non-dominating options may represent reasonable initial values ... One could also proceed by starting with this limited choice set ... considering more options, if desired.” However, Schwartz (2017, p. 21) claimed that individuals “won’t ignore alternatives if they don’t realise that too many alternatives can create a problem.” This is expected to be the case with cotton-grower crop and product choices. In support of this, Schwartz (2017, p. 21) has posited that there is a view among individuals that as culture promotes freedom of choice, individuals expect that more choice means more freedom, and yet research on choice overload suggests otherwise.

### **6.5.7 Attention Cues and Mental Effort (individual factor)**

How attention is guided is important to decision-making and involves focussing mental effort on an activity and maintaining that attention. As individuals become more skilled in an area, the demand for energy lessens; in other words, the “law of least effort” applies, asserting that if there are several ways of reaching the same goal, people usually gravitate to the least pressured option (Kahneman, 2011, p. 35). To understand what makes some cognitive operations more demanding and effortful than others, research shows that System 2 thinking has the capacity to program memory that overrides habits (Kahneman, 2011, p. 36). People who are challenged by a demanding cognitive task are more likely to succumb to a temptation against their willpower on an action or activity. CGEs speak of the demands of growing cotton and the cognitive attention required to stay on task. Baumeister (2008) found that the voluntary effort of emotion, cognition or physicality draws on a shared pool of mental energy and that an effort of will or self-control can deplete such energy. This is called ego depletion. When people succumb to ego depletion they are more likely to give up. Unlike cognitive load, ego depletion is in some ways a loss of motivation. These influencers can impact on crop choices. Also, refer to this chapter for Ego depletion.

### **6.5.8 Availability, Design for Working Memory (individual factor)**

Generally, up to seven items can be held in working memory at any one time (Ivengar & Leper, 2000). Therefore, to assist CGEs to make better choices and drive them to switch from learned behaviours, no more than seven best-possible options should be presented when making crop choices. As indicated in the discussion of choice overload above, crop choices are complex as they include many variables already mentioned: supply of water; seed; labour; machinery;

climate; soil; fertiliser; herbicides and so on. Keeping one traditional option and including five to six other options can help make choosing easier (Kahneman, 2011; Iyengar & Leper, 2000).

### **6.5.9 Summary of Applications**

The chapter highlights unconscious (automatic) judgements and behaviours to assist in better understanding how such influencers impact a business context. Each of the headings and sub-headings of this chapter includes the specific context that applies to the behavioural influencer – individual, environment or social. The chapter viewed the CGE environment and influencers, such as biases, heuristics and framing, and makes reference to principles of behavioural economics in individuals such that individuals make systematic errors and that individual, i.e. human behaviour is guided by logic yet influenced by the environment or context. Physical and cultural factors can influence or be a barrier to individuals' behaviour. Several factors that influence behaviour from the MINDSPACE framework (Dolan et al., 2010) and Behavioural Insights toolkit (Savage et al., 2011) were applied to this study context. Several factors are explored, such as messenger and how individuals are influenced by the source of information through reaction to who delivers the message, incentives whereby markets are full of incentive conflicts, and heuristics and cognitive biases that often influence responses. Norms provide an understanding of social and cultural influencers, while default options show that decisions depend on a reference point and influence an individual's choice. Salience shows that an individual is influenced by novel information, and information that seems more relevant stays longer in memory and is more likely to affect thinking and actions. Individuals are influenced by psychological unconscious cues that prime them to behave or choose in certain ways. In addition, emotions such as immediate emotions that are experienced at the time of decision-making and anticipated emotions such as regret and disappointment also influence decisions. A lack of willpower can be an internal constant battle polarised at particular times or in

particular contexts by individuals setting short-term targets, resulting in self-control problems when preferences are inconsistent across time or context.

Table 6.4 assists in the model development and provides further detail on each of the previous sections in the establishment of the model. The development of the model is built on the influencers of crop choice, and these are now highlighted against each influencer throughout this chapter, for example 6.4.9 Commitment (individual factor) and 6.5.3 Framing (environment factor). How individuals think and act depends on behavioural influencers. Understanding these influencers can assist in decision-making processes. Decision-making is based on both deliberate and automatic modes of information processing, largely shaped by contextual factors and cues in the environment. The listed influencers alongside the model factor provide the link to the model. The central argument of this study is that the individual is the decision-maker ultimately responsible for the decision, automatic or deliberate, and thus understanding influencers of decisions is important and a responsible way forward to improving decision-making processes.

***6.5.9.1 Behavioural Influencers in Cotton (building on the Quick reference to Behavioural insights in Tax (Savage et al., 2011))***

Behavioural insights in cotton (BIC) in Table 6.4 show how behavioural influencers can contribute to answering the research questions. The reason to use this framework is to apply behavioural insights, building on existing work in the behavioural science literature as applied to public policy, taxation and health, to the cotton industry context and CGE decision-making processes.

**Table 6.4** *Behavioural Influencers in Cotton (building on the works of Savage et al. (2011) and the Behavioural Insights framework).*

<b>Operational</b>	<b>How understanding behavioural influencers can contribute</b>	<b>Potential factors</b>
<p>Services Allowing researchers to see where to build capabilities to support CGE needs, and identify where gaps exist in the decision-making process</p>	<p>Initial detail provided in Part 1 of this study and in Chapter 5 in Part 2 of this study can identify problem areas across the CGE crop choice context, and behavioural insights can be used to assist CGEs with decision-making processes.</p>	<p>Timing Feedback and reminders Cognitive load</p>
<p>Pre-emptive communication and adoption This study through the method of data collection, i.e. interviews with growers and a national survey provide pre-emptive communication</p>	<p>The time and way the communication is delivered regarding crop choice can have a significant impact on response/adoption.</p>	<p>Messenger effect Timing Framing/Priming Self-image</p>
<p>Voluntary compliance How to promote and assure voluntary compliance and self-correction of errors</p>	<p>There is importance in feedback and reminders during decision-making, simplifying information and processes in crop choice. Social norms such as descriptive (what other CGEs do) and injunctive (perceived behaviour of what most people should do) can help CGEs make clearer decisions.</p>	<p>Feedback and reminders of previous decision-making processes Simplification Social norms</p>
<p>Maths errors and soft notices Demonstrating where systemic error detection methods can provide understanding of influencers on decisions.</p>	<p>Cognitive load may set in when making crop choices. Identifying points at which errors tend to happen enables feedback and reminders to be put in place to assist with decision-making processes.</p>	<p>Cognitive load Feedback Reminders Salience</p>

<b>Operational</b>	<b>How understanding behavioural influencers can contribute</b>	<b>Potential factors</b>
Adoption and penalties Demonstrating systematic error detection methods can provide detail on influencers of decision-making processes.	Appeals to image, identity and social norms encourage socially responsible actions. Understanding influencers on CGE crop choice can help uncover impacts to decision-making.	Social norms Timing Salience

### **Australian Cotton Grower Employer Organisational Factors**

This study has discussed the aspects of CGE organisations in relation to CGEs as the decision drivers of decision-making in crop choice in the Australian cotton industry, usually measured by sustainability indicators of economic, environmental and social factors. Decision-making behaviour within organisations is, of course, multifaceted (Savage et al., 2011), involving the individual (considered in the context of this study as the CGE who is the decision-maker and central to the argument of this study), the environment and social cues.

## **6.6 MODEL DEVELOPMENT**

This study commenced with development of the Australian cotton-growing motivation model in Chapter 2, which was based on SCCT from the academic discipline of psychology which provided insight into factors impacting motivation and personality traits, as well as self-efficacy of the task of cotton growing, job satisfaction and work engagement. It then progressed to explore behavioural economic theories and influencers on work motivation and decision-making in Chapter 5. This chapter utilises each of the dimensions of the MINDSPACE framework (Dolan et al., 2010) and Behavioural Insights toolkit (Savage et al., 2011), applied to the developed Behavioural Influencers in Cotton in sections 6.3 and 6.4

above to develop the multi-disciplinary Crop Choice Model. This model uses theories and insights from each of the disciplines explored in the thesis to explore the behaviour of the individual CGE responsible for the decision-making processes of crop choice influenced by both conscious and unconscious factors to answer the research question. The approach is consistent with the view of Savage et al. (2011, p. 8) that “no one model is ‘perfect’ and the best insights are often provided when more than one model is applied to a particular issue”. Together, these models and theories suggest a number of factors are likely to be important determinants of crop choice behaviour, as discussed throughout this chapter.

Behaviour is complex, and models are purposely simple as they are developed with a certain behaviour in mind (Savage et al., 2011). Savage et al. (2011) suggest that comprehensive models that try to cover extensive behaviours across all factors that impact behaviour often prove unworkable. The next section presents this multi-disciplinary model.

### **6.6.1 Individuals (CGEs) as drivers of decisions**

Decisions of cotton-growing businesses are made by individual CGEs, while “decisions of organizations are made by people” (Savage et al., 2011, p.33). CGEs in cotton-growing businesses ultimately make decisions that determine crop choices. The aim of this section is to explain that crop choice by CGEs within the Australian cotton industry, be it under the sustainability indicators of economic, environment and social, or as individual, environment and social explored in the Behavioural Insights toolkit (Savage et al., 2011). Either way, decisions are driven by the individual CGE. The central argument of this study is that individual CGEs are responsible for all decisions that surround crop choice, such as the adoption of technology, cotton industry science research, and other industry standards and

applications. These decisions and all operational decisions required for growing the crop, including those specified in the job task list in Chapter 2, can influence crop choice.

In “the Australian cotton industry there is a long history of independent assessments and documenting performance as well as practice change, unlike any other Australian agricultural industry” (Cotton Research and Development (CRDC) Strategic plan, 2013-2018). Economic indicators are measured by “production area, yield, quality, gross value, profitability and regional economic activity; environmental indicators are measured by industry datasets, case studies and research reports of soil, water, pesticide and transgenic crop trait stewardship, biodiversity and greenhouse emissions, while social indicators are measured by education levels attained, demographics, employment, health, community attitudes, social capital, research and development and compliance with law” (Roth, 2010). As “work is a fundamental dynamic driver for enhancing human development” (Human Development Report, 2015) and behaviour is how humans define their own lives, it is argued that the inclusion of the individual and the how, what and why people act in a work environment are important to the sustainability of any industry. Individuals are the main component of any work environment. In the workplace, behaviour and psychology provide an understanding of the emotions and mental processes that influence individuals, such as cognitive load, satisficing social norms, which can independently and collectively with other influencers (see sections 6.3 and 6.4) impact on the prosperity of a business and the well-being of the CGE.

The current key sustainability issues of the Australian cotton industry include environmental, economic and social factors and five sub-themes: pest and pesticide management, water management, soil management biodiversity, land use and climate

change. There are also three major economic themes: economic viability, poverty reduction, and security and economic risk management. There are also four social themes: labour rights and standards, worker health and safety, equity and gender, and farmer organisation, “defined broadly in the Cotton Report to include formally incorporated farmer associates, cooperatives and informal groups of farmers” (Measuring Sustainability Report Towards a Guidance Framework, 2015, p. 57).

Until now, social indicators in the Australian cotton industry have been referred to as one of the three sustainability indicators, and provide sufficient indication of behaviour among two or more people at a societal level. It is argued in this study, however, that all motivation starts with the individual, and it is for this reason that the individual human contribution and the extent that social factors have on how people act and think, often depends on actions of those around them (Savage et al., 2011). Most people make efforts to conform to social norms and expectations (Savage et al., 2011), and therefore the individual should be included as a driver of decisions and be responsible for decisions on sustainability and all organisational stewardship decisions. This quotation is central to the argument of this study:

The basic entity of the social process is the individual, his desires and fears, his passions and reason, his propensities for good and for evil. To understand the dynamics of the social process we must understand the dynamics of the psychological processes operating within the individual, just as to understand the individual we must see him in the context of the culture which moulds him. (Fromm, 1942, Foreword).

The MINDSPACE framework components discussed previously in this chapter in sections 6.3 and 6.4 include relevance to CGE application of decision-making processes. These links are relevant to the influencers of CGE crop choice and the

Decision Driver Model, building on existing frameworks used in other areas of public policy and health, and presented in this study alongside each framework heading as individual, environment and social concepts to the CGE crop choice context.

#### ***6.6.1.1 Economic***

Cotton growing is a major personal and financial commitment. In the calculation of participating in an activity or justifying a decision, the most common form of assessment is an analysis of costs and benefits. In comparing choice options, such as whether to participate in cotton growing for the season, the CGE compares the relative costs and benefits of each possible option (alternate summer crops, water availability, planting configuration and so on). The accuracy of the information and applicability to cotton-grower operations to inform the decision are essential to the strength of the final decision.

The way in which the financial aspects of CGE crop choice are presented influences the decision-making process. In preparing a cost-benefit analysis, the psychological insights of behavioural economics can support a more realistic understanding of how people usually assess risk and simplify better decision-making. However, the CGEs' current view is that given choice and information, they will be able to make rational decisions that are in their own best interests by processing all the relevant information available. This view does not account for the behavioural factors that influence decision-making processes in the context of complex, emotive decisions that involve a large degree of uncertainty such as crop choice. Beyond the cost-benefit analysis, other assumptions are considered in crop choice, such as cognitive ability, which enable CGEs to know how to apply the information available.

Individual CGEs behave in a way prescribed by the social role they find themselves in (employer, parent, partner, colleague, consumer). From an economic

perspective, individuals behave in ways consistent with trying to achieve some fixed objective usually related to private consumption. However, it is believed by CGEs that the reality draws from both perspectives. An individual's identity is the social category they belong to, and their ultimate behaviour is determined by trading off standard (e.g. financial) utility with behaving in a way consistent with their identity (Akerlof & Kranton, 2010).

#### ***6.6.1.2 Environment***

While behavioural economics refers to risks evaluated in terms of perceived losses and gains used widely in other sectors such as consumer behaviour, they can also be applied to the context of CGE crop choice. The losses and gains in evaluating the environmental factors of crop choice are laden with uncertainty and risk. The pressures of evaluating the choice of whether to participate in cotton growing each season is increasingly uncertain due to the increase in extreme weather events. Risk is always present in agricultural production, particularly in cotton, due to the high capital outlay to grow (i.e. land, water, seed, equipment) and the human capital factor of production – especially due to the sizeable personal and social contribution of the grower. Research in behavioural economics has shown that individuals are more opposed to losses than gains of the same size, which establishes that individuals may become opposed to risk in situations of uncertain choices (Kahneman & Tversky, 2010). In the case of CGEs, this may contribute to attention and retention issues. Separately, as expressed in cumulative prospect theory (Tversky & Kahneman, 1992), the average person will place more importance on the most favourable outcome and then ignore the risks that come with that decision.

#### ***6.6.1.3 Social***

In the second round of cotton interviews, participants suggested there is an element of social concept in cotton growing in delivery of information, reciprocity

and social norms. The social concept considers messenger effects, i.e. reactions to information regarding crop choice influenced by the messenger delivering it, and reciprocity, i.e. CGEs may feel obligated to return favours or make certain crop choices due to reciprocity. Social norms are the values, actions and societal expectations, both implicit and explicit, that influence behaviour. Norms are understood to play a significant role in crop choice, as explained by descriptive norms (observation of what others do and are considered as “normal”) and injunctive norms (perceptions of what most people approve of and information on what one “should” do) (Savage et al., 2011). In the delivery of information on crop choice, cotton consultant agronomists and on-sellers are the notable messengers in the Australian cotton industry on crop choice and are relevant to the decision-making processes of crop choice.

A similar example with reference to the delivery of information was found in the aspect of safety in the Australian aviation industry in a recent address to the Aviation Training and Safety Summit. Walker (2016) suggested that the data-driven, analytical safety model of the future of aviation revolves around communication of data and data flow between industry and the regulator, and stakeholder engagement, as the centre of future safety. Similarly, CGEs suggest that good cotton-growing choice is mostly based on good relationships between cotton industry crop consultants and CGEs. This sentiment is supported in most areas of cotton growing, as in this example:

“Growers don’t want to be dictated to, they demand collaboration” and “the more successful growers develop strong trusting relationships with consultant agronomists” [AC1]

Relationships are based on trust between growers and consultant agronomists, agronomists and research, and the data flow between industry and grower. As supported in the literature, messenger effects work well when information comes from a trusted source and a perceived expert (Savage et al., 2011). Central to the argument of this study, the individual is responsible for decision-making and considers economic, environment and social influencers.

### **6.6.2 Participant Experiences and Social and Individual Concepts**

Second-round interview participants were asked to share their experiences and perceptions regarding their decision-making processes relating to crop choice.

“It’s a passion for growing cotton; I don’t really think of growing anything else, but I do find it hard to have to motivate others.”

(P2 current grower)

“The way I got into cotton was working with a fellow who gave me a start; I literally don’t think I would have gone into it without that support.” (P3 current

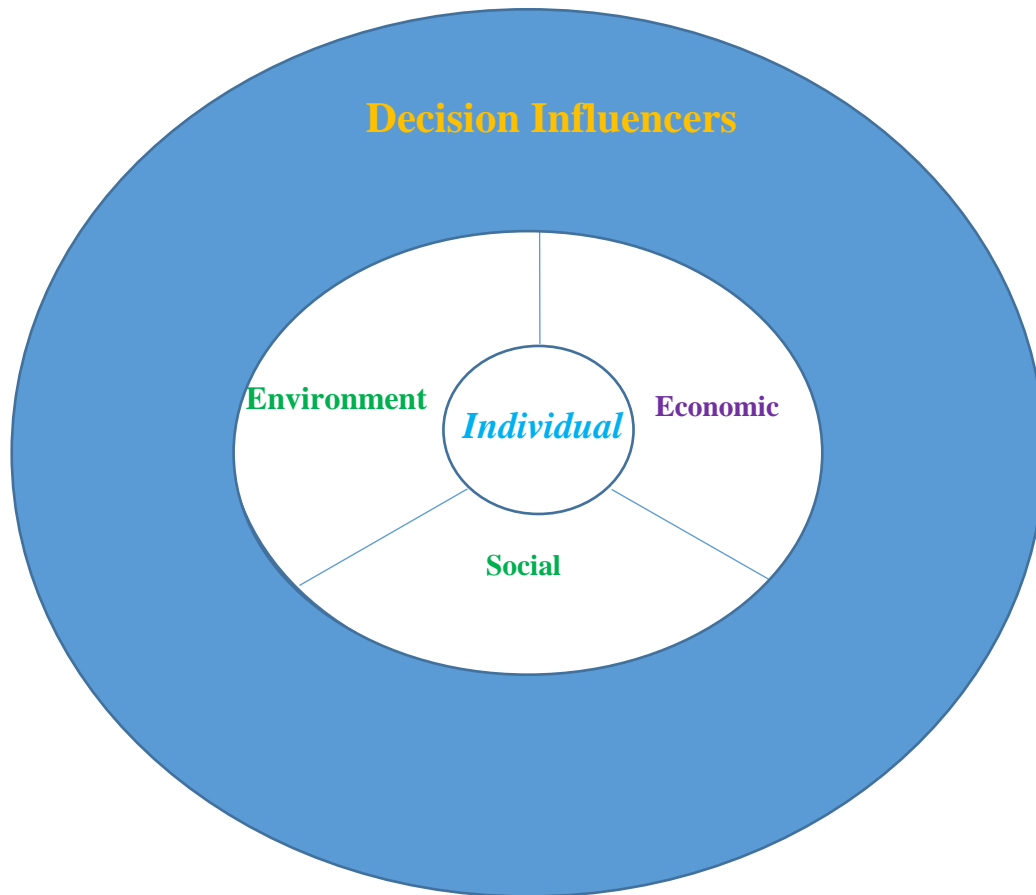
“Cotton is a food and a fibre; we get to clothe and feed the world. This excites me, makes it easy to be motivated when you’re part of something bigger. Trouble is, I still sweat the small stuff, and decision-making and motivating others every season can be overwhelming.” (P1, current grower)

Participants were passionate about growing cotton, and CGEs expressed that collegial support was important in considering cotton as a crop choice. This notion is supported in literature regarding social concepts, as mentioned in this section above. Participants

expressed how their own work motivation was driven by the passion they have for being in the industry, and yet trying to motivate others was something they didn't know how to do well. They expressed the difficulty of motivating others (staff), and whether running a large-scale cotton operation, or a small family-owned business, the problem was consistent; they expressed that having to constantly motivate others influenced their own motivation over time. Growers suggested that in motivating others, the idea to “not” employ was “real” and impacted on crop choices. People's mental resources can become drained by such challenges, leading to sub-optimal decision-making (Savage et al., 2011).

### **6.6.3 Decision Driver Model**

Models of behaviour help explain and project people's choices in everyday life and build on standard economic theory using the assumption that individuals behave rationally. Behavioural economics explains why people make decisions that do not always maximise their own well-being and act in ways that are not always in their own best interests, as explained throughout this study. The model (Figure 6.1) is composed of three factors: economic, environment and social, which are the sustainability indicators in the cotton-growing industry that can be understood through building on the behavioural insights framework (Savage et al., 2011) that refers to individual, environment and social factors. Applied in this chapter are each of the indicators listed alongside the influencers in section 6.5. The behavioural influencers are discussed in more detail in Chapters 2 and 5 and earlier in this chapter in sections 6.3, 6.4 and 6.5.



*Wunsch, 2016*

*Figure 6.1.* Decision Driver Model. A synthesis of cotton industry sustainability indicators and the behavioural influencers of CGE crop choice.

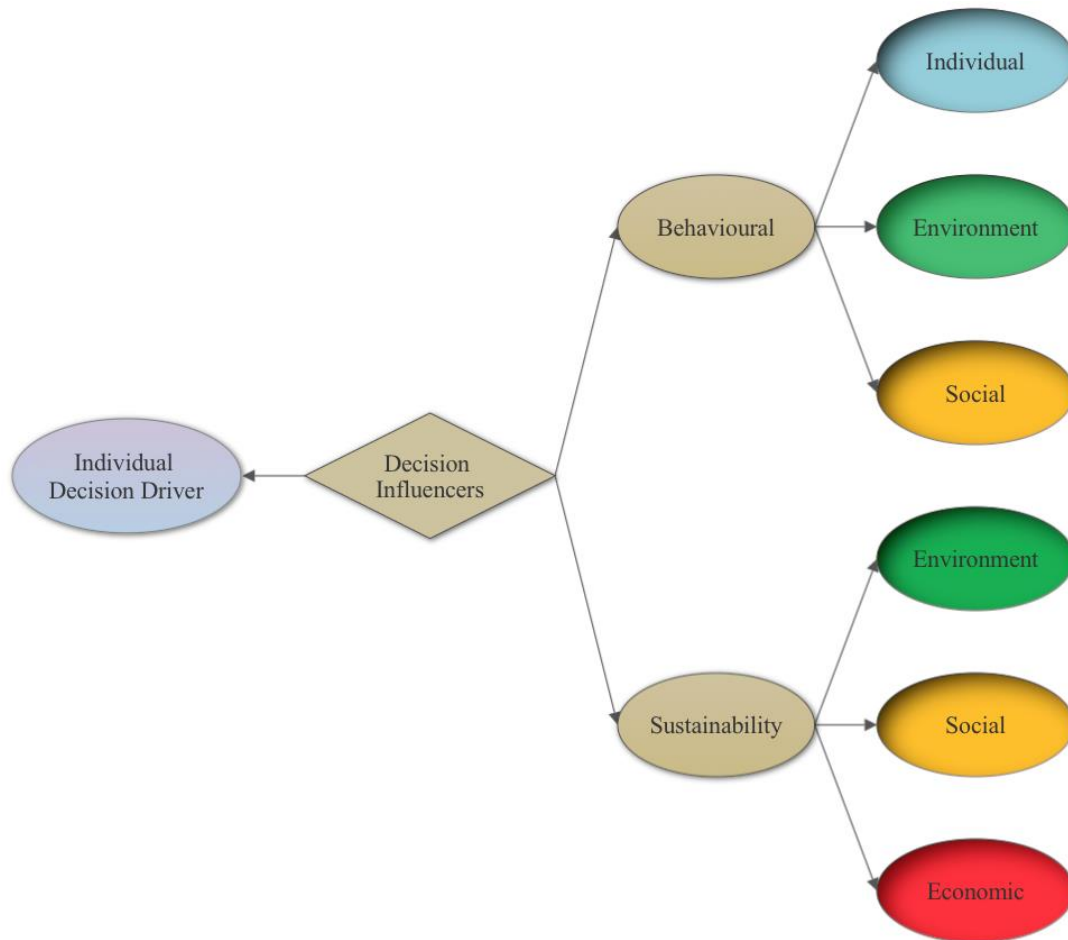


Figure 6.2 Flowchart of the Decision Driver Model (building on the works of Dolan (2010) and Savage et al. (2011))

Crop choice is influenced by both deliberate and automatic modes of information processing. These processes can be better understood to assist in desired decision-making. The CGE is the decision driver of crop choice. The Decision Driver Model is a synthesis of both the sustainability indicators (economic, environment, social) in Figure 6.1 and the behavioural influencers (individual, environment and social) found in detail in sections 6.3 and 6.4, and the behavioural concepts that apply to the cotton crop choice context found in section 6.5. The model shows that the individual is critical to the decision-making process and supports the argument of this study that CGEs are the decision drivers. Because human decision-making is based on

both conscious and unconscious processes, providing an understanding of how these processes influence decisions can assist CGEs in making better decisions for themselves.

Through SCCT theory, Maslow's Hierarchy of Needs theory and the Decision Driver Model, this study seeks to explain how CGE decision-making processes are impacted by unconscious (automatic) influencers in the context of crop choice. Research to date shows that unconscious influencers on judgement, emotion, behaviour and motivation are of practical importance to society and that much of what people do is often done with very little thought (Bargh, 2013). Life is full of endless choices: conscious (such as willpower) and/or unconscious (automatic) influencers shaped by contextual factors and environmental cues, as addressed in the CGE crop choice context in sections 6.3, 6.4 and 6.5.

The Decision Driver Model builds on the work of Savage et al. (2011) by providing insights used in practice and applying behavioural economic principles (in the Behavioural Insights toolkit applied to the tax and transport industries), and in this study integrating behavioural approaches into the cotton crop choice context. Interview and survey results contribute to the construction of the model through influencers of crop choice, as discussed in Chapter 2, survey results in Chapter 4 and sections 6.3, 6.4 and 6.5.9. Building on factors explained in Chapter 5, section 5.1, the role of behavioural economics and decision-making theory is used in this study to explore how CGEs make crop choices often with partial information, limited reasoning and decision biases. Furthermore, CGEs' decision-making behaviour can often be unconscious (automatic) and influenced by social norms, emotions, habits, other influencers and indicators mentioned in sections 6.3 and 6.4 in response to their surroundings. As people are faced with more decisions and information than can be

consciously processed, individuals rely on cognitive shortcuts (heuristics), as highlighted in detail in the CGE context in section 5.7.8, Table 5.1.

Often, decisions that are made can sometimes not align with an individual's intention; therefore, understanding behavioural influencers impacting CGE choice is important in helping to develop interventions that go with the grain of human nature to assist CGEs meet their desired outcomes. The model's focus is on the CGE as the driver of decisions and decision-making influenced by a combination of environmental, economic and social factors, and the synthesis of behavioural influencers and cotton industry sustainability indicators, shown in sections 6.3. and 6.4, made by the individual CGE. In these sections the influencers sit alongside the indicators, showing the connection between influencing factors and indicators.

Highlighting these influencers and indicators that impact CGE crop choice helps form the exploratory phase in the behavioural decision-making of this study in this crop choice context (i.e. establishing what are the influencers and indicators). The second step is to diagnose the behaviours, and this section is addressed also in sections 6.3 and 6.4 under each of the influencer/indicator headings. The third step is to design and implement possible interventions, such as changing the question being asked (for example, choice architecture, i.e. changing the way options are ordered or presented, thus assisting with cognitive overload); changing the information being provided (framing and salience); helping CGEs follow through on intentions (intention, time distortion); helping CGEs be more timely (providing feedback on previous successes, timing); and making decisions easier (self-image, incentives, social norms, messenger effects, reciprocity).

The characteristics, circumstances and attitudes are termed in this study objective evidence of CGEs choosing to grow or not to grow cotton, as discussed in

Chapter 2 and also found in the results section in Chapter 4. The attitudinal evidence used in this study refers to an understanding of what matters most to CGEs in their decision-making processes and why. The information is drawn from the interviews and survey data and explored in more detail through a behavioural lens in Chapter 5 that includes a review of the relevant theories and in this chapter as explained in the Decision Driver Model. The model is explained by outlining the indicators and influencers (please see sections 6.3 and 6.4) that help define the research problem of CGE retention by low levels of CGE cotton crop choice.

There is considerable debate about the extent to which individuals “choose” how to behave, and while mainstream economic theories assume that rational choices are the foundation of behaviour, other theories suggest that individuals are “locked-in” to patterns of behaviour over which they have little control, due to environmental, economic and social constraints. Low levels of CGE crop of choice can be impacted in the cotton context by indicators and influencers, as described in sections 6.3 and 6.4, and relate to conscious (willpower) and unconscious (automatic) processes. As originally proposed by Stanovich & West (2000) and more recently by Kahneman (2011), System 1 operates effortlessly and quickly (unconscious), while System 2 (the conscious reasoning self) requires attention to resolve mental activities. While it is beyond the scope of this study to discuss the extensive literature on Systems 1 and 2, it is important to note that further research in this area could be applied to assist CGEs in their decision-making processes.

Self-driven generally means motivated or influenced by something, and drive in psychology is an instinctual need that has the power of driving the behaviour of an individual. Self-motivation, on the other hand, is having an ability to do what needs to be done without influence from other people or situations where individuals

can find a reason and strength to complete a task even when it is challenging. Self-driven in the business sector therefore usually means something positive – a person who has a thirst for success without an external reward. Deci & Ryan (1985) established a theory of self-determination encompassing motivation and personality that addresses three universal, innate and psychological needs: autonomy, competence and psychological relatedness. An example of self-determination is the strength to keep farming even when the odds of a good season may not be known to be ideal. Self-driven applied in the model refers to the centre circle, individual (i.e. CGE) responsible for the decision-making and all functions of the cotton-growing business.

Within the Decision Driver Model, the meaning of self-driven is also positive – a person motivated by their work. There are two well-known basic types of motivation: intrinsic and extrinsic. Intrinsic motivation in this study refers to performing an activity for the enjoyment of the activity itself. Motivation provides individuals with personal satisfaction or fulfilment when achieving goals in life. Extrinsic motivation includes outside factors or influencers that help individuals stay focused on achieving goals. Common types of extrinsic motivators include wealth, business reputation and prestige. To be self-driven is the motivation to open one's mind to action, while being driven pushes individuals into taking action. One can be motivated without being driven but cannot be driven without being motivated.

CGEs in the case study interviews refer to self-driven energy they had in their entrepreneurial role as CGE and their view that people are more motivated when they have more control over their environments, a view also supported by the literature (Rigoglioso, 2008). Control is closely related to both power and choice. Research has found that power and choice are interchangeable; having more of one

compensates for having less of the other (American Psychological Association, 2011) while maintaining control. Sparks (2010a) suggests that engaging people to feel powerful by offering choices results in people being happier and more open to learn and accept challenges. This study provides an understanding of the influencers of choice, explained in detail in sections 6.3, 6.4 and 6.5, to assist CGE decision-making processes.

#### **6.6.4 Pressures on CGEs within Factors of the Model**

Cotton growers consider a wide range of reasons when making decisions, and Literature Review 1 provided a psychological focus in the context of such decision-making influencers. Research in this area (discussed in Chapter 2) suggests that these psychological factors, in addition to other behavioural influencers included in sections 6.3, 6.4 and 6.5, are among the most significant when choosing to grow cotton. Cotton growing is a specialty field of agricultural production. This study has used a behavioural science approach to increase the explanatory power of economics providing realistic psychological and behavioural economic foundations. These factors have been explored in detail in this chapter with reference to the BI toolkit, MINDSPACE framework and additional relevant factors to create the employer self-driven model choice model of automaticity and willpower of CGEs. This section will explore the pressures and impacts of these factors within the constructs making up the model.

As perceived by CGEs, the factors within the model are required to manage operations and manage relationships with people as an integral part of running a cotton-growing enterprise while addressing the perceived societal pressures of economic, environmental and social regulations. Behavioural economics resembles cognitive psychology by guiding individuals towards self-benefiting behaviour by

correcting cognitive and emotional barriers (Lowenstein and Haisley, 2008).

### **6.7 UNDERSTANDING (CGE) CHOICES**

Behaviour is determined by both person and situation, with cognition and motivation jointly predicting behaviour (Fiske & Taylor, 2013). Social cognition explains how people think and feel about others and themselves, and it is influenced by psychology, providing explanations of the unconscious elements of decision-making. Many people care about what other people think and are interested in understanding other people. Social behaviour focusses on perception and memory as a function of who and where a person is situated, while motivation predicts whether a behaviour will occur, and by how much. There is an increased understanding that knowing what to do does not mean doing it; therefore, cognition alone is not enough, and motivation is found to provide the drive of behaviour swayed by contextual influencers (Dolan et al., 2010). The perceived social expectations of CGEs identified through this study have led to a re-conceptualised behavioural approach. The contextual influencers comprise individual CGEs as consumers and include the MINDSPACE framework, BI toolkit and relevant influencers discussed in section 6.2, as well as the sustainability influencers mentioned above in section 6.7.4.

The first part of this study focussed on how the individual CGE is influenced by psychological factors. The theories examined were able to account for some of the aspects of CGE decision-making. Part 2 of this study has explored the application of behavioural economics to the CGE context to help answer the research questions by building on the realistic psychological foundations (found in Chapter 2) and increasing the explanatory power of economics in understanding the influencers of crop choice. Behavioural economics is concerned with the human aspect in decision-

making as well as relevant economic issues. The point of departure between traditional economic theory and behavioural economics is that traditional economic theory assumes that mistakes in decision-making are random, whereas in behavioural economics, systematic errors are influenced by unconscious (automatic) influencers (Kahneman, 2011).

Each of the influencers on a CGE may also introduce a level of bias into the individual CGE's decision-making and choices. Behavioural economics makes explicit the many biases of decision-making processes, and this study confirms how some of these influencers affect and are incorporated into the everyday choices CGEs face. For CGEs the unconscious (automatic) influencers are discussed in detail in sections 6.3, 6.4 and 6.5. Where to source advice on crop choice was found to be provided by:

- Consultant agronomists, because through collaborative meetings with CGEs they provide one-on-one historical data on individual farms and discuss planning factors for the upcoming season as well as providing detail on previous seasons' data and experiences;
- Families' and friends' opinions regarding the upcoming season and commitments that need to be accounted for during the growing season;
- CGE work colleagues who have experience in the growing of cotton; and
- Other industry advisers.

Recent research (Dolan et al., 2010; Kahneman, 2011; Savage et al., 2011) explains there are two ways of thinking about changing behaviour. The first is based on influencing what individuals consciously think about. The second focusses on

automatic processes of judgement and influence, known as the processes of mind which shift the focus towards altering the context in which people act (Dolan et al., 2010).

### **6.7.1 Changing the Mind and De-biasing**

Support for CGEs in their decision-making processes requires some strategies to assist them to make better decisions. This support can be provided by offering a broad view of strategies such as those based on changing the focus in decision-making research for many years (Dolan et al., 2010). Six strategies for making better decisions have been identified (Bazerman et al., 2009): 1) decision-analysis tools; 2) acquiring expertise; 3) de-biasing your judgement; 4) reasoning analogically; 5) taking an outsider's view; and 6) understanding biases in others. The first three strategies – decision-analysis tools, acquiring expertise and de-biasing your judgement – seek to create a broad change in intuitive responses to decision-making situations, and the last three strategies – reasoning analogically, taking an outsider's view and understanding biases in others – provide techniques for improving specific decisions in specific contexts.

Similarly, Fischhoff (1982) proposed four steps to assist people to make wiser choices: 1) offering warnings about the possibility of bias; 2) describing the bias potentiality; 3) providing feedback; and 4) offering training with feedback and coaching to assist individuals in making better choices. However, it is argued that even after such intervention, the bias may remain (Fischhoff, 1982). Larrick (2004) found that a bias can be altered through training if the testing is closely linked and within as close a timeframe as possible to the decision. Also, discussing de-biasing within groups is more effective in making people accountable for their decisions. (Larrick, 2004). Lichtenstein and Fishchoff (1980) found that individual

feedback is effective in the short term, and Larrick (2004) and Mussweiler, Strack, & Pfeiffer (2000) suggested that an opposing view in the decision-making process reduces overconfidence and anchoring effects. Factors that prevent individuals from changing their behaviour (Bazerman et al., 2009) include: 1) satisfaction with the status quo; 2) risk aversion; and 3) preference for known behaviour versus unknown outcomes for innovative behaviour.

Individuals do not make optimal decisions intuitively or automatically. On the contrary, intuitive decisions are “often quite useful, but sometimes lead to severe and systematic errors” (Bazerman et al., 2009 Kahneman, 2013, p. 11). While the ability of human judgement may be systematically flawed, the people component of decision-making processes is still evident over technology. People can regularly outperform computers in their ability to understand verbal language and recognise human faces compared with the fastest and most powerful computers. Computer-based decision-analysis tools are often used to provide people with advice on decision-making, and yet these approaches still require people to quantify preferences and place a value on them. Rational decision-making also requires individual input on specifics about calculating probabilities of risk and uncertainty. There are pros and cons for decision model choices, and regardless, people play a crucial role in models. People decide which variables to put into the model and how to weight them. People also monitor the model’s performance and determine when it needs to be updated” (Bazerman et al., 2009, p. 183). Improved admission and job hiring decisions are two examples that demonstrate how linear models can improve organisational outcomes that are applicable in the context of CGEs. Currently, job interviews are commonly used for predicting applicant suitability, but job performance shows that they are not always effective (Schmidt & Hunter, 1998). In

the context of CGEs, job interviews are commonly used for predicting applicant suitability, but job performance research shows that they are not always effective (Schmidt & Hunter, 1998). While there are assessment tools to predict performance that outweigh interview effectiveness, interviews are still strongly supported in cotton and other industries.

In the interview process (Bazerman et al., 2009) people rely on cognitive biases that include availability and managers relying on intuition to predict attributes of success; affect heuristic and evaluations being based on first impressions; representativeness and intuition providing a base for unsubstantiated performance; and confirmation heuristic providing no measure of selection effectiveness. Intelligence tests, years of work experience, and quantitative assessments of structured interviews for all candidates (if interviews are preferred) have been shown to be better predictors for hiring decisions (Bazerman et al., 2009). However, they are not always used in the cotton context by individual CGEs employing staff.

### **6.7.2 Changing the Context, Internal and External Pressures**

The aim of this section is to provide an understanding of the influencers of choice in the context of CGEs, including some of the biases that provide some evidence for heuristics of judgement as well as alternative sources of intuitive judgements and choices (Kahneman, 2013), i.e. the influencers that shape CGE crop choice, as explained in sections 6.3, 6.4 and 6.5. The internal and external pressures are discussed in further detail under the cotton industry sustainability indicator headings (the economic, social and environmental section in Chapter 7, sections 7.2.1, 7.2.2 and 7.2.3). Intuitive judgements and choices referring to emotion influence decisions. With the affect heuristic, judgements and decisions are guided by feelings (Kahneman, 2010) in various experiences such as the choice context of this study.

When CGEs are faced with a difficult question, research (Kahneman, 2010) tells us that individuals answer an easier question instead, usually without noticing the substitution. When the spontaneous search for an intuitive solution sometimes fails, individuals search for a slower more deliberate form of thinking (Kahneman, 2010), such as that described by System 2, while System 1 is considered more influential and responsible for many choices made (Kahneman, 2010). Much of the work in decision-making has been around slow, conscious deliberate thought processes, referred to as System 2. However, it is now known that System 2 is often overridden by System 1, which is fast, automatic and unconscious (Dolan et al., 2010; Kahneman, 2010). This study discusses the influencers of choice with the focus on System 1, automatic and unconscious decisions.

Understanding the context and why and what is shaping behaviour is important for any behaviour change intervention (Hollingworth, 2016). There are common circumstances of life intuition that may appear mysterious (Kahneman, 2013). In understanding such behaviour as crop choice, for example in cotton growing, if a CGE chooses to grow cotton in the coming season without knowledge of any long-range forecast of drought ahead, the decision to preserve moisture as a safety net against dry conditions, such as by growing cotton every second row, may seem feasible to some. However, for others this same choice in a different context may seem absurd. In any scenario, choice can be based on visceral factors (section 6.4.5.1) that influence all areas of behaviour, habit (section 6.4.6) and intuition (section 7.3.2). In another example related to crop choice, the behaviour under exploration in this study is also relative to other aspects of primary production that flow on from crop choice. Examples are recognising the danger of a planter wheel about to wedge loose, or pre-empting the wind changing direction during a spraying

activity and ceasing to spray until another time. In these situations related to the crop, decisions are based on intuition; in such cases, cues were provided that can be interpreted by an experienced CGE. This notion of cues is described by Simon (1997): “the situation has provided a cue; this cue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition.” However, not all professional intuitions arise from expertise, and more recent literature (Bargh, 2013) reveals a broader concept of heuristics, which now includes emotion (section 6.4.5).

Management decisions are described as affect heuristics where judgements and decisions are guided directly by feelings (Kahneman, 2013). When decisions are difficult and an intuitive solution is unable to be found, an individual’s choice is slower, with more deliberate and arduous thinking (Kahneman, 2013). On the other hand, fast thinking includes intuitive thought and the automatic mental activities of perception and memory, such that individuals can know there is danger present from the unusual noise of the machine or they can remember the average price of cotton per bale last season (Kahneman, 2013).

Much of the work in decision-making has been around slow, conscious deliberate thought processes referred to as System 2, and yet it is now known that System 2 is often overridden by System 1, which is fast, automatic and unconscious (Dolan et al., 2010; Kahneman, 2010).

## **6.8 DECISION DRIVER CHOICES OF CGES**

The decision of what varieties to choose, and where and if to plant in cotton growing has always been extensive, but increased choices in many other aspects of growing applicable to cotton crop choice (such as the various machines and types of applications of planters, harvesters, spray applicators due to advancements in

technology, impacts of extreme weather events), and a call for increased efficiencies has made CGE crop choice more important than ever and more overwhelming. Yet the influencers on CGE choice, the benefits before, during and after the season, are more complex than a trade-off of industry sustainability indicators. A cotton crop is a major individual personal and work commitment that means foregoing other opportunities, and the results of some decisions can be catastrophic. Although value comes from the skills, capability, self-efficacy and self-satisfaction of contributing to individual and business success and to a greater purpose to help feed and clothe others, there is, however, no measure or body of work that explores these factors. Thus the range of complex choices required in all aspects of cotton growing creates a difficult task that is heightened by the influencers, quantity and type of information, sources, and support available. The employer self-driven choice model of automaticity and willpower explores the individual CGE as the driver of such choice responsible for all decisions and behaviour change relating to crop choice. Behaviour change interventions are discussed in this final section of Chapter 6.

A pragmatic view on what defines the unconscious self and conscious self is typified by automatic thought processes as fast, efficient and typically outside the realm of conscious awareness (Kahneman, 2011). Conscious awareness is based upon an awareness of self-beliefs that drive individual motives that influence purpose and interests, which shape one's self to reach expected outcomes (Hoffman, 2015). Automatic thought processes require a simple motivation, for example, through incentives that activate behaviour (Bargh, 2013). These stimuli are the kinds that matter for unconscious priming effects in daily lives of CGEs. Controlled processes are the opposite of the engagement of a slow process of thought (Bargh, 2013). The employer self-driven choice model of automaticity and willpower is a

new approach on an individual level of unconscious and conscious influencers associated with a sustainability development focus among a population of Australian primary cotton producers. Self-driven primary production can be typified as having an increased level of information flow, transparency, collaboration, responsibility and choice, as well as qualitative, reasoned and tactical aspects. The self-driven concept is applied not in the sense of individualism, but in the sense of acting with knowledge and having the freedom of choice with an awareness of unconscious and conscious influencers. The potential exists to improve traditional decision-making processes and expand the concept of crop choice through being aware of these influencers, as identified in Chapter 5 and this chapter.

Traditional economics has differed from other disciplines in its belief that most human behaviour can be explained by relying on the assumption that our preferences are stable across time, articulated and rational. Behavioural approaches are not fundamentally new, and sometimes finding better ways of designing and delivering existing approaches requires being aware of “nudges” (Thaler & Sustein 2008) and in some cases making them more effective. Human behaviour is influenced by context (the world around us) and impacts on decision-making dependent on circumstance (our understanding of the world), location, time, societal influencers and emotional judgements (perceptions of the world and themselves). For CGEs to make choices, perceptions of costs and benefits, personal goals, awareness of others who are making similar decisions and confidence in their ability to change are considered. It is known that crop choice behaviour is complex and influenced by a range of factors and influencers.

### ***6.8.1 The Decision Driver Model***

Through a behavioural approach and application of the Decision Driver Model

there is potential to better understand how growers currently make decisions and how they may be helped to make better decisions consistent with their aims that relate to economic, environment and social aspects. It is understandably concerning that growers may not be deriving the most out of their agricultural experience because their crop decisions are influenced by processes that are not in their long-term interests.

The long-term interests of individual CGEs' work motivation, the longevity of the Australian cotton industry, and the Australian economy are inextricably linked. Through growing cotton, CGEs contribute by providing basic needs to society through the production of food and clothing, which provides an attractive drawcard to CGEs. The application of the MINDPSACE and Behavioural Insights toolkit to CGE crop choices in sections 6.3, 6.4, 6.5 and in the model development in section 6.6 has demonstrated how decisions can be influenced for the purpose of achieving CGE goals. This approach to addressing crop choices behaviour illustrates how behavioural economics can help the cotton industry and CGEs to understand and improve crop choices in this primary production field. It is important that CGEs are encouraged and supported to make the best decisions possible for themselves by providing influencers that impact on their choices, especially those automatic (unconscious) processes that do not require a determined admission and operate independently from conscious control.

Behavioural models and frameworks have been used in this study, and this chapter will conclude with an example of how the model can be applied in practice. Also included are the nine principles for developing interventions, as explained below (Darnton, 2008). Some examples are provided on how to use the model and material covered in this chapter and apply it to the CGE context (building on the

work of Savage et. al. (2011)).

*Messenger effect (Social)*

The way information is delivered is influenced by the messenger. The receivers of messages are influenced by their perceived opinions of the deliverer. Providing the most current information through collaboration with consultant cotton agronomists (seen as an expert and trusted source) with personalised information directed to the individual CGE can influence CGEs decisions. CGEs positively respond to face-to-face deliverers of information on crop choice.

*Timing (Environmental)* is relevant in crop choice, and developing prompts at times when CGEs are most receptive can assist in producing more desirable outcomes of crop choice by addressing choice behaviours, e.g. making a choice immediately following a “good” season or delaying the discussion on next season’s crop closer to the new season planting window.

*Cognitive Load (Individual)*

As an individual’s mental resources can be depleted following challenging situations (such as during cotton picking), or when many decisions can lead to choice overload or fatigue (during watering and cotton picking), individuals may make impulsive decisions that are not optimal to CGEs. CGEs would benefit from recognising that during times of mental fatigue, important decisions such as crop choices or selling cotton would be more optimal if the decision-making process is delayed.

### **6.8.2 Behaviour Change Intervention Explored**

*Behavioural Change*

This study views the decision-making factors in the cotton crop choice context to suggest interventions and help CGEs make better decisions for themselves, contributing to new knowledge to research “what works” in this context. A complete behaviour change intervention is beyond the scope of this study. However, in order

for behaviour change people need the change to: “be more advantageous; fit with their perceptions of self and or aspirations; have an increased awareness of who else is doing it; an increase in confidence in their ability to change; or their current behaviour needs to seem less of any of the above” (Savage et al., 2011, p.5).

There are two ways of thinking about changing behaviour. The first is based on influencing what individuals consciously think about, while the second focusses on automatic processes of judgement and influence known as the processes of mind, which shifts the focus towards altering the context in which people act (Christmas, Dolan et al., 2010; Kahneman, 2011). Given that much of the research in decision-making has previously focussed on de-biasing, the following section discusses both changing the mind and changing the context of decision-making processes and applies this to CGE choices behaviour in sections 6.8 and 6.9 below. The MINDSPACE framework and BI toolkit are relevant to CGEs and are incorporated in the Employer self-driven choice model of automaticity and willpower to account for influencers of choice of individual CGEs.

The nine principles for developing interventions based on models (Darnton, 2008) are used with the behavioural model developed to illustrate how it may be used as a tool in the design concept of a proposed behaviour change intervention. The behavioural model identifies factors influencing behaviour, and the theories of change show how behaviours can be altered (Darnton, 2008).

As with many industries there is a focus on technology and data analytics to enable more economically efficient decisions. This new perspective has been embraced by the cotton industry in support of this study (CRDC, 2015). For multi-faceted problems and for instrumental behaviour to change, joint collaboration of government, stakeholders and organisations, as well as individuals themselves, is

required (Darnton, 2008). Behaviour change interventions are designed to help individuals make better choices for themselves. The nine principles are:

1. Identify the audience groups and the target behaviour.
2. Identify relevant behavioural models.
3. Select the key influencing factors.
4. Identify effective intervention techniques.
5. Engage the target audience for the intervention.
6. Develop a prototype intervention.
7. Pilot the intervention.
8. Evaluate impacts and processes.
9. Feedback learning from the evaluation.

Each of these principles is briefly applied to the CGE cotton-growing context below.

1. Identify the audience groups and the target behaviour:

The behaviour to be changed is that of the CGE through awareness of influencers that impact crop choices.

2. Identify relevant behavioural models:

The influencing factors are established in the SCCT model and the Decision Driver Model. The outcome is to retain cotton growers to the Australian cotton industry by better understanding the influencers of their crop choices.

3. Select the key influencing factors:

The key influencing factors are addressed in both the MINDSPACE framework (Dolan et al, 2010) and Behavioural Insights toolkit (BIT, 2014). There were a number of key factors identified, and these may need

to be shortlisted to form the basis of objectives in a draft strategy for an intervention, because the implication is that when using a single model researchers need to be sure not to develop a rigid “one size fits all” intervention (Darnton, 2008). Models are concepts which can help understand behaviour but they do not demonstrate what makes people behave how they do (Darnton, 2008).

4. Identify effective intervention techniques:

In support of the nine principles, there is agreement that interventions should be informed by theory rather than be imposed based on uncritical adoption of a model (Darnton, 2008). To this end, this study requires the testing of the developed Decision Driver Model prior to any behaviour change intervention.

5. Engage the target audience for the intervention:

In line with the nine principles model, this study supports the concept of engaging the audience in the process of policy development, as effective interventions are known to be more effective when all stakeholders are involved.

6. Develop a prototype intervention:

Included in this step is collaboration with all stakeholders.

7. Pilot the intervention.

8. Evaluate impacts and processes, and

9. Feed back learning from the evaluation.

These principles are considered advisory and as such would include collaboration with industry representation at various levels to ensure crop choice intervention includes all pertinent influencers.

These nine principles of behaviour change (Darnton, 2008) can be applied to this study context as steps one through to four can utilise the current data and build on the data gathered in this study and apply them to the CGEs' crop choices context. The aim of applying the behavioural insights approach was not to try to help people become more rational, but to look for opportunities to design choice environments that align with the psychology of decision-making.

People are motivated by the physical environment, their abilities and awareness of the world around them, and their views including their perceptions of themselves. Understanding both models of behaviour and theories of change is important to develop effective interventions (Darnton, 2008). In order to facilitate interventions for behaviour change, this study developed the Decision Driver Model. The psychology literature (Darnton, 2008) supports that people dislike change; so for them to make choices and behavioural change to occur and be sustainable, the choices as outlined (Darnton, 2008) need to be:

- Appealing; in other words, the individual's perception of the costs and benefits need to seem more beneficial or set the default option to be the one that people would choose if they had more time, information and mental energy.
- More individual "It's all about me" appeal; in other words, to fit with self-perceptions and goals.
- More predominant, social proof; in other words, people are influenced by what others are doing; so, make use of such influencers (e.g. asking CGEs, "Did you know that you use more energy/water etc. than x% of your neighbours?").
- More achievable; in other words, an increased confidence in an ability to

change (Darnton, 2008).

*Skills, capability and self-efficacy*

Changes to choice architecture can also provide a simpler and easier way to influence behaviour for individuals. An example would be using a prompt list for CGEs to consider in decision-making processes, delivered by trusted cotton industry development and delivery staff or consultant agronomists. The concept of designing programs and presenting options in ways that help people make day-to-day choices consistent with their long-term goals is known as choice architecture, a term coined by Thaler & Sunstein) (2009). The concept of choice architecture is to design choice options to go with the flow of human psychology. Behavioural “nudges” are prompts for desired behaviour change, as opposed to the strict incentives of classical economics (Savage et al., 2011). Models are concepts and alone are insufficient to bring about behavioural change.

## **6.9 THE DECISION DRIVER MODEL**

Increased choices in many other aspects of growing applicable to cotton crop choice (such as the various machines and types of applications of planters, harvesters, and spray applicators due to advancements in technology, impacts of extreme weather events) and a call for increased efficiencies has made CGE crop choice more important than ever and more overwhelming. Yet the influencers on CGE choice, the benefits before, during and after the season, are more complex than a trade-off of industry sustainability indicators. A cotton crop is a major individual personal and work commitment that means foregoing other opportunities, and the results of some decisions can be catastrophic. Although value comes from the skills, capability, self-efficacy and self-satisfaction of contributing to individual and business success and a greater purpose to help feed and clothe others, there is, however, no measure or body

of work that explores these factors. Thus, the range of complex choices required in all aspects of cotton growing creates a difficult task that is heightened by the influencers, quantity and type of information, sources, and support available.

The Decision Driver Model explores the individual CGE as the driver of such choice responsible for all decisions and behaviour change relating to crop choice. Behavioural change interventions are discussed at the end of this chapter.

Conscious awareness is based upon an awareness of self-beliefs that drive individual motives that influence purpose and interests, which shape one's self to reach expected outcomes (Hoffman, 2015). Automatic thought processes, as mentioned previously, require a simple motivation, for example, through incentives that activate behaviour (Bargh, 2013). These stimuli are the kinds that matter for unconscious priming effects in daily lives of CGEs. Controlled processes are the opposite – the engagement of a slow process of thought (Bargh, 2013). The Decision Driver Model is a new approach on an individual level of unconscious and conscious influencers associated with a sustainability development focus among a population of Australian cotton primary producers. Self-driven primary production can be typified as having an increased level of information flow, transparency, collaboration, responsibility and choice, as well as qualitative, reasoned and tactical aspects. The self-driven concept is applied not in the sense of individualism, but in the sense of acting with knowledge and having freedom of choice, with an awareness of unconscious and conscious influencers. The potential exists to improve traditional decision-making processes and expand the concept of crop choice through being aware of these influencers, as identified in Chapter 5 and in this chapter.

Traditional economics has differed from other disciplines in its belief that most human behaviour can be explained by relying on the assumption that our preferences

are stable across time, articulated and rational. Behavioural approaches are not fundamentally new, and sometimes finding better ways of designing and delivering existing approaches requires being aware of “nudges” and in some cases making them more effective. Human behaviour is influenced by context (the world around us) and impacts on decision-making dependent on circumstance (our understanding of the world), location, time, societal influencers and emotional judgements (perceptions of the world and themselves). For CGEs to make choices, perceptions of costs and benefits, personal goals, awareness of others who are making similar decisions, and confidence in their ability to change are considered. It is known that crop choice behaviour is complex and influenced by a range of factors and influencers.

### **6.9.1 The Decision Driver Model Application**

The long-term interests of individual CGEs’ work motivation, the longevity of the Australian cotton industry, and the Australian economy are inextricably linked. CGEs’ purpose to participate by providing basic needs to society through the production of food and clothing is an attractive drawcard for CGEs. The application of crop choices using the MINDPSACE and Behavioural Insights toolkit has explored how decisions can be influenced for the purpose of achieving CGE goals. This approach to addressing crop choice behaviour shows how behavioural economics can help CGEs to understand and improve crop choices in this primary production field. It is important that CGEs are encouraged and supported to make the best decisions possible for themselves by providing influencers that impact on their choices, especially those automatic (unconscious) processes that do not require a determined admission and operate independently from conscious decisions.

Behavioural models and frameworks are used in this study, and issues are

explored to address the research problem. The nine principles for developing interventions are used with this behavioural model as a tool in the design concept for a proposed behaviour change intervention.

### **6.10 SUMMARY**

The approach in this study has been to explore behavioural influencers and decision-making processes across psychology and economics in the overlap known and previously mentioned throughout as behavioural economics. A focus on individual behaviour includes the characteristics of CGEs explored in Chapter 2 and explained in the results section in Chapter 4. Building on Literature Review 2 in Chapter 5, in this chapter an extensive list of influencers of CGE crop choices are explored, discussed and applied to this study context.

This chapter has followed an economic/psychological approach using the BI toolkit for this study and identified a list of key factors which determine specific behaviours of crop choice of CGEs. From the detail provided by applying the BI toolkit (Darnton et al, 2010), the next step is to design an approach to enable the behaviours that support the objectives and influencers that could be utilised to achieve behavioural change. While behaviour change intervention is beyond the scope of this study, factors of the design approach will consider a number of questions: To what extent is choice restricted?; How can nudges be incorporated to increase the effectiveness of the incentives approach?; What kinds of interventions am I proposing? For developing a logistical map of initiatives for behaviour change referring to the nine principles for developing interventions based on models (www.Gsr.gov.uk, 2008), the final section of this thesis will discuss the outcomes of the study in relation to the theory and the implications for the cotton industry.

# 7. DISCUSSION AND CONCLUSIONS

## 7.1 INTRODUCTION

This chapter concludes the thesis with a discussion of how theories from psychology (Chapters 1 to 4) and a behavioural economics approach (Chapters 5 and 6) provide valuable insight into the decision-making processes of CGEs in relation to crop choices. The outcomes of the study and their implications for CGEs and the cotton industry are outlined. The limitations of the research are reviewed, and the contributions of the research are presented, with suggestions made for further research to extend the knowledge in this emerging area.

Literature Review 1 established the psychology and social cognitive career aspects of CGEs as explained in the development of the Social Cognitive Model of Grower Retention. To more fully answer the research question, information on the decision-making processes of the individual CGE was explored in Literature Review 2. While understanding these aspects was important, and used in the development and explanation of the model, in order to answer the research question it was necessary to include the behavioural economic approach to provide a more comprehensive understanding of the research topic and more fully answer the research questions. This was achieved by providing a behavioural economic perspective in exploring the behavioural influencers of decision-making, building on the works of Savage et al. (2011) and Dolan et al. (2010) to explain what and why CGEs make crop choices and what influences their decisions. SCCT and behavioural economics were therefore used in this exploratory study with a

pragmatic approach to develop a model of CGE decision-making processes: the Decision Driver Model. This model incorporates all three sustainability indicators, and their intersection represents decision-making driven by the individual CGE. This study includes the use of psychological scales to measure aspects of a CGE in the crop choice context. The exploratory part of this study in Literature Review 2 sought to understand more fully the reasons CGEs choose to grow cotton (i.e. what else may influence their decision-making processes) from a behavioural economic perspective. The Decision Driver Model in section 6.6 includes the behavioural influencers and cotton industry sustainability indicators, as explained in sections 6.3, 6.4 and 6.5 that assist in the development of the model. Decision influencers include emotion, intuition, framing, choice overload, default options, mental accounting, anchoring and bias. Development of this model and identification of these influencers has the capacity to contribute to the industry and CGEs, in addition to making a contribution to knowledge.

Cotton growers are responsible for Australia's cotton for domestic, but mostly export, consumption. In 2015, Australia's cotton production was estimated at 1.9 million bales worth approximately AU\$2.2 billion, with an average cotton farm providing 6.6 jobs and a small grower base of 796 farms (CRDC, 2018). This constitutes a sizeable industry output for a small number of cotton growers. Until now, agricultural research and cotton industry research has largely focussed on single-factor sustainability influencers of cotton growing through economic, environmental and social aspects, in the sense of social referring to two or more people, rather than the individual. Research (CRDC, 2018) listed in current and previous research projects, such as the technology in round bale cotton pickers and the introduction of genetically modified cotton, has resulted in a comprehensive

scientific understanding of cotton growing. However, this study explored influencers of crop choice by CGEs. CGEs, and the use of the term, cotton grower employer, is referred to in this study, as cotton is a labour-intensive crop and a relevant part of crop choice. This study has provided an understanding of influencers that impact on CGE decision-making processes and can be used towards integrating behavioural approaches to CGE cotton crop choices and other decisions relevant to this context. CGE decision-making processes and motivations at work are impacted by many influencers, both automatic (unconscious) and (conscious), whether in large corporations or small family cotton-growing operations. CGEs are both producers and consumers. They are consumers of the products and services required to produce crops. As consumers, they are influenced by consumer behaviours in relation to all decisions associated with inputs required for primary production and crop choices.

CGE choices and influencers of choices drive desirable, and sometimes undesirable, cotton-grower outcomes. Exploring the conscious and unconscious (automatic) influencers of crop choices can help explain why CGEs may choose to grow cotton. The gap is in addressing this topic, and from a behavioural economic perspective is a new way of approaching this area of study in the cotton industry. Individuals leading large corporations or small cotton-growing family businesses bear the responsibility for decision-making within cotton-growing businesses, and research on how decisions can be influenced gives insight into advancing improvements in delivering more effective decisions. Exploring how and why CGEs are motivated, how they are influenced in their decision-making processes and how theory is applied to action in the context is important in assisting CGEs to make better decisions for themselves.

## 7.2 DISCUSSION OF FINDINGS

In combining the lessons from psychology with the tenets of economics, behavioural economics was used to extend the understanding of human behaviour. Traditionally, decisions have been thought to be guided by costs and benefits. In this study, influencers of crop choice include heuristics, biases and other factors discussed in sections 6.3, 6.4 and 6.5, that influence thinking, perceptions and decision-making processes (Kahneman, 2012). The theory underpinning influencers was explored in this study in Chapter 5. The impact of influencers of behaviour and behaviour change were then investigated in Chapter 6 to confirm whether what people consciously think about and the context in which behaviour takes place can be applied within a model to understand behaviour and decision-making (Dolan et al., 2010). While behaviour change is outside the scope of this study, approaches to behaviour change are covered briefly in Chapter 6 in section 6.1 on changing minds (such as beliefs and attitudes) and throughout Chapter 6 as indicated, on changing contexts (environment or situation), recognising that changes in behaviour and changes in contexts can provide more successful interventions (Dolan et al., 2010; Hollingworth, 2016). The Social Cognitive career retention model provides results on characteristics of CGES in earlier findings in this study (in the results section in Chapter 4) that CGEs are higher in some aspects of the Big Five personality factors than others, i.e. they scored higher on “openness to experience than on “neuroticism”. This openness to experience is reflective in Australia’s ranking in the top twenty globally in innovation (Dutra et. al., 2018), higher than the other developed countries of Austria, Italy and the United Arab Emirates. This characteristic is positive in terms of the attraction to the cotton industry and new technology innovation and application it provides, and in terms of CGE crop choice.

Research was also extended to include the Decision Driver Model to explore influencers of behaviour of CGEs' crop choices. One of the main ways where the application of behavioural science contributes to answering this research question is by understanding the design of current behaviour before deciding on interventions to make any changes (Hollingworth, 2016). These factors are considered essential in helping understand the context in which behaviour takes place and how that may be influencing behaviour. The effectiveness of understanding behaviour and designing behaviour change interventions is considered to be strongly dependent upon specific contexts, social norms and individual characteristics of the participants (Fehr et al., 2016); these aspects are provided by this study throughout and specifically in Chapter 6, section 6.2. The importance of how the current environment and context are shaping behaviour, the decision context and what CGEs are doing habitually or automatically, is supported in the behavioural economics literature as essential to first exploring and understanding the context of a behaviour before deciding on interventions to change it (Dyson, 2016). Contexts include topics covered in this study, for example, commitment, priming, defaults, norms, messenger effects, anchoring effects and others found throughout Chapter 6.

To further analyse how the Decision Driver Model assists with understanding the influencers of behaviour of CGEs' crop choices, the three sustainability indicators are discussed in greater detail that demonstrates their applicability and value to the industry and to individual CGEs.

### **7.3 CONTRIBUTIONS**

#### **7.3.1 Contributions to Knowledge**

The contribution this study makes to new knowledge is in the application of a behavioural approach to crop choice in the Australian cotton industry. A list of

contributions to knowledge is provided below:

1. A multi-disciplinary research approach was used and applied to an industry context. This study was informed by: data obtained from CGE interviews; a review of SCCT research; a national survey of grower personality types, self-efficacy, job satisfaction and work engagement, opinions of industry professionals, and a review of the psychology and behavioural economic literature.
2. A self-efficacy of cotton growing measurement scale was developed and validated.
3. The Social Cognitive Model of Grower Retention was then developed (adapted from Social Cognitive Career Theory (Lent & Brown, 2013)).
4. In Part 2, a behavioural approach was applied to CGE crop choice.
5. The MINDSPACE framework (Dolan et al, 2010), the Behavioural Insights toolkit (Savage et al., 2011) and the Government Social Research (GSR) behaviour change knowledge review reference report (Darnton, 2008) were applied to this study in the context of CGEs.
6. Finally, the Decision Driver Model was developed.

To date, the focus of much of the behavioural approach to decision-making has been in public policy, with incentives offered to influence individual behaviour but less so to influence organisations (Dolan et al., 2010 and Savage, 2011). The contribution to knowledge has also been in the gathering of data through interviews and through applying behavioural economic concepts to better inform CGEs regarding how influencers, conscious and unconscious, can impact on their behaviour and decision-making processes. For example, some CGEs show overconfidence, usually fuelled by emotion and habit, to influence choice, while

some base judgement on memory retrieval and don't seem to see any biases in relying on inaccurate information.

### **7.3.2 Implications for Practice**

The relevance of this study to the Australian cotton industry is through addressing labour attraction and retention of the individual CGEs. Put simply, without employers there are no employees. To the best of the researcher's knowledge, until now this line of inquiry into the influencers of decision-making processes of CGEs from their perspectives has not been considered in cotton or agriculture generally. The findings of this study can contribute to further understanding of the influencers of decision-making processes and provide novel and practical recommendations. Cotton production expanded rapidly in 1980s and 1990s, peaking in 2001 with a national gross value of \$1.9 billion. Drought since 2001 caused production areas to fall but increased cotton yields, which are now three times the world average, although premium grade quality could improve (<http://cottonaustralia>). Cotton is a major source of regional economic activity, and usually generates 30–60% of the gross value of all regional agricultural income, which makes up 10–30% of gross regional product. Its indirect impact on local economies is high (<http://cottonaustralia>). So, the potential impact of this study in improving decision-making and choices for the industry could be significant.

Well-informed crop choices by CGEs are important because they result from assessing the full range of potential opportunities, unobstructed by perceived peer-pressure by CGEs, social norms, or a lack of knowledge of influencers of decision-making processes applicable to the cotton industry. This research identifies a gap in the literature on CGE crop choice and suggests that while the agronomic and economic aspects of cotton growing have been covered extensively, little detail on

how growers currently make decisions and how they may be assisted to make better decisions is important in meeting business and personal goals. Growers who are well-informed will make good decisions, and understanding the influencers of those decisions can improve the decision-making process. Good decisions should benefit the cotton industry by improving cotton-grower job satisfaction, work engagement and retention.

To date, the focus of much of the behavioural approach to decision-making has been on public policy, with incentives offered to influence behaviour. Behavioural economics is used to assist in understanding CGE decision-making and discusses the mental shortcuts that CGEs use in difficult decision-making situations, which can create methodical errors or biases. Much of the focus of this study has been on the automatic (unconscious) forms of mental processing that influence behaviour. With a better understanding of how and why and in what context behaviour is shaped through CGEs' choices about what to grow, CGEs and industry are more likely to design and deliver effective behaviour change. The intention of this study is to empower them with information on the automatic influencers that impact their behaviour.

### **7.3.3 Contribution to Cotton Growers**

This thesis provides evidence that supports the role of the individual CGE as a driver of behaviour and behaviour change. Sustainability and the concept of its application to society became apparent in 2016, supported by the United Nation's World Commission on Environment and Development (Brundtland Commission). There has been prolific literature on the concept of sustainability and its many interpretations (Pezzey, 1992) since that time. However, there is a fundamental gap in the sustainability literature overall in that it does not include the individual as the

driver of behaviour and behaviour change. This study fills this gap by showing that individual CGEs drive behaviour and behaviour change and the way this is influenced by human decisions impacted by both conscious and unconscious influencers. Neither sustainability nor primary production can drive themselves; they require human contribution. Putting the idea of sustainability into action is not possible without the drive of individuals. As with any change, humans are required to make the change and guide themselves, others and systems by decisions. CGEs as drivers of cotton-growing businesses adhere to industry sustainability measures by individually making the decisions. Humans are drivers of change. The human contribution of CGEs is that they are responsible for the motivation, decision-making and culture of their businesses within the Australian cotton industry. Within these businesses there are impacts arising from the influencers of behaviours of crop choices, including those discussed in this chapter, such as social norms, and those in Chapters 2, 5 and 6, such as attitudes, habits, emotion, and biases.

#### **7.4 CONTRIBUTIONS TO THE INDUSTRY**

In the Australian cotton industry there is a long history of independent assessments and documenting performance, as well as practice change, unlike any other Australian agricultural industry (Cotton Research and Development (CRDC) Strategic plan, 2014). These assessments include sustainability indicators developed under the headings of economics that measure “production area, yield, quality, gross value, profitability and regional economic activity; environmental indicators are measured by industry datasets, case studies and research reports of soil, water, pesticide and transgenic crop trait stewardship, biodiversity and greenhouse emissions, while social indicators are measured by education levels attained, demographics, employment, health, community attitudes, social capital, research

and development and compliance with law” (Roth, 2010). The Decision Driver Model developed in this study can add significantly to these indicators as a measure of career motivation and satisfaction and will therefore make a contribution to the industry in a direct way as a strategic workforce indicator.

The current key sustainability issues of concern to the Australian cotton industry include environmental, economic and social factors. The environmental factors focus on five sub-themes: pest and pesticide management, water management, soil management, biodiversity, land use and climate change. The three major economic themes are economic viability, poverty reduction and security, and economic risk management. There are also four social themes: labour rights and standards; worker health and safety; equity and gender; and farmer organisations, “defined broadly in the Cotton Report to include formally incorporated farmer associates, cooperatives and informal groups of farmers” (Measuring Sustainability Report Towards a Guidance Framework, 2015, p. 57). While all are of importance to the industry, the scope of this thesis is limited to the social factor and sub-themes. Key sustainability indicators include production area, yield, quality, gross value, profitability and regional economic activity.

Within the Australian cotton industry, current sustainability indicators for the management of natural resources are identified as soil, water, biodiversity, land, and insecticide and herbicide use (Roth, 2010). Social indicators have been referred to as one of the three sustainability indicators providing insight into behaviour among two or more people at a societal level. However, it is argued in this thesis, that all motivation starts with the individual, and it is for this reason that the individual human contribution needs to be included as a sustainability indicator. Sustainability as defined in the Brundtland Report developed by the World Commission on

Environment and Development (1987) is: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. The Brundtland Report (1987) on sustainability established three headings of environment, economic and social aspects. It is the argument of this study that individual CGEs drive such concepts as sustainability across all three economic, environmental and social areas. The “basic entity of the social process is the individual, their desires and fears, their passions and reason, their propensities for good and for evil. To understand the dynamics of the social process we must understand the dynamics of the psychological processes operating within the individual, just as to understand the individual we must see him in the context of the culture which moulds him” (Fromm, 1942, Foreword).

As “work is a fundamental dynamic driver for enhancing human development” (Human Development Report, 2015) and behaviour is how humans define their own lives, it is argued that the inclusion of the individual and why, what and how people act in a work environment is important to the sustainability of any industry. Individuals are the main component of any work environment. In the workplace, behaviour and psychology provide an understanding of the emotions and mental processes that influence individuals, and these can independently and collectively influence the prosperity of a business.

### **7.5 GAPS IN THE RESEARCH**

Well-informed choices by CGEs, in this case crop choices, are important because they result from assessing the full range of potential opportunities, unobstructed by perceived peer pressure, social norms, or a lack of knowledge of influencers of decision-making processes applicable to the cotton industry. This research identifies a gap in the literature on CGE crop choice and suggests that while the agronomic

and economic aspects of cotton growing have been covered extensively, little detail on how growers currently make decisions and how they may be assisted to make better decisions is important in meeting business and personal goals. Growers who are well-informed will make good decisions, and understanding the influencers of those decisions can improve the decision-making process. Good decisions should benefit the cotton industry by improving cotton-grower job satisfaction, work engagement and retention.

To date, the focus of much of the behavioural economic applications has been on public policy, with incentives offered to influence behaviour. In the case of this study, the aim has been to better inform CGEs by understanding how specific information and guidance can be designed to best help CGEs' decision-making and empower them to make better choices for themselves. The focus of this study is on the automatic (unconscious) forms of mental processing that influence behaviour. Traditional approaches have viewed bias in decisions around changing an individual's mind (Kahneman, 2011). This study has also introduced the MINDSPACE framework and has been explored for its application in the CGE context. There is an increased understanding that knowing what to do does not mean doing it; therefore, cognition alone is not enough, and motivation is found to provide the drive of behaviour swayed by contextual influencers (Dolan et al., 2010).

## **7.6 LIMITATIONS**

There are inconsistent recorded data on CGE numbers, hampered by several issues, including the lack of CGEs' clarification regarding production activity. An important factor to note is that regardless of whether CGEs are currently growing cotton, have grown cotton consistently or grow cotton spasmodically, CGEs have a strong sense of connectedness to the industry; once growers consider themselves

growers, they are perceived by themselves as always growers, despite acknowledging that they grow cotton all of the time, most of the time, or some of the time (as defined in Chapter 2).

Another limitation is lack of accessibility to collected data, which hinders the exact knowledge of grower numbers each season in some of the previous years. Although some private companies gather data for, and within, the cotton industry, these data are not necessarily shared with the industry body. While licences are required to grow cotton, private companies provide and monitor this certification. Clarification of this definition is found in Table 2.1.

A further limitation that occurred during the course of the study was a low response rate to the national population survey. The rate of 9.5% is in line with a typical return rate for the industry of 5–10% (personal communication CRDC, 2017) for return of their annual industry questionnaires.

There are limitations in asking what CGEs report influences their decisions, because this information comes from a process of conscious reflection by the CGE and fails to offer insights into automatic or uncontrolled forms of mental processing that may not be able to be gathered consciously. Further research that would be valuable to be done in this area is discussed below.

## **7.7 WHAT HAS EMERGED AND FUTURE RESEARCH**

The background detail presented on the psychological literature related to work motivation informs the theoretical framework, while the second literature review provides exploratory research in the behavioural economics literature on decision-making processes involving crop choices and defines some influencers of behaviour and cognitive biases. The MINDSPACE framework is applied to a CGE context that gives a clearer understanding of how CGEs respond to incentives and influencers

that impact on decision-making processes. The model developed from the behavioural economics literature establishes some influencers of decision-making in relation to System 1 thinking, such as conscious and unconscious influencers relative to CGEs' crop choice. The exploratory nature of the second literature review and beyond provides a better understanding of how and why cotton growers are influenced in choices. Participant stories provide the focus on mental shortcuts that cotton growers use to lessen the weight of complex decision-making that can create systematic errors or biases. Insights from this study can help to better understand CGEs' crop choices.

The overarching aim of this study was to improve grower job satisfaction, work engagement, retention and outcomes, which are in the interest of cotton growers, and the cotton industry businesses reliant on the industry, such as consultants, merchants, banks, and legal and accounting firms servicing the cotton industry.

In support of the argument of this study, the individual CGEs are the drivers of decisions and behaviour change:

1. CGEs are realising that the current management methods, such as decision-making processes regarding triple bottom-line factors without acknowledging the human contribution of themselves and their employees, are not yielding the work satisfaction, return on investment or fulfilment anticipated. As perceived by CGEs, there is an expectation by society and by employees today that CGEs perform as leaders, mentors and coaches because younger generation employees have an expectation that work will be purpose-driven (provided by employers and their global purpose-driven businesses offering competitive flexibility while providing possibilities to

meet employee goal aspirations).

2. Work environments for employers are changing due to technology and globalisation in an era of extensive information gathering. As perceived by CGEs, there are expanding employee demands and mounting choices in many aspects of cotton-growing operations that require fast and efficient decisions.
3. Cotton growers are consumers of goods and services and consequently don't always behave rationally for a number of reasons: most people dislike the feeling of losing more than they like to win; the framing of options influences choices; ownership, temporary or permanent, makes people value things more; people are strongly influenced by a sense of belonging; and even small barriers can cause an extreme change in focus.

CGEs are mostly unaware of other biases present in their decision-making, and emotionally driven and subjective decision-making is expensive. Reducing the anxiety of decision-making by understanding the influencers of choice, recognising the benefits and providing possible behaviour change by firstly exploring the influencers of decision-making processes and providing a framework concept as an intervention for CGEs, is expected to assist CGEs to make better decisions for themselves. Behavioural economic research to date recognises that individuals often behave differently from predicted by usual understanding, and the choices individuals make relate to psychological, social and biological factors (Altman, 2015).

In order to further explain CGE choice, the Decision Driver Model was developed. A central cost of deliberation in decision-making is considered to be the opportunity cost of occupying shared resources over time. Once measures have been

established, testing can be carried out through further CGE interviews and/or surveys. With rapid development of technology and advanced systems with potential relevance to agriculture, research is also recommended that will assist growers in making informed choices.

## **7.8 CONCLUSIONS**

As well as considering the application of the abovementioned frameworks, this study includes understanding the CGE context, in so far as CGEs as both producers and consumers of products make decisions on supply and availability of product that impact on crop choices. This study explored behavioural models, frameworks and insights from a behavioural change review and applied them to the CGE context, suggesting there is scope to make significant progress against most of the behavioural influencers on CGEs.

Sustainability indicators have been the focus in the Australian cotton industry for some time and are supported by CGEs. However, CGEs are willing to do more in some areas, such as understanding and addressing external barriers to effective decision-making processes regarding crop choices that include more than seed, extending to other aspects such as water, labour, availability, cost, accessibility, infrastructure, cotton and other supplies from merchants, and labour and other services supplied from agencies. They are also willing to engage through collaboration with other growers, although those interviewed show preference mostly for one-on-one discussions and listening to other grower narratives and discussions with individuals whose opinions came from their “trusted” sources. CGEs prefer collaboration in a private way, not publicly at field days or forums. After all, as suggested by CGEs, “businesses at a planning level are private matters”.

Academic literature in two general domains, as well as interviews with cotton

growers and other cotton industry professionals, confirm that a majority of research approaches have been fundamentally focused on sustainability factors – economic, environmental and social – that are out of step with the real context of decisions by cotton-growers about the causality (the “why”) of crop choice contexts. These reasons are guided by the self-driven CGEs and the conscious and unconscious influencers that impact on the human processes driving CGE crop choice and decision-making. Decision-making processes, whether routine or complex, are best made using a methodical process. The more complex a decision, in many cases the more consideration should be given to making it. A clear process of defined steps can help the decision flow more effectively to following steps of related activities. A well-defined decision-making process is believed to minimise mistakes, and a structured process is critical to a good decision-making process.

CGEs say that they would appreciate more structure in decision-making, even though their work flow seems to prevent such structure from taking hold. In primary production, particularly cotton growing, while the context is complex in knowledge and experience to successfully participate as a CGE, there are repetitive activities each season regardless of other constantly changing variables. These repetitive activities can form the basis of a suitably developed choice framework that builds on the explored nine principles explained in Chapter 6, The Decision Driver Model.

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# **APPENDICES**

**Appendix A****Table A.1 SE Item Descriptions**

<b>SE Item</b>	<b>SE: Item Description.</b>
Item 1	SE: Produce enough cotton to make a financial profit.
Item 2	SE: Consult with financial advisers to engage in strategies and decide whether to viably grow cotton.
Item 3	SE: Clarify your position to your consultants (i.e. bank managers, accountants, solicitors) about the cotton industry and the risks and/or gains as they apply to your operation in the cotton industry.
Item 4	SE: Access external marketing assistance to achieve the best financial outcome for your operation in the cotton industry.
Item 5	SE: Handle your own marketing strategies for selling your cotton.
Item 6	SE: Manage the agronomy of cotton-growing tasks (e.g. managing pests, weeds and disease to achieve results).
Item 7	SE: Trusting your gut instinct to determine whether to grow cotton.
Item 8	SE: Following advice regarding whether to grow cotton.
Item 9	SE: Interpret tools (e.g. moisture probes, GPS, weather stations, planting windows) to understand environmental conditions and to inform your decision-making regarding cotton planting.
Item 10	SE: Carry out routine cotton tasks including maintenance (i.e. equipment maintenance and upgrades), scheduling of irrigations, commodity marketing and management.

<b>SE Item</b>	<b>SE: Item Description.</b>
Item11	SE: Manage staff, human resource issues, sourcing labour to meet the demands of your operation in the immediate short term and long term.
Item12	SE: Bounce back when your crop has seasonal setbacks (i.e. natural disasters, agronomic issues, machinery breakdowns).
Item13	SE: Recover when your cotton operation experiences setbacks (i.e. price and/or marketing).
Item14	SE: Bounce back when experiencing other setbacks (i.e. personal, family, work satisfaction)
Item15	SE: Maintain loyalty to cotton growing and the cotton industry despite adversity.

**Appendix B****Table B.1** *Item Descriptions for Correlation Matrix*

<b>Items</b>	<b>Item Description</b>
JS	Job Satisfaction
WE1	Work Engagement – Vigour
WE2	Work Engagement – Dedication
WE3	Work Engagement – Absorption
RT	Risk Tolerance
BPNS1	Basic Psychological Needs Satisfaction – Autonomy
BPNS2	Basic Psychological Needs Satisfaction – Competence
BPNS3	Basic Psychological Needs Satisfaction – Relatedness
SE1	Self-efficacy – Self-evaluative
SE2	Self-efficacy – Physical
SE3	Self-efficacy – Social

## **Appendix C**

### **Task List and Responsibility of CGES in the Task of Cotton Growing**

- Equipment maintenance and upgrades
- Workplace health and safety procedures and updates
- Management of pests, weeds and diseases
- Cotton industry commitments
- Scheduling irrigations
- Crop selection and rotation
- Insurance
- Commodity markets
- Yields
- Government regulations
- Time for family
- Consumer demand monitoring for marketing
- Training
- Awareness of new varieties
- Update training
- Finding labour
- Ginning contracts
- Monitoring interest rates and finance
- Monitoring weather events
- Health and mental health of self and staff
- Transport

- Energy costs
- Consultant agronomist
- Sustainability
- My BMP industry self-assessment standard
- Health and mental health maintenance

Source: [www.cottonaustralia.com.au](http://www.cottonaustralia.com.au)

## **Appendix D**

### **Glossary of Terms**

As different theories use terms that are interpreted differently, especially in the case of a multi-disciplinary study that refers to a range of theories and models, the following meanings are used expressly within this study:

**Motivation** refers to the sense of reason or driving force or behaving in a particular way to drive humans to do their best (Ariely, 2016).

**Image motivation** refers to individuals' tendency to be motivated partly by how others perceive them (Ariely et al., 2007).

**Extrinsic motivation** refers to any material reward or benefit, either monetary or non-monetary, associated with giving, such as thank-you gestures and tax breaks (Ariely et al., 2007).

**Intrinsic motivation** refers to the value of giving represented by private preferences for others' well-being, such as pure altruism or other forms of prosocial preferences (Ariely, et al., 2007)

**Behaviour** refers to the range of actions and mannerisms made by individuals, organisms, systems or artificial entities in conjunction with themselves or their environment, which includes the other systems or organisms around, as well as the physical environment (<http://psychologydefinition>)

**Behavioural economics** is a method of economic analysis that applies psychological insights into human behaviour to explain economic decision-making (Wilkinson & Matthias, 2012).

**Cotton grower employer (CGE)**, as defined under the term, employer, refers to "... individuals who manage a [cotton] business with the intention of expanding

that business and with the leadership and managerial capabilities for achieving their goals” (Gray, 2002, p 61). For purposes of this study, cotton growers are defined as CGEs who grow cotton all of the time, most of the time, or some of the time (please also refer to Chapter 5).

**Employer** refers to individuals who are leaders of large organisations or family-owned businesses.

**Employee** refers to people, including non-family members, contracted by employers, in this case CGEs, to assist with growing cotton in cotton-growing operations, who are remunerated for their labour (Fair Work Act, 2009).

**Generation Y** refers to people born between 1981 and 1996, also known as the Millennials.

**Individual Human Contribution** (Human Development, 2015) is defined in this study as the importance of individual human impact on an industry investigated in the sense of individualism, such as being independent and self-reliant as an employer or a leader who inspires an organisation and its employees.

**Sustainability** is defined (Brundtland Report, 1987) as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” The current key issues in the Brundtland Report include environmental, economic and social factors. Sustainability is defined (Roth, 2010) in the Australian cotton industry by its measures of sustainability in terms of economic, environmental and social indicators.

A knowledge gap exists in this line of enquiry and has not yet been considered within what is traditionally termed “sustainability”. Thus, this study provides important research for both current and future generations of the cotton industry, commencing with factors that influence an individual’s crop choice, career

motivations and decision-making processes.