Motivation in knowledge workers

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MOTIVATION IN KNOWLEDGE WORKERS

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BASc, BA, MBA

Submitted in partial fulfilment of the requirements for the Doctor of Philosophy

School of Business
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Declaration

To the best of the candidate’s knowledge, this thesis contains no material previously published by another person, except where due acknowledgement has been made. This thesis is the candidate’s own work and contains no material which has been accepted for the award of any other degree or diploma in any institution.

Human Ethics

The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007, updated 2018). The proposed research study received human research ethics approval from the University Of Notre Dame Australia Human Research Ethics Committee (EC00418), Reference Number: 013160S.

Signature:

Print Name:

Date:
Abstract

Traditional theories that form the basis of workplace motivation may be inadequate to manage workers in the knowledge-based economy. Knowledge workers are a growing segment of the workforce, and their needs differ from previous generations of employees. How managers can best motivate knowledge workers towards greater performance and employee satisfaction may not have a definitive answer, however we will explore the effectiveness of some of the commonly used practices in the current workplace.

Knowledge workers add value to a company's products and services by applying their knowledge. The self-determination theory (SDT) is considered a more encompassing theory than the traditional motivation theories (Ankli & Palliam, 2012) and provides the appropriate framework to understand motivation in knowledge workers. SDT makes the distinction between autonomous and controlled motivation (R. M. Ryan & Deci, 2000b), where the range of motivation types range on a continuum from intrinsic motivation through to amotivation, classified into 6 subclasses.

The aim of this thesis is to examine some of the factors that may impact the motivation of knowledge workers. These related factors of motivation were not previously considered in the traditional motivation theories, however are highly applicable approaches used to motivate knowledge workers in the current workplace. A quantitative approach has been taken to address the following research questions through three independent studies:

1. Is a knowledge worker’s motivation related to their personality traits?
2. How important is pay on the motivation of knowledge workers?
3. Does the motivation of knowledge workers differ significantly between age groups?
4. Are feedback and goal setting effective methods to motivate knowledge workers?

The first study validates Tremblay’s SDT model using the data collected from our sample of 935 knowledge workers, which shows the subclasses of motivation are correlated. Addressing Research Question “1 - Is a knowledge worker’s motivation related to their personality traits?” a number of related hypotheses on the role of personality traits on the
Motivation in Knowledge Workers

impact on motivation and work satisfaction were tested, and found that personality traits have a weak or negligible impact on the motivation of knowledge workers. Though compensation is often a major consideration for employees when they are seeking work, specific academic research in the area of using pay as a source of motivation has been limited. In the second study, 630 knowledge workers completed the Work Values Questionnaire, which consists of 37 items consisting of both intrinsic and extrinsic work values. The second study aims to answer Research Question “2 - How important is pay on the motivation of knowledge workers?”. Pay was rated to be an important work value, however the intrinsic factors stimulation, balance, independence, and intellect rated more important to knowledge workers.

Contrary to articles published in the popular press about generational cohorts, there is little theoretical justification or empirical data to support age-related differences (Ruth Kanfer & Ackerman, 2004a). Our findings add to the limited quantifiable data on the topic of age-related differences in motivation. Using data collected in the first and second study, knowledge worker participants were used to collect data to assess the level of work motivation, job satisfaction, and other work-related values to address Research Question “3 - Does the motivation of knowledge workers differ significantly between age groups?”. Age did not have a significant effect on most work-related values. Work motivation was found to increase with age, however the importance of extrinsic incentive decreases with age.

The practice of goal setting and feedback are commonly used methods in workplace performance management systems. Research Question “4 - Are feedback and goal setting effective methods to motivate knowledge workers?” In the third study, consisting of 730 knowledge worker participants, the majority of the hypotheses were found to be unsupported, indicating that goal setting and feedback are ineffective methods in increasing employee engagement and motivation, or enhancing performance.

The findings of these three independent studies makes a contribution to furthering knowledge in terms of the factors affecting the motivation levels of knowledge workers in Australia.
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Chapter 1 - Introduction

Knowledge workers are a growing segment of the workforce, and their needs differ from previous generations of employees. It is expected that the traditional motivational factors of employees have changed in line with the demands of today’s job requirements (Murtonen et al., 2008) and consequently organisations face significant risks to employee performance, productivity, retention, and innovation if their employees are not motivated.

The topic of motivation is studied through the complementary fields of organisational behaviour and industrial psychology. It also appears regularly in the study of management, including in the areas of leadership, teams, performance management, managerial ethics, decision making, and organisational change (Steers, Mowday, & Shapiro, 2004). Work motivation is defined as a set of energetic forces that originates both within, as well as beyond, an individual's being, to initiate work-related behaviour, and to determine its form, direction, intensity, and duration (Pinder, 1998).

Knowledge workers add to a company’s products and services by applying their knowledge. The classification includes professions such as Engineers, Scientists, Information Technologists, Accountants, Researchers, Social Workers, etc. (Frick, 2010; Jemielniak, 2012; Lord & Farrington, 2006). In Australia and globally, this research is important as knowledge workers are the fastest growing segment of the workforce in developed countries and needed to meet the demands of the modern workplace (Lord & Farrington, 2006). The aim of this thesis is to examine some of the factors that may impact the motivation of knowledge workers. These related factors of motivation were not
previously considered in the traditional motivation theories, however are highly applicable approaches used to motivate knowledge workers in the current workplace.

A quantitative approach will be taken to address the following research questions through three independent studies:

1. Is a knowledge worker’s motivation related to their personality traits?
2. How important is pay on the motivation of knowledge workers?
3. Does the motivation of knowledge workers differ significantly between age groups?
4. Are feedback and goal setting effective methods to motivate knowledge workers?

In the following thesis, I will explore whether the self determination theory is the appropriate framework to understand motivation in knowledge workers. I question whether personality traits and age have an impact the motivation of knowledge workers. Commonly used approaches used by managers and human resource professionals, such as compensation incentives, and providing feedback and setting goals, are also studied to determine if they are effective methods in motivating knowledge workers. By providing the proper means and incentives to knowledge workers to innovate and increase productivity, organisations may improve their return on investment in their human resource assets to achieve strategic growth and profit objectives. This thesis acknowledges the limitations of traditional motivation theories and advances the existing literature surrounding motivation of knowledge workers.
Chapter 2 - Literature Review and Hypotheses Development

Work motivation is a set of energetic forces that originates both within as well as beyond an individual's being, to initiate work-related behaviour, and to determine its form, direction, intensity, and duration (Pinder, 1998). The topic of motivation is studied through the complementary fields of organisational behaviour and industrial psychology. It also appears regularly in the study of management, including in the areas of leadership, teams, performance management, managerial ethics, decision making, and organisational change. While theoretical developments on work motivation may have declined in recent years (as compared to the 1960s and 1970s), the world of work has changed dramatically and accordingly requires new constructs to correspond to the modern workplace.

Interest in motivation research peaked in the 1970s and 1980s with a series of refinements and extensions of these theories. In the 1990s, intellectual interest in work motivation declined (Steers et al., 2004). Few articles focused on theoretical developments in motivation and academic publications mostly included empirical tests to support or discredit the existing theories or application of existing theories. This is likely due to the shift away from manufacturing organisations on which the traditional motivational theories were based.

In the 2000s, quantitative research methodologies have dominated recent research in work motivation with a broader focus on the integration of work motivation and effect (Kanfer, 2009). The empirical data is typically gathered through self-reported surveys distributed to a large sample across nominated populations allowed researchers to find
relationships between traits easier with available software tools. The survey questions and scales were developed to assess for individual factors.

The initial section of this literature review will focus on how motivation research has evolved. A description of traditional motivation theories is provided, followed by describing the common characteristics of knowledge workers.

**Traditional Motivation Theory**

Early developments in motivation theory date back to Greek philosophers who attempted to understand human behaviour in a relatively static environment. In the late 1960s and early 1970s, traditional theories were generated using simple psychology experiments. The traditional motivation theories were extended to be used in a workplace context, based on a manufacturing-based economy. Job roles and their tasks characteristics were simplified, and workers were primarily skilled to operate machines to produce standardised tangible goods (Shek, Chung, & Leung, 2015). The supporting organisational structures of manufacturing organisations were centralised, where decisions were made by managers high in the organisational hierarchy.

The traditional motivation theories used are well documented and formed the basis of contemporary motivation research. Considered as the seven traditional work motivation theories, these are in chronological order:

1. Skinner's Reinforcement Theory
2. Herzberg’s Motives and Needs
3. Vroom's Expectancy Theory
4. Adams’ Equity Theory
5. Locke's Goal-Setting Theory

6. Deci's Cognitive Evaluation Theory

7. Hackman and Oldham's Job Characteristics Model (Work Design)

**Skinner's Reinforcement Theory**

Skinner's reinforcement theory (1965) is one of the oldest motivation theories, and forms the basis of the traditional motivation theories that follow. Skinner’s reinforcement theory is also referred to as “operant conditioning” or “behaviorism”. The theory states that behaviours that lead to positive outcomes will be repeated, and conversely, behaviours that lead to negative outcomes will not be repeated.

In a workplace setting, the theory suggests that managers should positively reinforce employee behaviours that lead to positive outcomes such as work satisfaction and performance. An example of such positive reinforcement may be providing the employee with recognition in front of their peers, so they would be motivated to continue performing well. Conversely, negative reinforcement on employee behaviour will lead to subsequent negative outcomes.

Though the concept of the reinforcement theory may be simple to understand, the theory is limited to a narrow range of reinforcing actions that align to a similar restricted narrow range of behaviours (Malone, 1975). That is, the theory does not take into account the individual differences between employees and assumes that individuals will react to reinforcements in a similar manner. What one individual considers as positive reinforcement may not be interpreted as positive reinforcement to another employee, and hence the same motivational technique would lead toward a different outcome.
Skinner’s generalisations assume that common sense is the underlying motivation behind an individual’s behavior, however this is not always the case in a workplace setting. As an example, managers may ignore positive behaviours or contributions by their direct reports, in the fear that if their staff are praised and awarded frequently, they would get considered for a promotion into another role and leave their current team. Conversely, encouraging a problem team member to pursue other opportunities in another department by providing good feedback and reference, is a common management strategy to remove problem individuals from an otherwise high performance team.

Stajkovic and Luthans’ (1998) meta-analysis study compares the effectiveness of organisational behaviour modification in manufacturing and service-based organisations. Using financial reinforcement in manufacturing organisations yielded stronger effects on task performance, however these effects were not significantly different from non-financial reinforcers. Financial reinforcers in service organisations showed stronger effects on task performance than non-financial reinforcers; however non-financial reinforcers were matched with positive social opportunities, this combination resulted in superior task performance than financial reinforcers alone.

Skinner’s reinforcement theory precedes the motivation concepts that distinguish between intrinsic and extrinsic motivation factors (Herzberg’s Motives and Needs), and subsequently how external factors affect intrinsic factors (Deci’s Cognitive Evaluation Theory). Later studies indicate that although reinforcers deliberately manipulate the behavioural outcomes of employees, these practices may decrease an individual’s intrinsic motivation (E. L. Deci, 1972). Backed with little empirical data, the concept of reinforcement may lead to an overemphasis of its effectiveness (Malone, 1975). In today’s
knowledge economy, the use of reinforcers has further implications on project teams where collaboration is encouraged instead of competitiveness; and failures in product development are viewed as learning opportunities for innovation rather than negative outcomes are counterintuitive with the reinforcement theory.

**Herzberg’s Motives and Needs**

Herzberg’s two-factor theory (1959) of motivation makes the assumption that motivation originates from the employee themselves, rather than from external factors (Ambrose, L., Kulik, & T., 1999; Herzberg, Mausner, & Snyderman, 2011; R. M. Ryan & Deci, 2000a). By examining factors of satisfaction and dissatisfaction, Herzberg’s theory is the first to distinguish between intrinsic and extrinsic factors of motivation.

Motivation initiating from satisfaction arise from motivators that are intrinsic to the job and includes aspects such as knowledge, responsibility, recognition, accomplishment, and personal growth. These intrinsic factors or “motives” promote satisfaction and are more important determinants of motivation than extrinsic factors such as financial incentives (Bassett-Jones & Lloyd, 2005). Hygiene factors or “needs” are the extrinsic factors of the job that contribute to an employee’s dissatisfaction if they are not met. Examples of extrinsic components include compensation, work environment, and corporate policies (Adrian Furnham, Eracleous, & Chamorro-Premuzic, 2009; Adrian Furnham, Forde, & Ferrari, 1999; Warr, 1987).
Herzberg treats intrinsic and extrinsic factors as separate categories for satisfaction and dissatisfaction. For example, if an employee is subjected to work in an uncomfortable office environment that is too consistently too hot, the employee will be dissatisfied. When the temperature issue is resolved, the employee will be less dissatisfied, however would not be more motivated. In the case of intrinsic motivation, if a manager recognises an employee’s efforts in meeting a project deliverable, the employee is more likely to be satisfied and motivated to continue working hard on meeting future project deliverables.

The main limitation of Herzberg’s theory of motivation is that it assumes that adequately addressing both motivators (employee satisfaction) and hygiene factors (reducing employee dissatisfaction) will lead to greater employee satisfaction, and therefore productivity. While having more satisfaction may result in a more pleasant work environment and having happier employees, this doesn’t necessarily equate to having higher productivity in the organisation.

While pay is considered as a hygiene factor in Herberg’s motives and needs theory, this view is simplistic and ignores the symbolic value that pay represents in a knowledge-based economy. Employees may receive a nominal pay increase as a motivator when additional training is completed. The nominal pay increase is not meant to reduce dissatisfaction, but rather as recognition from the organisation that the employees skills are valued.

Though there are limitations to Herzberg’s motives and needs theory, it is the first theory that distinguishes between intrinsic and extrinsic motivation factors. These concepts are not wholly disputed, however are further developed in future
motivation theories, such as Deci’s Cognitive Evaluation Theory. The theory still provides a good starting point for managers and employees to discuss any concerns pertaining to the knowledge worker’s job role and future career aspirations.

**Vroom's Expectancy Theory**

Vroom’s expectancy theory (1964) is based on the assumption that employees are motivated to perform because of the expectation they will receive a reward. The effort individuals puts forth is based on factors such as personality, individual differences, knowledge, skills, and abilities. Vroom suggests that an employee’s effort leads to performance, then subsequently leads to rewards (Van Eerde & Thierry, 1996). The rewards will be considered valuable to the employee, and hence are a source of employee motivation.

Vroom’s Expectancy Theory (1964) expresses the product of three variables: expectancy, instrumentality, and valence.

\[
\text{Motivation Factor} = \text{Expectancy} \times \text{Instrumentality} \times \text{Valence}
\]

Expectancy can be defined as subjective probability of effort or action (Van Eerde & Thierry, 1996; Victor Harold Vroom, 1964) and considers whether the individual’s effort will result in high performance (Miner, 2015; Porter & Lawler, 1968). The employee’s beliefs in their own skills, and extrinsic factors that are provided by the organisation to support the employee’s effort, play important roles in the perception that effort predicts performance. For example, if an employee is not provided with the necessary tools to perform their job well, their expectancy would be sub-optimal. This would lower overall motivation as indicated in Vroom’s formula.
The belief that an employee’s performance will lead to subsequent outcomes is referred to as instrumentality (Miner, 2015). Rewards provided in the form of bonuses and merit pay are examples of reinforceurs that organisations use to enhance instrumentality as a result of high performance. Having consistent rewards programs and clearly informing employees on the performance measures required would increase motivation.

Valence makes reference to the anticipated satisfaction that will result from the outcomes (Miner, 2015). Motivation will be greater if the employee envisages the reward to be desirable. Through manager and employee discussions, or through employee satisfaction surveys, are commonly used methods to gauge which rewards are most attractive.

In theory, Vroom’s expectancy theory may be relevant in motivating employees that prioritise their own self interests and behave rationally. However, it doesn’t account for an individual’s uncalculated unconscious motives (Miner, 2015; Victor H. Vroom, 2005), the social benefits that serve as a motivating factor of working in a team environment, or the prosocial benefits associated with working in a socially responsible organisation.

Van Eerde and Thierry’s (1996) meta-analysis assessed the correlations in 77 studies on Vroom’s expectancy models and work-related criteria. The meta-analysis found that Vroom’s models lacked validity and the data analysis for many of the studies were performed incorrectly (Van Eerde & Thierry, 1996).
**Equity Theory**

Using perceived fairness as a motivator, Adams’ equity theory (1965) states that employees will attempt to restore equity through various means, some of which may not have positive impact on an organisation’s objectives or goals. For example, if an employee feels their work is unappreciated by their manager relative to another employee, they would perceive an inequity and will be unmotivated (Lindner, 1998). The theory suggests that employees may work less or more productively to compensate for the inequity.

The most studied topic in equity theory is pay equity, or the extent that employees perceive their compensation package to be fair (Miner, 2015; Mowday, 1991). When the income-outcome ratio of a referent is equal to the employee’s input-outcome ratio, then equity exists (Adams, 1965). The referent, or the person being compared to, may be a peer working in the same or different capacity in the same organisation, or working in a different organisation or industry (Hills, 1980).

The major strength of this theory is its prediction on an employee’s motivation and resultant output if they perceived to be underpaid compared to their peers. Under-compensated workers were found to reduce their inputs and performance, however the results were not consistent with over-compensated workers (Greenberg, 1982). The equity theory however doesn’t account for the lag time that it may take for the employee to react to the perceived inequity (Cosier & Dalton, 1983). Also, when individuals were subjected to various levels of inequity in field and laboratory studies, it was found that the participants did not necessarily act until an
inequity threshold had been reached (Cosier & Dalton, 1983).

The construct of equity sensitivity evolved from Adams’ original equity theory to suggest that reactions to inequity are a function of an individual’s preferences for different income-outcome ratios (Huseman, Hatfield, & Miles, 1987). Equity sensitive individuals feel discomfort when they perceive over-reward or under-rewards, however individuals who are equity insensitive will expect different rewards (Miner, 2015). For example, benevolents who are prosocially motivated provide significant work effort without receiving much in return in terms of pay equity.

This theory is more relevant in blue-collared work environments as many employees executed similar work and compensation packages are specified under union agreements. The concept however should still be taken into consideration by HR and the management team when developing motivation and retention strategies for knowledge workers as data on salary ranges for job roles are widely available through government agencies (for public servants), publicly-traded company’s annual reports, salary surveys performed by management consultancies, and job search websites.

**Locke's Goal Setting Theory**

Locke’s goal setting theory (1968) refers to the effect of setting goals on performance. It was thought that individuals who have goals set performed at higher levels than individuals with easy goals. The five principles of setting defined goals are: clarity, challenge, commitment, feedback, and task complexity.
Based on over 400 controlled and field studies, goal setting theory (Locke & Latham, 1990, 2002) was developed from the field of industrial and organisational psychology over a 25-year period. It was found that there was a positive linear relationship between goal difficulty and task performance, and specific and difficult goals lead to higher task performance in comparison to easier or vague goals (Locke & Latham, 2006).

The goal setting theory is widely used in today’s organisations. I look further into the existing literature and findings from previous studies of the goal setting theory’s effectiveness on motivation and work performance later in this chapter. Study 3 specifically tests the hypotheses for the perceived effectiveness of goal setting on the motivation of knowledge workers.

**Deci’s Cognitive Evaluation Theory**

Deci’s cognitive evaluation theory (1971) suggests that intrinsic and extrinsic motivation are not on the opposite ends of a scale, but rather extrinsic motivators will have an effect on intrinsic motivation. The theory focuses on an individual’s cognitive evaluation or the reasons why an individual will engage in an activity (E. L. Deci, 1972).

In contrast to Herzberg’s Two-Factor theory that separates intrinsic and extrinsic factors in distinctive categories that lead to either more or less satisfaction, or more or less dissatisfaction, Deci’s (1971) study reported that external reinforcements will affect an employee’s intrinsic motivation. The cognitive evaluation theory suggests that external factors such as compensation, bonuses, deadlines, and performance reviews tend to diminish an employee’s perception of autonomy, and this will in turn undermine their intrinsic motivation (R. M. Ryan & Deci, 2000b).
If an employee receives a reward for an activity that they would have executed regardless, the reward may have a negative effect on the employee’s future intrinsic motivation. Consistent with the reinforcement and expectancy theories, the employee may be motivated by expected similar rewards they will receive in the future if the activity was repeated, rather than from the intrinsic rewards of performing the activity itself.

The cognitive evaluation theory further breaks down the external reward constructs defined as controlling or informational (R. M. Ryan & Deci, 2000b). Rewards that are perceived as controlling where employees experience pressure towards specific outcomes, such as a promise of a promotion or pay increase, can undermine motivation. Rewards that are informational, such as verbal reinforcements or feedback that promote perceived competence, may increase intrinsic motivation (Edward L. Deci & Ryan, 1985). When extrinsic rewards are perceived by employees to be informative opposed to controlling, the cognitive evaluation theory predicts no decrease in intrinsic motivation (R. Kanfer, 1990).

Deci and Ryan further develops the cognitive evaluation theory to become the Self Determination Theory (SDT), which is explored further later in this chapter. The cognitive evaluation theory remains a core sub-theory of the SDT. Study 1 specifically tests whether the SDT framework is an appropriate model for knowledge workers.

**Hackman and Oldham's Job Characteristics Model**

Hackman and Oldham’s job characteristics model (1976) or “Work Design” is based on the idea that the job task itself is the source of an employee’s motivation. As such, the five job characteristics of: skill variety, task identity, task significance,
autonomy, feedback; should be considered when job roles are designed (J. R. Hackman & Oldham, 1980). Designing the job in accordance with an employee’s abilities, desired goals, and individual differences is thought to lead employees to experience three favourable psychological states: a view that their work is meaningful; they have responsibility for the outcomes; and they have a knowledge of results. Examples of the positive outcomes that follow increased motivation are work satisfaction and work performance (Miner, 2015).

The job characteristics model uses similar principles of task definition and receiving of feedback found in Locke’s goal setting theory. The intent of work design however is to maximise an employee’s experienced meaningfulness based on job characteristics, as opposed to setting goals to reach specific events and performance outcomes. Unlike other traditional motivation theories, the job characteristics model is used as a complementary theory used in conjunction with cognitive evaluation theory and SDT, as opposed to a competing motivation theory (R. Kanfer, 1990).

Empirical research on the effectiveness of the job design demonstrates relationships between intrinsic outcomes and work outcomes; however the evidence for job characteristics and performance is inconclusive (R. Kanfer, 1990). In practice, it is difficult to quantify how effective the job characteristics theory is when used in the knowledge economy, as outputs such work performance can be subjective and based on a collective team effort. The concepts of work design serve as a good starting point for manager / employee conversations to discuss the expectations of the job role.
Characteristics of Knowledge Workers

The term “knowledge worker” refers to those individuals with high intellectual capacity and expertise to use knowledge to create new ideas and innovatively develop new products or services (P. F. Drucker, 1989; Jones, 1990; Markova & Ford, 2011). Knowledge workers add to the company’s products and services by applying their knowledge, and includes professions such as Engineers, Scientists, Information Technologists, Accountants, Researchers, Social Workers, etc (Frick, 2010; Jemielniak, 2012; Lord & Farrington, 2006). In Australia and globally, this research is important as knowledge workers are the fastest growing segment of the workforce in developed countries and needed to meet the demands of the modern workplace (Lord & Farrington, 2006).

A knowledge worker is defined as “a person with the motivation and capacity to co-create new insights and the capability to communicate, coach and facilitate the implementation of new ideas” (The nature of work in 2010, 1995). The work performed by knowledge workers uses theoretical scientific knowledge and requires continuous learning, creativity, intuition, and imagination to build innovative processes or products. The work is result-oriented and non-repetitive in manner. Knowledge workers are highly skilled employees and typically have spent significant time gaining skills through formal education and professional training (P. Drucker, 1992). With years of specialisation, knowledge workers likely have intrinsic interest to their profession (Markova & Ford, 2011). The theoretical and analytical knowledge that these employees hold are a valuable asset to their organisations.
The work is result-oriented, often requiring tasks such as design, problem solving, data analytics, or reporting. Because their work often requires concentration, knowledge workers need the mental space to pursue challenging work and solve problems. They dislike intrusions, imposed deadlines, and unnecessary meetings. Knowledge workers are, however, most likely to use a collaborative approach and will work in teams (Beyerlein, Johnson, & Beyerlein, 2000; Joo, 2010). Because a collaborative approach is preferred, knowledge workers should be treated as an equal peer by their managers, rather than a subordinate (Massaro, 2012).

Seeing their profession as a source of identity (Feist & Gorman, 1998), knowledge workers are often continuous learners throughout their career. They are likely to increase their competence in their primary craft and other areas of interest, using any failures as learning opportunities for future projects (Fried & Slowik, 2004). Many knowledge workers are highly mobile and show little loyalty in moving to a different organisation if they feel underutilised, or if an opportunity for personal growth is offered (Massaro, 2012).

Because the knowledge they carry is part of the employee’s own skillset, managers must create autonomy in job roles and the knowledge workers’ interests in parallel with meeting organisation’s strategic plans (Markova & Ford, 2011). Autonomy may be the most important job characteristic valued by knowledge workers (Cheney, 1984; Goldstein & Rockart, 1984; Janz, Colquitt, & Noe, 1997). Managers should limit the number of required meetings and keep knowledge workers away from bureaucratic and administrative tasks, leaving them with the autonomy to pursue their tasks with minimal direction (Massaro,
2012). Providing the knowledge worker with accountability for their project will be a great source of motivation.

As the job function of knowledge workers entails unobservable tasks such as thinking, this makes performance appraisals and compensation reviews difficult to quantify (Markova & Ford, 2011; Osterloh & Frey, 2000). Knowledge workers and the teams that they interdependently work with require adequate amounts of time to deal with complexity, so time pressures may be especially damaging. Employees who have a degree of discretion to work within their own schedules will be more productive in their creative and analytical tasks (Markova & Ford, 2011).

The design of teams may be different for teams of knowledge workers or teams comprised of other types of employees (Bartol & Martin, 1982; Cheney, 1984; Goldstein & Rockart, 1984; Janz et al., 1997). Interdependency is a defining characteristic of all teams (Sundstrom et al., 1990). If not built or managed properly, teams may hinder the knowledge worker’s ability to effectively contribute (Leading Clever People, n.d.) due to the distractions they may be subjected to in completing complex work (Janz et al., 1997).

Having regular access to, and recognition by, senior executives is a popular method to motivate knowledge workers (Horwitz, Heng, & Quazi, 2003). However, motivational strategies centred around the ability to provide knowledge workers with the tools and work environment for them to perform have proven to be more effective (Massaro, 2012). Equipping knowledge workers with leading-edge technology is an effective way to motivate knowledge workers and increase productivity if these tools reduce menial and repetitive tasks (Horwitz et al., 2003). As above, other motivational and retention strategies may include
autonomy, job design and development opportunities (Kinnear & Sutherland, 2000; M. Thompson & Heron, 2002).

**Motivation in the Current Workplace**

In the second section of the literature review, I focus on the findings from motivation studies and connected concepts that address the research questions and the developed hypotheses. In the following studies, I continue with this trend of using quantitative research methodologies to assess the relationship between work motivation, their effects, and other related factors. Qualified scales for motivation and other related concepts are used; such as work engagement or the reasons for why an individual behaves in a particular way; and organisational commitment, which refers to an individual’s attitude and attachment towards their workplace (Saks, 2006).

Deci’s builds on cognitive evaluation theory, and this sub-theory becomes an important component of self-determination theory (SDT). The SDT has been suggested as a more comprehensive theory than traditional motivation theories (Ankli & Palliam, 2012). Using the dataset in Study 1, I determine whether the SDT framework is a good fit for knowledge workers.

Job satisfaction and work performance are used as measurable self-reported factors that are impacted by the change of motivation of knowledge workers. The importance of work-related values including pay, and the use of goal-setting and feedback as methods intended to motivate employees to higher performance will also be assessed for their effectiveness in knowledge workers.
Self Determination of Knowledge Workers

The role of SDT framework on knowledge workers is explored. Self-determined employees tend to increase their effort and perceive their organisation more favourably (Edward L. Deci, Connell, & Ryan, 1989). The Self Determination Theory framework is used to further the understanding of the motivation of knowledge workers.

Traditional motivation literature based on the industrial era has become inadequate to address the modern workplace (Ankli & Palliam, 2012; Herzberg et al., 2011). The evidence in organisational behaviour has demonstrated the value of the SDT framework in the understanding in current industries including health care, education, technology, and athletics (Herzberg et al., 2011; R. M. Ryan & Deci, 2000a). Motivation scholars often divide individuals into two categories consisting of those individuals who are more self-determined (intrinsically motivated) and those individuals who are less self-determined (externally motivated) (Gagné & Deci, 2005; Kennon M. Sheldon & Elliot, 1998; K. M. Sheldon & Elliot, 1999).

SDT refers to self-caused action (Wehmeyer, Little, & Sargeant, 2009). Individuals at a high level of self determination behave out of their own volition and intention (Deal et al., 2013). It has been suggested that SDT is a more encompassing theory than traditional motivational theories (Ankli & Palliam, 2012) and is appropriate in today’s workforce. The study of self-determination is not new in the field of organisational behaviour, however it is one of growing interest in optimising employee performance (Cameron, Bright, & Caza,
Self determination makes the distinction between autonomous and controlled motivation (R. M. Ryan & Deci, 2000b). The extent that a behaviour is self-determined is thought to be a function of the underlying motivation (Deal et al., 2013). The range of motivation types range on a continuum from amotivation through to intrinsic motivation, differing based on the degree of autonomy leading to self-determination. The theory suggests that employee performance is enhanced when behaviours are self-determined (Deal et al., 2013).

In SDT, amotivation is defined as “wholly lacking in self-determination” (R. M. Ryan & Deci, 2000b). Individuals who have amotivation behaviour will act passively or without intention (Tremblay, Blanchard, Taylor, Pelletier, & Villeneuve, 2009).

Extrinsic motivation can be described as “the desire to expend effort to obtain outcomes external to the work itself” (Grant, 2008). These outcomes are often in the form of compensation, approvals, rewards, punishment or recognition (Herzberg et al., 2011) and do not reflect the true self (Deal et al., 2013). In SDT, extrinsic motivation is classified into three types of motivation levels: external regulation; introjected regulation; and identified regulation. External regulated motivated individuals will perform an activity to obtain a reward (Tremblay et al., 2009). Introjected regulation refers to the behaviour through self-worth contingencies (Tremblay et al., 2009); where individuals believe they should engage in the work tasks, however do not fully embrace the value of the work tasks (Herzberg et al., 2011). Identified regulated motivated individuals will perform an activity
because they identify with the value or meaning of the activity and is consistent with their personal goals (Herzberg et al., 2011; Tremblay et al., 2009).

Integrated regulation motivation refers to “identifying with the value of the activity to the extent that it becomes an individual’s self identity” (Kennon M. Sheldon & Elliot, 1998; K. M. Sheldon & Elliot, 1999; Tremblay et al., 2009). Intrinsic motivation can be defined as the “desire to expend effort based on interest in and enjoyment of the work itself” (Grant, 2008) and lead to feeling of “intensely alive and authentic” (E. L. Deci & Ryan, 2001; Herzberg et al., 2011). Intrinsically motivated individuals will take action for its own sake as one would find the activity inherently interesting (Tremblay et al., 2009) and tend to have enhanced job performance and attitudes (Bono & Judge, 2003; Judge, Bono, Erez, & Locke, 2005). Employees who are given the opportunity to be their true selves at work are more likely to be autonomously motivated (Kahn, 1990; Leroy, Anseel, Gardner, & Sels, 2015).

Based on SDT, intrinsic motivation leads to the most positive behaviours, followed by integrated and identified regulations. These are the self-determined types of motivation. The non self-determined type of motivation: introjected, external regulations, and amotivation; lead to negative outcomes. With the sample of knowledge workers, I expect similar results found in Tremblay’s study (2009) such that there is a correlation between the various types of motivation, however stronger correlations are on adjacent subscales.
Hypothesis 1: Intrinsic motivation and integrated regulation show a strong positive correlation, whereas the subscales at the opposite ends show the smallest correlations.

The concept of SDT is based on an individual’s three basic psychological needs of competence, autonomy, and relatedness (Olafsen, Halvari, Forest, & Deci, 2015). When these needs are met in the workplace, employees are more likely to participate in activities for personal enjoyment, rather than their manager’s requests (Richard M. Ryan & Deci, 2006). Research has shown that all three basic needs need to be satisfied in order for intrinsic and extrinsic motivation to be optimised (Olafsen et al., 2015).

SDT assumes that there are behavioural outcomes when an individual’s basic needs are satisfied (Leroy et al., 2015). When these basic needs are satisfied, then employees are more likely to behave beyond the expectations of their formal role description (R. M. Ryan & Deci, 2000b). These behaviours are driven by being authentic to themselves, rather than by external rewards.

Employees that rate higher in self-determination evaluated their organisation more positively (Edward L. Deci et al., 1989). As knowledge workers see their profession as an extension of themselves, an organisation’s willingness to provide workers with flexibility on how to perform their jobs may not only motivate their workers, but lead to higher work satisfaction (Eisenberger, Rhoades, & Cameron, 1999). Work-related activities that are more in tune with the individual’s sense of self or authenticity, leads to greater work satisfaction than external rewards (Leroy et al., 2015).

A previous study the job satisfaction of knowledge workers identified that the nature of the work, employability prospects, and pay were the most important traits valued, along
with peer relationships, and freedom to make decisions; (Horwitz et al., 2003; Knowledge workers revealed: new challenges for Asia, 2001). I would expect similar findings from the sample of knowledge workers in this study.

**Hypothesis 2: Intrinsic motivation leads to higher work satisfaction. Extrinsic motivation also leads to higher work satisfaction, however to a smaller degree.**

By definition, knowledge workers are individuals with high intellectual capability who use their knowledge to create new ideas and innovatively develop new products or services (P. F. Drucker, 1989; Jones, 1990; Markova & Ford, 2011). The existing literature on innovation centres around motivating employees to enjoy their work (Gumusluoglu & Ilsev, 2009; Zhou, Ma, Cheng, & Xia, 2014). Managers and organisations that can provide a supportive and positive work environment where creativity can flourish and thinking processes are optimised, may intrinsically motivate employees to innovate and reach higher levels of performance beyond standard job role expectations (Badawy, 1988; Hammond, Neff, Farr, Schwall, & Zhao, 2011; Petronio & Colacino, 2008; Rego, Vitória, Magalhães, Ribeiro, & e Cunha, 2013; Zhou et al., 2014).

Research on individual differences in cognitive activities by Cacioppo and Petty (n.d.) suggested that individuals possessing high intrinsic motivation to use their mental abilities were thought to be deep thinkers, or chronic cognizers (Cacioppo, Petty, Feinstein, & Jarvis, 1996). Knowledge workers are classified as individuals with a need for cognition, characterised by their tendency to think about and reflect on the information and experiences to make sense of the stimuli presented (Cacioppo et al., 1996).
Employees who feel positive tend to broaden their thinking, which in turn results in increased work satisfaction, and higher levels of intrinsic motivation (Hammond et al., 2011; Rego et al., 2013; Zhou et al., 2014). Positive emotions stimulate an individual’s ability to develop new ideas, creative and thinking patterns (Fredrickson, 2001; Vinarski-Peretz & Carmeli, 2011). In converse, prolonged boredom and the lack of intellectual stimulation may lead to lower motivation and performance (Waldman & Avolio, 1986).

**Hypothesis 3: Need for cognition is positively correlated with intrinsic motivation.**

Reviews on the relationship between motivation and work effort have demonstrated that intrinsically motivated individuals will exert greater effort and attains goals than less intrinsically motivated individuals (Dysvik & Kuvaas, 2011, 2013; Grant, 2008; Piccolo & Colquitt, 2006; Zapata-Phelan, Colquitt, Scott, & Livingston, 2009). In Dysvik and Kuvaas’ study (2013), a positive relationship was found between intrinsic motivation and increased work effort for employees with high levels of mastery-approach goals. I expect that this relationship will also be consistent with knowledge workers.

External motivation may influence work effort in another manner. Meta-analytical studies have mixed results depending on the measurement of output; such as a positive relationship between extrinsic motivation and work effort when variable pay systems and increased performance quantity were measured, but not when evaluated with quality of work (Jenkins, Mitra, Gupta, & Shaw, 1998a). Deci and Ryan’s study (2000a) found that extrinsically motivated employees worked harder to attain goals or avoid punishment as a potential consequence (Gagné & Deci, 2005).
Hypothesis 4: Intrinsic motivation is positively correlated with work effort. Extrinsic motivation is positively correlated to work effort.

Personality and Motivation

Through questionnaires and interviews, personality is often assessed in the recruitment phase in an attempt to predict how well a potential employee will fit into an existing team and organisation. However, personality traits have not played a role in motivation theories (Judge & Ilies, 2002). Research suggests that personality measures are valid predictors of job-related criteria (Goldberg, 1993). Research has shown that personality traits are related to job performance, preference of job types, and work satisfaction (Rosse, Stecher, Miller, & Levin, 1998; Rothmann & Coetzer, 2003; Wright, Kacmar, & McMahan, 1995).

Personality is commonly assessed using the Big Five traits: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Neuroticism refers to the emotional stability of an individual. The neuroticism construct encompasses such traits as anxiety, anger, self-consciousness, and vulnerability. Extraversion describes the extent an individual engages with their social environment, and is characterised by traits such as friendliness, assertiveness, activity level, and cheerfulness. Traits of both neuroticism and extraversion showed moderate correlations with job satisfaction (0.29 for Neuroticism and 0.25 for Extraversion) in Judge’s analysis of over 100 independent samples (Judge, Heller, & Mount, 2002).
Openness to experience refers to the degree in which individuals embrace new thoughts or unconventional experiences. These facets can include imagination, intellect, adventurousness, and artistic interests. Extraversion and openness to experience have been shown to be associated with work satisfaction and organisational commitment in Thoresen’s study (Ozer & Benet-Martinez, 2006; Thoresen, Kaplan, Barsky, Warren, & de Chermont, 2003). Agreeableness is the personality trait that assesses the degree in which the individual exhibits a collective and cooperative approach toward their peers. Common characteristics of the agreeableness trait include trust, morality, sympathy, and cooperation.

Conscientiousness can be interpreted as the extent an individual engages in goal-directed behavior and follows social norms. These traits often comprise of self-discipline, achievement striving, self-efficacy, and orderliness. In previous meta-analysis, conscientiousness was the personality trait with the most predicted job satisfaction (Adrian Furnham, Eracleous, et al., 2009; Adrian Furnham, Petrides, Jackson, & Cotter, 2002; Judge, Higgins, Thoresen, & Barrick, 1999; Salgado, 1997). Overall, intrinsic, and extrinsic job satisfaction were found to be significantly associated with conscientiousness with an average correlation of 0.26 between conscientiousness and job satisfaction (Judge et al., 2002). It was thought that individuals rating high in conscientiousness are efficient and detail-oriented, therefore may be rewarded both intrinsically (i.e. given greater responsibilities and interesting projects) and extrinsically (i.e. bonuses or recognition) as the reason why work satisfaction is increased (Adrian Furnham, Eracleous, et al., 2009).

Judge and Ilies’ (2002) meta-analysis found that the Big Five personality traits had a multiple correlation of 0.41 with job satisfaction, however subsequent studies have shown
relatively little variance personality traits have accounted for their impact on work satisfaction and motivation (Adrian Furnham, Eracleous, et al., 2009).

**Hypothesis 5: There is a correlation between personality traits and work satisfaction.**

H5a. Negative correlation between neuroticism to work satisfaction

H5b. Positive correlation between extraversion to work satisfaction

H5c. Positive correlation between openness to work satisfaction

H5d. Positive correlation between agreeableness to work satisfaction

H5e. Positive correlation between conscientiousness to work satisfaction

Previous studies have indicated that Big Five personality traits and demographic factors account for 9 to 15 percent of the variance in motivation (Adrian Furnham, Eracleous, et al., 2009; Judge & Ilies, 2002).

Neuroticism and conscientiousness have the largest impact on correlations across motivation theories (Adrian Furnham, Monsen, & Ahmetoglu, 2009; Judge & Ilies, 2002). Individuals who rated high in neuroticism valued tangible hygiene factors more than individuals who rated lower (Adrian Furnham, Monsen, et al., 2009). This is consistent to the findings such that personality traits neuroticism, extraversion, conscientiousness was positively related to extrinsic motivation (Hart, Stasson, Mahoney, & Story, 2007). However, neuroticism was thought to be negatively related to overall work motivation as it has a significant impact on intrinsic motivation (Judge & Ilies, 2002).

Conscientiousness was positively related to both intrinsic and extrinsic motivation (Hart et al., 2007). Being persistent in reaching goals with increased effort (Grant, 2008; R. M. Ryan & Deci, 2000a) and gaining competence (Costa & McCrae, 1992; Judge, Simon,
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Hurst, & Kelley, 2014) are consistent behaviors associated with both intrinsic motivation and the conscientiousness trait (Judge et al., 2014)

Motivation factors were found to be more important to extroverts than introverts (A. Furnham, 1997; Gray, 1975). Extroverts responded more favourably to positive reinforcement and encouragement, whereas introverts were influenced by punishment (Gupta, 1976). This is consistent to the findings demonstrating the personality trait extraversion was positively related to both intrinsic and extrinsic motivation (Hart et al., 2007). I would expect extroverted knowledge workers would be highly motivated by intrinsic factors such as positive feedback and recognition due to their sociable nature.

As intrinsic motivation fosters curiosity and exploration, openness to experience was shown to be positively associated with intrinsic motivation (Teresa M. Amabile, 1985; Edward L. Deci & Ryan, 1985; Hart et al., 2007). Because individuals with high levels of the trait openness to experience prefer autonomy in their job role, intrinsic motivation would also be greater in these individuals (Judge & Cable, 1997; Judge et al., 2014).

Agreeableness was found to be negatively associated with extrinsic motivation (Hart et al., 2007), however positively associated with intrinsic motivation. As agreeable individuals work towards achieving team goals with the needs and preferences of their colleagues in mind, this behaviour fosters their sense of intrinsic motivation (Judge et al., 2014; R. M. Ryan & Deci, 2000a).
The Big Five traits of extraversion, openness to experience, and agreeableness showed weaker correlations to motivation factors (Judge & Ilies, 2002). I would expect the same results in the sample of knowledge workers.

**Hypothesis 6: There is a correlation between personality traits and work motivation.**

H6a. Negative correlation between neuroticism to work motivation

H6b. Positive correlation between extraversion to work motivation

H6c. Positive correlation between openness to experience to work motivation

H6d. Positive correlation between agreeableness to work motivation

H6e. Positive correlation between conscientiousness to work motivation

**Commitment and Motivation**

Coupled with motivation, commitment is an energising force that has yet to be fully acknowledged and used to full potential in organisations (Meyer, Becker, & Vandenbergh, 2004). Committed employees are loyal to their work organisations and identify with their organisational goals and values (Somers & Birnbaum, 1998). Their behaviours are typically reflected in metrics including increased job performance, work quality, retention, motivation, and work satisfaction.

Commitment is a force that binds an individual to a course of action that is of relevance to a particular target (Meyer & Herscovitch, 2001). The three unique themes underlying in the organisational commitment construct are affective commitment, normative commitment, and continuance commitment (Meyer et al., 2004). Affective commitment is
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defined as the “relative strength of an individual’s identification with and involvement in a particular organisation”, and has the greatest influence of the three themes to an individual’s behavior in the workplace (Chalofsky & Krishna, 2009; Riketta, 2002). Work motivation, however, can be defined as a set of energetic forces that originates both within as well as beyond an individual’s being, to initiate work-related behavior, and to determine its form, direction, intensity, and duration (Pinder, 1998).

Assessing organisational commitment is a good measure of a knowledge worker’s attitude. Commitment is also a critical mechanism that can drive knowledge workers towards pursuing innovation in their specialised field. There has been strong evidence to suggest the psychological contract and commitment is heavily related by the knowledge worker’s manager and how fairness is used to allocate resources (M. Thompson & Heron, 2005).

Lord & Farrington (2006) have found a strong correlation between job satisfaction and organisational commitment, and I suggest this relationship also applies to knowledge workers.

Though organisational researchers have been interested in both employee motivation and commitment, traditional motivation theory has not included commitment as a component of motivation. Myer, Becker & Vandenberghe (2004) argued that commitment and motivation are distinguishable but related concepts. Affective commitment has been shown to have the strongest positive correlation with job performance (Myer et al., 2004). Using this new sample of knowledge workers, I will confirm the following hypothesis.

Hypothesis 7: Both motivation and commitment lead to greater work satisfaction.
Though organisational researchers have been interested in both employee motivation and commitment, traditional motivation theory has not included commitment as a component of motivation. Meyer, Becker & Vandenberghe (2004) argue that commitment and motivation are distinguishable but related concepts. Based on Deci’s self-determination theory and Higgins’ regulatory focus (commitment) theory, the researchers present an integrative framework where commitment is presented as one of the several energising forces in motivated behaviour (Meyer et al., 2004).

As organisational commitment may be one component of motivation, I have made the following hypothesis:

**Hypothesis 8: Motivation is an antecedent to organisational commitment.**

**Role of Personality Traits on Performance**

The Big Five personality traits have been shown to strongly relate to an employee’s performance (Barrick & Mount, 1991). Generalisations made on personality traits however are complicated as a given trait can contribute to performance in some situations, but in the opposite manner in others (Tett & Burnett, 2003).

Numerous researchers have suggested that conscientiousness is the strongest predictor of work performance (Barrick & Mount, 1991; Frink & Ferris, 1999; Luthans & Youssef, 2007; Ones & Viswesvaran, 1997; Rothmann & Coetzer, 2003; Sackett & Wanek, 1996). Sackett and Wanek (1996) suggested that this significant correlation was attributed to integrity, a characteristic of conscientiousness (Rothmann & Coetzer, 2003). A meta-analysis study by Barrick and Mount found job performance was most predicted by the
conscientiousness trait (Barrick & Mount, 1991). This was found to be consistent when assessed by a variety of methods in different occupations. The use of goal setting and autonomy was found to influence the relationship between conscientiousness and job performance (Barrick & Mount, 1993; Rothmann & Coetzee, 2003).

Extraversion was found to be a valid predictor of performance in job roles characterised by social interaction, such as managers and sales professionals (Barrick & Mount, 1991; Bing & Lounsbury, 2000; Lowery & Krilowicz, 1994; Rothmann & Coetzee, 2003; Vinchur, Schippmann, Switzer, & Roth, 1998). Less significant correlations were found for extraversion and job performance in other occupational groups (Ozer & Benet-Martínez, 2006). Though conscientiousness may be the personality trait to how an individual performs at work, extraversion and openness to experience describe how an individual feels about work (Ozer & Benet-Martínez, 2006).

Less significant effects were found on the personality trait openness to experience, agreeableness, and neuroticism. Openness to experience was not a valid predictor of job performance (Tett, Jackson, & Rothstein, 1991), however this is contradictory to earlier studies where openness to experience was said to be related to consulting roles (Hamilton, 1988), upgrading skills (Barrick & Mount, 1991; Vinchur et al., 1998), and adapting to change (Raudsepp, 1990).

Agreeableness is the personality trait that assesses the degree in which the individual exhibits a collective and cooperative approach toward their peers. Common characteristics of the agreeableness trait include trust, morality, sympathy, and cooperation. In jobs where
teamwork was required, agreeableness was a key personality trait (Ozer & Benet-Martínez, 2006).

Neuroticism was thought to have a negative effect on job performance (Judge et al., 1999), however Salgado’s study showed that neuroticism predicts job performance in certain instances (Rothmann & Coetzer, 2003; Salgado, 1997).

Affective commitment has been shown to be the strongest component of commitment and positively correlates with job performance (Meyer et al., 2004). In Somers & Birnbaum (1998), the authors examine the relationships between work-related commitment and the three dimensions of job performance (task proficiency, performance not tied to formal reward systems, and performance that is detrimental to organisations). In this context, the authors define work-related commitment as a set of similar, but distinct affective variables tied to specific foci; that is: the job, the organisation, the work group, the career, and work values. Committed employees are thought to be loyal, productive members of work organisations who identify with organisational goals and organisational values (Somers & Birnbaum, 1998). After quantitative statistical analysis, the study concluded with some interesting findings. These include: Job involvement was related only to performance tied to intrinsically rewarding elements of work; career commitment was positively related to overall performance effectiveness; and organisational commitment was unrelated to job performance. It is interesting to note that organisational commitment was unrelated to job performance, though it would have been thought prior to the study that organisational commitment would lead to desirable behavioural outcomes including employee retention, attendance, work quantity, work quality, and job performance (Somers & Birnbaum, 1998).
Similarly, Riketta (2002) conducted a meta-analysis to estimate the correlation between affective organisational commitment and job performance. The study examined the correlation differences of both white-collared worker and blue-collared workers against performance assessed by self ratings. Affective organisational commitment, described as the relative strength of an individual's identification with and involvement in a particular organisation, was assumed to influence almost any behaviour that is beneficial to the organisation such as performance, attendance, and turnover. The level of affective organisational commitment was analysed across 111 samples published in the years from 1990 - 2001 across Anglo-American countries primarily in the service sector. It was found that there is a weak correlation between affective organisational commitment and performance.

**Consultancy Studies about Pay**

General management and human resources publications tend to publish articles that undervalue pay as a motivator (Giancola, 2012; Rynes, Gerhart, & Minette, 2004). It is believed that pay for performance hinders the creativity needed for innovation and has a negative effect on intrinsic motivation (Gerhart & Fang, 2015).

Academic research by behavioural psychologists in the area of motivating employees with pay has been limited (Giancola, 2012). Most data has been indirectly collected via employee satisfaction surveys, performed by management consultants and commissioned by public and private organisations. Employees completed surveys as the basis for determining how important pay is to recruitment, motivation, and retention of employees (Giancola,
Hundreds of studies have consistently documented the ineffectiveness of extrinsic rewards on motivation (Pfeffer, Jeffrey, & Thomas, 1998).

Surveys on pay satisfaction, engagement, and motivation at the workplace have led compensation scholars to suspect inconsistencies between what employees say is important to them and what research shows in motivating them (Giancola, 2012). The survey results have provided insights that demonstrate that employee’s attitudes about pay may be changing (Giancola, 2012).

**Role of Pay in Motivation Theory**

Compensation is an important incentive as no other motivational technique comes close to money with respect to its incremental value (Locke, Feren, McCaleb, Shaw, & Denny, 1980). However, little research has been done by behavioural scientists to assess how important pay actually is to employees (Giancola, 2012). Motivating employees with pay is theoretically grounded in a number of theories, explored in further detail below.

Economic agency theory (M. C. & Meckling Jensen (W. H.), 1976) supports the use of compensation to promote employee performance and motivation. In agency theory, it is assumed that agents (or employees in this case), are motivated by self-interest, are rational, and risk averse (Stroh, Brett, Baumann, & Reilly, 1996). Employers reward employees with more pay when their behaviours and performance help achieve their organisation’s goals, suggesting that compensation is the primary source of employee motivation. It is not clear how agency theory is related to extrinsic and intrinsic motivation (Olafsen et al., 2015).
Pay is considered a basic need in Maslow’s hierarchy of needs and distant to the goal of attaining self actualisation. In Herzberg’s motives and needs theory, salary is considered a hygiene factor and a factor for dissatisfaction. That is, factors of satisfaction and dissatisfaction are separate and are not opposites. When salary is adequately provided, an employee may not be dissatisfied, however neither would they feel satisfied.

Equity theory suggests that employees value fair treatment, which causes them to be motivated to keep the fairness maintained within the relationships of the organisation and coworkers (Adams, 1963). If employees feel under-compensated for their work effort, they will in turn reduce their inputs (Ambrose et al., 1999; Greenberg, 1982).

The application of Vroom’s expectancy theory (Pearce & Perry, 1983) is based on the belief that employees will be motivated to work harder if they believe their efforts will result in higher monetary rewards (Perry, Engbers, & Jun, 2009; Van Eerde & Thierry, 1996). Further, reinforcement theory (Durant, Kramer, Perry, Mesch, & Paarlberg, 2006) suggests that there is a direct relationship between a desired behavior and its consequences. In this case, pay can be used to reinforce behaviours such as high performance (Durant et al., 2006; Perry et al., 2009).

In contrast, motivation theories such as Maslow’s hierarchy of needs theory, Herzberg’s motives and needs theory, and Deci and Ryan’s cognitive evaluation theory (CET) views pay as a negative influence to motivation (Gerhart & Fang, 2015). In CET, pay for performance can undermine intrinsic motivation and interest to complete a task or activity (Gerhart & Fang, 2014). Building on CET, self-determination theory argues that intrinsic and extrinsic rewards are linked, and an individual’s actions depend on the degree in which they
feel autonomy (Edward L. Deci & Ryan, 2008; Stringer, Didham, & Theivananthampillai, 2011).

**Pay for Performance**

Pay for performance rewards systems are designed with the belief that money will motivate individuals to increase their effort and output to improve performance (Lawler, 1971). This is consistent to the economic agency theory and there has been some evidence that pay for performance will increase performance (Ariely, Gneezy, Loewenstein, & Mazar, 2009; Lazear, 2000).

Many organisations still use traditional compensation systems based on efficiency wage models (Yellen, 1995) where managers aim to offer greater than market-based monetary compensation to encourage greater employee efforts. In over 90% of firms, pay for performance compensation systems comprise of merit and bonus pay (Cohen, 2006; Nyberg, Pieper, & Trevor, 2016). Merit pay is the incremental increase to base salary, whereas bonus pay is a lump sum (Milkovich et al., 2011). This compensation system recognises past performance and set future expectations and aligns with expectancy theory, where future performance should improve based on the expected resultant rewards (Nyberg et al., 2016; Schaubroeck, Shaw, Duffy, & Mitra, 2008). Bonus pay tends to have a greater impact than merit pay, and is a better motivator on future performance (Nyberg et al., 2016).

Despite widespread pay for performance usage, meta-analysis on past studies suggest a weak positive relationship from individual pay for performance to employee performance (Jenkins, Mitra, Gupta, & Shaw, 1998b). This is because, in practice there are many
downfalls to motivation when a pay for performance compensation system is implemented. For example, the compensation system may fail to account for an employee’s past individual experience, skill development, and contributions to the organisation (Wilson, Mueser, & Raelin, 1994). Immediate supervisors who are tasked with rating employees are often poor evaluators of talent or are unwilling to differentiate among employees (Adler et al., 2016) as projects or tasks are worked interdependently in a team environment. Award employees with different incentives would undermine cooperation and collaboration, and promote undesirable internal competition (Deming, 1986). This makes the pay for performance system very difficult to implement effectively (Lawler & III, 1999).

In today’s modern workplace, it is even more challenging to design compensation systems for knowledge based job roles that require specialised competencies and self-managed efforts where productivity and performance are often difficult to evaluate (Markova & Ford, 2011). Kanter (1990) claims that traditional pay systems do not motivate people to do more (Wilson et al., 1994). In behavioral economics studies, pay for performance is negatively related to performance ((Ariely et al., 2009), has been found to be not motivating (Pfeffer et al., 1998), and undermines intrinsic motivation (Edward L. Deci & Ryan, 1980).

**Extrinsic versus Intrinsic Incentives**

Compensation is perhaps the motivational practice that is most used in the workplace. Although pay is often a topic of conversation, as discussed above, there has been little research done by behavioural scientists to assess how important pay actually is to employees (Giancola, 2012). Further, pay is often considered a negative influence on
motivation by human resource professionals. Knowledge workers will be motivated to go to work for a number of reasons. Sometimes money is the main source of motivation, but often more important is that workers care what they do (Besley & Lse, 2016). As the modern workplace continues to change to knowledge intensive roles requiring increased creativity, innovation, and productivity, the manner in which organisations design their compensation strategies must also change to motivate their workers.

Extrinsic motivation places explicit importance on external rewards such as salary, bonuses, and promotions (Van Herpen, Van Praag, & Cools, 2005) or job redundancy or wage cuts (Frey, 1997). While the attention on extrinsic rewards has merit, the application of contemporary agency theory needs to include behavioural models to also include the use of intrinsic motivation methods to motivate employees (Frey, 1997; Kreps, 1997; Merchant, Van der Stede, & Zheng, 2003; Stringer et al., 2011). I aim to investigate the importance of pay further to its effects on extrinsic and intrinsic motivation on knowledge workers.

Knowledge intensive jobs not only require intellectual capacity and significant training, but also creativity to generate new ideas and develop new products (Markova & Ford, 2011). Research suggests that extrinsic rewards will decrease performance on creative tasks (Curran & Walsworth, 2014). This could be explained by Amabile’s (1996) theory that intrinsic motivation is needed to engage in an activity because it is interesting (Deci et al., 1999). When working for pay or other extrinsic incentive, the worker’s attention is diverted from the creative task at hand. Supportive evidence indicates that individual incentives are poor motivation for innovation as workers feel overly controlled (T. M. Amabile et al., 1996; Shipton, West, Dawson, Birdi, & Patterson, 2006) and compromises intrinsic motivation (T.
M. Amabile et al., 1996; Curran & Walsworth, 2014; Edward L. Deci, Koestner, & Ryan, 1999).

Performance-based compensation has become increasingly popular among organisations in the last decade. Rewarding employees extrinsically for performance may result in the following outcomes including increased productivity and efficiency, retaining highly valued employees, and gaining favourable attitudes toward the organisation. Kuvaas (2006) looks at the relationship between work motivation, affective commitment, and work performance. Specifically, Kuvaas investigates employees' work performance and affective commitment under different forms of pay administration and variable and fixed pay levels; i.e. bonus programs and base pay. It was found that the bonus was not significantly related to self-reported work performance because of the low expectancy. Bonus opportunities in variable pay plans must typically represent 5-10% of base pay in order to be motivating (Heneman, Ledford & Gresham, 2002).

Hypothesis 9: Knowledge workers are more intrinsically motivated than by extrinsic incentives.

In contrast to agency theory, SDT differentiates between different types of motivation and assumes that workers are more naturally inclined toward intrinsic motivation (Olafsen et al., 2015). The theory suggests that higher pay incentives does not necessarily lead to better work performance or job satisfaction.

Existing studies show that extrinsic motivation impacts job satisfaction negatively, whereas intrinsic motivation is found to be positively associated with both pay and job satisfaction (Stringer et al., 2011). It was hypothesised that as knowledge workers progress
in their careers, they will prioritise job satisfaction in their job role and organisational environment over compensation.

**Hypothesis 10: Pay is less important in older knowledge workers than younger workers.**

Organisations that offer autonomy as a means of intrinsic motivation to their knowledge works may reduce the need for explicit incentive pay (Besley & Ghatak, 2016). Often startup technology companies comprise of a small number of employees who work to solve a problem with little or no pay until their product is successfully commercialised. If workers are given autonomy to pursue tasks and projects that interest them, they will be donating their effort for free, as opposed to being paid to do so (Besley & Ghatak, 2016).

In contrast, large organisations will often have structured pay for performance compensation systems linked to individual key performance indicators. Because of the formality of performance monitoring and organisation budgeting process, autonomy will be compromised as knowledge workers may feel controlled to pursue individual performance requirements. This is consistent to SDT, where there is a distinction made between autonomous motivation and controlled motivation (Deci & Ryan, 2000, 2012; E. L. Deci & Ryan, 2012; Olafsen et al., 2015; R. M. Ryan & Deci, 2000a).

**Hypothesis 11: Pay is more important to employees in larger organisations than smaller organisations.**

Compensation plans that are skills based are more likely to improve employee motivation by providing opportunities to enrich their roles by using their specialised skills
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(Forest & Gagne, 2011; Murray & Gerhart, 1998). These pay plans aim to satisfy the worker’s psychological needs and are consistent to Maslow’s hierarchy of needs.

Previously, CET was seen as a negative influence on motivation for many years and researchers warned against implementing performance-contingent compensation plans (Gerhart & Fang, 2015). With further theory development, SDT researchers recognise that pay may be an effective motivator to employees for reaching their personal goals and does not undermine intrinsic motivation (Gerhart & Fang, 2015).

Pay dispersion can be used as a compensation vehicle to motivate employees. Pay dispersion distributes salaries across the organisation and awards employees higher pay for past performance and increased productivity. It is also commonly used in the recruitment of sought-after employees who are considered specialists in their industry or hold higher positions of influence. Using pay dispersion works positively for firms in the form of increased productivity and performance and employees high on distribution respond favorably (Downes & Choi, 2014).

I hypothesis that pay is more important to employees at higher positions and with managers, as these employees would have developed their skills and competencies and would expect to be compensated more for the value they provide, past performance, and increased productivity.

**Hypothesis 12:** Pay is more important to employees at higher positions than lower positions.

**Hypothesis 13:** Pay is more important to managers than employees.
Annual surveys conducted by the Society of Human Resource Management (SHRM) have shown that pay typically ranks high in work rewards, along with job security and benefits (Gerhart & Fang, 2014). The results between how human resource professionals assess the importance of pay are often misaligned however to those reported by employees. In SHRM (2006), employees rated pay as the most important reward versus sixth in importance by human resource professionals. I hypothesize that both intrinsic and extrinsic work values will impact a knowledge worker’s pay satisfaction.

**Hypothesis 14: Both intrinsic and extrinsic work values impact a knowledge worker’s pay satisfaction.**

**Generations**

It is acknowledged that multiple generations of employees are currently in the workplace and may be motivated by different factors. Generalisations and differences are often written about in the popular press and social media. The aim of this study is to investigate whether the mechanisms of motivating employees changes at different life stages. Articles are frequently published in popular press that suggest Millennials (or the cohort known as Generation Y) who are currently entering the workplace, must be motivated differently than previous generations. As the general workforce demographics change into the 21st century in developed countries, companies must attract, motivate, and retain productive aging knowledge workers (Lord & Farrington, 2006). Literature pertaining to age-related motivation and generational characteristics are reviewed in this chapter. Initial interest in workforce aging focused on the potentially negative outcomes to job performance and organisational effectiveness (Ruth Kanfer & Ackerman, 2004a). To date, little research
has been focused on age-related differences that contributes to the retention and motivation of workers.

For the first time in history, the workplace will comprise four generations who work together towards a common goal. These generations are commonly identified as the Silent Generation, Baby Boomers, Generation X, and Generation Y (Feyerherm & Vick, 2005). Research has shown that cultural differences and social constructs are what divide and shape generations of people into their particular generational cohorts (Tulgan, 2009).

From a social science perspective, a generation is defined as a group of individuals who are born within the same cultural and historical context. This group of individuals will have gone through similar historical experiences and therefore develop commonalities (J. P. Duncan & Mannheim, 1952; Lyons & Kuron, 2013; Pilcher, 1994). Strauss and Howe’s (1992) generational theory observed that events in history roughly split people into 40 to 45 year generational ranges (Carpenter & de Charon, 2014; Howe & Strauss, 1992).

The theory of generations been built from two distinct perspectives: the social forces and cohort perspectives. Together, generations are viewed as interrelated and multi-dimensional social groups that share a common history, and born in a given range of time (Gilleard, 2004; Laufer & Bengtson, 1974; Lyons & Kuron, 2013). It is argued by researchers that the shared values of a generation affect people’s commitment, attitude, and ethical approach to work (de Waal, Peters, & Broekhuizen, 2017).

It is thought in popular theory that generational differences occur because major historical events will influence the development of personality, values, beliefs and expectations. As each generation matures through shared events, the cohort develops
characteristics that differentiate it from previous and following generations (Kupperschmidt, 2000; Smith, 2015; Wey Smola, Smola, & Sutton, 2002).

Although I cannot make assumptions about how individuals view their jobs and are motivated in each generational cohort, it is evident that individuals born in the same date range may predispose them to have similar expectations and behaviours (Smith, 2015; Wey Smola et al., 2002). Kapoor and Solomon (2011) suggest that employers must respect these unique characteristics of each generation present in their workplace, then encourage workplace environment and practices to promote productivity for every generation (de Waal et al., 2017; Kapoor & Solomon, 2011).

Both academic research and popular press often suggest that there are generational differences in the workplace, however the evidence is mixed (Parry & Urwin, 2011). Few articles actually challenge the popular view that generational cohorts exist (Macky, Gardner, & Forsyth, 2008). Described generational differences may be perceived rather than actual (Lester, Standifer, Schultz, & Windsor, 2012; Mencl & Lester, 2014). Hess and Jepson’s study on psychological contracts found that career stage differences and generational cohorts yielded more similarities than differences (Deal et al., 2013; Hess & Jepsen, 2009). There also has been little effort to examine the nature, causes, and reactions to generational differences empirically (Uricon, Hollensbe, Masterson, & Lyons, 2016). Recent review of the existing body of research remains largely descriptive in nature, is contradictory, and contains methodological inconsistencies making the generation construct difficult to be defined (Lyons & Kuron, 2013). Further, many studies have been undertaken in single
organisations where similarities can be attributed to the individual groups rather than generational cohorts.

Differences in Motivation at Life Stages

Workforce demographics in western societies continues to shift to older workers as a result of longer life expectancies and economic conditions that discourage retiring early (Ruth Kanfer & Ackerman, 2004a; Roth, Wegge, & Schmidt, 2007).

Empirical evidence on generational differences in motivational drivers in the workplace is limited (Wong, Gardiner, Lang, & Coulon, 2008) and contains discrepancies. In Solnet’s study (2012), Millennials scored their levels of work engagement, job satisfaction, and organisational commitment to be significantly lower than other generation cohorts (Solnet et al., 2012). However, Furnham (2009) did not find any significant correlation between motivation and age, years in full-time employment, or job tenure (Adrian Furnham, Eracleous, et al., 2009). Appelbaum (2005) argued that motivation to work hard is more attributable to life stage, rather than generational cohort (Appelbaum et al., 2005; Millar, Culpin, Kultalahti, & Liisa Viitala, 2014).

Differences between younger and older workers were not found in Catania and Randall’s study (2013) when intrinsic motivators were measured. Younger participants however prioritised extrinsic motivators, especially financial factors. Wong (2008) found that there were no differences between generations on the subject of job security as a motivator, but younger workers were more motivated by opportunities to advance in their careers than older workers. Kanfer and Ackerman (2004a) suggests that motivation to work in mid-career and later career periods should follow the same principles as in younger years.
No significant differences in motivation factors of Generation Y and Generation X workers (those at the beginning of their career and at mid-career stage) were found (Gursoy, Maier, & Chi, 2008). Conversely, other previous studies and literature indicated that extrinsic motivation factors are more important for Gen Y. In terms of comparing differences between Generation X and Generation Y workers, there is no consensus (Acar, 2014).

Lifespan theories of development by Heckhausen and Schultz (1995) indicate that work motivation continues at a high level through the mid-career stage (P. B. Baltes & Baltes, 1990). At the mid-career stage, most workers aim to maintain their established standard of living, raise families, and obtain further capital resources. Age-related changes in work motivation is thought to change in later career workers (B. B. Baltes, Rudolph, & Bal, 2012; Furchtgott, 1999).

For knowledge workers, I expect that older workers have had more opportunities to pursue projects throughout their careers that align with their personal interests. Therefore, the following hypotheses are tested:

**Hypothesis 15:** Overall work motivation is higher in older knowledge workers than younger workers.

**Hypothesis 16:** Intrinsic work motivation is higher in older knowledge workers than younger workers.

**Hypothesis 17:** Extrinsic work motivation is higher in younger knowledge workers than older workers.

Workers who view their profession as a central component for their life and identity tend to exhibit increased work engagement, commitment, and job satisfaction (Macdonald &
Levy, 2016). Both young and later career works cite negative stereotypes lead to less opportunity for promotions due to their age; that is, younger workers report being inexperienced as the reason for negative treatment, whereas later career workers are often considered incompetent (C. Duncan & Loretto, 2004; Macdonald & Levy, 2016).

Studies have shown that perceived age discrimination is experienced by workers of many age groups and has a negative impact on motivation (Hassell & Perrewe, 1995; Macdonald & Levy, 2016; Snape & Redman, 2003). Generation Y workers reported having less satisfaction on both extrinsic and intrinsic motivation factors in comparison to Generation X workers. This suggests that generational cohorts have their own set of unique characteristics and workforce expectations, and subsequently leads to a difference in their level of work satisfaction (Tan & Wan Yusoff, 2012).

Later career workers generally have the choice to work or retire. Several studies have shown that late career workers perceive work as a source of providing satisfaction for personal development and an environment for social networking (Ruth Kanfer, Beier, & Ackerman, 2013). A study in Nordic countries suggests that the relationship between job satisfaction and age was linear, when younger workers were less satisfied at work (Eskildsen, Westlund, & Kristensen, 2004).

**Hypothesis 18: Overall work satisfaction is higher in older knowledge workers than younger workers.**

Older workers have been shown to have less motivation to learn and desire to pursue career development opportunities (Ng & Feldman, 2012). In studies on aging, Kanfer and Ackerman found that older individuals’ ability to recall data and memorise declines with age
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(Ruth Kanfer & Ackerman, 2004b). The extra work effort required to learn new skills may deter older workers from traditional training sessions and refuse to participate in projects that require high cognitive skills. In contrast, younger knowledge workers are keen to embrace formal and informal training opportunities to build up their portfolio of skills.

**Hypothesis 19:** Perceived work effort is higher in older knowledge workers than younger knowledge workers.

**Hypothesis 20:** Need for Cognition is greater for younger knowledge workers than older knowledge workers.

Each generation has unique attitudes towards work ethics and relationships, organisational hierarchy and change (de Waal et al., 2017). Research on generations theory has identified differences in factors such as personality, work values, expectations, teamwork, and leadership (Lyons & Kuron, 2013).

Research conducted on generational differences prior to 2009 concluded with mixed evidence. Many studies found contradictory evidence or no differences in regards to generational differences in work values (Parry & Urwin, 2011). Mencl and Lester’s review (2014) of existing literature on generational differences in work factors suggested that there are more similarities than differences (Cennamo & Gardner, 2008; Hansen & Leuty, 2012; Lester et al., 2012). Differences found were in the areas of immediate recognition and feedback, career advancement opportunities, and diversity (Mencl & Lester, 2014).

A study performed by Inceoglu, Segers & Bartram on age-related differences supports that people’s motives change rather than a general decline in work motivation with age. Job features and
extrinsically rewarding outcomes that required greater personal resources were found to be less motivating to older workers; whereas intrinsic motivators were valued more. Inceoglu (2012) concluded that older workers are motivated by different job features, however are not less motivated.

**Hypothesis 21: Work-related values vary at different age groups.**

**Work Engagement**

Work engagement can be described as having high levels of mental energy, strong involvement, and feelings of pride towards work. It is characterised by vigor, dedication, and absorption (Bakker, Schaufeli, Leiter, & Taris, 2008; Schaufeli, Salanova, González-romá, & Bakker, 2002; Schaufeli, Taris, & van Rhenen, 2008; Schou Andreassen, Ursin, & Eriksen, 2007). Engaged workers have a sense of energy and connection with their activities, and thrive in their work environment (Bakker et al., 2008; Luthans, 2002; Van den Broeck et al., 2008).

Engagement has been defined as “the extent to which employees commit to something or someone in their organization, and how hard they work and how long they stay as a result of that commitment” (Chalofsky & Krishna, 2009; Corporate Leadership Council, 2004). Opposite of burnout, engaged workers are mentally stimulated, take fewer sick days, and are a positive influence to others in their work environment (Bakker et al., 2008; Maslach & Leiter, 1997; Van den Broeck et al., 2008).

Most of the literature on work engagement is based on survey results generated by consulting firms contracted by organisations rather than empirical research (Chalofsky & Krishna, 2009). Past survey results indicate that the majority of employees in the workplace
are not engaged in their work assignments and their organisations (Chalofsky & Krishna, 2009). The subject of employee engagement is a recent "business driver" of organisational success, as organisations who rank at the 75th percentile on employee engagement scores tend to rate 16% greater profitability than those in the 25th percentile (Gignac & Palmer, 2011; Harter, Schmidt, Agrawal, Plowman, & Blue, 2013; Lockwood, 2007).

While the constructs of motivation and engagement are related, motivation refers to the reasons for why an individual behaves in a particular way, while engagement refers to the will of executing a task or activity. Engaged and motivated employees are more committed, work harder, and are likely to exceed performance requirements and expectations (Chalofsky & Krishna, 2009; Lockwood, 2007).

**Effectiveness of Goal Setting**

Based on Locke’s Goal Setting theory, organisations still use this method to motivate their employees to increase performance. This section explores the role of and feedback and how it impacts employee motivation in knowledge workers. Performance management systems commonly use goal setting to align organisational goals to employee activities. Setting goals is intended to motivate employees to greater performance and productivity. Employees and their line managers may work together to agree target goals, which in turn is supposed to motivate the individual to be better focused on their tasks, prioritise activities, and perform more effectively (Bandura, 1997; Bandura & Jourden, n.d.; Gibson, 2001; Latham & Lee, 1986; Locke & Latham, 1990; Schilit & Locke, 1982; Stajkovic & Luthans, 1998). These goals aim to improve performance outcomes that drive organisational success such as customer service deliverables, improving safety attitudes, increased productivity and
In early goal theory (Locke & Latham, 1990; Locke, Shaw, Saari, & Latham, 1981), the literature concludes that if there is a lack of commitment, then a goal will have no effect on motivation (Klein, Wesson, Hollenbeck, & Alge, 1999). Somers & Birnbaum (Somers & Birnbaum, 1998) examined the relationship between work-related commitment and three dimensions of job performance (task proficiency, performance not tied to formal reward systems, and performance that is detrimental to organisations) (Somers & Birnbaum, 1998). Committed employees are loyal, productive members of work organisations who identify with organisational goals and values (Chalofsky & Krishna, 2009).

Setting goals for workers was thought to lead to success in organisational life (Seijts & Crim, 2006). Leaders would provide clarity on the direction of their organisations and its desired achievements. These organisation goals are propagated to employees by their managers, with a methodology on how to achieve these goals.

Early works in goal setting theory made the assumption that goals and their associated rewards were given to workers with the expectation that they needed to be accepted without negotiation. In the modern workplace, it is more common that knowledge workers play a more active part in shaping their organisational environment and set their own goals (Crant, 2000; Frese & Fay, 2001; Grant & Ashford, 2008; Parker, Bindl, & Strauss, 2010). Because employees are included in defining their own goals, I expect the goal setting activity would lead to greater work engagement.
Hypothesis 22: There is a positive correlation between goal setting and work engagement.

At every organisational level, improvements in management may account for greater work performance by improving goal setting (Perry et al., 2009). Research has shown that individuals who are actively included in the goal setting process and are given sufficient support in establishing these goals will result in greater self-efficacy and effectiveness (Gibson, 2001).

The goal setting process clarifies performance expectations (Mitchell, 1973) and allows for the individual worker to control their behaviour (Erez & Kanfer, 1983; Staw, McKechnie, & Puffer, 1983). Goals are effective even when assigned by others, as long as the employee is committed to the goal, has the ability to attain it, and is not in conflict with another goal (Locke & Latham, 2006). I expect that these findings from previous studies would be relevant to knowledge workers.

Hypothesis 23: There is a positive correlation between goal setting and work performance.
Goal Setting on Motivation

Based on McGregor’s Theory X and Theory Y, the role of managers of knowledge workers is based on Theory Y. This theory assumes that employees are not inherently lazy, are self-controlled and capable of self-direction, and are able to provide input into organisational effectiveness (Kopelman, Prottas, & Davis, 2008). Rather than micro-managing direct reports, managers should be providing the adequate job resources to enable employees to reach their full potential.

Goal setting is a commonly used human resources management process that aims to direct employees to increased performance, however this strategy may have adverse effects to its intent on knowledge workers. Research completed by Shalley (1995) showed mixed results on the effect of goals on creativity and productively. Kanfer and Ackerman’s research demonstrated that for complex tasks, setting goals can be detrimental (Dean and Professor of Industrial Engineering and Management Miriam Erez, Erez, Christopher Earley, & Christopher, 1993; Ruth Kanfer & Ackerman, 1989).

It was thought that by setting clear and specific goals, employee behaviours associated with specific organisational goals would be intrinsically motivating for the workers (Boswell, Bingham, & Colvin, 2006; J. Richard Hackman & Oldham, 1976) and increase performance across the organisation (Marginson & Ogden, 2005; Stringer et al., 2011).

As research has shown, goal setting focuses attention. The use of goal setting can have a negative impact on a knowledge worker’s performance by focusing on specific tasks, inhibiting teamwork, encouraging risk taking and unethical behaviours, and reducing intrinsic
motivation (Ordóñez, Schweitzer, Galinsky, & Bazerman, 2009). By focusing narrowly on the goals set, the knowledge worker may overlook other important aspects of the task as it relates to other organisation goals and priorities, or be distracted from the creative process that is needed for innovation.

Traditional performance approaches that include ratings from managers, goal setting, and feedback about performance, have failed to produce the intended results of motivating employees, enabling performance, and achieving higher levels of productivity (Adler et al., 2016; O’leary & Pulakos, 2011). Most employees find the performance appraisal process unmotivating, frustrating, and often not relevant to their jobs (Adler et al., 2016).

Characteristic of knowledge workers and assuming Theory Y is relevant, employees are not inherently lazy and are capable of self-direction. If feedback received and goal setting do not align with their own professional views and identity, performance appraisals and setting objectives would have a negative impact on their motivation. Therefore, the following hypotheses were tested:

**Hypothesis 24:** Feedback is a moderating factor from intrinsic motivation to work engagement.

**Hypothesis 25:** Goal setting is a moderating/mediating factor from intrinsic motivation to work performance.
Chapter 3 - Method of Approach

The chosen method of approach was through online surveys. This method was chosen to source a large number of participants for quantitative analysis and modeling through social media. The data collection is segmented into three studies, with the length of each survey intended to be completed within 15 minutes to reduce the risk of survey fatigue. The studies were issued in succession several months apart, and the survey link was open for approximately two months.

A link to the online surveys were advertised via social media platforms including LinkedIn and Facebook, and by individual email invitation. The surveys were designed using validated scales to measure components of motivation and related concepts, and are not interconnected. The survey started with questions pertaining to demographics (age range, gender, position level, etc).

In addition to scales that measured constructs of motivation, scales of related topics including engagement, work-related factors, and commitment were also used. Commonly used in industry employee satisfaction surveys, I chose the constructs of job satisfaction and work performance as measures of the resultant output or outcome of motivated employees. Scales to assess personality traits (Big Five factors) and need for cognition were used in the surveys, as these are possible influencers of the motivation of knowledge workers.

An application (Reference Number: 013160S) for ethical clearance to the university’s Human Research Ethics Committee in accordance with the National
Statement on Ethical Conduct in Human Research (2007) was granted for this research project in December 2013.

**Study 1:**

**Purpose**

The relationships between intrinsic motivation, integrated, identified, introjected, external regulations, and amotivation are determined to validate SDT as an appropriate framework to understand motivation in knowledge workers.

Research question “1 - Is a knowledge worker’s motivation related to their personality traits?” is answered using the following sample of knowledge worker participants and measures.

**Participants**

Participation was voluntary and were sourced through social media to complete an online survey, commencing in August 2014. Based on the 11 initial demographic questions, participants that could not be determined to be knowledge workers were eliminated from the data analysis. The participants in Study 1 comprised of 935 knowledge workers.

The largest professional groups of the sample comprised of Engineers (22%) and Project Managers (12%). Participants were working in a variety of industries, the largest groups from engineering (13%), ICT (13%), education and training (11%), and health care and medical (9%). Almost half of the participants worked at organisations with over 500 employees (49%), in large sized organisations (13%), in medium sized organisations of 16 - 200 employees (20%), in small organisations of 3 - 15 employees (11%), and in micro organisations of 1 or 2 employees (7%). The majority of participants were permanent
employees with their current employer (84%). Most participants worked full time or over 35 hours per week (82%).

The age group of the participants were under the age of 26 (2%), between the ages of 26 - 35 (31%), between the ages of 36 - 45 (29%), between the ages of 46 - 55 (25%), and participants were over 56 (13%). The majority of the participants were male (63%) and the remaining were female (37%). Participants were primarily university educated with a Bachelor degree as the highest level of education (41%) and with a Master degree as the highest level of education (38%). Almost half of the participants were professionals (45%), others were at management level (33%) or at executive level (7%). Many had direct reports (60%).

Measures

The Commitment Scale Items (Allen & Meyer, 1990) is a three component model of organisational commitment. 10 items in this scale were chosen to be used in this survey to measure affective, normative, and continuance organisational commitment. The calculated scores are based on the participant’s reactions ranging on a Likert-type scale ranging from 1 “Strongly disagree” to 5 “Strongly agree”. Half of the items are reverse scored. 2 of 5 affective commitment items were reverse scored, 1 of 2 continuance commitment items were reverse scored, and both normative commitment items were reverse scored.

The Intrinsic Motivation and Extrinsic measured against Achievement Goals scale (Dysvik & Kuvaas, 2013) is an 34-item scale based on achievement goal approach and the self determination theory. The seven subscales measure intrinsic motivation, work effort,
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master-approach goals, mastery-avoidance goals, performance-avoidance goals, performance-approach goals, and extrinsic motivation. The scores are based on the participants' ratings ranging on a Likert-type scale from 1 “Strongly disagree” to 5 “Strongly agree”.

The Mini-IPIP is a 20-item short form of the 50-item International Personality Item Pool, a Five-Factor Model measure (“Items in the Mini-IPIP,” n.d.). The short form version is a practical measure of the Big Five factors of personality (Donnellan, Oswald, Baird, & Lucas, 2006). The scale has 20 items assessing each of the dimensions of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. The calculated scores are based on the participant’s behaviours and reactions ranging on a Likert-type scale from 1 “Strongly disagree” to 5 “Strongly agree”. Half of the items are reverse scored.

The short form Need for Cognition Scale (Cacioppo & Petty, n.d.) is an 18-item measure of an individual’s tendency to engage in and enjoy cognitive endeavors. Half of the items on the scale are reverse scored. The scores are based on the rating for the statements ranging on Likert-type scale from 1 “Extremely uncharacteristic” to 5 “Extremely characteristic”.

The Work Extrinsic and Intrinsic Motivation Scale (WEIMS) is an 18-item measure of work motivation (Tremblay et al., 2009) based on the SDT (R. M. Ryan & Deci, 2000a). The WEIMS is divided between six three-item subscales and correspond to the six types of motivation. These are intrinsic motivation, integrated, identified, introjected, external regulations, and amotivation. The scores are based on the participant’s reactions ranging on a Likert-type scale from 1 “Does not correspond at all” to 5 “Corresponds exactly”. The
underlying level of self-determination was measured by the Work Self-Determination Index (W-SDI) using the following formula: $W-SDI = (+3 \times IM) + (+2 \times INTEG) + (+1 \times IDEN) + (-1 \times INTRO) + (-2 \times EST) + (-3 \times AMO)$.

The Work on Present Job Scale is a subset of the improved Job Descriptive Index (Balzer et al., 2000; Hanisch, n.d.; Weiten, 2010). This 18-item subset scale is used to measure satisfaction with work. Participants are asked to answer “Yes” if the item describes their current job, “No” if the item does not describe their current job, and “?” if they are unable to decide. Some of the items included are: fascinating, pleasant, challenging, and gives a sense of accomplishment.

Procedure

The participants were invited to participate in the online survey via a link through social media or email. The electronic link to the survey provided information about the study and consent was provided when the participant proceeded to the questions.

The survey started with 11 general questions to collect demographic information. The survey layout was designed to display each question individually and did not allow participants to “go back” to a previous question or skip questions. The intention of this design layout was to gather data based on the participants “first impression” to the questions and to reduce any potential errors in mis-aligning questions to answers given the large number of questions in each survey. Most surveys were completed within 15 minutes and are based on self-report.
Study 2:

Purpose

The purpose of Study 2 is to address research questions “2. How important is pay on the motivation of knowledge workers?” and “3. Does the motivation of knowledge workers differ significantly between age groups?”. The following sample of knowledge worker participants and measures were used.

Participants

The participants comprised of 630 knowledge workers in Study 2. Based on the 11 initial demographic questions, participants that could not be determined to be knowledge workers were eliminated from the data analysis. Participation was voluntary and were sourced through social media to complete an online survey, starting in October 2014.

The largest professional groups of the sample comprised of Engineers (21%) and Project Managers (12%). Participants were working in a variety of industries, the largest groups from engineering (11%), ICT (13%), education and training (10%), and health care and medical (9%). Almost half of the participants worked at organisations with over 500 employees (45%), in large sized organisations (14%), in medium sized organisations of 16 - 200 employees (23%), in small organisations of 3 - 15 employees (10%), and in micro organisations of 1 or 2 employees (8%). The majority of participants were permanent employees with their current employer (83%). Most participants worked full time or over 35 hours per week (80%).
The age group of the participants were under the age of 26 (2%), between the ages of 26 - 35 (25%), between the ages of 36 - 45 (29%), between the ages of 46 - 55 (25%), and participants over 56 (19%). The majority of the participants were male (60%) and the remaining were female (40%). Participants were primarily university educated with a Bachelor degree as the highest level of education (42%) and with a Master degree as the highest level of education (37%). Almost half of the participants were professionals (48%), others were at management level (33%) or at executive level (14%). Many had direct reports (59%).

Measures

The Work Values Questionnaire consists of 37 items (Hansen & Leuty, 2012). The items consist of both intrinsic and extrinsic factors. The participants are asked to what extent each work-related factor is important to them when looking for a job. The scores are based on the participant’s ratings ranging on a Likert-type scale from 1 “Unimportant” to 5 “Very important”.

Procedure

The participants were invited to participate in the online survey via a link through social media or email. The electronic link to the survey provided information about the study and consent was provided when the participant proceeded to the questions.

The survey started with 11 general questions to collect demographic information. The survey layout was designed to display each question individually and did not allow participants to “go back” to a previous question or skip questions. The intention of this
design layout was to gather data based on the participants “first impression” to the questions and to reduce any potential errors in mis-aligning questions to answers given the large number of questions in each survey. Most surveys were completed within 15 minutes and are based on self-report.

**Study 3:**

**Purpose**

The purpose of Study 3 is to answer research question “4 - Are feedback and goal setting effective methods to motivate knowledge workers?” using the sample of knowledge worker participants and measures.

**Participants**

Participation was voluntary and were sourced through social media, commencing in May 2015. Based on the 11 initial demographic questions, participants that could not be determined to be knowledge workers were eliminated from the data analysis. The participants in Study 3 comprised of 710 knowledge workers.

The largest professional groups of the sample comprised of Engineers (29%), Project Managers (13%), and Software Developers (9%). Participants were working in a variety of industries, the largest groups from engineering (12%), ICT (13%), education and training (9%), manufacturing, transport, and logistics (8%), and health care and medical (7%). Almost half of the participants worked at organisations with over 500 employees (47%), in large sized organisations (14%), in medium sized organisations of 16 - 200 employees (21%), in small organisations of 3 - 15 employees (11%), and in micro organisations of 1 or 2
employees (8%). The majority of participants were permanent employees with their current employer (83%). Most participants worked full time or over 35 hours per week (82%).

The age group of the participants were under the age of 26 (2%), between the ages of 26 - 35 (24%), between the ages of 36 - 45 (32%), between the ages of 46 - 55 (26%), and participants were over 56 (16%). The majority of the participants were male (64%) and the remaining were female (36%). Participants were primarily university educated with a Bachelor degree as the highest level of education (46%) and with a Master degree as the highest level of education (36%). Almost half of the participants were professionals (48%), others were at management level (33%) or at executive level (13%). Many had direct reports (62%).

Measures

The survey items were based on Kuvaas’ study (2007) on the relationship between development performance appraisal and self-reported work performance. The 36-items in the survey are based on scales such as Allen and Meyer’s Commitment Scale (1990) to measure affective commitment. Other factors in Kuvaas’ survey aims to measure goal setting, feedback, intrinsic motivation, autonomy orientation, and work performance. The scores are based on the participant’s ratings ranging on a Likert-type scale from 1 “Strongly disagree” to 5 “Strongly agree”.

The groups were split into two groups: Participants with direct reports or ‘Manager’ and participants without direct reports or ‘Staff’. 26-items were completed by all participants and measured intrinsic motivation, autonomy orientation, and work performance. The remaining 10-items to measure goal setting and feedback were worded to reflect whether the
Manager felt they were giving support to their Staff member (for the Manager’s survey) such as “My staff understand what is expected so they are able to contribute to organisational effectiveness” or whether the Staff member felt they were receiving support from their Manager (for the Staff’s survey) such as “My manager provides recognition when I perform well”.

Work and well-being was measured using Utrech’s 17-item work engagement scale “UWES-17” (Schaufeli & Bakker, 2003). The five and six-item subscales measure vigor, dedication, and absorption. The scores are based on the participant’s reactions ranging on a Likert-type scale from 1 “Never or Rarely (once a month or less)” to 5 “Always (every day)”.

Procedure

The participants were invited to participate in the online survey via a link through social media or email. The electronic link to the survey provided information about the study and consent was provided when the participant proceeded to the questions.

The survey started with 11 general questions to collect demographic information. The survey layout was designed to display each question individually and did not allow participants to “go back” to a previous question or skip questions. The intention of this design layout was gather data based on the participants “first impression” to the questions and to reduce any potential errors in mis-aligning questions to answers given the large number of questions in each survey. Most surveys were completed within 15 minutes and are based on self-report.
Chapter 4 - Results

Study 1:

Table 1 provides descriptive statistics and the types of motivation. The level of significance between the factors is also presented. The hypotheses were tested using statistical analysis (IBM SPSS Statistics version 23) and Structural Equation Modeling (AMOS version 23) to determine the relationship between intrinsic motivation, integrated regulation, identified regulation, introjected regulation, and external regulation.

**Hypothesis 1:** Intrinsic motivation and integrated regulation show a strong positive correlation, whereas the subscales at the opposite ends show the smallest correlations.

Hypothesis 1 was tested using two methods. In correlation analysis, all alphas are above 0.70, and all correlations between the types of motivation are significant at the p<0.01 level except between intrinsic motivation and amotivation. The effect size was large between intrinsic motivation and integrated relation, showing support for hypothesis 1. The effect size was larger between adjacent subscales, than at opposite ends.
Table 1

*Means, Standard Deviations, Alphas, Correlations between the types of motivation (N=935)*

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Alpha</th>
<th>Intrinsic Motivation</th>
<th>Integrated Regulation</th>
<th>Identified Regulation</th>
<th>Introjected Regulation</th>
<th>External Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Motivation</td>
<td>3.7390</td>
<td>.95913</td>
<td>0.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated Regulation</td>
<td>3.3758</td>
<td>1.07387</td>
<td>0.82</td>
<td>.599**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified Regulation</td>
<td>3.4592</td>
<td>1.00532</td>
<td>0.78</td>
<td>.602**</td>
<td>.666**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introjected Regulation</td>
<td>3.1219</td>
<td>1.05640</td>
<td>0.71</td>
<td>.519**</td>
<td>.556**</td>
<td>.555**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External Regulation</td>
<td>3.6178</td>
<td>.93068</td>
<td>0.75</td>
<td>.202**</td>
<td>.333**</td>
<td>.462**</td>
<td>.365**</td>
<td></td>
</tr>
<tr>
<td>Amotivation</td>
<td>1.8866</td>
<td>.97603</td>
<td>0.78</td>
<td>-.033</td>
<td>.090**</td>
<td>.088**</td>
<td>.265**</td>
<td>.094**</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).**
Tremblay’s (2009) six-factor structure of the WEIMS was used as the proposed structural equation model (SEM). Goodness of fit indices of the SEM was achieved in the model (GFI>0.96, AGFI>0.94, TLI>0.95, and CFI>0.96). Consistent to the correlation analysis, there was little relationship between intrinsic motivation and amotivation. As seen in Figure 1, support was obtained for hypothesis 1. Strong correlations were found between adjacent subscales, whereas the subscales at opposite ends showed the smallest correlations.
Figure 1. SEM of six-factor structure of WEIMS
Hypothesis 2: Intrinsic motivation leads to higher work satisfaction. Extrinsic motivation also leads to higher work satisfaction, however to a smaller degree.

Hypothesis 2 was tested using SEM, shown in Figure 2. Goodness of fit indices of the SEM was achieved in the model (GFI>0.99, AGFI>0.98, TLI>0.99, and CFI>0.99). Intrinsic motivation was positively associated with work satisfaction (beta = 0.69, p<0.001), whereas extrinsic motivation was negatively associated with work satisfaction (beta = -0.16, p<0.001).

Hypothesis 3: Need for cognition is positively correlated with intrinsic motivation.

Using SEM to test hypothesis 3, the need for cognition was found to be positively associated with intrinsic motivation (beta = 0.17, p<0.001). The need for cognition was found to be negatively associated with extrinsic motivation (beta = -0.43, p<0.001), shown in Figure 2.

Hypothesis 4: Intrinsic motivation is positively correlated with work effort. Extrinsic motivation is positively correlated to work effort.

The same SEM in Figure 2 was used to test hypothesis 4. Intrinsic motivation showed positive correlation to work effort (beta = 0.48, p<0.001), whereas there was a negligible positive association between extrinsic motivation and work effort.
Figure 2. Parametric estimates for the hypothesized pathways between intrinsic motivation, extrinsic motivation, job satisfaction, need for cognition, and work effort.
Table 2 provides descriptive statistics and correlations for work satisfaction, the five factors of personality, work motivation, and the three factors of work commitment. The level of significance between the factors is also presented. The hypotheses were tested using statistical analysis (IBM SPSS Statistics version 23) and Structural Equation Modeling (AMOS version 23) to determine the relationship between affective commitment, work motivation, work satisfaction, and personality.
Table 2
Means, Standard Deviations, Alphas, and Correlations for Work Satisfaction, Personality, Motivation, Commitment (N=935)

|                                | Mean  | SD    | Alpha | SFN | N   | E    | O    | A    | C    | MOT  | AC   | CC   |
|--------------------------------|-------|-------|-------|-----|-----|------|------|------|------|------|------|------|------|
| Work Satisfaction (SFN)        | 36.8877 | 11.1309 | 0.812 |     |     |      |      |      |      |      |      |      |      |
| Neuroticism (N)                | 2.2501  | 0.69699 | 0.647 | -.332** |   |      |      |      |      |      |      |      |      |
| Extraversion (E)               | 4.0083  | 0.62047 | 0.687 | .238** | .487** |   |      |      |      |      |      |      |      |
| Openness (O)                   | 3.5134  | 0.65444 | 0.223 | .125** | -.198** | .264** |   |      |      |      |      |      |      |
| Agreeableness (A)              | 3.8538  | 0.64768 | 0.573 | .210** | -.201** | .401** | .182** | 1    |      |      |      |      |      |
| Conscientiousness (C)          | 4.2658  | 0.56615 | 0.767 | .211** | -.448** | .633** | .147** | .422** |   |      |      |      |      |
| Work Motivation (MOT)          | 5.4103  | 5.51437 | 0.877 | .622** | -.406** | .236** | .185** | .234** | .239** |   |      |      |      |
| Affective Commitment (AC)      | 3.2659  | 0.87757 | 0.713 | .503** | -.169** | .179** | .061 | .132** | .138** | .477** |   |      |      |      |
| Continuance Commitment         | 3.2232  | 0.92220 | 0.379 | -.091** | .147** | -.049 | -.056 | -.021 | -.001 | -.145** | .061 |      |      |      |
| (CC)                           |        |       |       |      |     |      |      |      |      |      |      |      |      |
| Normative Commitment (NC)      | 2.8016  | 1.12683 | 0.543 | .189** | -.080*  | -.004 | -.004 | .037 | .016 | .184** | .307** | -.008 |      |

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Figure 3. Parametric estimates for the hypothesized pathways between work motivation, affective commitment, job satisfaction, and the agreeable personality trait.
Hypothesis 5: There is a correlation between personality traits and work satisfaction.

Hypothesis 5 was tested with correlation between each of the personality traits to work satisfaction were found to be significant at the p<0.01 level. The correlation between neuroticism and work satisfaction was negative. All other personality traits had a positive correlation to work satisfaction. Although there is a significant correlation between the personality traits to work satisfaction at the p<0.01 level, all show a weak relationship.

When evaluating the fit indices of the SEM with each of personality traits, goodness of fit could only be achieved when using the agreeableness personality factor (GFI>0.99, AGFI>0.95, TL1>0.94, and CFI>0.99), shown in Figure 3. The SEM model is consistent to the correlation analysis, however there is a weak direct relationship between agreeableness personality factor to work satisfaction.

Hypothesis 6: There is a correlation between personality traits and work motivation.

Correlation between each of the personality traits to work motivation were found to be significant at the p<0.01 level. Consistent to hypothesis 5, the correlation between neuroticism and work motivation was negative. All other personality traits had a positive correlation to work motivation. Though there is a significant correlation at the p<0.01 level between the personality traits to work motivation, all show a weak relationship.

When evaluating the fit indices of the SEM with each of personality traits, goodness of fit could only be achieved when using the agreeableness personality factor (GFI>0.99, AGFI>0.95, TL1>0.94, and CFI>0.99). In the SEM model shown in Figure 3, there was no direct relationship between the agreeableness personality factor to work motivation.
Hypothesis 7: Both motivation and commitment lead to greater work satisfaction.

The relationship between work motivation and satisfaction were strongly positively correlated, $r(933) = 0.62, p<0.01$. The relationship between affective commitment and work satisfaction was moderately positively correlated, $r(933) = 0.50, p<0.01$. Continuance commitment and normative commitment were both found to be significant at the $p<0.01$ level, however both have a weak relationship to work satisfaction.

The SEM was tested with each of the personality traits, however the agreeableness personality resulted with the best indices of fit for the structural model, shown in Figure 3. Work motivation was positively associated with satisfaction in all personality factor models (range from beta=0.48 to beta=0.50, $p<0.01$). Affective commitment was positively associated with work satisfaction in all personality factor models (beta=0.27, $p<0.01$).

Hypothesis 8: Motivation is an antecedent to organisational commitment.

Hypothesis 8 was tested using SEM, shown in Figure 3. It was hypothesized that motivation leads to commitment, however it was found through the SEM that commitment is the antecedent to motivation. Affective commitment was positively associated from affective commitment to work satisfaction (beta=0.48, $p<0.01$).

Study 2:

Hypothesis 9: Knowledge workers are more intrinsically motivated than by extrinsic incentives.

Hypothesis 9 was tested by calculating the mean of each of the 37 work values. The mean of the 37 work value items were ranked to determine which work values items were
most important to knowledge workers. Pay ranked 10 of 37, indicating that though intrinsic factors including stimulation, supervision, and relevance were the most important, pay and benefits were found to be very important and rated higher than other intrinsic factors. Hypothesis 9 was found to be partially true, as knowledge workers valued intrinsic factors were ranked both higher and lower than extrinsic incentives. Refer to the Table 3 on the subsequent page.
Table 3

*Rankings, Means, and Standard Deviations of 37 Work Value Items (N=630)*

<table>
<thead>
<tr>
<th>Rank</th>
<th>Work Value</th>
<th>Intrinsic (I) / Extrinsic (E) Factor</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stimulation</td>
<td>I</td>
<td>4.48</td>
<td>.726</td>
</tr>
<tr>
<td>2</td>
<td>Supervision</td>
<td>E</td>
<td>4.43</td>
<td>.782</td>
</tr>
<tr>
<td>3</td>
<td>Relevance</td>
<td>I</td>
<td>4.34</td>
<td>.760</td>
</tr>
<tr>
<td>4</td>
<td>Balance</td>
<td>I</td>
<td>4.27</td>
<td>.851</td>
</tr>
<tr>
<td>5</td>
<td>Growth</td>
<td>I</td>
<td>4.20</td>
<td>.858</td>
</tr>
<tr>
<td>6</td>
<td>Power</td>
<td>I</td>
<td>4.12</td>
<td>.861</td>
</tr>
<tr>
<td>7</td>
<td>Independence</td>
<td>I</td>
<td>4.12</td>
<td>.917</td>
</tr>
<tr>
<td>8</td>
<td>Intellect</td>
<td>I</td>
<td>4.11</td>
<td>.880</td>
</tr>
<tr>
<td>9</td>
<td>Benefits</td>
<td>E</td>
<td>4.00</td>
<td>.945</td>
</tr>
<tr>
<td>10</td>
<td>Pay</td>
<td>E</td>
<td>3.90</td>
<td>.927</td>
</tr>
<tr>
<td>11</td>
<td>Conditions</td>
<td>E</td>
<td>3.87</td>
<td>1.046</td>
</tr>
<tr>
<td>12</td>
<td>Safety</td>
<td>E</td>
<td>3.87</td>
<td>.977</td>
</tr>
<tr>
<td>13</td>
<td>Flexibility</td>
<td>E</td>
<td>3.87</td>
<td>1.043</td>
</tr>
<tr>
<td>14</td>
<td>Teamwork</td>
<td>E</td>
<td>3.85</td>
<td>.930</td>
</tr>
<tr>
<td>15</td>
<td>Location</td>
<td>E</td>
<td>3.84</td>
<td>.971</td>
</tr>
<tr>
<td>16</td>
<td>Security</td>
<td>E</td>
<td>3.84</td>
<td>1.083</td>
</tr>
<tr>
<td>17</td>
<td>Responsibility</td>
<td>I</td>
<td>3.83</td>
<td>.921</td>
</tr>
<tr>
<td>18</td>
<td>Variety</td>
<td>E</td>
<td>3.81</td>
<td>.969</td>
</tr>
<tr>
<td>19</td>
<td>Society</td>
<td>E</td>
<td>3.80</td>
<td>1.075</td>
</tr>
<tr>
<td>20</td>
<td>Clarity</td>
<td>I</td>
<td>3.75</td>
<td>1.112</td>
</tr>
<tr>
<td>21</td>
<td>Comfort</td>
<td>E</td>
<td>3.75</td>
<td>1.052</td>
</tr>
<tr>
<td>22</td>
<td>Teaching</td>
<td>E</td>
<td>3.75</td>
<td>1.036</td>
</tr>
<tr>
<td>23</td>
<td>Insurance</td>
<td>E</td>
<td>3.75</td>
<td>1.294</td>
</tr>
<tr>
<td>24</td>
<td>Organisational image</td>
<td>E</td>
<td>3.64</td>
<td>1.113</td>
</tr>
<tr>
<td>25</td>
<td>Recognition</td>
<td>E</td>
<td>3.63</td>
<td>1.074</td>
</tr>
<tr>
<td>26</td>
<td>Promotion</td>
<td>E</td>
<td>3.61</td>
<td>1.097</td>
</tr>
<tr>
<td>27</td>
<td>Equipment</td>
<td>E</td>
<td>3.60</td>
<td>1.092</td>
</tr>
<tr>
<td>28</td>
<td>Bonuses</td>
<td>E</td>
<td>3.53</td>
<td>1.175</td>
</tr>
<tr>
<td>29</td>
<td>Social interaction</td>
<td>E</td>
<td>3.30</td>
<td>1.153</td>
</tr>
<tr>
<td>30</td>
<td>Regularity</td>
<td>E</td>
<td>3.25</td>
<td>1.173</td>
</tr>
<tr>
<td>31</td>
<td>Tranquility</td>
<td>E</td>
<td>3.05</td>
<td>1.217</td>
</tr>
<tr>
<td>32</td>
<td>Status</td>
<td>I</td>
<td>2.99</td>
<td>1.207</td>
</tr>
<tr>
<td>33</td>
<td>Perks</td>
<td>E</td>
<td>2.94</td>
<td>1.249</td>
</tr>
<tr>
<td>34</td>
<td>Competition</td>
<td>I</td>
<td>2.86</td>
<td>1.359</td>
</tr>
<tr>
<td>35</td>
<td>Simplicity</td>
<td>I</td>
<td>2.57</td>
<td>1.290</td>
</tr>
<tr>
<td>36</td>
<td>Visibility</td>
<td>I</td>
<td>2.49</td>
<td>1.305</td>
</tr>
<tr>
<td>37</td>
<td>Effortlessness</td>
<td>I</td>
<td>2.18</td>
<td>1.235</td>
</tr>
</tbody>
</table>
Hypothesis 10: Pay is less important in older knowledge workers than younger workers.

Hypothesis 10 was tested using a one-way between participants ANOVA to compare the value of pay on the different age groups. There was a significant effect of the value of pay at the p<0.05 level at the different age groups [F(4,630)=4.92, p=0.001]. Post hoc analyses were conducted given the statistically significant ANOVA F test. Specifically, the Games-Howell tests were conducted on all possible pairwise contrasts. The following pairs of groups were found to be significantly different (p<0.05): The group age over 56 (M=3.65, SD=0.944) differed significantly from age group 26-35 (M=4.05, SD=0.949) and 36-45 (M=4.03, SD=0.847) on their attitudes towards pay. In other words, pay is more important to knowledge workers from ages 26-45 than beyond age 46. Hypothesis 10 was found to be true, as pay becomes less important at older age groups. Refer to Figure 4, which shows the distribution of data from the study.
Figure 4. Distribution of the Value of Pay versus Age Group in Knowledge Workers

(N=630)
Hypothesis 11: Pay is more important to employees in larger organisations than smaller organisations.

Hypothesis 11 was tested using a one-way between participants ANOVA to compare the value of pay on the size of organisations. There was a significant effect of the value of pay at the p<0.05 level at the different organisational sizes \[F(4,630)=8.48, p=0.001\]. Post hoc analyses were conducted given the statistically significant ANOVA F test. Specifically, the Games-Howell tests were conducted on all possible pairwise contrasts. The following pairs of groups were found to be significantly different (p<0.05): The medium sized (16-200) organisation (M=3.70, SD=0.958) differed significantly from large sized (200-500) organisations (M=4.06, SD=0.849) and enterprise (500+) organisations (M=4.05, SD=0.867) on their attitudes towards pay. In other words, pay is more important to knowledge workers who work in larger organisations. Refer to Figure 5, which shows the distribution of data from the study.
Figure 5. Distribution of Value of Pay versus Size of Organisation in Knowledge Workers

(N=630)
Hypothesis 12: Pay is more important to employees at higher positions than lower positions.

Hypothesis 12 was tested using a one-way between participants ANOVA to compare the value of pay on the different position levels. There was a significant effect of the value of pay at the \( p<0.05 \) level at the different position levels \( [F(4,630)=5.595, p=0.001] \). Post hoc analyses were conducted given the statistically significant ANOVA F test. Specifically, the Games-Howell tests were conducted on all possible pairwise contrasts. The following pairs of groups were found to be significantly different \( (p<0.05) \): The Management group (\( M=4.08, SD=0.860 \)) differed significantly from the Professional / Specialist group (\( M=3.86, SD=0.975 \)), Executive group (\( M=3.79, SD=0.772 \)), and Other group (\( M=3.50, SD=1.059 \)) on their attitudes towards pay. In other words, pay is more important to knowledge workers who are managers than at any other level. Refer to Figure 6, which shows the distribution of data from the study.
Figure 6. Distribution of Value of Pay versus Position Levels in Knowledge Workers

(N=630)
Hypothesis 13: Pay is more important to managers than employees.

Hypothesis 13 was tested using a t-test to compare the value of pay for managers with direct reports and employees. There was a significant difference for the value of pay for managers with direct reports (M=3.98, SD=0.88) and employees (M=3.78, SD=0.98); t(630)=2.75, p=0.006. Refer to Figure 7, which shows the distribution of data from the study.
Figure 7. Distribution of the Value of Pay versus Position Type in Knowledge Workers

(N=630)
Other demographics that were collected such as gender and level of education showed insignificant effect on the value of pay.

**Hypothesis 14: Both intrinsic and extrinsic work values impact a knowledge worker’s pay satisfaction.**

Hypothesis 14 was tested with correlations analysis to determine which work values have the largest effect size to pay. I expected that other work values will have an impact on a knowledge worker’s value of pay. The most significant factors with medium or higher effect sizes are shown in Table 4:
Table 4

*Ranking of Work Values by Effect Size to Pay (N=630)*

<table>
<thead>
<tr>
<th>Work Value</th>
<th>Intrinsic (I) / Extrinsic (E)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonuses</td>
<td>E</td>
<td>0.479</td>
</tr>
<tr>
<td>Promotion</td>
<td>E</td>
<td>0.416</td>
</tr>
<tr>
<td>Organisational image</td>
<td>E</td>
<td>0.399</td>
</tr>
<tr>
<td>Perks</td>
<td>E</td>
<td>0.386</td>
</tr>
<tr>
<td>Recognition</td>
<td>E</td>
<td>0.382</td>
</tr>
<tr>
<td>Insurance</td>
<td>E</td>
<td>0.366</td>
</tr>
<tr>
<td>Equipment</td>
<td>E</td>
<td>0.334</td>
</tr>
<tr>
<td>Conditions</td>
<td>E</td>
<td>0.330</td>
</tr>
<tr>
<td>Location</td>
<td>E</td>
<td>0.328</td>
</tr>
<tr>
<td>Clarity</td>
<td>I</td>
<td>0.320</td>
</tr>
<tr>
<td>Security</td>
<td>E</td>
<td>0.320</td>
</tr>
<tr>
<td>Benefits</td>
<td>E</td>
<td>0.311</td>
</tr>
<tr>
<td>Comfort</td>
<td>E</td>
<td>0.305</td>
</tr>
</tbody>
</table>
**Hypothesis 15: Overall work motivation is higher in older knowledge workers than younger workers.**

Hypothesis 15 was tested using a one-way ANOVA between participants to compare the overall work motivation of the various age groups. There was a significant effect of motivation levels at the \( p<0.05 \) level at the different age groups \([F(4,935)=25.40, \ p=0.001]\). Post hoc analyses were conducted given the statistically significant ANOVA F test. Specifically, the Games-Howell tests were conducted on all possible pairwise contrasts. The following pairs of groups were found to be significantly different \((p<0.05)\): The age group 26-35 (M=3.28, SD=5.45) differed significantly from groups age 36-45 (M=5.39, SD=5.29), age 46-55 (M=6.42, SD=4.95), and ages over 56 (M=8.62, SD=5.21) on work motivation. In other words, the hypothesis was found to be true as overall work motivation in knowledge workers is higher in older workers. Refer to Figure 8, which shows the distribution of data from the study.
Figure 8. Distribution of Overall Motivation versus Age Group in Knowledge Workers (N=935)
Hypothesis 16: Intrinsic work motivation is higher in older knowledge workers than younger workers.

Hypothesis 16 was found to be false. A one-way ANOVA between participants was used to compare intrinsic work motivation at the different age groups. The data analysis shows an insignificant effect of intrinsic motivation levels at the p<0.05 level at different age groups \[F(4,935)=2.032, p=0.088\].

Hypothesis 17: Extrinsic work motivation is higher in younger knowledge workers than older workers.

Hypothesis 17 was tested using a one-way ANOVA between participants to examine the effects of extrinsic motivation at the various age groups. There was a significant effect of extrinsic motivation levels at the p<0.05 level at different age groups \[F(4,630)=17.43, p=0.001\]. The age group 36-45 (M=2.94, SD=1.06) differed significantly from groups age 46-55 (M=2.52, SD=0.93) and ages over 56 (M=2.33, SD=0.98) on extrinsic motivation. In other words, extrinsic motivation in knowledge workers is important earlier on in the career. Extrinsic motivation becomes less important in knowledge workers in the age range 46-55 and older than at younger age groups. Refer to Figure 9, which shows the distribution of data from the study.
Hypothesis 18: Overall work satisfaction is higher in older knowledge workers than younger workers.

Hypothesis 18 was tested using a one-way ANOVA between participants to examine the overall work satisfaction at the various age groups. A test of homogeneity of variances was found to be violated when testing for the overall work satisfaction between the various age groups. The hypothesis was therefore found to be false.
Hypothesis 19: Perceived work effort is higher in older knowledge workers than younger knowledge workers.

Hypothesis 19 was tested using a one-way ANOVA between participants to compare their perceived work effort. There was an insignificant effect of perceived work effort at the p<0.05 level at the different age groups [F(4,630)=2.06, p=0.085]. The hypothesis was therefore found to be false.

Hypothesis 20: Need for Cognition is greater for younger knowledge workers than older knowledge workers.

A one-way ANOVA between participants was used to compare need for cognition at the different age groups to test hypothesis 20. There was a significant effect of need for cognition at the p<0.05 level at the different age groups [F(4,630)=15.88, p=0.001]. Post hoc analyses were conducted given the statistically significant ANOVA F test. Specifically, the Games-Howell tests were conducted on all possible pairwise contrasts. The following pairs of groups were found to be significantly different (p<0.05): The age group 26-35 (M=3.53, SD=0.58) differed significantly from groups age 36-45 (M=3.70, SD=0.59), age 46-55 (M=3.90, SD=0.61), and ages over 56 (M=4.04, SD=0.51) on the need for cognition. In other words, older knowledge workers have a higher need for cognition than younger knowledge workers. Refer to Figure 10, which shows the distribution of data from the study.
Figure 10. Distribution of Need for Cognition versus Age Group in Knowledge Workers (N=630)
Hypothesis 21: Work-related values vary at different age groups.

Fifteen of the highest ranking work-related values were evaluated. One-way ANOVA between participants was used to compare the work-related values at the different age groups to test hypothesis 21. The results were as follows, shown in Table 5:
<table>
<thead>
<tr>
<th>#</th>
<th>Work Value</th>
<th>Significantly Different</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stimulation</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>2</td>
<td>Supervision</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>3</td>
<td>Relevance</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>4</td>
<td>Balance</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>5</td>
<td>Growth</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>6</td>
<td>Power</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>7</td>
<td>Independence</td>
<td>Yes</td>
<td>There was a significant effect of independence at the p&lt;0.05 level at the different age groups [F(4,625)=2.66, p=0.032].</td>
</tr>
<tr>
<td>8</td>
<td>Intellect</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>9</td>
<td>Benefits</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>10</td>
<td>Pay</td>
<td>Yes</td>
<td>There was a significant effect of the value of pay at the p&lt;0.05 level at the different age groups [F(4,625)=4.92, p=0.001]. Discussed further in hypothesis 10.</td>
</tr>
<tr>
<td>11</td>
<td>Conditions</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>12</td>
<td>Safety</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>13</td>
<td>Flexibility</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>14</td>
<td>Location</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
<tr>
<td>15</td>
<td>Teamwork</td>
<td>No</td>
<td>There was no significant effect at the different age groups.</td>
</tr>
</tbody>
</table>
Post hoc analyses were conducted given the statistically significant ANOVA F test. Specifically, the Games-Howell tests were conducted on all possible pairwise contrasts. The following pairs of groups were found to be significantly different (p<0.05): The age group 26-35 (M=3.92, SD=1.01) differed significantly from group over 56 (M=4.24, SD=0.82) on the work value independence. Refer to Figure 11, which shows the distribution of data from the study.
Figure 11. Distribution of Independence versus Age Group in Knowledge Workers (N=630)
Study 3:

**Hypothesis 22: There is a positive correlation between goal setting and work engagement.**

Hypothesis 22 was tested with correlation between goal setting to each of the factors measured in work engagement: vigor, dedication, and absorption. In the managers’ group, these correlations were found to be significant at the p<0.01 level, with dedication having the largest effect size (0.519), followed by vigor (0.478), and absorption (0.387).

When the employee’s group was assessed, these correlations were found to be significant at the p<0.01 level as well, however with a smaller effect size as follows: dedication (0.330), vigor (0.386), and absorption (0.295).
Figure 12. Parametric estimates for the hypothesized pathways between intrinsic motivation, affective commitment, feedback, goal setting, work engagement and work performance for Managers.
Figure 13. Parametric estimates for the hypothesized pathways between intrinsic motivation, affective commitment, feedback, goal setting, work engagement and work performance for Employees.
When evaluating the fit indices of the structural equation model (SEM) with the managers group (managers with direct reports), goodness of fit was achieved (GFI>0.99, AGFI>0.98, TL1>0.99, and CFI>0.99). The SEM model is shown in Figure 12.

Similarly, evaluating the fit indices of the SEM with the employees group, goodness of fit was achieved (GFI>0.99, AGFI>0.97, TL1>0.99, and CFI>0.99). The SEM model is shown in Figure 13.

**Hypothesis 23:** There is a positive correlation between goal setting and work performance.

Hypothesis 23 was tested with correlation between goal setting and work performance. In the managers’ group, the correlation was found to be significant at the p<0.01 level, with a high effect size (0.509). In the employees’ group, the correlations were found to be significant at the p<0.01 level, with a medium effect size (0.295).

Goodness of fit was achieved in both managers and employees groups, shown in Figure 12 and Figure 13.

**Hypothesis 24:** Feedback is a moderating factor from intrinsic motivation to work engagement.

Hypothesis 24 was tested using SEM, shown in Figure 12 and Figure 13. It was hypothesized that feedback is a moderating factor to work engagement, however there was no direct relationship found in either the managers group or the employee group. In other words, receiving feedback (employees group) or providing feedback (managers group) did not have an effect on work engagement.
Hypothesis 25: Goal setting is a moderating/mediating factor from intrinsic motivation to work performance.

Hypothesis 25 was tested using SEM, shown in Figure 12 and Figure 13. It was hypothesized that goal setting is a moderating / mediating factor to work performance. Both the managers group and employees group models achieved goodness of fit and goal setting was found to be mediating factor between intrinsic motivation and work performance.

However, in comparing the magnitude of parametric estimates between the managers group and employees group models, it was found that the managers group resulted in significantly larger parametric estimates (0.58 from goal setting to work engagement and 0.28 from goal setting to work performance) than the employees group (0.03 from goal setting to work engagement and 0.06 from goal setting to work performance). In other words, setting goals had a negligible impact on employees attitudes towards work engagement or performance. The manager group shows the belief that goal setting can make a sizable impact on their employees work engagement and performance.

Hypothesis 8: Motivation is an antecedent to organisational commitment.

Hypothesis 8 was tested using SEM. Consistent to the findings in Study 1, affective commitment was found to be an antecedent to intrinsic motivation, shown in Figure 12 and Figure 13.
Chapter 5 - Discussion

Each of the traditional motivation theories aims to understand the underlying processes the individual employee's behaviour in their work, however on the view as "separate agents" (Ellemers, De Gilder & Haslam, 2004). That is, the theory and research was focused on the individual's needs, their goals and expectations, or personal outcomes. In a knowledge environment in the modern workplace, an increasing proportion of workers work in a team setting to reach a collective goal or outcome. The traditional motivation theories do not take into account the significant role that group and team dynamics play in how individuals behave in the workplace, independent of their own individual motivation. Therefore, new theoretical frameworks must account for group dynamics in explaining motivation in the contemporary workplace (Ellemers, De Gilder & Haslam, 2004).

Further, the traditional motivation theories are based on the assumption that humans will consistently make rational decisions. Based on executed social experiments, Dan Ariely demonstrated that this is not usually the case in human nature. Ariely’s research shows that irrational behaviour is neither random, nor senseless, and can be systematically repeatable (Ariely, 2009). The study of behavioural economics is a relatively new field and draws upon psychology and economics to explain human behaviour, and 'irrational behaviour' needs to be included in new theoretical frameworks (Ariely, 2009).

Though seven traditional motivation theories have limited empirical data to support their effectiveness in today’s workplace, these topics are still commonly found in
recent editions of management and organisational behaviour textbooks, business trade journals, and in the popular press.

Summary of Hypotheses

A Summary of Hypotheses is attached on the subsequent pages:
Table 6

Summary of Hypotheses

<table>
<thead>
<tr>
<th>Number</th>
<th>Hypothesis</th>
<th>Hypothesis Supported</th>
<th>Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intrinsic motivation and integrated regulation show a strong positive correlation, whereas the subscales at the opposite ends show the smallest correlations.</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Intrinsic motivation leads to higher work satisfaction. Extrinsic motivation also leads to higher work satisfaction, however to a smaller degree.</td>
<td>Intrinsic motivation = Yes</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extrinsic motivation = No</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Need for cognition is positively correlated with intrinsic motivation.</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Intrinsic motivation is positively correlated with work effort. Extrinsic motivation is positively correlated to work effort.</td>
<td>Intrinsic motivation = Yes</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extrinsic motivation = No</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>There is a correlation between personality traits and work satisfaction.</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>There is a correlation between personality traits and work motivation.</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Both motivation and commitment lead to greater work satisfaction.</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Motivation is an antecedent to organisational commitment.</td>
<td>No</td>
<td>1, 3</td>
</tr>
<tr>
<td>9</td>
<td>Knowledge workers are more intrinsically motivated than by extrinsic incentives.</td>
<td>Partial</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Pay is less important in older knowledge workers than younger workers.</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Pay is more important to employees in larger organisations than smaller organisations.</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Pay is more important to employees at higher positions than lower positions.</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Pay is more important to managers than employees.</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Both intrinsic and extrinsic work values impact a knowledge worker’s pay satisfaction.</td>
<td>Yes, however most are extrinsic</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>values.</td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>Hypothesis</td>
<td>Hypothesis Supported</td>
<td>Study</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>-------</td>
</tr>
<tr>
<td>15</td>
<td>Overall work motivation is higher in older knowledge workers than younger</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>workers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Intrinsic work motivation is higher in older knowledge workers than younger</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>workers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Extrinsic work motivation is higher in younger knowledge workers than older</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>workers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Overall work satisfaction is higher in older knowledge workers than younger</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>workers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Perceived work effort is higher in older knowledge workers than younger</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>knowledge workers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Need for Cognition is greater for younger knowledge workers than older</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>knowledge workers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Work-related values vary at different age groups.</td>
<td>No, except for the work</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>values &quot;Independence&quot; and &quot;Pay&quot;.</td>
<td>values &quot;Independence&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>and &quot;Pay&quot;.</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>There is a positive correlation between goal setting and work engagement.</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(Manager's perception = Yes Employee's perception = Negligible)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>There is a positive correlation between goal setting and work performance.</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(Manager's perception = Yes Employee's perception = Negligible)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Feedback is a moderating factor from intrinsic motivation to work</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>engagement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Goal setting is a moderating/mediating factor from intrinsic motivation to</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>work performance.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Study 1:

Knowledge workers are a growing segment of the workforce and are motivated differently than previous generations. In this study, the findings add to the existing motivation research in SDT framework by demonstrating that the results of the SEM based on data collected from knowledge workers participants aligns similarly to previous studies.

Two methods, both correlation analysis and SEM was used to show support of hypothesis 1. A greater effect size of correlation was observed between the self-determined types of motivation: intrinsic motivation, integrated and identified regulation; than with non self-determined types of motivation. As expected, amotivation had the smallest effect size to the self-determined types of motivation. Intrinsic and extrinsic motivation was viewed at opposite ends of the motivation scale, however in the SEM, the regression weight coefficient suggests that there is a small influence.

Goodness of fit indices of the SEM was achieved in the proposed model and showed that intrinsic motivation leads to greater job satisfaction in knowledge workers, showing support for the first part of hypothesis 2. Extrinsic motivation was expected to lead to a higher work satisfaction, however this hypothesis was found to be false. The SEM shows that extrinsic motivation had a negative impact on the work satisfaction of knowledge workers.

For hypothesis 3, the need for cognition was assessed as a key job trait of knowledge workers. The need for cognition was found to be positively correlated to intrinsic motivation, indicating that challenging tasks such as problem solving or innovative design would have a positive impact on intrinsic motivation and work satisfaction.
It was expected both intrinsic and extrinsic motivation lead to greater work effort. Hypothesis 4 was found to be partially supported. The SEM indicated that intrinsic motivation results in greater work effort, however extrinsic motivation has a negligible impact on work effort on knowledge workers.

The next area of study addresses the Research Question “1 - Is a knowledge worker’s motivation related to their personality traits?”. Two methods were used to assess the relationship between each of the Big Five personality traits to work satisfaction. Correlation between neuroticism and work satisfaction was found to be negative. The other traits showed a weak, but positive correlation between extraversion, openness to experience, agreeableness, and conscientiousness and work satisfaction. With further analysis through SEM, agreeableness was the only personality trait that achieved goodness of fit. The scale of this relationship however was shown to be weak and almost negligible. Therefore, hypothesis 5 is rejected and suggesting that there is very little impact of personality on work satisfaction.

The same analysis was used to test hypothesis 6. Correlation between neuroticism and work motivation was found to be negative. All other personality traits showed a weak, but positive correlation to work motivation. With further analysis through SEM, goodness of fit could only be achieved with the personality trait agreeableness, however there was no direct path between agreeableness to motivation. Hypothesis 6 is therefore rejected and the findings indicate there is no direct relationship on personality to work motivation in knowledge workers. In the SEM, the personality trait agreeableness leads to greater job satisfaction if the individual was motivated and committed to their organisation.
Correlation analysis showed that both work motivation and affective commitment satisfaction were strongly correlated. Within the three components of commitment, affective commitment or the individual’s identification with their organisation, has the largest impact on the work satisfaction of knowledge workers. The SEM also confirmed support for hypothesis 7.

It was hypothesised that motivation was an antecedent to organisation commitment, that is that highly motivated knowledge workers would be more committed to the organisations where they were employed. Hypothesis 8 was found to be false. The SEM demonstrates that affective commitment is actually the antecedent to motivation; or in other words, the stronger an individual identifies to the organisation where they work, the more motivated they will be to contribute.

This study adds to the body of research on the role of personality on motivation, work satisfaction, and work performance. During the recruitment process at many organisations, psychometric testing is administered to assess a candidate’s personality in order to predict how well they would perform in their job role and fit into the organisation’s culture. Unlike other studies, the participants sampled in this study were knowledge workers.

Study 2:

Few academic studies previously had focused on motivating employees with pay. Published articles have generally undervalued pay as a motivator, as it was believed that pay hinders creativity and has a negative effect on intrinsic motivation (Herzberg et al., 2011). This study adds to the research on the effect of pay on motivation for knowledge workers and
addresses Research Question “2 - How important is pay on the motivation of knowledge workers?”.  

Hypothesis 9 was found to be partially supported. The extrinsic incentives pay and benefits both ranked high on the list of important work values, but lower than those intrinsic work values of stimulation, relevance, balance, growth, independence, and intellect. These characteristics are consistent with the nature of knowledge work, where employees must apply theoretical and analytical knowledge to develop new products, services, and solve complex problems.  

Younger and mid-level knowledge workers rated the value of pay higher than workers older than 46 years, thus showing support for Hypothesis 10. Due to the length of time in formal academic training often requiring expensive post-secondary education, younger knowledge workers may need to pay off their student loans and thus prioritising pay. Through the start and through mid-level age range, the knowledge worker would likely be setting up or sustaining their lifestyle which may include home ownership, starting a family, furthering education, or pursuing world travels. All would require money and therefore, pay would be an important work value.  

Support was shown in Hypothesis 11 indicating that pay is a more important work value to knowledge workers who choose to work in larger organisations. In startup organisations with limited employees and budget, knowledge workers are usually recruited based on intrinsic incentives such as working as part of team on innovative projects, is relevant to their interests and intellectual capability, and offers area of personal growth. In large organisations, competition and social comparisons are more likely to occur between
employees, and pay is an easy measurable work value. Workers who perceived their pay was not fair in comparison to others or did not reflect their effort may lower their performance (Greenberg, 1982; Stringer et al., 2011).

Using the age ranges collected in this study, how motivation changes of knowledge workers is examined at different life stages, stated in Research Question “3 - Does the motivation of knowledge workers differ significantly between age groups?” With the aging workforce, change of generational demographics, and the prevalence of working in a team environment, more research and empirical data is needed to support new conceptual frameworks that reflect the current workplace.

In terms of position levels, Managers valued pay more than at any other level. This result shows partial support of Hypothesis 12. Perhaps knowledge workers at the Manager level are expected to be compensated for both their technical competence and the additional administrative duties that comprise the role. Hypothesis 13 was also found to be supported where managers with direct reports rated value of pay higher than employees without supervision duties.

It is interesting to note that other extrinsic incentives such as recognition, promotion, bonuses, status, and perks ranked with lower importance in the list of work values when testing Hypothesis 14. When further analysis was performed to test for Hypothesis 14, all of these work values had medium or high effect size on pay. This result can be interpreted to mean that these work values hold a direct relationship to pay and cannot be discounted when compensation systems are designed.
Previous studies showed mixed results on the relationship between motivation and age. Unique from other previous studies, the participants in this study were limited to knowledge workers. Hypothesis 15 was supported indicating that overall motivation increases with age. When intrinsic work motivation data was analysed for hypothesis 16, there were no significant differences between age groups. Further study would be required to determine whether the findings could be attributed to the management level of the role or individual differences, rather than due to age range.

In Hypothesis 17, extrinsic motivation in knowledge workers was shown to be more important at the younger age ranges. This is consistent to Inceoglu’s (2012) study where job features and extrinsically rewarding outcomes that required greater personal resources were found to be less motivating to older workers.

Hypothesis 18 was not supported showing no overall work satisfaction differences between the age groups. This is in contrast to previous studies on generational differences on job satisfaction. Perhaps the nature of the job roles of a knowledge worker such as completing a project or treating a patient are satisfying regardless of age.

Hypothesis 19 was also not supported suggesting that perceived work effort was similar at the different age groups. In previous studies, it was shown that older workers have less motivation to learn and pursue career development opportunities (Ng & Feldman, 2012). This was not in line with the findings of this study, as there was no increased perceived work effort at older ages. It is possible however that older inexperienced workers may have more difficulty and require more work effort to perform at acceptable standards in comparison to younger workers (Waldman & Avolio, 1986), however this is outside the scope of this study.
Hypothesis 20 was not supported, however the data shows that the need for cognition is higher in older knowledge workers. Older knowledge workers were already in the workforce approximately 20 years ago when the widespread use of technology started to be used in the modern workplace. These older workers needed to learn new skills and systems to enable them to continue to work and contribute to a team environment with younger workers competent in technology.

When evaluated at the age groups, hypothesis 21 was not supported with the exception of two of the work-related values, independence and pay. There were no significant differences between the age groups for the remaining work-related values. Consistent to hypothesis 10, the extrinsic motivator pay and was shown to less important with older knowledge workers.

Study 3:

This study adds to the body of research on the effectiveness of goal setting on employee motivation and performance and was developed to answer Research Question “4 - Are feedback and goal setting effective methods to motivate knowledge workers?” Human Resources professionals have widely implemented performance appraisal systems based on providing feedback and goal setting, however this traditional methodology may have a detrimental effect on the performance of knowledge workers. Organisational consultants have recently focused on the construct of employee engagement as a measurement for comparison, however there has been little research on how employee engagement is related to motivation and work performance.

There was a positive relationship between goal setting to work engagement, showing
preliminary support for hypothesis 22 when using correlation analysis. The managers’ group had a larger perceived effect size on the exercise of setting goals and its impact on their knowledge worker’s engagement than the employees’ group. Further investigation through SEM shows a more significant finding, showing that goal setting has a negligible impact on work engagement overall. Managers expect that setting goals for and with knowledge worker employees will result in higher engagement, however these expectations are unwarranted. Based on the data collected by the knowledge worker participants, hypothesis 22 is unsupported.

Similarly, there is preliminary support for hypothesis 23 when using correlation analysis showing a positive relationship between goal setting and work performance. The manager’s group had a large perceived effect size on the role of goal setting and its impact on the knowledge worker’s work performance, than what was scored by the employees group. Further investigation through SEM shows that managers expect that goal setting will have a positive impact on work performance. In the employees’ group, the result is negligible, indicating the goal setting has little impact on work performance. Therefore, hypothesis 23 is also unsupported.

Based on widely used performance appraisal systems, I would expect that receiving feedback on work performance would result with higher work engagement and improved performance. In hypothesis 24, feedback as a moderating factor between intrinsic motivation to work engagement was assessed through SEM. As expected, a direct positive relationship was found between intrinsic motivation to engagement, indicating that employees who enjoyed their work tasks and job role approached work with dedication, absorption, and vigor. Receiving feedback however was found to have no impact on engagement or on work
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performance. Therefore, hypothesis 24 is unsupported.

Hypothesis 25 explored the role of goal setting on intrinsic motivation and work performance. It was expected that goal setting was a mediating factor and a meaningful tool to use to improve employees work performance. The relationship between these factors were evaluated with SEM. As expected, there was a positive relationship between intrinsic motivation and work performance. Goal setting as a mediating factor between intrinsic motivation and work performance was unfounded, and therefore the hypothesis 25 is unsupported.

The relationship between affective commitment as an antecedent to intrinsic motivation was re-confirmed and is consistent with the findings in Study 1. Hypothesis 8 was supported.

**Strengths and Limitations**

**Study 1:**

The participants in the study were comprised of 935 knowledge workers, distributed across professions and industries. As the sample collected is greater than 623 respondents, it is representative of the population size (margin of error=0.05) (Barlett, Kotrlik, & Higgins, 2001) and the findings can be generalised to the Australian population of knowledge workers. All participants were sourced voluntarily through social media. As the study was not tied to any incentives, academic or workplace requirements, it is expected that the participants would be honest in their responses and commentary.
The data collected relied on self-report scales for measurement of the input variables (need for cognition), motivation subscales, and the output variable (work satisfaction). This method may be viewed as a potential limitation due to the subjective nature of measurement, however other methods are not necessarily superior as these constructs are experiential (Conway & Lance, 2010). The construct validity of the self-report scales used have also confirmed on previous studies, so the limitation is minimal.

A two-step statistical approach was used to analyse the data collected. Both correlation analysis and SEM proved consistent to the SDT framework, which indicates that any self-report bias is not a major concern in the study. Goodness of fit was obtained in the hypothesised models.

The output variable, work satisfaction, was used for the statistical analysis and modeling. Though the role of personality traits on work performance has been the subject of previous studies, this is outside the scope of this study. The association of personality traits to work performance through motivation in knowledge workers would be a worthwhile future research topic. It was also acknowledged that personality traits can broadly influence occupational interests and choices (Ozer & Benet-Martínez, 2006) or while working
collaboratively on a project team, however these considerations are also outside the scope of this study.

A two-step statistical approach was used to analyse the data collected. Correlation analysis and SEM showed consistent weak relationship between both work motivation and satisfaction. Goodness of fit was only achieved with the personality trait agreeableness. The 20-item short form mini-IPIP was used to categorise the five personality traits may not sufficient to definitively confirm the relationship between personality and motivation. I suggest that a larger subset of questions from the IPIP be chosen based on more relevant characteristics that would exist at the workplace be used in a future study.

Study 2:

Two datasets were taken in this study. The participants in the first dataset comprised of 935 knowledge workers, distributed across professions, industries, ages, and various sizes of organisation. The first dataset was used to gather data on motivation sub-classes and work satisfaction. There were 630 knowledge worker participants in the second dataset. The second dataset was used to collect ratings to work-related values, perceived work effort, and need for cognition. The samples collected in both datasets are greater than 623 respondents, and therefore are representative of the population size (margin of error=0.05) (Barlett et al., 2001) and the findings can be generalised to the Australian population of knowledge workers. All participants were sourced voluntarily through social media. As the study was not tied to any incentives, academic or workplace requirements, it is expected that the participants would be honest in their responses and commentary.
The data collected relied on self-report to the Work Values Questionnaire. A brief definition was provided for each of the 37 work values to reduce misinterpretation of the terms used. Descriptive statistic methods were used to compare data between demographic groups. Further statistical techniques including t-test, ANOVA and correlation analysis were used as appropriate to test for the hypotheses.

The data collected was based on a cross-sectional design and compares the groups based on age range. In both academic research and popular press, it is often suggested that there are generational differences. In this study, the age ranges collected range within a decade, rather than the defined generational cohorts (i.e. Baby Boomers, Generation X, the Millennials, etc). In future studies, the age or year of birth collected as a nominal number.

The data collected relied on self-report. A brief definition was provided for each of the 37 work-related values in the Work Values Questionnaire to reduce misinterpretation of the terms used. Descriptive statistic methods were used to compare data between demographic groups. Further statistical techniques including t-test, ANOVA and correlation analysis were used as appropriate to test for the hypotheses. For a more comprehensive study, a longitudinal design would be more appropriate to study the changes in motivation as an individual progresses through their career.

For assessing the value of pay, nominal employee wages and full compensation packages were not measured. The study is therefore limited to the individual’s perceived value of pay compares to other work-related values.
Study 3:

The participants in the study were comprised of 710 knowledge workers, distributed across professions and industries. As the sample collected is greater than 623 respondents, it is representative of the population size (margin of error=0.05) (Barlett et al., 2001) and the findings can be generalised to the Australian population of knowledge workers. All participants were sourced voluntarily through social media. As the study was not tied to any incentives, academic or workplace requirements, it is expected that the participants would be honest in their responses and commentary.

The data collected relied on self-report scales for measurement of the variables: intrinsic motivation, affective commitment, feedback and goal setting; and the output variables: work engagement and the self appraisal of work performance. The construct validity of the self-report subscales used to assess intrinsic motivation and commitment have proven reliability, so the limitation is minimal.

The sample of knowledge workers included 437 managers with direct reports and 273 individual contributors. Because the wording of 10-items on the 36-items on the Perception of Development Performance Appraisal and Work Performance Survey were reworded to reflect the manager’s or individual contributor’s perception, the results may be more reliable with the percentage of the respondents was more representative an organisation’s line structure; i.e. 8 employees reporting to each manager. As the SEMs in this study achieved goodness of fit, I expect that the skewness of the sample is limited.

The performance outcomes of the knowledge workers were not empirically measured in this study. I argue that managers of knowledge workers may rate work performance inaccurately; for reasons such as the “Lake Woebegone Effect” (ie. giving high performance
ratings to all employees) to maximise motivation (Adler et al., 2016) or the difficulty in making quantifiable appraisals on work activities like thinking and innovation. I have used self-report to measure perceived work performance, coupled with the measure of affective commitment. Commitment has been suggested to be a better predictor of performance (Riketta, 2002). Future studies in this area can include peer ratings for rating a knowledge worker’s performance. A mixed methods approach can also be taken in future studies to consider both qualitative and quantitative data to better understand the complexity of motivating work performance in knowledge workers.

**Theoretical & Practical Implications**

Study 1:

The findings provide further evidence of the reliability and validity of the 18-item WEIMS in an organisational setting. Tremblay (2009) used confirmatory factor analysis to validate the model, whereas SEM was used to confirm the goodness of fit with the sample of knowledge workers in this study. The three-item subscales correspond to SDT’s six types of motivation. WEIMS and the generated relative index W-SDI are valuable to quantify an individual’s self-determined or nonself-determined motivational profile.

The design of a knowledge worker’s job role should aim to maximise self-determined motivation. As knowledge workers view their work as a source of their identity, the job can be a powerful source of intrinsic motivation (Giancola, 2011). This is not a new concept, as the topic of job enrichment was a popular topic in the 1970s, as suggested in Hackman and Oldham’s Job Characteristics Model. It is however even more important in the current workplace, as jobs have become more complex.
In the popular press, Pink (2009) believes that financial incentives are most effective in increasing productivity for routine blue collar jobs, by having the opposite effect on complex jobs that require problem solving and innovation. Through his public speaking engagements, Pink continues to encourage business leaders to make work intrinsically rewarding to benefit from having motivated employees. I argue that although intrinsic motivation leads to higher work satisfaction and work effort than extrinsic motivation, pay and other extrinsic factors cannot be ignored and are highly valued by knowledge workers (from the findings in Study 2). In practice, increasing self-determined motivation may include numerous methods including not only job design, but redefining the organisation’s formal structure; rewards and incentives; and informal management techniques (Petronio & Colacino, 2008).

The study has shown that personality traits have little effect, if any, on work satisfaction and work motivation of knowledge workers. The use of self-reported psychometric testing however, has become common in the recruitment process, most particularly in large organisations without empirical evidence that choosing the most “personality appropriate” employees will result in higher work motivation, work satisfaction, and ultimately greater productivity and performance. The lengthy recruitment process that can also include phone interviews, in-person interviews, intelligence quotient (IQ) testing, role-specific skills testing, and reference checking is often viewed negatively by both the candidate and hiring manager, but deemed necessary by Human Resource procedures. To improve efficiency in the recruitment process, I would suggest eliminating self-report psychometric testing completely during the recruitment process, and other tests that are not proven empirically to best predict work performance.
A key characteristic of knowledge workers is seeing their profession as a source of their identity, and they are committed to continuous learning and improving their skills throughout their career (Fried & Slowik, 2004). To gauge motivation, the use of employee satisfaction or engagement surveys and performance reviews are frequently used in modern organisations. Intended to improve employee motivation and performance, these activities can result in the opposite effect on knowledge workers as they are perceived as time-consuming activities by knowledge workers and have little positive impact on their job function. Meyer (2004) suggests the term “commitment” in everyday language is reserved for long-term implications, whereas “motivation” are shorter-term focused. This aligns with the findings that show that organisational commitment is an antecedent to motivation. I suggest that rather than spending resources on the mandatory employee satisfaction surveys and performance reviews, perhaps a better method of motivating employees to better performance is by providing opportunities in their job role to align with their long-term goals and values.

The specific methods and implementation of motivation strategies may vary between organisations and professional groups, and would require development. Further research of individual differences of the outliers on the overall motivation scale (i.e. workaholics and burnout individuals) may also provide insight on how to successfully implement motivation improvement strategies. The use of prosocial motivation, or working toward a cause or moral principle with the desire to benefit others without extrinsic awards (Grant, 2008; Shamir, 1990; J. A. Thompson & Stuart Bunderson, 2003) also falls outside of the current motivation frameworks.
Study 2:

The study found that some intrinsic work-related factors ranked higher extrinsic incentives. Specifically, pay was rated as an important work value, ranking 10th of 37 from the Work Values Questionnaire. Ranking more important than pay are the intrinsic work values: stimulation, relevance, balance, growth, independence, and intellect; and the extrinsic work values: supervision, power, and benefits. Additionally, the work values with the highest correlation to pay are extrinsic work values: bonuses, promotion, perks, and recognition.

Though extrinsic motivators do not necessarily hinder intrinsic motivators in all instances, managers and human resources professionals need to consider the possible negative outcomes of implementing merit pay, pay for performance systems, and bonus systems. These methods can result in de-motivating employees for the following reasons:

1. Perceived unfairness, as knowledge workers usually work interdependently on a project team. As per the Equity Theory, knowledge workers may adjust their output if they perceive they are not fairly compensated.

2. Increased competition will decrease collaboration between employees and stakeholders.

3. Performance measures are difficult to define. Due to the nature of the tasks that knowledge workers perform, innovation often takes years of research and multiple failures in design, implementation, and production before successful commercialisation of a product or service.

4. Employees who are driven to continuously demonstrate improved performance may become burnt out.
5. Bonuses are discretionary and unreliable. If bonuses are small, high-performing knowledge workers may feel their efforts are unappreciated.

In the study, pay was found to be more important to younger employees, to knowledge workers working in large organisations, and for Managers who had direct reports. Previous studies have found that Engineers were also motivated more with corporate rewards and recognition, whereas giving scientists more freedom to pursue their research interests is more motivational (Badawy, 1988; Petronio & Colacino, 2008). In designing compensation strategies, management and human resources professionals need to consider the work values that are most important to knowledge workers, as well as their age, role responsibilities, and the perceived unfairness (as per the Equity Theory). Compensations strategies may include a combination of pay and other important work values identified in Table 4 - Ranking of Work Values by Effect Size to Pay (N=630), and nonmonetary incentives such as opportunities for personal growth and workplace flexibility.

Work motivation in knowledge workers was found to increase with age. This result is encouraging as the individuals in today’s workforce continue to extend the length of their careers for economic or social reasons. In industry, older workers can be a valuable resource in organisations as their expertise and knowledge can be shared with less experienced employees. In a previous study, work performance was also demonstrated to increase with age (Waldman & Avolio, 1986).

Though it is easy to group people by their age range, addressing the unconscious age-related bias must be addressed by organisations to enable a collaborative and supportive work environment. Expectations that people hold certain attitudes and what motivates them based on a generational cohort or differences of age can be a negative impact on team
dynamics. Age discrimination in the workplace can be minimised with diversity training and communications forums.

Ageism may also affect the self-perception of older workers (Nelson, 2016). Kooij and Zacher (2016) found that older workers lower expectations for learning and developing new skills. In the study, however, the need for cognition increases with age. Therefore, I recommend developing different training strategies to enable older workers to meaningfully apply their knowledge without necessarily learning new tools or administrative processes. This may be a good opportunity to pair older workers with younger workers on project teams or mentoring programs. The arrangement of bringing back retired employees on short-term contracts can be mutually beneficial for the organisation and the retiree.

Study 3:

Performance management is one of the key functions of Human Resources departments. From designing performance management processes, training managers and employees to follow the defined processes, implementing systems to record data, and following up on subsequent actions, can take up a lot of resources and time. The dissatisfaction of performance appraisals is common in organisations as they are often used for multiple conflicting purposes (Adler et al., 2016; Cleveland, Murphy, & Williams, 1989), however they continued to be commonly used in many large organisations.

The majority of the hypotheses in this study were found to be unsupported, suggesting that the use of feedback and goal setting did not stimulate better work engagement or performance in knowledge worker employees. Although these findings are unnecessarily surprising given the continuing evidence of dissatisfaction with performance reviews and
how they are commonly practiced in the business environment (Adler et al., 2016).

Though further research may determine that the use of Locke’s goal setting theory is still relevant in today’s workplace, its implementation must be improved. The results demonstrate that there is a disconnect of views on the effectiveness of feedback and goal setting between managers and employees. Goals that poorly set (i.e. too difficult to achieve, are too narrow-focused, or too generalised) are likely to hinder a knowledge worker’s intrinsic motivation.

For knowledge workers, receiving feedback was found to have no impact on engagement or work performance. It is possible that employees who receive negative feedback may reject the feedback (Ilgen, Fisher, & Taylor, 1979) or abandon their prescribed goals altogether (Kluger & DeNisi, 1996). As knowledge workers see their profession as a source of identity (Feist & Gorman, 1998), receiving negative feedback may be viewed as a personal attack. Further, knowledge workers may feel less autonomy, a valued job characteristic, when treated as a subordinate rather than a respected and equal peer (Massaro, 2012).

Knowledge workers may rightfully believe that the existing performance management requirements may be a time-consuming administrative process that offers little value in enabling better work performance. In practice, the approach to performance management needs to be used as a vehicle to encourage open communications, as per the intentions of Hackman and Oldham’s Job Characteristics Model. As knowledge workers have spent significant time and resources into building their own competencies and their skill-set in their area of specialisation (Markova & Ford, 2011), they have the ability to objectively define the
required job resources that would enhance performance. Examples of job resources may include the purchase of plant and equipment, software tools, or extra project support to help reduce the job demands and be functional in achieving work objectives (Bakker et al., 2008; Schaufeli & Bakker, 2004; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). In line with SDT, providing knowledge workers with the required job resources (extrinsic factor) will promote intrinsic motivation and overall motivation.

Rather than using performance appraisals as a means to assess provide feedback on past performance and a discussion to set future goals, I recommend that organisations and Human Resources practitioners redefine their objectives given the demographics and job roles in their workforce, prior to designing processes that promote motivation, innovation, work satisfaction, and performance. The new processes must be in line with the characteristics of knowledge workers, their most desired work-related factors, the organisational / project team structure, and long-term strategy.
Chapter 7 - Conclusion

To conclude, SDT is considered to be a more encompassing theory than traditional motivational theories. Tremblay’s six-factor structure of the WEIMS was supported using SEM in an organisational setting. The model shows strong positive correlation between self-determined types of motivation, and smaller correlations between motivation types at the opposite ends of the self-determination continuum. Intrinsic motivation was confirmed to lead to greater job satisfaction in knowledge workers, however extrinsic motivation does not lead to greater job satisfaction. Need for cognition has a positive impact on intrinsic motivation and work satisfaction of knowledge workers. Work effort is also boosted when intrinsic motivation rises.

Study 1 has empirically demonstrated the weak relationship between personality and motivation. Previous research addressed employee commitment and motivation as separate topics. The SEM achieved goodness to validate that affective commitment is an antecedent to motivation, and both motivation and commitment lead to greater work satisfaction.

The relative value of pay against 36 other work-related values consisting of both intrinsic and extrinsic factors was rated. Pay was considered to be a very important work value, however intrinsic factors including stimulation, relevance, balance, independence, and intellect rated more important. Pay was found to be more important to younger employees, to knowledge workers working in large organisations, and for Managers who had direct reports. Results were generally consistent with the hypotheses, and work-related values that rated highest aligned with the characteristics of knowledge workers.
Generational and age-related differences in motivation, work-related values, and performance has been historically descriptive and unsupported by empirical data. In this study, two datasets of consisting of 935 and 630 knowledge workers were used to compare the level of work motivation, satisfaction, and work-related values at the different age ranges. Work motivation in knowledge workers was found to increase with age, however the importance of extrinsic incentive decreases with age. Perceived work effort does not increase with older workers, and the need for cognition continues to increase as we age. Of the highest rated work-related values, only independence and pay were found to have a significant effort at the different age groups.

Goal setting and feedback are methods commonly used in performance management systems. Intended to motivate employees to greater performance and productivity, the findings indicate that the perceived use of goal setting and feedback are ineffective methods for knowledge workers. Further, the empirical data and subsequent statistical analysis show that managers overestimate the effectiveness of these methods. It is recommended that new processes in performance management systems need to be developed to align with knowledge worker characteristics and their most desired work-related factors.

The findings of these independent studies makes a contribution to furthering knowledge in terms of the factors affecting the motivation levels of knowledge workers in Australia.
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Appendix 1 - List of Survey Questions

General Demographics

1. Gender:
   - Male
   - Female

2. Age range:
   - <25
   - 26-35
   - 36-45
   - 46-55
   - 56+

3. Highest Level of Education complete:
   - Diploma
   - Bachelor Degree
   - Master Degree
   - Doctorate
   - Other: (free text)

4. Profession:
   - Accountant
   - Architect
   - Economist
   - Engineer
   - Teacher
   - Medical Professional
   - Professor / Lecturer
   - Project Manager
   - Software Developer
   - Legal Professional
   - Other: (free text)
5. Nature of Employer’s Organisation:
   Accounting
   Administration and Office Support
   Advertising, Arts, and Media
   Banking and Financial Services
   Call Centre and Customer Service
   General Management
   Community Services and Development
   Construction
   Consulting and Strategy
   Design and Architecture
   Education and Training
   Engineering
   Farming, Animals, and Conservation
   Government and Defence
   Healthcare and Medical
   Hospitality and Tourism
   Human Resources and Recruitment
   Information and Communication Technology
   Insurance
   Legal
   Manufacturing, Transport, and Logistics
   Marketing and Communications
   Mining, Resources, and Energy
   Real Estate and Property
   Retail and Consumer Products
   Sales
   Science and Technology
   Sports and Recreation
   Trades and Services
   Other: (free text)
6. Size of Organisation (in terms of the number of employees):
   - Micro (1 – 2 employees)
   - Small (3 – 15 employees)
   - Medium (16 – 200 employees)
   - Large (201 – 500 employees)
   - Enterprise (> 500 employees)

7. Level of Position:
   - Professional / Specialist
   - Management
   - Executive
   - Other: (free text)

8. Do you have direct reports?
   - Yes
   - No

9. Contact type:
   - Permanent Employee
   - Fixed term Contract
   - Other: (free text)

10. Average number of hours worked in an average week:
    - <20
    - 20 – 35
    - > 35

11. Country currently located for employment:
    - Australia
    - Other: (free text)
Commitment Scale Items

How committed am I towards my organisation? Using the scale below, please indicate your perception towards the following statements.

1 - Strongly disagree
2 - Slightly disagree
3 - Neither agree nor disagree
4 - Slightly agree
5 - Strongly agree

1. I would be very happy to spend the rest of my career with this organisation.
2. I enjoy discussing my organisation with people outside it.
3. I think that I would easily become as attached to another organisation as I am to this one.
4. This organisation has a great deal of personal meaning for me.
5. I do not feel a ‘strong’ sense of belonging to my organisation.
6. I am not afraid of what might happen if I quit my job without having another one lined up.
7. Too much in my life would be disrupted if I decided to leave my organisation right now.
8. One of my few serious consequences of leaving this organisation would be the scarcity of available alternatives.
9. I do not believe that a person must always be loyal to his or her organisation.
10. Jumping from organisation to organisation does not seem at all unethical to me.
Intrinsic Motivation and Extrinsic measured against Achievement Goals Scale

How would you describe your job?

$1 = \text{strongly disagree}$

$2 = \text{moderately disagree}$

$3 = \text{neither agree nor disagree}$

$4 = \text{moderately agree}$

$5 = \text{strongly agree}$

1. My job is very exciting.

2. The tasks that I do at work are enjoyable.

3. My job is so interesting that it is a motivation in itself.

4. My job is meaningful.

5. The tasks that I do at work are themselves representing a driving power in my job.

6. Sometimes I become so inspired by my job that I almost forget everything else around me.

7. I often expend more effort when things are busy at work.

8. I often expend extra effort in carrying out my job.

9. I usually do not hesitate to put in extra effort when it is needed.

10. I intentionally expend a great deal of effort in carrying out my job.

11. I try to work as hard as possible.

12. I enjoy challenging and difficult tasks where I’ll learn new skills.

13. I often look for opportunities to develop new skills and knowledge.

14. I prefer to work in situations that require a high level of ability and talent.

15. I am willing to select a challenging work assignment that I can learn a lot from.

16. For me, the development of my work abilities is important enough to take risks.

17. When I am engaged in a task at work, I find myself thinking a lot about what I need to do to not mess up.

18. At work, I am just trying to avoid performing the tasks required for my job poorly.
19. My goal is to avoid being incompetent at performing the skills and tasks required for my job.

20. At work, I focus on not doing worse than I have personally done in the past on my job.

21. I just try to avoid being incompetent at performing the skills and tasks necessary for my job.

22. I just hope I am able to maintain enough skills so I am competent at my job.

23. I am concerned about taking a task at work if my performance would reveal that I had low ability.

24. I prefer to avoid situations at work where I might perform poorly.

25. Avoiding a show of low ability is more important to me than learning a new skill.

26. I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.

27. I try to figure out what it takes to prove my ability to others at work.

28. I enjoy it when others at work are aware of how well I am doing.

29. I am concerned with showing that I can perform better than my co-workers.

30. I prefer to work on projects where I can prove my ability to others.

31. It is important for me to have an external incentive to strive for in order to do a good job.

32. External incentives such as bonuses and provisions are essential for how well I perform my job.

33. If I had been offered better pay, I would have done a better job.

34. If I am supposed to put in extra effort in my job, I need to get extra pay.
Mini-IPIP is a 20-item short form

How do I typically behave? Using the scale below, please indicate your most typical behaviour.

1 - Strongly disagree
2 - Moderately disagree
3 – Do not agree or disagree
4 – Moderately agree
5 - Strongly agree

1. Am the life of the party.
2. Sympathise with others’ feelings.
3. Get chores done right away.
4. Have frequent mood swings.
5. Have a vivid imagination.
6. Don’t talk a lot.
7. Am not interested in other people’s problems.
8. Often forget to put things back in their proper place.
9. Am relaxed most of the time.
10. Am not interested in abstract ideas.
11. Talk a lot of different people at parties.
12. Feel others’ emotions.
13. Like order.
15. Have difficulty understanding abstract ideas.
17. Am not really interested in others.
18. Make a mess of things.
19. Seldom feel blue.
20. Do not have a good imagination.
Need for Cognition Scale (Short Form)

For each of the statements below, please indicate to what extent the statement is characteristic of you.

1 = extremely uncharacteristic
2 = somewhat uncharacteristic
3 = uncertain
4 = somewhat characteristic
5 = extremely characteristic

1. I would prefer complex to simple problems.
2. I like to have the responsibility of handling a situation that requires a lot of thinking.
3. Thinking is not my idea of fun.
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.
6. I find satisfaction in deliberating hard and for long hours.
7. I only think as hard as I have to.
8. I prefer to think about small, daily projects to long-term ones.
9. I like tasks that require little thought once I've learned them.
10. The idea of relying on thought to make my way to the top appeals to me.
11. I really enjoy a task that involves coming up with new solutions to problems.
12. Learning new ways to think doesn't excite me very much.
13. I prefer my life to be filled with puzzles that I must solve.
14. The notion of thinking abstractly is appealing to me.
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
17. It's enough for me that something gets the job done, I don't care how or why it works.
18. I usually end up deliberating about issues even when they do not affect me personally.
Perception of Developmental Performance Appraisal and Work Performance

A. For Employees with no direct reports

Using the scale below, please indicate to what extent each of the following items corresponds to your relationship with your Line Manager.

1 - Strongly disagree
2 - Moderately disagree
3 - Do not agree or disagree
4 - Moderately agree
5 - Strongly agree

1. My manager helps me understand what is expected from me in such a way that I can contribute to organisational effectiveness.
2. My manager provides clear goals I can direct attention to.
3. The feedback I receive agrees with what I have actually achieved.
4. My manager provides me with information about organisational goals.
5. My manager helps me prioritise between different work activities.
6. The feedback I receive helps me understand the organisation’s strategy.
7. My manager helps me understand the organisation’s vision and strategy.
8. My manager provides clear and direct information about my standing in relation to the goals of my department.
9. My manager provides recognition when I perform well.
10. I see clear coherence between my own work and the performance of my department.
11. The tasks that I do at work are enjoyable.
12. My job is so interesting that it is motivation in itself.
13. My job is meaningful.
14. The tasks that I do at work are themselves representing a driving power in my job.
15. I feel lucky being paid for a job I like this much.
16. The job is like a hobby to me.
17. I enjoy discussing my organisation with people outside it.
18. I often perform better than what can be expected.
19. I almost always perform better than what can be characterised as acceptable performance.
20. The quality of my work is top notch.
21. I often expend extra effort in carrying out my job.
22. I have a greater need than most people to make decisions on the basis of my own independent thinking.
23. I seek out situations that provide room for independent decision-making.
24. I am more independent than most people.
25. I do not feel a strong sense of belonging to my organisation.
26. I do not feel “emotionally attached” to this organisation.
27. I do not feel like “part of the family” at my organisation.
28. I try to work as hard as possible.
29. It is very important for me to do good at work.
30. I really feel as if this organisation’s problems are my own.
31. The opportunity to determine my own schedule is not important for me.
32. Freedom to make my own decisions is not important for me.
33. I do not have a great need for self-determination in what I do.
34. If I believe that something is wrong, I speak out regardless of who I’m talking to.
35. I am able to say what I mean regardless of the situation I’m in.
36. I think I could easily become as attached to another organisation as I am to this one.
B. For Managers with direct reports

Using the scale below, please indicate to what extent each of the following items corresponds to your relationship with your direct reports.

1 - Strongly disagree
2 - Moderately disagree
3 - Do not agree or disagree
4 - Moderately agree
5 - Strongly agree

1. My staff understand what is expected so they are able to contribute to organisational effectiveness.
2. I provide clear goals that my staff can direct attention to.
3. I provide positive feedback in a timely manner and agrees with complexity of the tasks achieved.
4. I provide my staff with information about organisational goals.
5. I help my staff prioritise between different work activities.
6. I provide feedback that helps my staff understand the organisation’s strategy.
7. My manager helps me understand the organisation’s vision and strategy.
8. My manager provides clear and direct information about my standing in relation to the goals of my organisation.
9. My manager provides recognition when I perform well.
10. I see clear coherence between my own work and the performance of my organisation.
11. The tasks that I do at work are enjoyable.
12. My job is so interesting that it is motivation in itself.
13. My job is meaningful.
14. The tasks that I do at work are themselves representing a driving power in my job.
15. I feel lucky being paid for a job I like this much.
16. The job is like a hobby to me.
17. I enjoy discussing my organisation with people outside it.
18. I often perform better than what can be expected.
19. I almost always perform better than what can be characterised as acceptable performance.

20. The quality of my work is top notch.

21. I often expend extra effort in carrying out my job.

22. I have a greater need than most people to make decisions on the basis of my own independent thinking.

23. I seek out situations that provide room for independent decision-making.

24. I am more independent than most people.

25. I do not feel a strong sense of belonging to my organisation.

26. I do not feel “emotionally attached” to this organisation.

27. I do not feel like “part of the family” at my organisation.

28. I try to work as hard as possible.

29. It is very important for me to do good at work.

30. I really feel as if this organisation’s problems are my own.

31. The opportunity to determine my own schedule is not important for me.

32. Freedom to make my own decisions is not important for me.

33. I do not have a great need for self-determination in what I do.

34. If I believe that something is wrong, I speak out regardless of who I’m talking to.

35. I am able to say what I mean regardless of the situation I’m in.

36. I think I could easily become as attached to another organisation as I am to this one.
Work Engagement (UWES-17)

Please rate the following statements as how you feel at work.

1 - Never or Rarely (Once a month or less)
2 - Sometimes (A few times a month)
3 - Often (Once a week)
4 - Very often (A few times a week)
5 - Always (Every day)

1. At my work, I feel bursting with energy.
2. I find the work that I do full of meaning and purpose.
3. Time flies when I am working.
4. At my job I feel strong and vigorous.
5. I am enthusiastic about my job.
6. When I am working, I forget everything else around me.
7. My job inspires me.
8. When I get up in the morning, I feel like going to work.
9. I feel happy when I am working intensely.
10. I am proud of the work that I do.
11. I am immersed in my work.
12. I can continue working for very long periods at a time.
13. To me, my job is challenging.
14. I get carried away when I am working.
15. At my job, I am very resilient, mentally.
16. It is difficult to detach myself from my job.
17. At my work I always persevere, even when things do not go well.
Work Extrinsic and Intrinsic Motivation Scale (WEIMS)

Why do I work? Using the scale below, please indicate to what extent each of the following items corresponds to the reasons why you are presently involved in your work.

1. **Does not correspond at all**
2. **Corresponds slightly**
3. **Corresponds moderately**
4. **Mostly corresponds**
5. **Corresponds exactly**

1. Because this is the type of work I choose to do to attain a certain lifestyle.
2. For the income it provides me.
3. I don’t seem to be able to manage the important tasks related to this work.
4. Because I derive much pleasure from learning new things.
5. Because it has become a fundamental part of who I am.
6. Because I want to succeed at this job, if not I would be very ashamed of myself.
7. Because I chose this type of work to attain my career goals.
8. For the satisfaction I experience from taking on interesting challenges.
9. Because it allows me to earn money.
10. Because it is part of the way in which I have chosen to live my life.
11. Because I want to be very good at this work, otherwise I would be very disappointed.
12. I don’t know why, we are provided with unrealistic working conditions.
13. Because I want to be a “winner” in life.
14. Because it is the type of work I have chosen to attain certain important objectives.
15. For the satisfaction I experience when I am successful at doing difficult tasks.
16. Because this type of work provides me with security.
17. I don’t know, too much is expected of us.
18. Because this job is a part of my life.
Work on Present Job Scale

How would I describe my current job? Think of the work you do at present. How well does each of the following words or phrases describe your job?

Yes – if it describes your work.

No – if it does not describe your work.

? – If you cannot decide.

1. Fascinating
2. Routine
3. Satisfying
4. Boring
5. Good
6. Creative
7. Respected
8. Uncomfortable
9. Pleasant
10. Useful
11. Tiring
12. Healthful
13. Challenging
14. Too much to do
15. Frustrating
16. Simple
17. Repetitive
18. Gives sense of accomplishment
Work Values Questionnaire

Below are 37 different work-related factors that may be important to you when you look for a job. Please indicate how much you personally value each one of them.

1. Unimportant
2. Marginally important
3. Of medium importance
4. Important
5. Very Important

1. Balance - A job that allows me to lead a balanced life.
2. Benefits - A job that provides many features additional to pay.
3. Bonuses - A job that provides many opportunities for topping up the base salary.
4. Clarity - A job with clear and well-defined roles and responsibilities.
5. Comfort - A job that can be carried out in physically comfortable conditions.
6. Competition - A job that provides me with opportunities to compete with others.
7. Conditions - A job that can be carried out in conditions that are safe, modern, and clean.
8. Contribution to society - A job that allows me to work for a good cause.
9. Effortlessness - A job that is relatively easy and does not require excessive effort.
10. Equipment - A job that can be carried out with up-to-date equipment and technology.
11. Flexibility - A job that allows me to work flexible hours to suit my personal needs.
12. Independence - A job that allows me to work autonomously without much supervision.
13. Insurance - A job that provides health and life insurance.
14. Intellectuality - A job that is challenging and involves a lot of thinking and analysis.
15. Location - A job that is conveniently located and easily accessible.
16. Organizational image - A job within an organization that is widely recognized and respected.
17. Pay - A job that is very well paid.
18. Perks - A job that provides many extra (e.g. company car, discounts on goods, etc.).
19. Personal Growth - A job that provides opportunities for self-improvement.
20. Personal relevance - A job that provides me with opportunities to use my personal talents, education, and training.
21. Power - A job that allows me to control my destiny and be influential.
22. Promotion - A job that provides opportunities for rapid advancement.
23. Recognition - A job that leads to clear and wide recognition of my achievements.
24. Regularity - A job that can be performed in a standard, stable, and controlled manner.
25. Responsibility - A job with many appropriate responsibilities.
26. Safety - A job that can be carried out in safe and secure conditions.
27. Security - A job that is secure and permanent.
28. Simplicity - A job that is not overly complicated.
29. Social interaction - A job that provides many good opportunities for social contact with others.
30. Status - A job that is generally recognized as “high-status” in our society.
31. Stimulation - A job that I personally find very interesting.
32. Supervision - A boss who is fair and considerate.
33. Teaching - A job that allows me to train others and to pass on my expertise.
34. Teamwork - A job that provides me with opportunities to cooperate with others.
35. Tranquility - A job that is not particularly stressful.
36. Variation - A job that allows me to get involved in many different kinds of activities.
37. Visibility - A job that gives me a fair amount of publicity.