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A three dimensional job utility model to predict turnover intention.

Thesis

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Doctorate in International Management

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Why is there no I in this document? (acknowledgements)

I was told, repeatedly, that I should write my thesis in the singular first person. At some point I tried, but it did not feel natural and most importantly it did not feel right. It doesn't feel right because if it were just I, this document wouldn't exist. This journey and its output has only been possible because of the guidance, help, critical feedback and emotional support from the people around me.

Dr. Aline Masuda, my supervisor, played the most important role in three ways. 1: Gently highlighting the holes in my knowledge and logic. 2. Patiently teaching me the things I didn't understand. 3. Expertly picking me up and getting me back going whenever I was down and demotivated. Aline went way beyond her contractual obligation, and I hope she will remain my mentor and friend in the future.

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mind engrossed with some abstract concepts instead of being present in the moment with them. I promise to be more present now.

Lastly but not least I want to thank my parents Jan and Hilde, for the obvious life of comfort, privilege and opportunity. But also for the autonomy-supportive upbringing and igniting intellectual curiosity. One day in the early 90's when I was around 10 years old, I asked my dad, "If I don't believe in God then what am I?" He said "well maybe you are an existentialist" and the next day he managed to find some pre-Encarta encyclopedia information about existentialism, printed it out at work and brought it home. I didn't understand any of it, but arguably it was the beginning of this journey, and it is definitely illustrative of my family's role in getting here.

Another reason why there is no "I" in this text is because in the narrative I'm speaking to you, the reader. I don't want you to sit there facing me but I want you to grab my hand, turn shoulder to shoulder and let's walk together into this adventure, and adventure into our worlds, our minds, and the philosophical fabric of our existence.

Come, let us walk together.

List of Abbreviations

ALT: Adaptation Level Theory

ASA: Attraction Selection Attrition (theory)

BPNES: Basic Psychological Need in Exercise Scale (scale)

CCSM: Comprehensive Compensation Satisfaction Model (scale)

CFA: Confirmatory Factor Analysis (method)

CFI: Comparative Fit Index (statistic)

CMB: Common Method Bias

CRM: Customer Relationship Management (software)

DRM: Day Reconstruction Method (method)

EFA: Exploratory Factor Analysis (method)

EQ: Emotional Quotient

ERG: Existence, Relatedness & Growth (theory)

ERP: Enterprise Resource Planning (software)

ESM: Experience-Sampling Method

FFM: Five Factor Model (theory)

GFI: Goodness of Fit Index (statistic)

HR: Human Resources

IFDFW: In-Charge Financial Distress/Financial Wellbeing (scale)

IQ: Intelligence Quotient

JDI: Job Descriptive Index (scale)

JES: Job Emotions Scale

JOLTS: Job Openings and Labor Turnover Survey (report)

JSS: Job Satisfaction Survey (scale)

LMX: Leader-Member Exchange (theory)

MBTI: Myers–Briggs Type Indicator (theory)

MDT: Motive Disposition Theory

MMG: Multi Motive Grid (method)

MOAQ: Michigan Organizational Assessment Questionnaire (scale)

MOAQ-JSS: Michigan Organizational Assessment Questionnaire Job Satisfaction Subscale (scale)

MoR: Managers-once-Removed (role)

NPS: Net Promoter Score (method)

OCB: Organizational Citizenship Behavior (theory)

OCM: Organizational Career Management (theory)

OCQ: Organizational Commitment Questionnaire (scale)

OIT: Organismic Integration Theory (theory)

OKR: Objective Key Results (method)

PCO: Protean Career Orientation (theory)

POS: Perceived Organizational Support (theory)

RMSEA: Root Mean Square Error Approximation (statistic)

SaaS: Software as a Service (business model)

SARA: Survey Analysis and Reporting Automation (software)

SAT: Job Satisfaction (variable)

SDT: Self Determination Theory

SIT: Social Identity Theory

SMART: Specific Measurable Achievable Relevant and Timed (method)

SOEP: German Socio-Economic Panel

SPOS: Survey Of Perceived Organizational Support (scale)

SSA: Smallest Space Analysis (method)

TAT: Thematic Apperception Test (method)

TI: Turnover Intention (variable)

TIS-6: 6 item Turnover Intention Scale

TLI: Tucker-Lewis Index (statistic)

WAMI: Work And Meaning Inventory (scale)

W-BNS: Work Related Basic Need Satisfaction (scale)

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Abstract

In the economical context of tight labor markets, “the great resignation” and “the battle for talent” and within the philosophical zeitgeist based on utilitarian and existential beliefs, we explore the value of work, that is, the value experienced by the employee. We followed a cross disciplinary approach integrating both recent and not so recent insights in organizational and behavioral psychology in an economic model of cardinal utility.

The extensive literature review led to the conceptually clustering of the types of needs that are addressed, material needs, social needs, and identity related needs. We distanced ourselves from a needs satisfaction perspective following the economic assumption of non satiation. We developed the subsequent utility categories: material utility, social utility, and transformational utility. The theory and the random utility model created is a cross disciplinary integration effort. A survey was created and validated following DeVellis (2016) scale development method.

The study confirmed, via the methods of factor analysis and structural equation modeling (SEM) at least 3 and possibly 4 dimensions of job utility. Further refinement of the scale with SEM led to the compact and robust Simple Present Job Utility Scale supporting the three factor model.

The simple present job utility scale is found to explain more variation in turnover intention than conceptually near scales evaluated in this study.

Special attention was paid to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice.

1. Introduction

The purpose of this study is to create and validate a scale that measures job utility. In doing this I am expanding the classical concept of material utility with the psychological utility based on the developments of the last decades in the fields of behavioral science and organizational psychology (e.g. Deci & Ryan 2008a; Kahn, 1990; Sirota et al., 2005; Fiske 1992). In order to do this the types of utility have to be defined and categorized drawing from congruences in a wide array of literature, this is done in the literature review. Then a scale has to be developed and tested to adequately measure these. To do this the scale development methodology of DeVellis (DeVellis, 2016) is used. Then it is ascertained that these categories are adequately delineated with confirmatory factor analysis and structural equation modeling. This is to check if the categorization is supported in the sample with our question. Then it is tested that the utilities are related to other known constructs as predicted by the theory.

The outcome, the three dimensional model of job utility and the scale to measure it, is useful in measuring job utility. If utility can be measured behavior can be mathematically predicted because individuals seek to maximize utility. If job utility can be measured it can help predict turnover, but also different behavioral outcomes both positive and negative, and it can be used to quantify ROI on HR activities or policy changes. By adding material and psychological factors together in one model it should eventually become more useful than those that are strictly material or strictly psychological. There currently isn’t a model to systematically compare material utility and psychological utility. The possibilities are endless, but this thesis is limited to development of the model and the validation of the scale. Hopefully much more will come after this.

This is the introduction. The purposes of the introduction are; To set the context of the research question. In what context are we looking at the utility of work? To underline the importance of the research question. What is the point of measuring job utility? To introduce the two philosophical foundations of the work. Existentialism, the belief that meaning is created and not inherent. Utilitarianism, the belief that utility can, and should, be calculated and maximized. To acknowledge the ethical dangers of utilitarianism. To establish a nuanced view on utilitarianism that is adequate for this work. This chapter also introduces key concepts such as, rational agent theory (Becker, 1976), socio-emotional maturity (Kegan 1982; Barrett 2011), hedonism and eudaimonia (Deci & Ryan 2008b) that will be used along the thesis.

What is the use of it all? Why bother? Why should we wake up in the morning and toil long days for the payman? So many hours spent at work, hours turn into months, months turn into years, youth turns into seniority. Life ticks and ticks, like a steady train covering a variety of terrain. It seems like we are always on the road to somewhere, but we all end the journey at the same station. If we dare to look close enough through the rational lens, like the existential philosophers did, we will find nothing. Jean-Paul Sartre said:

> “Life has no meaning a priori… It is up to you to give it a meaning, and value is nothing but the meaning that you choose.” Jean-Paul Sartre (1947)

First you feel fear and anger, our ancestors promised us, at least in my neck of the woods, heavens in the skies, meaning on earth, and a book with all the answers. We seem hardwired to expect some kind of meaning. Instead we get more existential quotes eternalized in a flood of self help wisdom in social media echo chambers.

> “Man cannot endure his own littleness unless he can translate it into meaningfulness on the largest possible level.” Ernest Becker (1997)

No pressure. We are expected to find grandiose meaning in a world fundamentally void of meaning. Sounds like a Catch 22.

Yet it is not, it is a carte blanche for identity creation, a sandbox game to be played multiplayer. But then what are the building blocks that can make meaning?

Instincts and feelings are here to guide us, in their rawest form they help us survive, we are inclined to eat food and drink water (and other things), in a simple form they are the organism telling us what needs to be done. In its most sophisticated form they are the voice that says “there must be more than this” and the voice that suggests altruism and compassion. They are the communal organism telling us what needs to be done.

The word “emotion” is relatively new in the English language, it was properly adopted from the French language in the 19th century (Smith, 2016) by Thomas Brown. The French word émouvoir literally means to move or to put in motion.

We could follow the hedonic axiom that the purpose of our conscious agency is to maximize pleasure and minimize pain, for it is the sentiments that guides and moves us. But ancient Roman and Greek Stoics left us writings on the wall. To live a slave of desire leads us to a tormented and empty existence. One must live with virtue.

Now how can we reconcile the concept of virtue with the existential ideas in the modern mind. Maybe the answer lies upon two axes, one temporal one and one on identity. As to the temporal one, the role of our conscious agency is not to maximize “pleasure minus pain” now but we maximize expected

“pleasure minus pain” over a lifetime. This we do with a discount rate for future values, much like discounted cash flow calculations in investing (Seaman et al., 2022). The computation does not happen consciously but rather in the subconscious feeding us with the sense that we want to quit smoking or go to college to improve our overall lifetime experience. Maybe there is a subconscious “discounted emotion flow” calculation going on, maybe not, but for sure we consider the future consequences of our current actions. Requisite organization theory uses the estimated cognitive time horizon of subjects as a proxy for maturity (Jaques 2017).

Regarding the identity axis. Our consciousness is a very individual experience, perhaps the most individual thing there is. We therefore feel, especially in the western world, that we are an independent entity, and may feel that our relationship to other entities is transactional. Yet biologically we are as much part of a larger organism as the cells in our organism are part of us. Baruch Spinoza developed this idea extensively in the 17th century (Spinoza & Elwes, 2019, o.v. 1677) creating a non religious concept of God, synonymous to nature. So how does our organism tell our consciousness that it is broader, well you guessed it, through sentiments and instincts. The extent to which one is aware of his or her broader identity is used today to measure social emotional maturity in adults (eg, Kegan 1982, Barrett 2011).

We could combine these ideas on adult social-emotional maturity models onto a two dimensional sketch.

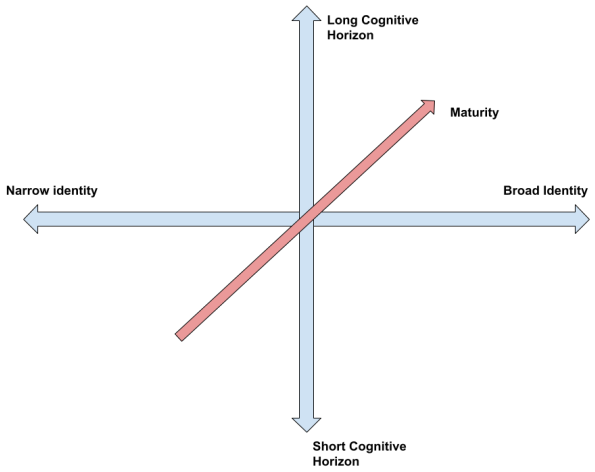

Figure 1: Sketch of maturity concepts, based on theories by Jaques, Kegan, Barrett, Sedikides and Gaertner. (Jaques, 2017), (Kegan, 1982, 2018), (Sedikides & Brewer, 2015), (Gaertner et al., 2012)

In the last decade there has been an increased academic interest in this broader sense of identity. Notably Sedikides and Gaertner (Geartner et al 2012, Sedikides & Brewer 2015) elaborated on three components of the self, the individual self, the relational self and the collective self. Within the concept of a broader identity the terms pleasure and pain become somewhat too limited as there may be more second order abstract sensations. That is why utilitarians rather speak of the maximization of happiness, whatever it is that makes you happy, be it an ice cream, the good health of your family or peace in Ukraine (Diener et al 1998).

So to live with virtue is to pursue the maximization of happiness for both the now and the future, from the broadest possible sense of identity.

This leads us to a modern form of utilitarianism. Utilitarian thoughts play a fundamental role in the way our societies are organized. Just think of the debate around the strictness of covid measures, lockdowns, mask mandates, etc. We have grown accustomed to the trade-offs between human lives, personal freedoms and economic interests. The categorical argument that

these things can't be traded is dead and buried together with millions who didn't survive the pandemic. The only discussion left is where the tradeoff points are, and a rightfully heated discussion it is. Utilitarianism is more entrenched than ever. The beauty of this perspective championed by Jeremy Bentham and John Stuart Mills is that fluffy abstract ideas can be quantified, rational decisions can be made, and the collective well being can be maximized. Concepts such as quality adjusted life years (QALY) and disability adjusted life years (DALY) have found their way to all health policy makers. QALYs and DALYs literally put a price on human life, and not everyone gets the same price, the value of your life depends on your age, your health and the GDP per capita of the place where you live (Whitehead 2010). The measurements looks at your current remaining life expectancy corrected by a factor for life quality based on your current health, each 100% quality year is one Qaly (or Daly) and the World Health Organization recommends the maximum comunal expense per QALY to the local GDP per capita. Incidentally one of the few differences between a QALY and the DALY is that the latter discount for future health, much like the previous hypothesized "discounted emotion flow" it is a "discounted health flow". The practicalities have forced our hand into the most useful theory on ethics, but that does not mean it is the most ethical. The issue with utilitarianism is that great injustice can be done to the individual in the name of the numbers.

In a famous series of trolley problems the Harvard philosopher Michael Sandel who has a rock star status for his rhetorical abilities, illustrated the paradox of utilitarianism (Sandel, 2005). Sandel presented his students with 4 scenarios where the utilitarian outcome is the same, one person is sacrificed to save 4 peoples lives, but the context shifts from the most conducive to utilitarian thought, to the most outrageous. Students were asked to formulate their argumentation at each step. In the first step, you are the trolley driver and are about to run over 4 people, but there is a side track with one person no different from the ones on the main track. In the last case students are

asked if as a doctor they would be willing to murder an unsuspecting non consenting individual to harvest his healthy organs to save 4 lives. The last question is outrageous, and when I replicate Sandel's thought experiment in my classes nobody is ever up for doing that. But the interesting thing is how the utilitarian arguments students express in the first scenario fall apart in the later one. For the latter example there are categorical principles that trump the utilitarian calculation, but the further we are from the trigger and the blood the less categorical principles can withstand the onslaught of utilitarian logic.

There is no practical alternative to our utilitarian world, so utilitarianism is here to stay both politically and philosophically in the zeitgeist. On the bottom line that is a good thing. The theory, study and story of this paper is deeply ingrained in utilitarian philosophy, it therefore inherits the utilitarian paradox explained above, we need to keep that in mind while we lower a level of abstraction to the practical question at hand: how does our perception of work and our motivation to work fare in this utilitarian world?

While you read this you are likely one of around two billion people at work. How many exactly will depend on your time zone and time. According to the "World Employment Social Outlook" report of 2019 (Kühn, 2019) by the International Labour Organization there are 3.3 billion people currently employed. Of those approximately 1.7 billion are categorized as "waged and salaried workers". Assuming these people have a career consisting of 40 years with each 250 work days 8 hours long, there are 264 trillion working hours to go around, of which 136 trillion salaried. Considering we as a species choose to invest so much of our most finite resource doing this thing called work, some questions are warranted. Is it worth it? For whom does work create value? And what value can we speak of?

There are usually two parties directly involved in the relationship and a myriad of others indirectly affected by the externalities of the activity. Focussing on the two parties directly involved; one of them is a human being offering their

aforementioned scarcest resource. The other is often an abstract organizational construct created to organize resources towards different purposes chosen by the people at the helm. In the western world we have by and large chosen to legally treat these organizations as individual personas. These organizations rely on resources, both human and other. However, and fortunately, since the abolishment of slavery worldwide, organizations can`t own people. So they have to, somehow, convince people to give their time to a non-human persona. The ability to convince people to do this drives the reach and impact of organizations.

For the salaried worker, who shall be our main focus, there can be intrinsic and extrinsic rewards, the latter being the most obvious and the easiest to understand within our economic logic. You get paid for your work, a de facto exchange mechanism for work, with your salary you can buy the fruits of other laborers and the increased productivity brought about by role specialization allows us to have and consume more stuff, and to escape poverty and suffering to a large extent. For many a job is a means to an end, a necessary evil tolerated for its economic benefits. A sensitive listener will have noticed that this idea is deeply ingrained in our languages. We expect to receive a proper compensation for our work, the word “compensation” implies the work is a negative experience that requires compensation. Even in sentences which propagate intrinsic motivation, such as the catch phrase “If you love your job, you won’t have to work a day in your life” implies work is a negative to be avoided. Was that always the case? Karl Marx (Engels & Marx 1844) would argue it wasn’t, this is a by-product of the industrial revolution coined “alienation”. Alienation refers to a psychological disconnect between the work and the final fruits of the labor due to division of roles and limited line of sight. Was work more meaningful before the industrial revolution? No idea, but thanks to the same industrial revolution and the subsequent agricultural and technological revolutions the world has changed so drastically that any comparison would be quite absurd. Additionally our modern behavioral

experience measuring techniques cannot be applied retroactively on decayed corpses, so we cannot try to measure subjective experience at that time. Therefore we shall consider the world as starting with the industrial revolution and division of labor to be the norm. But then, is viewing work as a negative, unpleasant, a burden, also to be the norm? Well despite what our language suggests about our culture, a lot of people enjoy working. According to surveys of Sirota Consulting (Sirota 2005, p7) 76 percent of people enjoy the work they do. In our own research a survey we did had a question asking whether they agreed with the statement “I currently enjoy the work itself,” and the answers were clearly more positive than negative (mean: 3.17 mode: 4 with 5 being “strongly agree” and 1 being “strongly disagree” on a Likert scale). So what is this enjoyment people speak of? Enjoyment can be dissected in many ways, and we will do so later, but in essence comes down to a positive hedonic experience, to provide pleasure and avoid pain, and positive eudaimonic experience, the pleasures of the reflective self.

Let us explore a utilitarian thought experiment, without endorsing untempered utilitarianism or disregarding categorical principles, just a thought experiment.

Let’s start from an epicurean proposition that the individual’s subjective experiential value of her own life is the sum of the positive experiences minus the sum of the negative ones. Adding up hedons really. Now here it is important to point out that this does not only include physical pleasure but also and maybe more so those hedons coming from different levels of psychological abstraction of the reflective self, such as described before when discussing the concept of virtues. Suppose we create a scale where 1 is the worldwide average, 0 is a neutral experience and -1 would be a negative experience of the same weight as +1 (but in the other direction). Suppose these measurements are per hour and one hour at +1 we will call 1 hedon. Assuming we are conscious for 16 hours per day and live for 70 years the average life is around 400K hedons. This measurement would be structurally

similar to QALYs but about broader experience rather than health. Now what if we can find for both employees and employers a better understanding of what is in work that provides Hedons and how the dynamic of Hedons from work works. Suppose we can influence 0.1% of the population of salaried employees and improve their average work experience by 0.1 hedons. Then we provide 340 million hedons per year which is the potency equivalent of 850 full lives. So to put it more controversially, such a seemingly modest success would have the same utility as saving 850 babies from early death annually, and that is without taking into account the economic benefit of better job engagement.

Now, at this moment in time, I cannot think of anything more powerful or useful in which to invest our most limited resource.

It is neither practical nor our ambition to try to measure hedons in individuals. However it is our ambition to contribute to the understanding of what utility individuals derive from work and how those relate to job satisfaction and ultimately turnover intention.

Employee motivation and turnover are my original personal drivers for this work. In my world of tech startups, competition over talent is fierce and employee loyalty is hard to earn. This inspired my initial quest to understand the components of what the job should offer the employee, or better said what the employment relationship should enable.

In the industrial economy the competitive advantage of a firm could be found on the balance sheet, it had something to do with property, machines and or capital. In the knowledge economy a competitive advantage could be found in patents and other forms of intellectual property. But both those times are gone. Knowledge has democratized and is free for all, markets move too fast to wait for patents, software has eaten the world (Andreesen 2011), and software is notoriously hard to patent and the patents, if any, are hard, slow

and expensive to defend. Meanwhile the world changes faster, opportunities come and go and a company's competitive advantage lies in the agility to respond to the changing world and the ability to quickly iterate and innovate. In all this, size matters less, speed matters more and the talent of the team matters most. Yet we are all fishing in the same talent ponds, especially as remote work becomes the norm in the post pandemic world. Location no longer plays such a paramount role in the availability and price of talent. So on that backdrop the ability to attract and keep top talent becomes a key competitive competence, so we need to learn more about this.

We followed rational agent theory, the idea that the agents rationally evaluate options along different dimensions in order to optimize for the outcomes of their actions. Nobel laureate Gary Becker championed the idea that all human behavior can be seen from an economical perspective, even the behavior that seems irrational on the surface (Becker, 1965; 1976) his Theory of Allocation of Time proposes a production function based on time and other inputs. Such functions can be optimized subject to a constraint in resources.

There are definitely limits to rational agent theory. In the first place, as described by another Nobel laureate, Herbet Simon, our estimation of utility is limited by finite time, information and cognitive capacity at our disposal. (Simon, 213) But the limitations go much further than that. The last three decades the behavioral field has developed a wealth of understanding in the limits of rationality and the psychological processes around them. But that does not mean that people are not rational in their decisions, it rather provides nuances and exceptions of a wide range of potencies. So let us evaluate the utility the individual may experience from the employment relationship integrating more of the newer understanding in behavioral psychology in the estimation of such. The perceived expected utility of the current job must therefore be bigger than the perceived utility of the best alternative minus the switching cost. The switching cost can be both material and psychological.

Kahneman, Knetch and Thaler, (Kahneman et al. 1991) elaborated on the potency of the status quo bias, the bias towards not switching. The reason for the status quo bias is theorized to relate to the cognitive and emotional effort required to switch. Therefore the status quo bias could be considered as part of the switching cost.

The endowment effect is the tendency to overestimate the value of an item one owns as opposed to the one with which there is no ownership relationship. Carmon and Ariely (2000) found students to value sports event tickets 14 times greater when they owned them rather than when they didn't, even if they got them by chance. The endowment effect surely applies to jobs too, distorting the economic rationale of employment decisions. Of course we must look at expected utility from the individuals perspective, expected perceived utility if you will. Kahneman goes a step further differentiates between the experiencing self and the remembering self arguing that the memory is but a shadow of the experience and that we are guided in our decisions by the expected remembered utility rather than expected experienced utility. This relates to the psychological distinction between hedonic and eudaimonic well being (eg. Ryan & Deci 2001) hedonic being the direct experience and the eudaimonic being the higher order of abstraction reflective experience. This nicely fits our above discussion on reconciling the ancient concept of virtues and modern concept of utilitarianism: hedonic pleasure is here and now, whereas eudaimonic happiness relies on some cognitive constructs of a good life.

Overview

This section was the introduction. The following section covers the literature review, here we took a broad look at the known factors in the academic literature that have been found to influence turnover intentions, as well as the literature on utility in the context of work. In chapter 3 we identified the gap in the literature and proposed an integration of existing theory to address the

gap. Our theoretical contribution is in chapter 3 theory development. In chapter 4 we outlined the methodology and established how the proposed theory and survey was tested. In chapter 5 we explored the core findings of the study. Chapter 6 covers limitations which led us to suggestions for further research expressed in chapter 7. Special attention is paid, in chapters 8, to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice. Finally we conclude with the managerial impact, (chapter 9) and the high level conclusions (chapter 10).

2. Literature Review

This chapter introduces all relevant theories and concepts. It defines concepts that are used in this work and debates the academic consensus and conflicts around the topics that are relevant to this work. The chapter covers utility as it is the core concept in this research. The chapter covers turnover intention as it is the main outcome looked at in this study to validate the job utility scale. As it is a cross sectional study, turnover intention is chosen rather than turnover itself. Argumentation for and limitations of this choice are discussed here, later in methodology and in limitations.

A large part of the chapter is dedicated to known concepts and theories affecting organizational behavior such as turnover. This in order to establish the existing literature predicting turnover and to which job utility is to add (e.g. Rubenstein et al., 2018; Porter et al., 2019; Podsakoff et al., 2007; Griffeth et al., 2000). The choices to include or exclude theories and concepts from this section of the literature review is best understood by looking at figure 8. The Combined Behavioral Model. Personal factors such as predispositions affect behavior. Universal factors such as psychological needs affect behavior. Agency factors such as self-efficacy affect behavior. Contextual factors such as the abundance of alternatives also affect behavior. At the core of the combined behavioral model are attitudes that mediate many of these relationships.

Special attention is paid to personal needs theories, that are covered longitudinally in an attempt to synthesize them into clusters which later show to have meaningfully different types of experience utility. The logic of the integrations is best understood from Figure 7. Non-exhaustive concept map sketch. Even though this sketch is incomplete it depicts the logic of the clustering. Whether or not this clustering makes sense is one of the core

outcomes from this study (proposition 1). It makes sense based on the confirmatory factor analysis done in this study.

There is also a section debating the academic discussion around the challenges measuring from cognition and the best practices in doing so. Those best practices are implemented in this study. For example, we rely on self reports rather than projection.

Wall street media loves a good catchphrase to dramatize the events of the day. Little did I know, when I embarked on this journey into the mind of the individual and his inclinations to stay at, or to leave his job, that at the time of writing this paragraph, many years later, the catchphrase of the moment would be “the great resignation” (Cook 2021). However, the writing was on the wall, especially in the “tech” industry which I call mine. In 2021 in the United States more than 38 million employees quit their jobs, an absolute record (Bureau of Labor Statistics, 2021). Some attribute it to the pandemic giving people a forced opportunity to take a step back and some time to think about their life’s direction and priorities. However if we look closer we see that the trend started in 2009 after the last recession (Economic Policy Institute, 2021).

The health of the labor market is an important factor in voluntary turnover. We clearly see voluntary turnover tick down during a recession when alternatives are at least perceived to be less abundant (Economic Policy Institute, 2021). Rubenstein et al. (Rubenstein et al., 2018) did a meta analysis of 316 papers on antecedents of turnover, 79 of those papers operationalize a measure of “alternatives in the job market”, the meta-analysis found a significant correlation with turnover intentions ($\hat{\rho}$ =0.23 , 95% CI [.19, .27]). Despite the shock of the pandemic, labor markets are in good shape and many economies are rebounding quickly, at least for now. So alternatives are relatively abundant, but that is surely not the whole story.

In the sixties, the cultural icon Bob Dylan, who was later awarded the Nobel Prize in literature made a song named:

> “The Times They are A-Changing” Bob Dylan (2014)

A lot changed in the sixties, but change is not confined to that decade. Change happened before and after. Much earlier, 2500 years earlier, the Greek-Persian philosopher Heraclitus pointed out that:

> “The only thing constant in life is change.” Heraclitus (Wheelwright, 1974)

Some argue, debatably, that the rate of change is faster than ever, and that it is ever accelerating. I vaguely remember a world without computers when I was a small child. Today writing this kind of paper without a computer, the internet and software for statistical analysis seems inconceivable. So how do these changes affect turnover intentions? Beyond the economy, the changes that matter are cultural changes, the changes in our priorities, expectations and values. What gets internalized in the new environment of the newer generations?

In an article on Linkedin last year I explored this topic in a speculative way (Flachet, 2021). I compared the liberation of the workforce to the sexual liberation of the sixties. People used to stay with an employer for long stretches of time, building a whole career in one firm seemed to be best practice. Now “job-hopping”, up to some extent, seems to be recommended as the best way to build your career. People’s expectations and priorities have changed, cultural studies of the generation Y and Z in the workplace (Dixon 2018) (Deloitte 2018, 2019, 2020) indicate that the transactional nature of the job has become less important. Possibly as a consequence of a more comfy economical environment, material benefits seem to have lost a lot of their shine in favor of more abstract requirements such as “meaningful work” and

“personal fit”. Protean Career Orientation (PCO) is a measure of the degree to which the individuals self-direct their careers guided by their personal values.(Briscoe et al. 2006; Hall, 1996 & 2002; Hall & Moss, 1998). PCO is a factor relatively high in the younger work generations. Holtschlag et al. (2020) explored the relationship between PCO and turnover intention, they found that the stereotype of job-hopping millennials is not correct and the relationship between PCO and turnover intentions is mediated by personal goal achievement and moderated by Organizational Career Management (OCM). OCM refers to “the policies and practices deliberately designed by their organizations in order to enhance the career effectiveness of employees” (Pazy, 1988, p. 313). This means that millennials are unloyal only when they feel they are not making progress towards their goals and the company is not being helpful with the progress. When making perceived progress towards goals at organizations with high OCM, high PCO individuals will be more rather than less loyal than their low PCO counterparts.

Interestingly there is another meta-analysis paper on antecedents of turnover published 17 year before the Rubenstein et al. one. Griffeth et al. (Griffeth et al, 2000). Comparing the two analyses nearly a generation apart we could find some interesting clues. Of course there are some limitations to the validity of the comparison because each research group has their own system of categorization of concepts that can be differently delineated. Additionally some concepts have been further developed and some have drifted. But most importantly the older paper looks at turnover as the dependent variable whereas by 2017 this was nuanced to voluntary turnover and turnover intention. This means that we can not really compare the evolution over the years based on these two meta-analysis papers other than comparing the relative proportion of factors at face value.

The meta analysis by Griffeth highlights supervisor satisfaction, coworker satisfaction, stress factors, participation, alternative job opportunities and

comparison of alternatives with present job as non behavioral antecedents of turnover. Rubenstein's analysis highlights, age, children, tenure, instrumental communication, job characteristics, job security, participation, pay, rewards, role ambiguity, workload, job involvement, job satisfaction, organizational commitment, other commitment, other satisfaction, coping, engagement, stress, organizational climate, influence, job embeddedness, leadership, psychological contract breach and work-life conflict as significant non-behavioral antecedents of turnover intentions. We will venture in the coming pages to define, explore and categorize these factors but first we want to look at utility, which neither of these meta analysis papers invokes as a concept.

Utility

If you live in Barcelona, like I do, you know that Balmes, the street, can take you from the old monasteries on the hill to the old edge of the town, which has now become the modern epicenter of the city. Few people in Barcelona know that Jaime Balmes, the philosopher whom the street is named after, took us from Catholic Spanish Scholaristic ideas, to the edge of Thomistic philosophy by developing the notion utility, which is now on the central square of behavioral economics. (Balmes, 2020)

Interestingly, the old Spanish Scholastic interpretation of utility was a qualitative concept, speaking to the appeal of products rather than putting a number on it. Putting a number on it is what the Swiss mathematician Daniel Bernoulli did, setting the stage for the Austrian School to develop key concepts such as Marginal Utility, the utility of acquiring one extra unit (Jensen, 1967).

Another school lamented the absurdity of putting a number on it, advocating for comparison-only systems such as indifference curves. That approach is referred to as ordinal utility as opposed to cardinal utility. On an indifference

curve any points of the curve are a different mix of outcomes that have the same total utility (Batley 2008).

Bernoulli also introduced the concept of “expected utility” emphasizing that the value is to be measured subjectively within the individual, different across individuals, different within individuals at different times and different when having different resources such as information or time to think. Kahneman and Tversky later built on this to develop Prospect Theory, exploring the dynamics in which expected marginal utility changes.

Kahneman also identified the difference between Expected Experienced Utility and Expected Remembered Utility. This builds on the psychological concepts of the experiencing self and the remembering self , the experiencing self is a hedonic entity where the calculation comes down to subtracting pain from pleasure. Much before that Jeremy Bentham one of the founding fathers of utilitarianism had defined utility in such terms. However there is also a more eudaimonic self that reflects upon quality of existence, this is the remembering self. Shockingly, your remembered life is not the same as your experienced life. So which self sits at the helm? Kahneman argues, and found some empirical evidence to support, that when we are making consciously deliberated decisions we are guided by Expected Remembered Utility, so at least in some well deliberated situations the remembering self is dominant.

Vroom’s concept of valence (Vroom, 1964), which we will discuss in more detail later, invokes expected utility is the estimation of valence of the outcome for the individual. Mobley's turnover model (Mobley, W. H. 1977) (also discussed in depth later) also relies on expected utility estimations by individuals. In later research in organizational behavior the term utility became less ubiquitous to make room for more affective terminology such as satisfaction, engagement and commitment as covered in previous sections. This represents a shift to a more nuanced biological perception of behavior.

Yet the prevalent mathematical approaches to the structural equations underlying behavior find part of its roots in random utility models.

Random utility models (Manski, 1977) are mathematical models that estimate the probability of behavior on both measurable attributes and unmeasurable attributes. The measurable attributes can be attributes of the individual, attributes of the available choices and universal parameters. Unmeasurable attributes are represented by an error term that represents the randomness in the sample, the bigger the error term the more random the outcomes, the smaller the error terms the more definable behavior is. The theory states that individuals consciously or not, will when presented with a discrete choice, select the alternative with the perceived highest net utility and that in this function any measurable components, such as biases, affect, mood, which generally contradict the classical rational agent theory can be included. Thus it can be considered as a broader approach to the rational theory including other behavioral components and probabilistic distributions.

Bedian and his colleagues (1991) explored a specific component of job utility and its effect on turnover intention. They considered the job's utility in attaining career goals and found, expectedly, to be negatively related to turnover intention but only for individuals with high career commitment. For individuals with low career commitment they found the opposite relationship, more career growth opportunities at the job lead to higher turnover intention. A possible explanation is that those individuals are looking for something else in the job that may be negatively related to career growth opportunities. Or another possible explanation, based on Csikszentmihalyi's flow theory (Csikszentmihalyi,1990), could be that these individuals are over-challenged and stressed.

Douglas & Shepherd (2002; Levesque et al. 2002) explored self-employment as a career choice. They tested a utility maximization model where total utility is a function of a. income anticipated b. work effort anticipated c. risk

anticipated d. independence anticipated E. net perquisites anticipated. And each factor of the individual's predisposition and the job attribute. Hence by knowing people's predisposition to income, risk, work-aversion and independence we could predict up to certain extent their likeness to choose self employment. In their sample of 91 alumni of an Australian university they found the data to support the hypothesis about risk and independence but not about work effort and income. This highlights the problem in their model and assumptions. Flow theory, job engagement theory and SDT suggest that people are not necessarily work averse but can intrinsically enjoy work, especially in the ideal psychological conditions. It is likely that this sample contains both individuals that are predominantly extrinsically motivated and therefore have some degree of work aversion, and some that are more intrinsically motivated and would therefore enjoy work. Furthermore the job utility considered in this model is restricted to income, independence and perks. We argue that there is more psychological utility to be derived from relatedness and identity related needs.

Korpi explores the utility of employment, unemployment and unemployment with benefits. (Korpi, 1997) However they equate utility to subjective well-being based on Clark & Oswald's work on unemployment and unhappiness (Clark & Oswald, 1994) and then they operationalize subjective well-being with a psychological distress score. This negativist approach ignores the entire field of positive psychology and the idea of material well being. Utility is much more than the absence of psychological distress and was therefore not the best terminology to use in this research.

Kaplan & Schulhofer-Wohl (2018) looked at the evolution of utility derived from work. They have a more holistic view of utility relating it to both positive and negative feelings. Specifically they looked at 6 feelings which they were able to measure over time thanks to historical surveys. These six feelings are: happiness, sadness, stress, tiredness, pain and meaning. On a macro level

the good news is that they found happiness and meaning to have gone up and sadness, pain and tiredness to go down. Stress has gone up but has been more or less stable for the last decade. Things got worse before they got better and the worst era seems to be the 70's. This approach to utility is more complete than the one of Kopri, but it focuses only on affective states and hedonic factors. The research was of course limited by the availability of historical data, if new data can be collected it would be interesting to add hedonic factors, eudaimonic factors and material utility in one model.

In fact, that is what we did, and we will get to that. But first let's explore the antecedents of turnover intention from a behavioral psychological perspective.

Turnover Intention

Turnover intention has traditionally examined intention to turnover rather than actual turnover (Cohen et al. 2016). Tett & Meyer (1993) define turnover intention as "the conscious and deliberate willfulness to leave the organization". Sousa-Poza & Henneberger (2002) define turnover intention as "The subjective probability that an individual will change job within a certain time period". Lacity et al. (2009) define it as "The extent to which an employee plans to leave the organization". According to Carmeli & Weisberg (2006) turnover intention refers to the following three elements of the withdrawal cognition process: firstly the thought of quitting the job, secondly the intention to search for a different job the intention to quit.

Mechanistic Views

Both meta papers of Griffeth and Rubenstein invoke the concept of withdrawal cognitions as an antecedent of turnover intention and turnover. This relationship is mechanistic in nature, it doesn't tell us "why" someone quits or wants to quit but it tells us something about the mechanics by which the idea

of quitting develops and turns into action. Mobley (1977) created a model for the cognitive process of quitting. (See Figure 2).

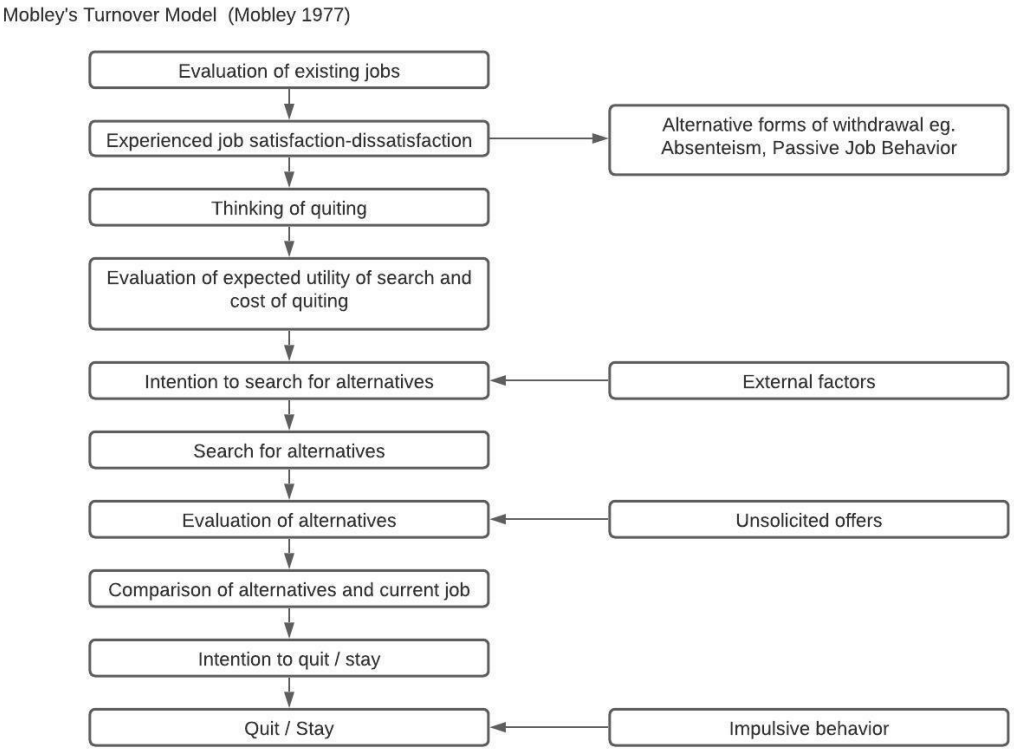

Figure 2 : Mobley's Turnover Model (Mobley 1977)

This model depicts a rational comparison where information is gathered about the current job and the perceived utility of the alternative and the switching cost. On the other hand the model suggests that the evaluation is not done regularly but comes from three different triggers, these triggers are the first three entry points into the flow chart above. The last entry point is impulsive behavior that is somewhat different from the cognitive development of the others. The first potential trigger is the evaluation of the current job, the second is the sudden unsolicited offer and the third is an external factor, such as a personal reason to move to a different location. We would imagine that today compared to 1977 the percentage of turnover cognition processes started by the second route, unsolicited offers, is much larger. In the seventies

an offer would have been per letter, fax or phone call. Today emails, social media and targeted advertisements make it much easier for unsolicited information about other opportunities to reach us, Linkedin always makes sure you know what companies are looking for your profile. So in an abundance of information about alternatives, how do we evaluate the utility of our current job?

Expectancy Theory formulated by Vroom has a similar rational cognitive mechanistic approach to motivation (Vroom 1964). There is an obvious theoretical negative link between job motivation and turnover intentions. (Maio et al. 2020) Vroom establishes three evaluations the individual considers. 1: Can I do this? If I work hard will I achieve that which we label performance? Will I achieve the goals set out? This cognitive process is called “expectancy”. 2: If I achieve performance, will I get the promised reward? This question refers to expected procedural justice, will my performance be recognized and adequately rewarded? Trust in people and process are key. This step is called “Instrumentality”. 3: The last step is the value we place on the potential reward, the expected utility if you will. Vroom called this Valence. The theory states that motivational force = Expectancy * Instrumentality * Valence. Interestingly factors are not added together but multiplied, this implies it is better to have moderate scores on all factors than to have divergent scores with the same average. Any factor with a very low score will make the outcome very low. Ngo-Henha linked the expectancy theory to turnover intention and classified it as one of eight turnover intention theories. (Ngo-Henha, 2018)

The downside of the model is that it is extrinsic in nature. One could argue that intrinsic motivations are covered in the broad appreciation of Valence including psychological need satisfaction, values and all sources of motivation. But in Vroom’s model, work is always instrumental in nature. Deci and Ryan, in Self Determination Theory (SDT) (Deci & Ryan, 2008), found

that work, or any motivated activity, does not have to be instrumental but can be an end in itself. They speak of intrinsic motivation. Csikszentmihalyi speaks of Flow (Csikszentmihalyi, 1990), as the optimal human experience. Flow is a state of full cognitive absorption in an activity and is linked to happiness and well-being (Haworth & Evans 1995). Havais and her colleagues linked SDT to volunteer engagement and turnover in 349 Romanian volunteers (Havais et al., 2013) and found specifically autonomy and competence to have a direct effect on turnover intention.

The first factor Vroom called expectancy was later further developed by other authors into self-efficacy. Bandura's (1995) concept is more of a characteristic of the individual rather than an evaluation of a situation as it is in Vroom's model but it would arguably be the key factor that would define the situational Expectancy judgment. It is a learned characteristic, and the way in which it is learned resonates with the old words of Confucius. Confucius said:

> "By three methods we may learn wisdom: First, by reflection, which is noblest; Second, by imitation, which is easiest; and third by experience, which is the bitterest." Confucius circa 500 BC

Of course Bandura is talking about self-efficacy. Developing self-efficacy is more of a transformative learning, an internalization of identity related beliefs that are highly emotionally charged. Reflection alone, noble as it may be, will not cut it, even though meta-cognition, the thinking about the self and reflecting on one's congestive process, plays an important role (Mezirow 2018). Confucius, Mezirow and Bandura all agree that for experience to deliver the respective growths it mustn't be a walk in the park, the harder the better. If difficult challenges are overcome self-efficacy goes up if failure persists self-efficacy goes down. Confucius and Bandura agree that role models play an important role, Bandura points out that the perceived similarity between the subject and the role model is an important factor. In plain English: if people similar to me can do it, so can I.

The nature of self-efficacy is subjective and up to a large extent a self fulfilling prophecy, self-efficacy leads to success via perseverance and effort. So if we could implant self-efficacy in people it would, with a bit of luck in the outcomes of the efforts spent, lead to more success and more self-efficacy. So that is indeed the third source of self-efficacy according to Bandura, after experience and social imitation: social persuasion. Being told that you can do it.

McNatt and Judge (2008) did a field experiment testing the effects of self efficacy on job attitudes and turnover. A group of 71 newcomers at a firm were randomly divided into two groups between which the only difference was that in one of the groups they received a personal communications of the management that was specifically aiming to induce self-efficacy by social persuasion and role models. They found, as expected, that self-efficacy had a positive effect on job attitudes and a negative effect on turnover.

More recent studies have linked self-efficacy to entrepreneurial intentions and business ownership (Gielnik et al. 2020) which again relates PCO, to computer and information literacy (Hatlevik et al. 20218) and even to attitudes towards robots (Latikka et al. 2019). The logic is that individuals with higher self-efficacy are more confidently engaging with new tools and technologies thus mastering them faster and confirming their efficacy.

Personal Characteristics

Expectancy theory to self-efficacy theory is our segway into the world of personal characteristics, one of the largest fields in industrial organizational psychology. The individual has many more dimensions than we can understand today and maybe ever will, and the scale of any of these dimensions is always a spectrum, not categorical scales. Yet we have been trying to put people in boxes for a long time. And the boxes are useful. As the statistician George Box eloquently said.

"All models are wrong, but some are useful." George E. P. Box

There is a massive economic incentive for predicting future job performance, job applicants accept and in fact expect some kind of tests. Whole industries are built on this predictive promise and the underlying theories have an exceptionally broad audience. Part of the affective appeal of the wide audience is the attention that is paid to the individual, most people like this attention hence are interested in the test, this is illustrated by the many entertainment driven tests going around the internet with little to no theoretical support. This is exacerbated by the Barnum Effect, the tendency to believe vague positive statements about our personality (Dana & Fouke 1997). The popularity of astrology is an illustration of this effect.

Some tests do have theoretical and empirical support, we shall look at some of these theories, especially those expected to relate to turnover intentions and it's antecedents such as job-engagement, job- satisfaction and personal-fit. Looking at the Rubenstein meta-analysis on the antecedents of turnover intentions we see 17 studies have considered this and found a quite strong negative relationship between personal fit and turnover intention ($\hat{\rho}$ =-0.29 , 95% CI [-.41, -.17]).

Personal fit is the degree to which the characteristics of the individual matches the characteristics of the organization or the role. (Anderson et al. 2008) It builds on the broader concept of person-environment fit. Kristof et al. (2005) did a meta analysis of the consequences at work of person-job, person-organization, person-group and person-supervisor fit. They found, on all measures that had sufficient data, there to be a strong negative relationship to intent to quit (up to $\hat{\rho}$ = -0.46 for person-job fit) and a lighter negative relationship to actual turnover ($\hat{\rho}$ = -.14 for person-organization fit).

Schneider pointed out that the organization's behavior is a product of the compound characteristics of its people (Schneider, 1987). Culture, structure and process are all a consequence of the attributes of the people that make up the organization. He coined the perspective the attraction-selection-attrition (ASA) model, pointing out that the organization will have a tendency to attract and retain similar people, thus gradually losing diversity. The lack of diversity will cause a lack of adaptability and an eventual decline of the organization.

Supporters of hiring for value-fit argue that when done correctly it doesn't have to undermine diversity (Hofman & Judge, 2019). You can hire for value-fit but also hire for diversity at the same time. However, what diversity are we speaking of here? Ethnicity? Religion? Wouldn't those relate to your values? Are we looking for black people with catholic caucasian values? Furthermore if we manage to find a diverse workforce that has similar values, wouldn't their way of thinking also relate to their values, so while more productive in working together and belonging, less diversity of thought which is ultimately what matters, not the skin color. Hence less creativity and agility for the team in the long run.

This suggests that hiring for personal-fit can be an effective way of lowering future turnover rates, yet at the same time damaging the organization prospects of survival. This brings us to the main ethical concern of using value assessment, the fact that they can be discriminating. If we have a company that is dominated by white males, born and raised in the country and of the same social-economical class, a female immigrant from a different cultural background and a different social-economical class will most likely never pass the personal-fit filter yet she could be the best person for the job. Here we arrive at the second ethical concern of the use of personality assessments in recruiting. We may often be measuring things that are not directly related to the job, there can therefore be an issue with procedural justice. If by all logical measures the individual is the best person for the job, but he is not chosen for

the job because of a personality attribute that is not directly related to the job, she may rightly feel unfairly treated. In chapter 8: Ethical considerations we will dive much deeper into these problems and more.

Which brings us to the third major ethical concern. To what extent do we really have the right to ask some of these questions? Attributes which are in the private domain should not be asked about. This is tricky, even in verbal job interviews, you want to get a feel of the person yet you should stay away from hobbies, family and others that may be an invasion of their privacy. Following a “need to know only” privacy policy most personality assessments can not be used, neither at recruitment nor at any time during the employment.

In “chapter 8: Ethical Considerations” we will dive much deeper into these problems and more.

So models of categorization of individuals are in all cases wrong, as they oversimplify, in many situations unethical but definitely useful in predicting turnover intentions and turnover, likely via the concept of personal fit.

Some of the categories identified have become so mainstream that they become part of our common vocabulary today. The concepts of extraversion and introversion for example require no introduction. What is interesting about it is where they came from. Carl Jung (2018) exactly 100 years ago published a paper called “Psychologische Typen” which would become the cornerstone of personality assessment for the coming century. Jung identified three dimensions of personality. For the first one, the extraversion/introversion dimension, it is a scale of preferred behavior, sometimes linked to energy levels and hedonic enjoyment of the moment by later researchers. Carl Jung proposed that we all have both sides but that one side is dominant. However practical use of the measurement has been on a continuous scale.

The second dimension identified by Jung is the thinking/feeling dimension. This scale considers the process of judging, the “thinking” type is more inclined to use impersonal logic whereas the “feeling” type is more inclined to consider feelings and tastes, theirs and others.

The third dimension identified by Jung is intuition/sensing dimension. This scale relates to the way understanding is built, the intuition type will gravitate towards top down, from abstract to practical, deductive logic. Whereas the sensing type will gravitate towards bottom up, from fact to theory, inductive logic. Intuitive types will like developing abstract concepts as they are the source of knowledge. Sensing types will like measuring the facts as they are the source of knowledge.

So if we label subjects binarily on these scales we have 8 (2^3) boxes to put people in. In the sixties Myers and Briggs developed a model based on those three dimensions adding a fourth (Myers, 1962). The fourth dimension is the judging/perceiving dimension. They relate to the tendency or not to plan ahead. Judging types will prefer to have a plan in place to decrease uncertainty and be prepared, perceiving types will prefer to plan later and keep the freedom to change plans as much as possible. In the Meyers and Briggs Type Indicator (MBTI) there are now 16 (2^4) boxes to put people in.

Despite its widespread popularity there are some problems with the MBTI. The scientific foundation of it is lacking at best, there are issues with validity and reliability (Boyle, 1995; Stein & Swan 2019). Additionally it is argued that the measurement is not comprehensive as it is missing a neuroticism dimension. Nonetheless it is very popular as in part as in the dimensions one side is not better than the other, it can therefore be used in a non threatening way as a conversation starter in team building activities and respondents are less likely to answer the question based on the expected social desirability of the outcome. Something which can’t be said of the neuroticism dimension.

However to address the critique variations exist where an additional dimension is added labeled turbulent/assertive, which de facto measures neuroticism. Neurotic people are less emotionally stable and more reactive to stressors. An alternative measurement framework sometimes called the Big Five or the Five Factor Model (FFM) was developed applying factor analysis (Tupes & Christal, 1992) on personality surveys. The five dimensions in fact conceptually overlap with the four in MBTI plus neuroticism, and three of them can be traced back to Carl Jung's types. If we simplify into binary labels that gives us 256 (2^5) boxes to put people in.

Who are you? What makes you different from other people? One of the answers may be the personality attributes above, they depict your preferences in ways of thinking (cognition) and interacting. But it doesn't tell us anything about your preferred outcomes. The goals of your thinking and your interactions will depend on your philosophical framework, the way you understand existence and the things that populate it, including yourself. Lowering one level of abstraction it comes down to what are the things you value deeply, your values. At first glance there is a near infinite amount of personal values across the world. It seems inconceivable that we could break the diversity of humanity into a manageable set of dimensions when it comes to personal values. Yet a very impressive effort was made by Schwartz in the eighties and nineties.

Schwartz identified 10 universal types of human values. (Schwartz & Bilsky, 1987; Schwartz 1992) unlike the personality characteristics these are not two sided continuums but rather a one sided dimension as in the degree you have this value or not. There are values that are close together and there are those that are somewhat opposing. Each individual is a cocktail of these 10 types of values and these values are universal. Cultural differences across the world are attributed to different expectations and benchmarks within a value not in the individual's strength of the value. For example in traditionalist society the

average self rated value of tradition is not necessarily higher, but the bar of what it means to be traditionalist is higher. The baseline disposition to the values is therefore universal. The ten types of values are: universalism, benevolence, tradition, conformity, security, power, achievement, hedonism, stimulation and self direction. The researchers asked questions around a total of 56 values in 20 different countries across the world and in 13 different languages. The results were analyzed with a smallest space analysis (SSA) technique drawing on the closeness or distance between the concepts. From there the 10 value types could be depicted on a two dimensional scale, where the scales now are two sided continuums. One from self-enhancement to self-transcendence and one from openness to change to conservation. The value types can thus be depicted in figure 3:

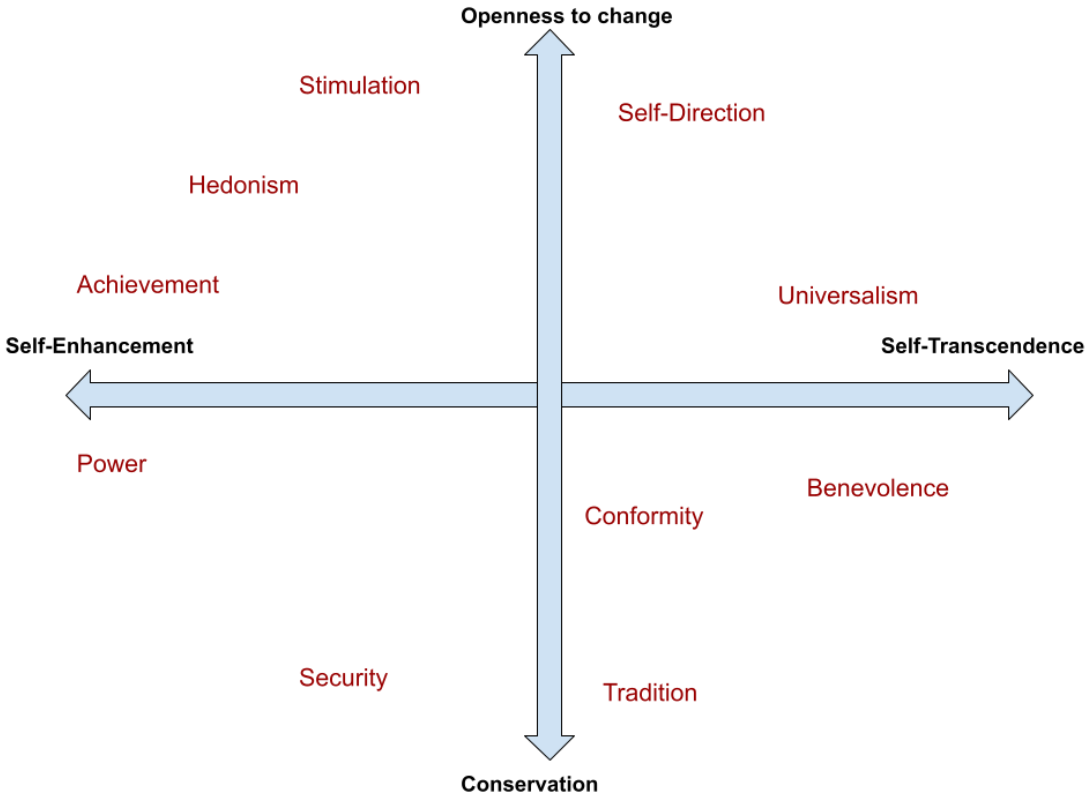

Figure 3: 10 value types mapped on 2 dimensions. (Schwartz, 1992)

Notice that the self-enhancement to self-transcendence scale matches the existence of the narrower or broader sense of identity which we discussed in the introduction. (Geartner et al 2012, Sedikides & Brewer 2015) Those with values on the transcendence side have a broader sense of identity than those on the self-enhancement side.

On the self-enhancement side we find achievement and power which we also find in Motive Disposition Theory (MDT) (McClelland 1961). MDT proposes that there are three core motives to which we are to a different extent disposed. The theory states that the differences in motivation in individuals in a work environment will be linked to the degree they have these motives. It could therefore make sense to measure these and estimate the degree to which these motives will be fed in the role at hand. If the individual does not feel like his motives can be satisfied on the job then turnover would be likely. In the opposite case, if the motives are satisfied or have a promise of satisfaction the individual is motivated and hence would be happy to stay on the job.

Individuals with a strong achievement motive have a strong need to set and achieve challenging goals. The achievement of goals is independent of the team and the relationship to it, these individuals may choose to work alone if that is perceived as the best way to achieve their goals. Theory of Goal Setting which traces back to Locke and Latham 1990, 2019) builds on the achievement motive. In order to be effective goals need to be clear, if it is hard to understand it is hard to motivate. Goals need to be challenging to the right extend, this resonates with Flow Theory (Csikszentmihalyi, 1991) that suggest a pathway of optimal experience were the challenges are hard enough to absorb our full cognitive attention but not so hard as to stress us out or have us burn out. The individual must have “buy-in” in the goals, top down set goals could undermine the individual’s autonomy as seen in Self Determination Theory (SDT). The subject should therefore be included as much as possible

in the setting of the goal. It must be possible for the individual to assess the progress he is making towards the goal. Complex goals must be broken down into achievable goals with a good line of visibility. The power of goals has made them a widely adopted tool in management, OKR (Objective Key Results) and SMART goals are current best practices. SMART stands for Specific, Measurable, Achievable, Relevante and timed.

Goal setting theory is mechanistic in the nature that prescribes certain events, the setting of good goals, to achieve motivation. MDT is more of a personal characteristic approach; some people have a high achievement motive and some less so. The achievement motive can be linked with personal vision, Masuda et al. (Masuda et al. 2010) explored the link between having a challenging and vivid personal vision and the self setting of good goals. They found that those who do have a strong vision tend to have good goals and be motivated by them. Potentially the achievement motive could be awoken by visualizing outcomes and developing a vision for the future. At the same time some individuals will naturally be more triggered by them than others. Verbalizing visions and goals also improves line of sight and the mechanistic effectiveness of goals setting.

The achievement motive differentiates itself from the power motive in MDT. Power is about the position in the relationship with others, to be the boss or to be winning, whereas achievement is measured in a rational world of abstractions. Any abstract goal can trigger the achievement motive but if it is a goal related to our position in the social fabric it is the distinct power motive in MDT. Characters with a high power motive will be particularly competitive and conscious about social status.

The third motive we could be disposed towards according to MDT is “affiliation” . Affiliation is the desire to belong to a group, to be accepted and liked. This can be linked to the socialized mind in constructive-developmental theory (Kegan, 2018). This theory suggests that individuals who are

predominantly driven by an affiliation motive may develop a stronger self authored identity when the other drives will be strengthened. The third stage of development would be the self transforming mind. Depicted on Schwartz's map of value types, the self transforming mind or the interconnected mind shifts to the right and top and can be driven by universalism, benevolence and self-direction.

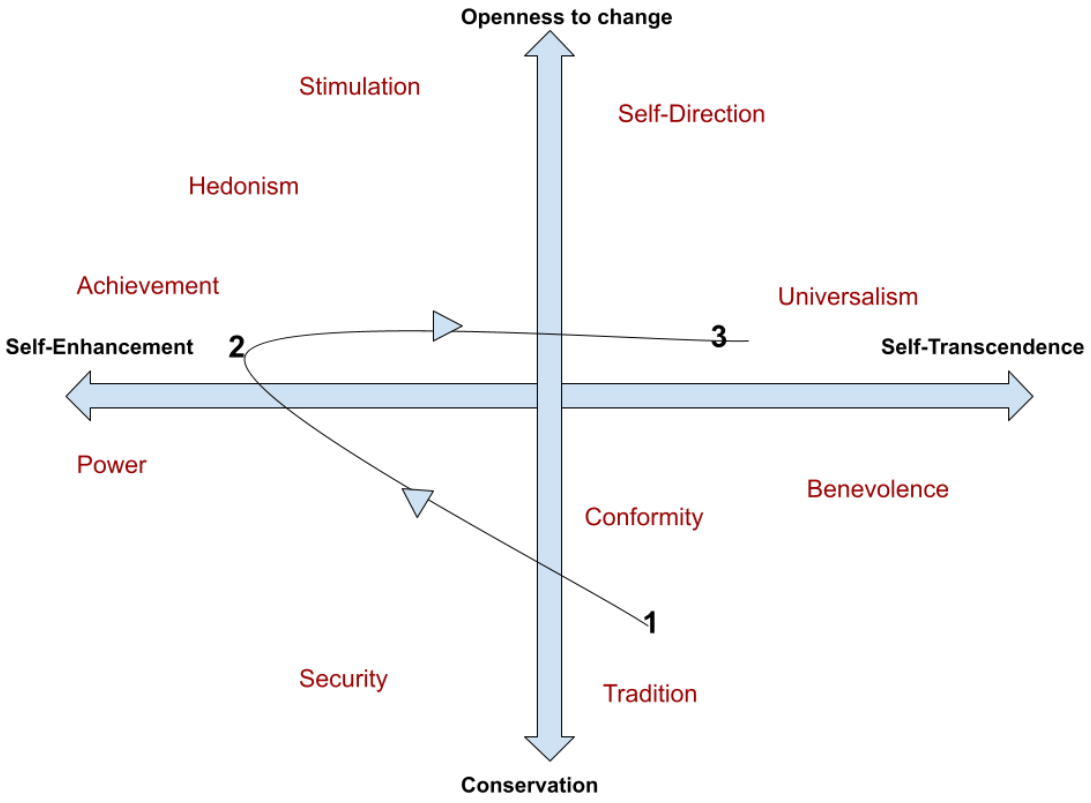

Figure 4: MDT mapped according to Kegan on Schwartz's values (Schwartz, 1992), (Kegan, 1982, 2018), (McClelland 1961)

We connect the theories and map Kegan's stages of development on Schwartz's values map.

Point 1 is the socialized mind driven by the affiliation motive, which may be linked to conformity, tradition and security. Point 2 is the self authoring mind driven by power and achievement. Point 3 is the interconnected mind driven by universalism, benevolence and self direction.

Values can also be seen from a cultural perspective, to do this on a macro level Hofstede (2011) developed 6 dimensions of culture. Which could be mapped onto the universal values of Schwartz. The emphasis here is culture, that is the values a group of people have in common.

Power Distance defines the bottom up acceptance of social hierarchy or power relationships. High power distance relates to conformity, security and tradition in Schwartz's taxonomy.

Uncertainty Avoidance refers to a desire for structure and predictability, more rules and less freedom. This again relates to conservation on Schwartz's 2 dimensions or the bottom values on it's visual representation in the previous image.

Individualism relates to the balance between the narrower I and the broader we, or to put it in the terms of Gaertner and Sedikides (2012) the balance between the individual self and the collective self. On Schwartz's value map this is represented at the left with Self-Enhancement values.

Masculinity - Femininity dimension relates to the role distribution and especially the values in men, in masculin society there are large emotional and role differentiations between men and women. IQ trumps EQ in masculine societies. Hosfstede's masculinity relates to the left side Schwartz's value map with competitive values such as power and achievement.

The Long Term Orientation dimension is based on Bond's Confucian Work Dynamism (Bond & Hofstede, 1989), basically the confusian work ethic or a meritocratic long term vision. It relates to openness to change, self direction and agency.

The last dimension to be added based on Minkov's research (Minkov, 2007) is indulgence vs restrained. To put it in our lingo, indulgence relates to hedonism

and an epicurean life view, whereas restrained refers to more eudaimonic goals and a stoic attitude.

Hofstede's model seems less parsimonious than Schwartz's but is useful as it identifies dominant dimensions of culture and there is a lot of benchmark data available on it. However we will discuss the utility and dangers of cultural analysis in HR, especially in recruitment, in the next section.

So who are you? Now we have explored four possible answers, your personality, your values, your culture and your motive dispositions. However, arguably there is only one answer. You are your values. But another distinction should be made between terminal values and instrumental values (Rokeach, 1973). Terminal values are the ones we have been focusing on here, the preferred outcomes. Instrumental values are the preferred means to achieve outcomes. Arguably your personality could largely be distilled into instrumental values and your motive disposition to instrumental and terminal values. So if we were to distill your non physical identity down to the bone, would we have only values left? Or is there something else missing? That is a very interesting question to which I don't have an answer.

Job Attitudes

Job attitudes are a subcategory of social attitudes which can be defined as: "A psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor." (Eagly & Chaiken, 1993).

Judge & Kammeyer-Mueller (2012) define the concept thus: "Job attitudes are evaluations of one's job that express one's feelings toward, beliefs about, and attachment to one's job." (page 341) This definition encompasses both affective and cognitive components, relating to both hedonic and eudaimonic evaluations of the job. With job they mean a very broad idea of "job" including

the job itself but also the role of the profession and even the relationship with the organization and supervisors. “Job” in its broadest sense.

Classically it is said that there are three types of job attitudes (Judge & Kammeyer-Mueller 2012), the aforementioned affective and cognitive but also behavioral. However, one could argue that behavioral attitudes are an outcome of affective or cognitive attitudes.

Cognitive Commitment

The most explored cognitive job attitude is by far job satisfaction (Spector, 2021), it can be defined as “An evaluative state that expresses contentment with, and positive feelings about, one’s job.” (Judge & Kammeyer-Mueller 2012) It covers both cognitive and affective aspects and both aspects are very hard to separate from each other as affect also relies on cognition about affect and affect is influenced by preceding cognitive processes. (Ashby & Isen, 1999)

The Job Descriptive Index (JDI) is the most widely used tool to measure the construct of job satisfaction. JDI was originally developed by Smith in 1969 (Smith, 1969) and revised in the 1980 when a subscale “Job In General” was added (Kinicki et al. 2002). The other subscales are, “People on present job”, “ Work on present job”, “pay”, “opportunities for promotion” and “supervision”. The meta analysis of Kinicki et al. found all subscales to be negatively correlated to turnover intention and turnover with the strongest effect to work on the present job (corrected r=.50 and .30 respectively)

Organizational commitment is a job attitude that stands close to behavior and has been, unsurprisingly, negatively linked to turnover. Traditionally it was thought of as a three-dimensional construct, the dimensions are affective, normative and continuance (Meyer & Allen, 1984).The affective relates to congruences of values with the organization, the normative relates to the willingness to do effort on behalf of the organization and continuance relates

to the desire to continue at the organization (Cohen 2007). There is a broadly used scale based on this interpretation of organizational commitment; the Organizational Commitment Questionnaire (OCQ) (Porter et al. 1974) however most researcher have used this scale in a one dimensional fashion arguing that the affective dimension is the sources of the attachment and normative and continuance dimensions are consequences of the commitment. The scale was also criticized for confounding attitude with behavior in part due to the possibly faulty conceptualization of organizational commitment (Mowday et al. 1982).

Cohen suggests a different classification with only two dimensions: timing and bases (Cohen, 2007). The timing dimension refers to the time the commitment develops, before or after entry into the organization, where the former is more of a predisposition and the latter more of a reaction to situations. The bases refers to instrumental or psychological commitment, instrumental being a transactional relationship, psychological being more affective in nature. In fact the wording of psychological commitment is sometimes changed to affective commitment.

Affective Commitment

A critique of the mechanistic view is that not all decisions are based on conscious cognitive processes, in fact sometimes cognitive processes only rationalize a decision that has been made on a more emotional subconscious level. The concept of rationalization dates all the way back to 1908 when neuroscientist Ernest Jones (1908) described it as the process of fabricating explanations for decisions made on a subconscious emotion level. The idea was pushed to the background with the rise of rationalist theories and the demise of the psychoanalytic theory. However the idea found a revival in behavioral studies in the later part of the 20th century. Festinger first defined the concept of cognitive dissonance in 1956 (Festinger, 2017). Cognitive dissonance refers to the discomfort felt when one's actions conflict with one's

cognitive thoughts. This implies that some decisions are made outside of the reach of the cognitive process.

In SDT, in Flow theory and in Kahn's job engagement theory we see an approach that is more affective rather than strictly rational. In SDT intrinsic motivation leads to joy in work or play. In the flow state consciousness of the activity seems to be pushed aside as cognitive attention goes entirely to the activity itself, losing track of time and environment. This suggests some non-cognitive affective operating mode of our mind. According to Kahn, personal engagement has three components of being present: physical, cognitive and emotional. The theory suggests that under the right conditions we are inclined to engage ourselves in the tasks at hand and that the engagement then causes the affective attitudes towards the work.

In 2003 Barsade et al.(2003) wrote a chapter on the "affective revolution in organizational behavior" and explored "job affect" as a component of job satisfaction. In its basic division there are two types of affect, trait and state. Trait refers to an individual's characteristic that is relatively fixed over time. Affective traits are likely influenced by nurture, the past experiences of the individual, as well as nature, the neurochemical predisposition. Traits can be treated much like personality attributes, the person may have a general positive or negative predisposition which affect all types of interactions.

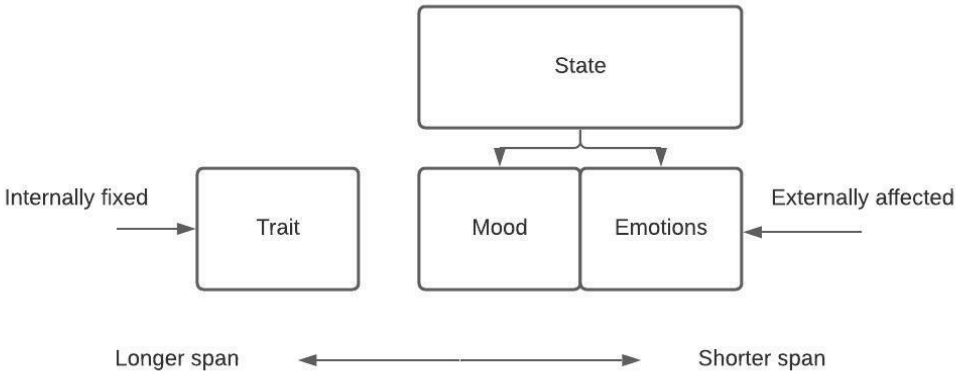

Figure 5: Types of affect. (Barsade et al. 2003)

On the other hand there are affective states which shift faster and are affected externally, emotions representing the most volatile externally influenciable components and moods, the somewhat longer lasting affective states.

Fisher argued that the missing piece in understanding job satisfaction and job attitude are a reliable measurement of moods and emotions (Fisher, 2000). To that effect she developed the Job Emotion Scale that measures 16 emotions experienced at work both positive and negative (Fisher, 1997). This scale is still widely used as a standard to measure emotions at work (example: Madampe et al., 20220, Pérez-Rodríguez et al, 2019)

Moods and emotions are contagious. Kelly & Barsade (2001) proposed a group´s affective system where group emotions are formed and regulated. They are built “bottom-up” from affective compositional effects and “top-down” from affective content. The bottom-up components are the three aforementioned aspects of affect, traits, also called affective predispositions(1), moods(2) and emotions(3), but also emotional intelligence and sentiments. Sentiments refer to specific affective preferences about objects or situations.

Emotional Intelligence is defined by Mayer (1999) as “the ability to to recognise the meaning of emotions and their relationships, and to reason and problem solve on the basis of them.”. More specifically there are four abilities that comprise emotional intelligence in a hierarchical developmental order: 1: Perceiving and expressing emotions 2: Assimilating emotion in thought 3: understanding emotions 4: reflectively regulating emotions.

Emotional intelligence influences the impact of the individuals on the group's affective system. It also regulates internal affective processes to be more effective. For example Carriochi (2002) found emotional intelligence to mediate the relationship between stress and mental health.

Emotional intelligence is a slow changing personal quality hence can be treated operationally as a personal characteristic. Emotional intelligence in leaders has been negatively associated with turnover (Mohammad et al. 2012; Gaio et al. 2020) and Gaio found the relationship to be moderated by perceived organizational support. One possible explanation of these relationships is via the idea of transformational leadership (Bass, 1999) where the leader in the organization plays an active role in understanding the growth needs of the individual and in facilitating opportunities for growth. The leader would need a certain degree of emotional intelligence in order to be effective at this, and the leadership style is likely to be associated with perceived organizational support.

The affective value of a job is predominantly hedonic, and together with cognitive evaluations form job attitudes.

Attributes Of The Job

If your characteristics influence your affective experience of your work, via personal fit, then there must be characteristics to the other side too.

Characteristics to the job, organization, people, ... whatever it is you experience fitting to.

If we are predominantly our instrumental and terminal values, and we are attracted, according to Attraction-Selection-Attrition (ASA) theory to an environment that is similar to us, then we should look at the values of the environment. But can a company have values? Can a group have values? Schein argues they can, and they are a component of what we call culture. (Schein, 2010) There are three levels of culture in Schein's perspective, the artifacts which are the visible symptoms of the culture. The values and beliefs that are the core of culture. And the underlying assumptions that are the source of values and beliefs. Large part of it is instrumental, how do we get things done. But there are also terminal values in group or organizational cultures. Of course, as we have mentioned before, if we hire for cultural fit we kill diversity, are de facto discriminating and the organization will eventually decline due to a lack of adaptability. However, being aware of our organization's culture and quantifying some data about it, may be able to help us reach a sweet spot between the advantages of diversity and fit.

Because of the problems and dangers of hiring for cultural fit, practitioners have started to move on to the concept of "culture-add" (Rock, 2021), defined as "...find someone who is a bit different and would thus add to your culture" effectively looking for the sweet spot mentioned above. There is a consensus academically that diversity improves performances (Gomez and Bernet, 2019) and other researchers have found a negative correlation between diversity climate and turnover intention (Buttner & Lowe, 2017).

There are surely characteristics of the job that are universally attractive to all individuals, or at least the vast majority. Job Characteristic Theory was developed by Hackman & Oldham (1973) and identifies 5 significant characteristics required for work to be motivating. "Skill variety" refers to there being a diversity of skills used in the job, this was later explored further in SDT

where competence is one of the core psychological needs of the individual. The need for competence is fed by work that makes use of a variety of skills, less so by a repetitive job addressing narrow abilities. Daniel Pink in his popular book Drive (Pink, 2011) built on SDT and turned “competence” into “mastery” focussing more on the acquiring rather than the having of the skills. This seems to fit with flow theory that posits that we must be challenged to the right degree to stay engaged and motivated, hence the job must sometimes address new skills.

Job identity relates to a clearly defined job, the individual must know what to do, either the desired final outcome or the desired way of working towards the outcome. If neither the desired outcome nor the method of working are clear it is hard to be motivated toward those misty goals. The method may be optional especially for individuals in Kegan’s self-authoring minds stage of development. Socialized minds will require goals and methods to be provided.

Task significance refers to the work having a meaningful impact on other people's lives. Impact can be either physical or psychological as long as it is perceived so in the worker. The impact may both be within the organization or to people outside the organization. The impact has to be a positive impact.

Autonomy refers to having a significant degree of freedom in how the job gets done. Having more agency in the process creates a sense of ownership over the work and connects the individual to the work psychologically. Total lack of connection is called alienation (Engels & Marx, 1844) a term coined by Marx during the industrial revolution. Autonomy can therefore prevent alienation up to a certain degree. Deci & Ryan, the thought leaders of SDT would later speak of the “perceived locus of control” which is closely related to sense of agency. Autonomy is a key psychological need within SDT where the effect on satisfaction and well being is echoed. The effectiveness of autonomy on job affect is found to be independent of the aforementioned self-efficacy in a study of teachers in 2014 (Skaalvik & Skaalvik, 2014). Thus even though they are

mechanically related concepts, each are independent predictors of engagement, job satisfaction and emotional exhaustion.

The fifth characteristic required according to Hackman & Oldham's job characteristics theory is feedback. Feedback refers to knowledge of the results of your actions. It is paramount in learning and improving and instrumental to task significance. Imagine bowling but not seeing, hearing or knowing in any way how many pins you hit, that would obviously not be a fun or motivating experience. Feedback does not have to be interpersonal feedback, in fact periodic performance reviews are too far apart and too subjective to be relied on soly. Ideally feedback is immediate and automatic, like the pins in the bowling alley. Fortunately the explosive adoption of all kinds of analytical dashboards in companies softwares such as ERPs, CRMs, marketing dashboards and others makes this possible for an increasing number of roles. Gamification of the workplace, the implementation of game-like features in the work environment (Chou, 2019) leverages this feedback loop to powerful drives. The catch is that overly relying on quantified KPIs has employees game the points rather than the purpose. The scores become the goal, which is disconnected for the real task significance related goal as well as different to the underlying company goals.

More recent research on Job Characteristics Theory found a relationship between motivating job characteristics and experienced happiness at work (Oerlemans & Bakker, 2018). This relationship was moderated by personal characteristics of the individual labeled "positive affect". The study used a Day Recontrustruction Methodology (DRM) where individuals are invited to relive the day in order to approximate the emotions of the moment. (Kahneman et al., 2004) This is an alternative to the experience sampling method (ESM) championed by Csikszentmihalyi which measures experience in the moment, which is not always practically possible.

In line with social exchange theory (Cook et al, 2013) and Fiske's equity matching mindset (Fiske, 1991, 1992), Eisenberg et al. invoked the construct of perceived organizational support (POS) (Eisenberger et al. 1986, page 500). POS can be described as the (for employees at an organization) "the global beliefs concerning the extent to which the organization values their contribution and cares about their well-being". Perceived Supervisor Support (PSS) is closely related and analogy considers the question from a person to person perspective rather than a person to organization perspective. (Eisenberger et al. 2002). Both POS and PSS are correlated with turnover intention, and the relationship between PSS and POS is partially mediated by "job fit" and the relationship between POS and turnover intentions is partially mediated by "personal sacrifice" (Dawley et al. 2010). Job fit is discussed in the previous section on personal characteristics whilst "personal sacrifice" is closely related to organizational commitment that was discussed in the job attitudes section. (Powell, & Meyer, 2004)

Job stressors are mental pressure and mental strain created by the job. They can be divided into hindrance stressors and challenge stressors. (Podsakoff et al. 2007) Hindrance stressors are those that are perceived by the individual as "... as potentially constraining their personal development and work-related accomplishment" and challenge stressors as "...potentially promoting their personal growth and achievement". Growth stressors are negatively related to turnover intentions whilst hindrance stressors are positively related to turnover intentions. Csikszentmihalyi would argue that the same situation could be a growth stressor for one person and hindrance stressor for the other, based on the available level of perceived competence. Bandura would argue something similar from an efficacy perspective. We are therefore inclined to see job stressors more as an affective interpretation of a work situation rather than a characteristic of the job itself. Or as the stoic emperor said:

> “It doesn’t hurt me unless I interpret it’s happening as harmful to me.”
> Marcus Aurelius

Personal Needs

So in employment characteristics there are two types of factors that matter in the context of retention. There is the personal-fit that fits to personal attributes of the individual and there is universally attractiveness such as described in the Job Characteristics Theory. For universally appealing characteristics to exist there must be some commonalities in all humans. Something that works for everyone.These universal dispositions are in organizational psychology called psychological needs. They are assumed to be present in all or nearly all individuals.

The field of study was kickstarted by Maslow in 1944 (1943) with the proposition of a hierarchical pyramid of needs. The subsequent 80 years saw an abundant interest in the field. Culminating into what is today, arguably the dominant psychological need theory Self Determination Theory (SDT) (Deci & Ryan, 2008). We shall discuss first the structure and then the content of some impactful theories in the field.

Behavioral studies have identified a tendency to stick to the first idea that we accept in our minds, evidence of this was found in confirmation bias (Nickerson 1998), the endowment effect (Kahneman et al, 1991), mere-exposure effect (Zajonc, 2001) and the in the still abundant acceptance of Maslow’s theories on main street despite the abundance of scientific critique. The critique can be categorized into three clusters, critique on methodologies, critique on content and critique on structure.

Structure

Structurally Maslow suggested a well known pyramid, according to the theory lower-order needs need to be satisfied before higher-order needs can emerge. This assumption was challenged in later research (Alderfer, 1969) as well as the proposed order of the pyramid. Later research did not find consistent evidence for the structural order of the needs (Wahba & Bridwell, 1976).

Level of aspiration theory suggests that the level one aspires to is contingent on previous successes and failures (Lewis et al. 1944). Alderfer proposed the ERG (existence, relatedness and growth theory) where the desire of the needs develops from existence to relatedness and then to growth. In this theory there is a fundamental difference between the first two needs to which the desire decreases as satisfaction increases, the growth need however has the opposite dynamic where satisfaction of the desire would increase it rather than decrease.

This two factor view is also seen in Hertzberg's theory on motivation (Herzberg et al.1959). The hygiene factors are required to be satisfied not to have a negative effect on job satisfaction but can only lead to a certain apathetic state, for enthousiasme to be possible other factors, called motivators, must be employed. The two factors are categorically different but not dependent on each other, each can be developed independently and hence 4 motivational states are possible including one with high motivation and low hygiene. Such a state is likely to invoke a sense of injustice, as the work is interesting but the employee does not feel treated fairly.

More recent research largely dropped the hierarchical structure of psychological needs. Self Determination Theory (SDT) (Deci & Ryan, 2008) proposes that there are three basic psychological needs the satisfaction of which leads to satisfaction, engagement, internalization and well-being. In this

view all three independent needs are to be satisfied and none of them is contingent on a prior satisfaction of another need. In his exploration of personal engagement at work Kahn (1990) found there to be three psychological requisites to develop engagement. In this theory the needs are also not substitutable nor contingent with each other. Sirota (2005) and his team also identified three fundamental needs employees universally feel and which are, in this perspective, the requisites for enthusiasm at work.

In Sirota's “three factor model” all factors are important but one of them has a moderating effect on the other two, hence the potency of the latter is contingent on the first.

We can summarize the structure of the psychological need theories by the following schematic representation:

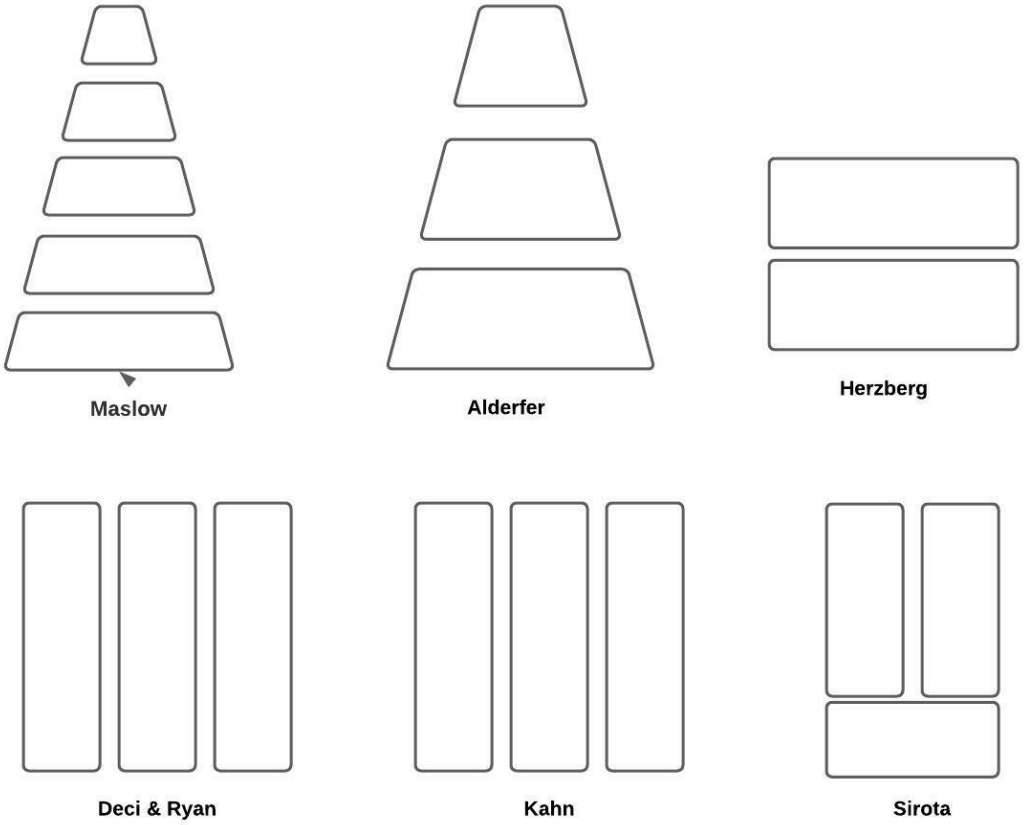

Figure 6: Structure of psychological need models. (Maslow, 1932), (Alderfer, 1969), (Herzberg, 1959), (Deci & Ryan 1985), (Kahn, 1990), (Sirota et al., 2005)

Content

With regards to content there is a plethora of terminology that has been used throughout decades much of which overlaps conceptually. Mapping different needs in different theories we can identify certain clusters.

The “material needs” cluster.

At the fundamental level on Maslow’s pyramid are physiological needs, this is sometimes also referred to as biological needs. It is a concept that is easy to grasp as it does not rely on any abstraction or even a psychological process. So much so that later psychological need researchers have started ignoring it, not that we do not have physiological needs, of course we do, but arguably

these are not psychological needs. Alderfer speaks of “existence” needs, existence needs include both material needs and the need for physical safety. Safety needs are also found in Maslow’s pyramid on the floor between physiological needs and for belonging and love.

The developmental economist Max-Neef (2019) identified 9 universal human needs of which the first two are “subsistence” and “protection”. His work is largely in the context of socio-economic development yet the basic human needs should be consistent across disciplines as they are an innate part of human nature. Max-Neef also points out the importance to differentiate between needs, satisfiers and outcomes. For example: We have a need for nutrients, food is nutrients and the outcome is subsistence.

So in the context of protection or safety, could we qualify this as a material need? The answer may be quite nuanced. Safety can refer to physical safety, in which case it is effectively expected future material well being. But safety may also relate to psychological safety which is one of the core needs of Kahn's job engagement theory. In that context “safety” relates to a more abstract form and relates to expected future psychological well being.

What is the net psychological effect of safety or the lack thereof? Is it simply a time discounted probability corrected expected value? It is not. In prospect theory Tversky and Kahneman (1992) point out that we do not value risk in line with its economic value. When the expected outcome is most likely negative we will value risks higher to attempt to escape the negative outcome. But much more often in our daily lives the opposite happens, we pay an economic premium to avoid risks. Think of all the insurance products we are tempted to buy, rarely do they make sense from a rational agent perspective. This implies some cognitive cost to the risk. People say “I’ll take the insurance so I don’t have to worry about it.” So the value of safety is future discounted outcomes plus the “peace of mind” value. This latter value is psychological even if the underlying risk is physiological.

Sirota and co invoke the concept of “equity” to cover the material benefits from the job. This sees pay from the perspective of wanting fair compensation for our work. But many don't necessarily want a fair salary, we want a lot of money. When I cut a cake for my daughter's birthday, none of her friends want a fair piece, they all want a big piece. Sure they are kids, and maybe mature adults are different, or maybe mature adults are much more diplomatic in communication and experienced in fostering trust and collaboration to break the Nash equilibrium (Nash 1951). Game theory suggests that if we all try to maximize utility we are not likely to achieve the best total social utility. In order to collaborate and achieve a bigger pie we need to foster trust and the perception of fairness. Integrity goes a long way. These dynamics are so strong and have run deep in our societies for much longer than they have been explicated by game theorists. Therefore this collaborative posture has become an integral part of the mature educated persons culture. That however does not mean that we would not have more utility from a more than fair piece of the pie, we just learned to ask for a fair piece because it is the best strategy in the long run.

If we receive a too small piece of the pie however this is much worse than the loss of material utility as it adds insult to injury. The psychological offense of being unfairly paid is a very strong emotion famously illustrated by an experiment with monkeys in cages (Brosnan & De Waal, 2003). Monkeys prefer grapes to cucumbers. Two monkeys in adjacent cages were happily eating cucumbers they got in exchange for a simple task, until for one of them the cucumbers were replaced by grapes. The “still on cucumber” monkey gets visibly angry and eventually violent with rage. You can find a video of the experiment on Youtube if you are intrigued.

The monkeys seem to care about fairness or justice. There are four types of justice: distributive, or who gets what, procedural, how is it decided, restorative, restoring fairness, and retributive, punishment for wrongdoing.

The theory of justice has roots in the Rawlsian philosophy (Rawls, 1999) but it is especially the first two types of justice, distributive and procedural, that have been widely associated with job satisfaction, organizational commitment and organizational outcomes. (McFarlin & Sweeney, 1992) (Lambert et al., 2020)

Would there be a psychological price for too big a piece of pie? At least in monkeys in cages there doesn't seem to be, but there could be in humans. Unde a piece-rate system, Adams (1963) found some workers to self-regulate work volume and quality to address perceived overpayment inequity. If there is, it is surely eudaimonic, it would be based on the identity the individual wants to consider himself. This identity would be based on the different degrees of psychological integration of values such as equity, a process analyzed and described in Organismic Integration Theory (OIT) (Deci & Ryan 1985). If this is true then the effect of overpayment inequity should be somewhat related to some form of social maturity which is exactly what Vecchio (Vecchio 1983) found in his study, where he operationalized moral maturity with a shortened version of the Kohlberg's Moral Judgment Scale (Kohlberg & Hersh, 1977). We could conclude that, for some people, there probably is a psychological price for too big a piece of the pie, but it is not universal. And by asking people we would get a distorted picture because game theory and culture has us systematically overstating the psychological integration of equity.

In SDT and OIT a lot of thought is given to the difference between intrinsic and extrinsic motivation. Extrinsic motivation is defined as motivation that is externally driven. Hence all material needs are extrinsic motivators as they are based on material that exists outside of the self. But not all extrinsic motivation is based on material needs. Grades in school for example, these would be considered extrinsic motivators yet are not material needs. In fact the strength of the motivation by grades largely depends on the cognitive

process around internalization of a rationale around the importance of good grades. It could furthermore be assumed that material needs drive externally regulated extrinsic motivation as no internalization is needed because there is no abstraction.

But pay does not only satisfy material needs. If the subject has internalized meritocratic capitalistic beliefs, then pay can function as a scoreboard for success and achievement via identified regulation or integrated regulation. Integrated regulation is the “deepest” form of internalization in OIT, the beliefs are integrated with the sense of self. Identified regulation is the second deepest form of integration where the belief is identified with.

The satisfaction of material needs is hedonic in nature as it does not rely on any abstraction. When money is used as a proxy for success or achievement then the utility may be eudaimonic in nature but the need it addresses also shifts to the identity need category.

The pursuit of the satisfaction of material needs is a transactional process. Fiske (1991, 1992) identified four types of relational mindsets that shape cognitive processes around interactions. The “market pricing” mindset is employed when we are in a transactional setting and hence will be the dominant mindset when pursuing the satisfaction of material needs. This is the rational agent in action and can best be understood by classical microeconomic theory.

Money can be seen as a way of storing material utility providing a form of material safety. In that sense it is deferred hedonic utility.

We outline the theories linked to material utility in table 1.

Cluster 1	Material Needs
Definition	Material needs are all needs related to the physical survival and physical well being of the individual.
OIT Status	External or Introjected
Hedonic or Eudaimonic	Hedonic
Relational Mindset	Market Pricing
Related concepts	Maslow: Psychological and Safety needs ERG: Existence Two-Factor Theory: Security, Remuneration, Salary Schwartz's: Individual Biological Needs Human Scale Index: Subsistence Sirota: Equity Kahn: Psychological Availability

Table 1: Material Needs, (Maslow, 1932), (Alderfer, 1969), (Herzberg, 1959), (Deci & Ryan 1985), (Kahn, 1990), (Sirota et al., 2005), (Max-Neef 2019), (Schwartz, 1987 & 1992), (Fiske, 1991), (Ryan et al. 2008),

The “social needs” cluster.

Possibly the most consistently recognized fundamental psychological across the literature is the need for relatedness. We are herd animals, the instinct to belong and be accepted by the herd is very strong. We also see status and hierarchy as pack animals. Fiske points out that if we interact under a “authority ranking” social mindset we recognize and are motivated by social structure. Arguably there could be two types of social needs, interpersonal connection and person to group connection. As Maslow points to “love” (interpersonal) and “belonging” (person to group).

Relatedness plays an important role in SDT as it is the catalyst to internalization and motivation. Whilst autonomy is a core factor in SDT this does not mean that individuals want to play solo. In fact it means that they want a sense of agency over their actions. But at the same time they want a sense of belonging and connection. Autonomy is therefore not to be confused with selfishness, the purpose of our actions may very well be social by nature as long as we feel that we have the choice.

Social Identity Theory (Tajfel, 1997) elaborates on the process of social identity creation. Any social categorization can provide a social identity, this can be the company, the division, the team, the profession or even something like methodological affiliation. In fact, the categorization is the first step in the process, the individual mentally defines and delineates the group. The second step is to identify with the group and the third step is to compare “us” vs. “them”.

The pleasure from human contact is evidently hedonic, it is the experiencing self that enjoys positive human interactions. The individual to group relationship can be both hedonic and eudaimonic, especially when related to the social status in the group the pleasure will be eudaimonic. It is the

reflective self that enjoys the it's status in the group. However the feeling of acceptance and safety in the group surely also has a hedonic component.

Which brings us to the topic of social safety, Kahn (1990) points out that one of the requisites for job engagement is psychological safety. Psychological safety relates to the perceived acceptance of the individual to the group, the agreement on norms and expectations and respect. Norms and expectations follow one of Fiske's (1991) four models of interaction, market pricing, authority ranking, communal sharing and equality matching. In well established communities communal sharing may develop, whilst they are developing or in context such as a work environment where the members of the team regularly change, equality matching, is a likely first approach to community forming, especially when there is no strong hierarchical structure that would create an authority ranking dynamic. Equality matching is based on reciprocity and respect. Social Exchange Theory (Cook et al, 2013) highlights the sense of reciprocity in social interactions.

Edmondson further developed the concepts of psychological safety relating it to the interpersonal risks in the workplace. (Edmondson, 1999) (Edmondson & Lei, 2014) which construct was related to turnover intention by other researchers. (Kruzich et al., 2014)

Respect is also an important component in Sirota's concept of equity, and relates to social psychological safety. The broader concept of relatedness is covered in their concept of camaraderie, camaraderie approaches relatedness from a task oriented, mechanistic nature. Less about the hedonic pleasure connection or the eudaimonic social status but rather the trust and reliability of your team to get the job done.

Cluster 2	Social Needs
Definition	The needs related to interpersonal relationships and person to group relationships.
OIT Status	Identified or Integrated
Hedonic or Eudaimonic	Hedonic in the interaction. Eudaimonic in social status.
Relational Mindset	Equity Matching & Authority Ranking
Related concepts	Maslow: Love, Belonging and Social Esteem ERG: Relatedness Two-Factor Theory: Responsability, Recognition, Supervision, Relationships McClelland: Relatedness, Power SDT: Relatedness Schwartz's: Requisites of coordinated social interaction Human Scale Index: Affection, Participation Sirota: Camaraderie Kahn/Edmondson: Psychological Safety

Table 2: Social Needs (Maslow, 1932), (Alderfer, 1969), (Herzberg, 1959), (Deci & Ryan 1985), (Kahn, 1990), (Sirota et al., 2005), (Max-Neef 2019), (Schwartz, 1987 & 1992), (Fiske, 1991), (Ryan et al. 2008), (Edmondson, 1999, 2014), (McClelland, 1961)

The “identity needs” cluster.

For Maslow and Alderfer the higher order needs were related to self-actualization, the further development of the self. Barrett (2011), in his seven levels of consciousness model, added additional layers on top of that relating to “meaning and purpose”, “community involvement” and “societal contribution”. We could link this to the previously mentioned stages in social emotional maturity. Self actualization being the more narrow sense of identity and connection and contribution the most expansive sense of identity.

Kahn speaks of psychological meaningfulness and relates it to task characteristics which we covered in the previous section on job characteristics. Kahn also relates meaningfulness to role characteristics, which is the identity that a role gives to the wearer of the role. This surely has a social status component that relates to the person-to-group relatedness. But role status also plays a role in the self image and the construction of identity.

In SDT the sense of autonomy and competence are key in the development of intrinsic motivation and of internalization, this can also be explained from an identity perspective. We desire a certain degree of autonomy so that we may feel like we are in control of our work and we can associate some of our identity to the work. Should the opposite be the case, and the locus of control be clearly outside of ourselves, then there is no part of our identity that is employed or manifested in the work, we would feel instrumental rather than purposeful. We would have no pride in the work. On the competence side SDT also relates to Flow theory by Csikszentmihalyi (1990). We want to feel that we are skilled or masterful at our job, for which there is an ideal amount of challenge in a job. Too little challenge will bore us, and too much challenge will stress us out and frustrate us. We want to say to ourselves “that was hard but I did really well” this positive feeling is related to the competence component of our identity “I’m really good at this”.

To be satisfied or proud of one's work upon reflection is a eudaimonic joy, yet Csikszentmihalyi explored the experiencing self rather than the reflective self in his experience sampling methodology. He would have subjects interrupted in everyday activities to evaluate their current mental state, he found that the achievement of flow, the state of optimal task involvement, to be hedonically pleasant.

We have a desire to feel good about our identity and to further develop ourselves, this is reflected in all the self-actualization and growth related psychological needs identified in the literature. Consider the notion that individuals on a mature social-emotional stage expand their sense of self to encompass part of their social identity or communal identity. Gaertner et al. elaborated on identity as a broader concept based on the relational or communal self. This broader identity could also be explained by linking Social Identity Theory (SIT) with Organismic Integration Theory (OIT), the combined flow would be: We identify an entity, this can be as narrow as our tribe and as broad as humanity or the universe. Next we identify as a member of that category. Third, the sense of identity is internalized to different degrees based on the availability of the SDT requisites, autonomy, competence and relatedness. Integration is the deepest form of internalization where concept becomes a core part of our identity. Transcendence and spirituality are integration of a wide sense of identity such as a religious identity, humanity or the universe.

Therefore doing something for the greater good we could be motivated by two needs. If we do in order to attain position in the social fabric by being a hero, for example, we would be driven by social needs, but if we do it intrinsically for the purpose of the greater good we want as us, an identity defined unit, to do better, be better or grow. Hence those actions are based on broad identity related needs. Should we be in such a mindset Fiske would point out that we

are operating on a Communal Sharing relational mindset, where we attempt to maximize utility for the community without negotiating individual shares.

Intrinsic motivation in SDT is defined as a motivation that comes from within the self. The flow state concept is very close to the pure intrinsic motivational state which provides hedonic enjoyment. However working towards long term goals there may be some eudaimonic identity related goals that are extrinsic, they would have to be internalized up to some extent in order to function, as we can only be driven to a goal if we believe we want it. The weakest form of internalization is introjected internalization, here we would expect a rather shallow motivation. On the road to our terminal goals, which may be related to our terminal values (Schwartz, 1987 & 1992) we will employ intermediate or instrumental goals. As they are conceptually loser related to the terminal goals instrumental goals may be experienced as more extrinsic. However when identity runs deep, goals are clear and attainable motivation should be intrinsic or strongly internalized.

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Cluster 3	Identity Needs
Definition	Identity needs are all needs related to descriptors of identity and changes in those, either for the individual self, the relational self or the communal self.
OIT Status	Internalized or Intrinsic
Relational Mindset	Communal Sharing (for relational or communal self)
Related concepts	Maslow: Self-Esteem, Self-Actualization ERG: Growth Two-Factor Theory: Achievement, Advancement, The Work Itself McClelland: Achievement SDT: Competence, Autonomy Schwartz's: survival and welfare needs of groups + non physical individual needs Human Scale Index: Creation, Freedom, Identity, Understanding Sirota: Achievement Kahn: Psychological Meaningfulness

Table 3: Identity Needs (Maslow, 1932), (Alderfer, 1969), (Herzberg, 1959), (Deci & Ryan 1985), (Kahn, 1990), (Sirota et al., 2005), (Max-Neef 2019), (Schwartz, 1987 & 1992), (Fiske, 1991), (Ryan et al. 2008), (McClelland, 1961)

Concept map

We have grouped the work related needs into three related clusters. To support these clusters we can sketch the conceptual proximity of these overlapping theories.

Unfortunately the paper, or more likely the screen you read this has only two dimensions, and if you have a three dimensional screen, I'm sorry I didn't anticipate that. The following sketch attempts to organize a select series of concepts discussed by the conceptual proximity. This is inherently problematic because there are of course many more dimensions on which two concepts may be close and distant at the same time, and there are too many concept to be included, however attempting to do this has helped me form a mental map of the concept landscape, imperfect but useful, especially for those with a visual/spatial cognitive approach to problem solving.

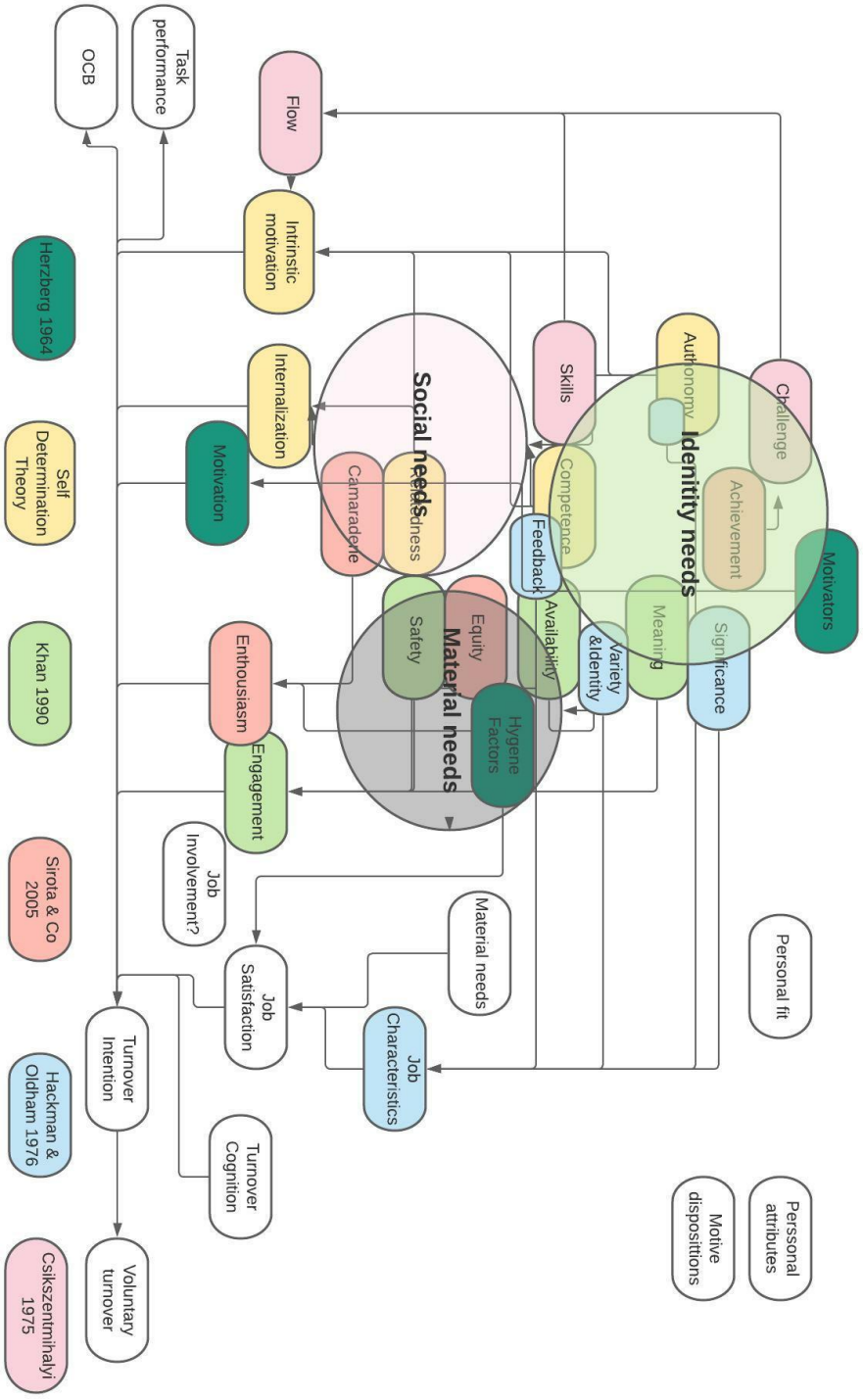

Figure 7: Non-exhaustive concept map sketch. (Herzberg, 1959), (Deci & Ryan 1985), (Csikszentmihalyi, 1990), (Kahn, 1990), (Sirota et al., 2005), (Ryan et al. 2008), (McClelland, 1961), (Hackman & Oldham, 1973),

Combined Behavioral Model

There are only relative truths, we all live in a different world and look at different layers of existence. It is inherently problematic to try to combine all the above perspectives into one logical flowchart. The flowchart is definitely imperfect but can help to form a mental map of what we have discussed and how all these concepts interact with each other to drive behavior.

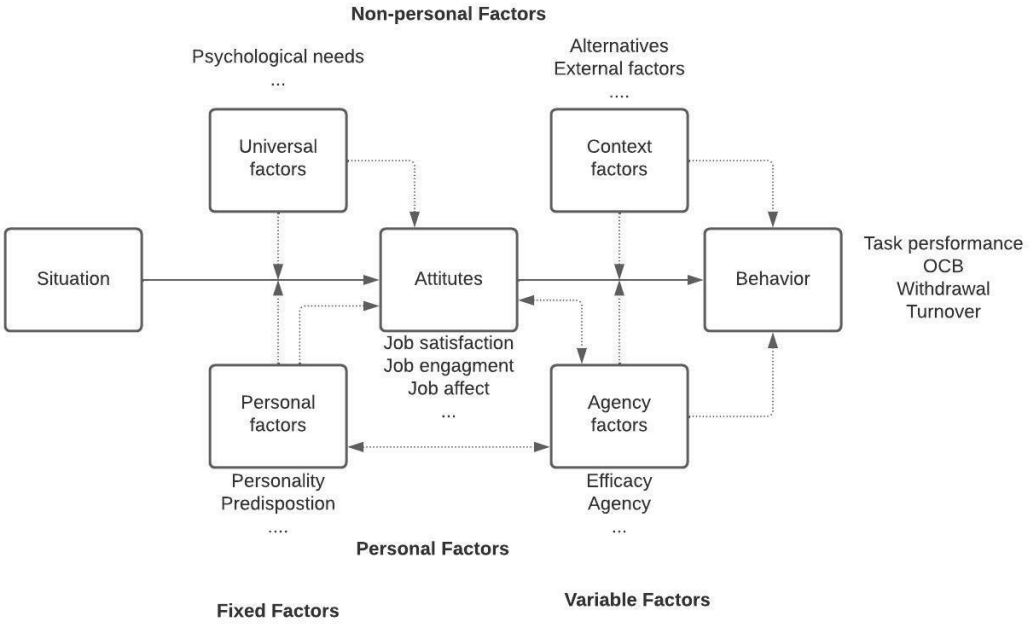

Figure 8: Combined Behavioral Model. This is a high level overview sketch based on all citations of this chapter.

We can say with confidence that situations affect attitudes and that attitudes affect behavior, those are the full lines in the model. Attitudes are also influenced by non-personal factors and personal factors either directly or by mediating the relationship between the situation and the attitude, those are dotted lines. Behavior is also affected by context factors and agency factors either directly or indirectly via moderation of existing relationships, hence the

dotted lines. Lastly agency factors may relate to personal factors and to attitudes hence the two two-directional dotted lines.

The top left side of the model represents the situational approach to behavior, the idea that it can be understood from a situational perspective with strong understanding of the universal forces at hand. The bottom left approach is the relativist approach where the differences between people play a central role. The left side of the image describes how attitudes are formed, the right side how attitudes turn into behavior. The top has non-personal factors, the bottom covers personal differentiating factors. The factors on the left are fixed factors and the factors on the right are variable factors.

Behavioral Outcomes

The ultimate goal of all these constructs and models is to better understand behavior. In our study we are primarily interested in employee turnover, in essence we are also interested in productive behaviors which we expect to be (negatively) related to the turnover measurement found. As turnover is relatively easy to quantify both from a behavioral perspective, as from a company cost perspective, it is a good place to start looking at the outcomes, specifically the negative outcomes from the psychological processes around work. Evidently it is voluntary turnover we are interested in, this is the turnover voluntary from the employee's side. Maertz & Campeon (1998) delineate it with the following definition. "Instances wherein management agrees that the employee had the physical opportunity to continue employment with the company, at the time of termination." Voluntary turnover is preceded by turnover intention, which is the cognitive antecedent to the behavior, the intention to leave the job. Other researchers have invoked the concept of turnover cognition, which is a wider concept based on the aforementioned Mobley turnover model. For us this seems to grasp at the concept too widely and confuses antecedents with the actual intention.

On the positive side there are concepts that measure the positive outcome of a well performing individual in a professional context. We can identify task performance and contextual performance. Task performance consists of job-specific behaviors including core job responsibilities, for which some primary antecedents are likely to be ability and experience (Conway, 1999).The contextual performance can be looked at via the concept of organizational citizenship behavior (OCB). OCB is defined as “Individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization" (Organ, 1988). Because of the broad definition of OCB both concepts together can aspire to exhaustively capture positive work behavior.

Becton and his colleagues explored the relationship between task performance and voluntary turnover as well as between OCB and voluntary turnover (Becton et al, 2017). They found, in their samples, there to be a negative linear relationship between OCB and turnover intention. Interestingly task performance had a curved relationship with voluntary turnover, the lowest voluntary turnover was at medium task performance. OCB is closely related to it's attitudinal antecedent organizational commitment.

Turnover can be considered as a withdrawal behavior related to other withdrawal behaviors such as absenteeism, lateness and procrastination (Hanisch & Hulin 1990, 1991). According to Hanisch & Hulin there are two types of withdrawals, job withdrawal and work withdrawal, the first one related withdrawal from the formal role and the latter withdrawal from the work itself. Voluntary turnover is a job withdrawal behavior and is therefore most closely linked to other job withdrawal factors such as voluntary retirement. According to models of withdrawal, work withdrawal can be seen as an antecedent to job withdrawal, as withdrawal cognition and conviction develops. (Koslowsky, 2009; Podsakoff et al. 2007)

In research the line between attitude and behavior is somewhat blurred as scales such as those of Hanisch and Hulin measure behavior broadly by also asking questions around intent. When relationships are calculated from one data collection point there is an inherent problem with the measurement because those who left intended to leave before but are no longer amongst the statistics of intention. The better research is longitudinal measuring turnover intention on one moment and actual turnover in the subsequent period. For this purpose we must be wary of the difference in methods of measurement. However there is consensus that there is significant slippage between withdrawal cognition and behavior (Rubenstein et al. 2018). This is one of the many challenges in accurately measuring psychological processes that precede our behavior and leads us to the next sections on measuring techniques.

Measuring From Cognition

The measuring of a cognitive process is challenging because we can not directly access or read the thoughts of an individual. We rely on communication of thoughts by the individual to us. In order to do so the individual must first reflect on thoughts or emotions in order to classify them. There may be several problems with this process. 1. The individual may not have cognitive access to the factors we are trying to measure, especially if they are partially or fully subconscious to him. 2. Each individual may significantly differently interpret certain sensations and cognitive experiences. 3. Individuals curate the information they share, we learn not to share our unfiltered thoughts and social desirability plays a factor in self evaluation. 4. The interpretation of thoughts and emotions will be influenced by moods (Murray et al., 1990). 5. Each may have different meanings for words especially for quantifying measures such, “a little”, “a lot” or “often”.

To address the last issue Likert scales are widely used in self-reported questionnaires (Likert, 1932). Likert scales offer multiple choice options with labels from the most positive possible answer to the most negative possible answer. For example, from not “never” to “always” typically with 5 or 7 linear options. Likert scales have the added advantage of visualizing the possible range and thereby anchoring the answers to that range rather than to the perceived value of a quantifying adjective.

Regarding the first problem; We don’t know what we want and we are quite bad at predicting what will make us happy. (Kasser & Ryan 2001, Wilson & Gilbert 2005). McClelland suggested that there are two kinds of motives explicit and implicit, the implicit motives are the ones we are not consciously aware of. Explicit motives, the ones a subject is consciously aware of, we can just ask directly in a survey. Implicit motives require indirect techniques such as projection. Projection techniques relate to free association and present subjects with ambiguous images and measure in which direction the subject interprets them thus projecting subconscious affect or preferences. The Multi-Motive-Grid (MMG) (Sokolowski, Schmalt, Langens, & Puca, 2000) is a method based on indirect projective measurements. The method presents subjects with a series of pictures and possible descriptions. Each description represents a motive and the selection of the description upon ambiguous pictures suggest the strength of underlying motive. The Multi-Motive-Grid is an offspring of the TAT (Thematic Apperception Test) (Murray 1943) which requested subjects to provide a narrative to a set of pictures, these open narratives then had to be codified by the researcher which opponents argue could confound the interpretation of the researcher with the interpretation of the subject.

But that is not the only critique of the technique, Sirota & co for example argue that, what needs to be measured, in their research, is the present satisfaction of needs, which is a real experience that can be polled directly. Projection is

rooted in Freudian psychoanalytic theory and Kiekegaerdean psychology (Becker, 1997), as the empirical support for these theories has crumbled in the last decades, so has the scientific acceptance of the projective method. (Lilienfeld et al. 2000)

We are not very good at remembering emotional states (Levine & Safer 2002, Kahneman, D. 2011), our remembering self lives a life quite different to our experiencing self. If I asked you how you felt yesterday morning I'm very unlikely to get a reliable answer. Csikszentmihalyi in his research on flow relied on the Experience Sampling Method (ESM), taking advantage of the at the time cutting edge telecom technology called "the pager". The pager would buzz at random times during the day and the subject would have to report their cognitive state directly into a notebook. The clue is to write down the observation immediately thus recording from the experiencing self rather than the remembering self. However, ESM is not always practically possible, therefore Kahneman developed the day reconstruction method (Kahneman et al,. 2004) in this method individuals are encouraged to relive the moment in order to improve the accuracy of the emotional memory.

Timing is key! Analogly the best time to do an exit interview is, wel, at the exit. In exit interviews valuable information can be gathered from employees who in the best case scenario can provide honest feedback on the working of the firm and possibly the factors that lead to the decision. Whilst social desirability and diplomatic dishonesty still plays a factor to the extent that we probably cannot reliably use them as direct measurement of the factors and their weights in turnover behavior. Exit interviews can be very valuable in exploratory search of possible issues to be identified. (Spain & Groysberg, 2016). Exit interviews can help us develop case specific or general theories that should then be tested by other means.

Furthermore on the topic of the timing of questionnaires, the best time is multiple times. Especially if we want to quantify the slippage between intent

and behavior, or the transition from cognition to behavior. Longitudinal studies will follow the same subject for a certain period of time and then link measured states to subsequent behavior. Considering the importance of measuring attitudes in the now and the significant difference between intent and action, longitudinal studies seem to be the gold standard for some of this research. It does however have practical difficulties as more resources and especially time is needed. And perceived anonymity may be a factor that needs additional attention as the respondents cannot entirely be anonymized along the process. Fortunately there are technological solutions to address the difficulty of perceived anonymity in longitudinal surveys. (Flachet, 2021b)

Overview

This section was the literature review, here we took a broad look at the known factors in the academic literature that have been found to influence turnover intentions, as well as the literature on utility in the context of work. In the next chapter we identified the gap in the literature and proposed an integration of existing theory to address the gap. Our theoretical contribution is in this coming chapter. In chapter 4 we outlined the methodology and established how the proposed theory and survey was tested. In chapter 5 we explored the core findings of the study. Chapter 6 covers limitations which led us to suggestions for further research expressed in chapter 7. Special attention is paid, in chapters 8, to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice. Finally we conclude with the managerial impact, (chapter 9) and the high level conclusions (chapter 10).

3. Theory Development

The purpose of this chapter is to outline the proposed new theory. It starts off by identifying the existing gap. The gap lies between the economic approach to behavior based on utility and psychological literature predicting behavior. The psychological developments are not integrated in the economical model of behavior. To this effect the job utility concept is future developed and a scale is made to measure it. It establishes the general economical model of behavior. It defines the three types of utility. It integrates these types of utility in the economical model of behavior. This chapter also defines parameters by which questions about utility can be asked. These parameters are important because they lead to an attempt to be exhaustive in the survey. Finally this chapter leads to the propositions of this study.

Mind The Gap

Recent research in the field has broadly explored the antecedents of turnover and turnover intention. Job attitudes such as organizational commitment, (Guzeller & Celiker, 2019) career commitment (Zhu et al, 2020), work-engagement, Job Satisfaction (Kim & Kim, 2021) (Madigan & Kim, 2021), (Yan et al. 2021) have a strong association with turnover intention, they are the attitudinal antecedents of turnover intention. They are the outcome of what happens in the context of the employment, on their own they are not terribly useful for practitioners. If I wonder why my employees are quitting and the answer I'm provided is that there is a problem with organizational commitment, that is not an actionable piece of information, in fact it doesn't really answer the question, it is more symptoms of the problem. There are of course antecedents to organizational commitment (Zhu et al, 2020) such as autonomy and self-efficacy. This suggests that I, the employer, may want to look at Self Determination Theory (SDT) and, or, Self Efficacy Theory to understand the source of the problem of organizational commitment and

turnover. SDT provides the theoretical framework to predict psychological engagement and intrinsic motivation but it does not incorporate quantifiable extrinsic drive measures.

Other researchers looked at environment and fit measures such as personal-organizational fit, job embeddedness (Kim & Kim 2021), perceived organizational support (Astuti & Helmi, 2021), work -life balance (Xu & Cao, 2019) and network positions (Porter et al. 2019). These factors seem more actionable. If I, the employer, am told that there is a problem with perceived organizational support, or work-life balance, leading to turnover intention, that, I can act upon. Others, such as job embeddedness and personal fit, depend on factors that are much more difficult to change once the person has been hired, or may entirely fall outside the organization's power beyond hiring and firing. Arguably some of these factors are circumstantial and are a reflection of underlying factors such as alignment of values and culture. In the literature review we have introduced the practical, economical and ethical dangers of using culture in recruitment, retention and motivation, in chapter 8 on ethical consideration we will contemplate more on this. It seems that by using environmental factors there are definitely some low hanging fruit, but this is by no means an exhaustive toolbox to address the challenges of retention.

Other researchers looked at emotional and well-being states; burn out (Madigan & Kim, 2021), emotional exhaustion, job stress (Kim & Kim, 2021), (Park & Min, 2020), these are evidently strong predictors of turnover intention. Up to some extent they are accionable, we could rely on Flow Theory (Csikszentmihalyi, 1990) to reduce the level of challenge or workload, or we can rely on Kahn’s job engagement theory to provide more psychological safety or other relevant theories. This however is a negative approach in the sense that we are going from a negative situation to a neutral one. We are putting out fires. The absence of negative indicators of well being do not guarantee us loyal employees.

On the other hand we have material interests and extrinsic motivation, material interests are often out of scope in the models of psychological engagement (SDT, Kahn's engagement theory, etc..) however they play an important role even in the most social of jobs (Luo & Chiu, 2020).

What is missing is a practical tool to get a high level exhaustive overview of what people get out of a job, materially and psychologically. In order to be able to measure and compare categorically different things we can look at everything from a utility perspective. How much value does this create for the subject?

From a rational agent perspective the subject will decide to quit when the expected utility of the job is lower than the opportunity cost, that is, the best alternative, which can be another job, or not working. The dimensions of utility derived from work can be synthesized building on the developments in the field of organizational psychology and behavioral sciences.

In essence we are broadening the perspective on utility to include the things we have, in recent decades, identified as creating psychological utility. Such a tool would be highly actionable as it leaves the abstraction of job attitudes out of it and measures effective affective outcomes from the job.

In the literature review on needs we clustered different needs into clusters of conceptual proximity, this led us to three clusters, one on material needs, one on social needs and one on identity needs. It therefore seems logical that utility exists in these three dimensions and we label them material, social and transformational utility respectively.

The General Model

Converging the economical and psychological outputs of work we propose that what economists call "utility" in the context of work really has three

dimensions. Worded differently: There are outcomes along three dimensions that can be considered utility. The Nobel Laureate economist Gary Becker's logic (Becker, 1965; 1976) argued that these are the affective outcomes that need to be added together into a total utility.

$$U_J = f(x_{1,}x_{2,}\, x_3)$$

Assuming the relationship is linear the utility function can be expressed in terms of its components

$$U_J = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \alpha$$

Where U_j is the total utility derived from the job and x_1 , x_2 and x_3 are the dimensions of utility, Material, Social and Transformational which shall be labeled M, S and T respectively. Hence:

$$U_J = f(M_{,}S_{,}\, T)$$

If linear:

$$U_J = \beta_m M + \beta_s S + \beta_t T + \alpha$$

A rational agent is expected to voluntarily leave employment when the expected utility of opportunity cost, or the best alternative use of their time (another job or a non job activity) minus the switching cost is greater than the perceived utility from the current job.

Turnover (Q) occurs when

$$U_j < U_a - c_s$$

where U_a is the perceived utility of the best alternative and c_s is the switching cost.

So the probability of Q is

$$P(Q) = P(U_j < (U_a - c_s))$$

or

$$Q = f(M, S, T, U_a, c_s)$$

Material, Social and Transformational utility dimensions are themselves a function of the different components that make up these affective outcomes.

$$M = f(m_1, m_2, ... m_n)$$

$$S = f(s_1, s_2, ... s_n)$$

$$T = f(t_1, t_2, ... t_n)$$

The three dimensions of utility

Synthesizing Maslow's psychological need theory (Maslow, 1943), Alderfer ERG theory (Alderfer, 1963), Hertzeberg's two factor theory (Hertzberg et al, 1959) McClelland's motive disposition theory (McClelland, 1961), Deci and Ryan's SDT (Deci & Ryan, 2008), Deci & Ryan's OIT (Deci & Ryan, 1985), Schartz's universal values (Schwartz, 1992), Max-Neef's human scale index (Max-Neef, 2017), Sirota's Three Factor Model (Sirota et al. 2005), Kahn's work engagement theory (Kahn, 1990), Csikszentmihalyi's flow theory (Csikszentmihalyi, 1990) and Fiske's social mindset theory (Fiske, 1991) we identified three clusters of psychological needs and psychological antecedents of job attitudes and behavior.

Definition of dimensions

From those conceptual clusters the following categorizations and definitions are created:

Material Utility: The utility derived from material benefits.

Social Utility: The utility derived from human interaction.

Transformational Utility: The utility derived from the development of the individual, social or communal self.

Definition of sub dimensions

For each utility category different questions can be created that look at different aspects of the factor. In this section we cover in a structural way the dimensions of variations in the questions.

Hedonic vs eudaimonic.

Hedonic is physical enjoyment or pleasure (Young, 1936). It is the enjoyment of the experiencing self (Zajchowski, 2017).

Eudaimonic is a second order psychological enjoyment. It is the enjoyment of the reflective self. It relies on a mental construct of “good”. Or to cite Deci and Ryan “(in eudaimonia) ... the focus is on living life in a full and deeply satisfying way” (Deci & Ryan, 2008b, page 1) It relates to the reflective self rather than to the experiencing self. (Ryan et al. 2008)

Focal point

The focal point refers to the entities involved in the perception of the utility. For material utility we compare to the focal point, for social utility we have a relationship with the focal point and for transformational utility it is the version of the self that is the focal point.

For material benefits this is the reference point that defines the subjective experience of the level of benefit. The focal categories for material utility are selected aided by from research by the German Socio-Economic Panel (SOEP) that explored in a longitudinal study on 30.000 subjects how we

experience relative income (Mayraz et al. 2009) and work by Clark & Frijters (Clark et al. 2008) relating relative income to happiness and utility.

For social utility the focal point refers to the counterpart involved in the interactions or relationships. There are “horizontal” relationships with colleagues without formal power components and there are “vertical” relationships that have formal power components. Additionally there are perceived people to group relationships. (Masterson et al. 2000) (Raggins & Winkel, 2011).

For transformational utility the focal point refers to the version of the self that is considered. Here we follow Gaertner & Sedikides broad conceptualization of the self that can be, more individual or more communal. (Gaertner et al., 2012). This also relates to Fiske’s social models of cognition. (Fiske, 1992)

Time

Time refers to the temporal distance of the expected utility. Some behaviors are driven by immediate rewards and some are driven by future rewards. In an infamous experiment with children and marshmallows at Stanford, Michel and his colleagues investigated the different ability to delay gratification (Mischel & Ebbesen, 1970). The conclusions from this study were later refuted, including by the same author (Benjamin et al., 2020). However in later econometric research the concept of temporal discounting for utility, health and money has been well established (Chapman, 1996) and it seems that each individual has an implicit discount rate defining his tradeoff point between instant and delayed gratification (Critchfield & Kollins 2001) (Seaman et al., 2022).

Material Utility

Material utility is useful to fulfill material needs identified in the material needs cluster in the literature review (table 1 in the literature review).

The material benefits from the job are the most evident economic motivator of employment. As mentioned in the discussion on material needs in the literature review these needs are not necessarily psychological. However they are clearly value provided by the organization to the employee, most of which, the money part, has a market value and is tradable for other goods or services, now or later.

Researchers have found situations where more extrinsic rewards for behavior undermine intrinsic motivation and can actually decrease overall motivation. This is called the overjustification effect (Tang & Hall, 1995) and finds its theoretical explanation in SDT's autonomy component. Extrinsic rewards shift the perceived locus of control outward hence undermining intrinsic motivation and internalization. This is however the exception to the general rule, which is that people are motivated by money.

As mentioned before in the literature review, there can be eudaimonic components to pay levels. Specifically when under meritocratic values prosperity is linked to achievement. Then arguably the eudaimonic outcome is psychological in nature and relates to the Transformative Utility we will discuss later.

How much is 7? Is it a lot? Without knowing what the number reflects it's impossible to say whether 7 is a big number or a small number. The same goes for material packages, individuals evaluate these based on reference points, their previous pay packages, the pay packages of their friends, their perceived market value, pay packages of their colleagues. Our Items at the scale attempt to target the different reference comparisons. (Mayraz et al. 2009) (Clark et al. 2008)

Social Utility

Social utility is useful to fulfill social needs identified in the social needs cluster in the literature review (Table 2 in the literature review). The prevalent related concept is relatedness. Neurochemically oxytocin and vasopressin play a role (Basso & Suzuki, 2017). There are two types of relationships, horizontal as in relationships with colleagues at a same or similar level, and the hierarchical relationship which has a formal power component. In hierarchical relationships we argue that the upwards relationship is the most impactful in the work experience as it is the closest to the abstract concept of the individual to organization relationship. Legally a company is a persona but psychologically it is rather a group of people in the first place represented by your boss. Social utility can be hedonic as in enjoying the interaction and eudaimonic as in being proud of your colleagues.

Transformational Utility

Transformational utility is useful to fulfill identity needs in the identity needs clusters identified in the literature review (table 3 in the literature review). It is the most abstract of the three. Important to note here is that we follow Gaertner (Gaertner et al.2012) and Sedikides (Sedikides & Brewer, 2015) broad definition of identity including the relational self and the communal self. Concept such as meaning, purpose, learning, growth can be seen from a perspective of improving the “I” or the “us”. More individualistic individuals look for personal meaning, more spiritual or transcendental individuals look for communal meaning. Many in between try to do something for their “in group” , the group that provides their social identity (Tajfel et al 1979). So the concept of the self is a parameter that differentiates transformative utility from one person to the next. Identity related development is largely eudaimonic as it relies on the abstract construct of identity and the cognitive process around it (Ryan et al. 2008). However there are also hedonic instances such as flow

and intrinsic motivation that do not seem to be reflective in nature. Flow relates to fun, as in having fun working / playing (Csikszentmihalyi, 1990). It is best understood from the playing perspective, games are fun when the level of challenge is enough to be challenging but not too much to be out of reach. It is in essence an identity challenge - identity confirmation loop. “This is hard. Can I do this? Yes I can! I did it jej! Oh, the next level is hard…” neurochemically this relies on stress neurotransmitters (cortisol, norepinephrine and adrenaline) and reward/pleasure neurotransmitters (dopamine, endorphin and serotonin) (Basso & Suzuki, 2017). Games are in essence hijacking the achievement reward system (Chou, 2019). Hence the hedonic experience of flow is still an identity related utility.

The eudaimonic transformational utility can be quite complex and varied. Here Organismic Integration Theory (OIT) (Deci & Ryan, 1985), explored in the literature review section, can provide further categorization. When we are proud of our position this may be based on introjected values and beliefs, when we are proud of the work itself this may be based on integrated values and beliefs. OIT is relevant in transformational utility rather than the other types of utility because the utility is based on our self-concept, and OIT addresses the process of integration which can be understood as the psychological construction/development of the self construct.

Lastly there is as in the other utility categories the possibility of delayed rewards, the promise of utility in the future. Many achievement oriented personal goals will be relatively long term goals. The future orientation can be brought back to a personal parameter called the “delay discount” (Madden & al, 2003) this concept has its roots in financial decision making where future cash flows are valued less than present cash flows and the difference is discounted at a certain interest rate that the set preference level by the actor. Psychologically we do the same with future utility both material and psychological utility (Critchfield & Kollins 2001).

Delineation of social utility and transformational utility

As transformation assumes a broad concept of the self that includes the relational self and the communal self there is seemingly a possible gray area between social utility and transformational utility. Social utility is about human contact, interaction and belonging, transformational utility is about transforming the “us” in the social identity. So the first relates more to the relationship between the individual and the group, especially the more hedonic aspect of that relationship. “Do I feel accepted?” “Are these people my friends?” relate to social utility . “Are we the best team?” relates to transformational utility because it is the status of the “us” in the environment. When relating to social status within a group this actually relates to a relatively narrow identity need, because the “I” wants to achieve status in the group. If my self is truly integrated with the social group then the “we” becomes more important than the “I” in the group.

Table 4 below provides an overview of the dimensions and sub-dimensions of job utility addressed in our research.

Item Code	Questions	First Dimension	Focus	Time	Hedonic or Eudaimonic	OIT
		Is it Material, Social Or Transformational utility	Focal point of the measurement . The reference point in M. The relationship in S. And the identity in T.	present or delayed ?	Relating to the experiencing self or the reflecting self.	Underlying process of identity construction

M1:	I believe I get paid a lot for my work. I am paid well for my contributions.	Material	Contribution	Present	Hedonic	
M2	Other employers would pay me more. I could make more money at another organization.	Material	Market	Present	Hedonic	
M3	I get paid more than my colleagues. I have a larger income from the job than others at our organizations.	Material	Internal	Present	Hedonic	
M4	My job provides me with a large income compared to the jobs of people I interact with outside of work. I make more money from my job than my friends do from theirs.	Material	External	Present	Hedonic	
M5	I will make a lot more money in the future working for this employer. My income will go up significantly working for this organization.	Material	unspecified	Delayed	Hedonic	
S1	I enjoy interacting with my current colleagues at work. I like working with the people I work with.	Social	Colleagues	Present	Hedonic	
S2	I enjoy interacting with my boss(es). I like working with my boss(es)	Social	Boss	Present	Hedonic	
S3	At work I feel like I am part of a team. I feel accepted by my colleagues.	Social	Person to Group	Present	Hedonic	

S4	I am proud of my team. I tend to talk positively about my team.	Social	Group	Present	Eudaimonic	
S5	There is a good atmosphere at my organization. There is a good vibe at work.	Social	Group	Present	Hedonic	
T1	My work is meaningful. My work projects are useful.	Transformational	Communal	Present	Eudaimonic	Integrated
T2	My work is fun. I currently enjoy the work itself.	Transformational	Individual	Present	Hedonic	Intrinsic
T3	I learn new things on this job. I am learning new things working here.	Transformational	Individual	Present	Eudaimonic	Unsp.
T4	Thanks to my job I'm growing as a person. The job enables my personal growth.	Transformational	Individual	Present	Eudaimonic	Identified or integrated
T5	I am proud of my position. I like the identity associated with my function.	Transformational	Individual	Present	Eudaimonic	Introjected
T6	I am proud of the work itself. I am proud of what we/I do.	Transformational	Unspecified	Present	Eudaimonic	Integrated
T7	My career is advancing rapidly with this organization. Working here is the right career move.	Transformational	Individual	Delayed	Eudaimonic	Introjected or Identified

Table 4: Full list of items considered in study. (Maslow, 1932), (Alderfer, 1969), (Herzberg, 1959), (Deci & Ryan 1985), (Kahn, 1990), (Sirota et al., 2005), (Max-Neef 2019), (Schwartz, 1987 & 1992), (Fiske, 1991), (Ryan et al. 2008), (Edmondson, 1999, 2014), (McClelland, 1961)

For transformational items there is an additional dimension that relates to the type of integration based on Organismic Integration Theory (OIT). Transformational items relate to a concept of identity whereby OIT becomes

relevant in defining how this identity is constructed. Material and Social does not rely on identity hence there is no OIT dimension here.

Propositions

The microeconomic approach to predicting behavior assumes we look at the perceived utility of different outcomes (Echenique et al. 2021) and decide based on these. The organizational psychology approach looks at psychological processes (Ryan et al. 2021) of motivation. OIT looks at the continuum towards internalization by looking at the core needs. Recent research point outs that utility in classical game theory should be called material utility (Dhami et al. 2019) and that apart from that there is psychological utility, however, there is not yet an exhaustive overview of psychological utility, as not enough of the developments in organizational psychology have been translated into utility for decision making. Dhami and his colleagues looked at reciprocity, guilt and surprise seeking. Bedian and his colleagues (Bedeian, et al. 1991) use the term job utility for what is really career utility, how useful it is for the subject's career. Douglas & Shepherd (Douglas & Shepherd, 2002; Levesque et al. 2002) looked at self employment as a career choice and composed a utility function consisting of a. income anticipated b. work effort anticipated c. risk anticipated d. independence anticipated E. net perquisites anticipated. Kopri operationalizes the utility of employment with the absence of psychological distress. Kaplan & Schulhofer-Wohl (Kaplan & Schulhofer-Wohl, 2018) operationalize job utility with 6 feelings, happiness, sadness, stress, tiredness, pain and meaning. There is no consensus on what utility is derived from employment other than the consensus on material utility. Nor is there a high level exhaustive view of the dimensions of job utility. Based on the emerging consensus in organizational psychology we can propose such dimensions and definitions.

Proposition 1

The utility derived from work has three dimensions.

One dimension relates to the material benefits (Material)

One dimension relates to interpersonal experiences (Social)

One dimension to identity related developments (Transformational)

If we correctly identified the dimensions of utility then these measures should each independently have a relationship with turnover intentions. We assume that, the higher the utility derived from the job, the less likely employees will intend to quit. (Reinagel, 2021)

Proposition 2

The three utility factors will predict turnover intentions such that employees who experience higher material, social and transformational utility will be less likely to quit their jobs.

The ambition of this study was to develop an instrument that may be of added value to leaders of organizations in providing, to employees, valuable employment. We specifically looked at turnover intentions as a negative indicator of the employer's success at providing valuable employment. Even though we did not yet look at it in this study we would expect, based on existing theory, the same factors that are related to a decrease in withdrawal behavior also to be linked to an increase in positive work behaviors. We chose to start from turnover and turnover intention as it is a salient, costly and measurable matter.

Overview

In this chapter we identified the gap in the literature and proposed an integration of existing theory to address the gap. Our theoretical contribution was in this chapter. In the next chapter we outlined the methodology and established how the proposed theory and survey was tested. In chapter 5 we explored the core findings of the study. Chapter 6 covers limitations which led us to suggestions for further research expressed in chapter 7. Special attention is paid, in chapters 8, to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice. Finally we conclude with the managerial impact, (chapter 9) and the high level conclusions (chapter 10).

4. Methodology

This chapter outlines the methodology. It starts with general descriptive statistics of the sample. It outlines how the DeVellis scale development methodology is followed. The data is rigorously cleaned to filter out noise of for example people who are not reading the questions. The analysis of normality is done to ascertain that the methods used are adequate to the sample. It is explained how reliability and validity are tested. Nine other existing and validated scales are used to test construct and criterion validity. The predictive value is tested to test proposition 2.

Introduction

We conducted a cross sectional international study administered to 540 employees across 53 countries. The survey was conducted in two batches on different days of the week using the Prolific research platform. A platform evaluated and approved by other researchers. (Palan & Schitter, 2018) The survey was used to validate a scale to measure job utility.

In total, after the cleaning of the data we retained 505 submissions of which 290 were collected on a Sunday and 215 were collected on a Wednesday. The sample contains 450 people who self-identified as employees, 13 as interns and 42 as self employed. The subsequent questions respondents were allowed to leave blank if they preferred not to answer, this was rarely done. This is why not all numbers add up to 505. Our sample of respondents is relatively young, most respondents were younger than 30 years old (59%) followed by 30-40 year olds (30%) 41-50 (8%) and 50+ (3%). We had respondents located in 30 different countries who self identified as 53 different nationalities. Most respondents identified as South African (19%), British (18%), Polish (10%) and Portuguese (8%). Of the very wide range of industries people worked in the most common were: IT (10%),Computer

software/Engineering (6%), Retail Industry (5%), Hospital/Health Care (5%). 84 industries were represented at least once but less than 10 times. Most people have been with the current organization between 6 and 18 months (22%) followed by 18 months to 3 years (21%), more than three years (18%), less than 6 months (14%). Most respondents had 1 to 5 years of professional experience (43%) followed by 5 to ten years (22%). Our sample was relatively highly educated with 44% signaling a bachelor degree as their highest level of education followed by 26% master degrees. For more details on the demographic characteristics of the sample please refer to Annex 1.1 for the full report.

A Likert type scale to measure the proposed dimensions of utility was developed and tested. We explored the internal reliability with Cronbach alpha. We explored the validity of the scale at face validity, construct validity, criterion validity and content validity. In order to do this we also measured other constructs that are theoretically related to the three utilities proposed.

We developed and tuned our model based on exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM) following Bryne (Byrne 2001, 2013) and DeVellis (DeVellis, 2016). Our calculations were done with two software applications, SPSS Amos, the ancient IBM solution and JASP, the new open source solution from the University of Amsterdam. (Goss-Sampson, M. 2019)

We then proceeded to evaluate whether this proposed model is of added value in predicting turnover intention beyond that which is already predicted by existing constructs.

Finally the areas of interest for further research were defined.

Scale development

In the scale development process we followed the DeVellis (DeVellis, 2016) method, this method consists of 8 specific steps which we follow with minor adaptations as we are building on some previous pilot studies at the Geneva Business School that were probing the items to be on the scale. However previous studies were under slightly different definitions of the categories and a different methodological approach, so we did not formally consider them pilot studies but rather efforts by the group of experts to explore and review items, which in the Develliz method relates to step 4.

Step 1: Determine Clearly What It Is You Want to Measure

What you have (hopefully) read so far constitutes the theoretical foundation, the construct definitions and the delineation of possible ambiguities. We identified three sub dimensions that can be used to attempt to create an exhaustive list of questions covering the utilities.

- The focal point (of the relationship or reference)
- Hedonic or eudaimonic (relates to the experiencing self or the reflective self)
- Time of experienced utility (present or delayed)

Notice that the proposed model is very deeply anchored in existing theory.

Step 2: Generate the item pool

Material Utility

For material utility the focal point relates to the reference point, we identified possible focal points:

- Compared to my perceived contribution
- Compared to my perceived market value
- Compared to others at the organization
- Compared to others outside the organization

And we considered the expected progress of income. We considered all questions from a hedonic perspective as eudaimonic perspective on pay would be categorized as transformational utility as mentioned above.

For each parameter there are two differently worded questions asking the same exact question in order to evaluate internal reliability. In the question labels we used the letter A for dependent variables, the letter B for our scale items, and the letter C for related scales measured with the purpose of validating our scale. The questions were also presented in this order so as to first ask about the dependent variables before asking about the independent variables to avoid having the answer to the dependent variables influenced by having just thought about the independent variables.

The study was limited to two questions per sub construct to optimize the survey length. Pairs of questions were spread out in the question order to make it less obvious we are asking the same question and increase the chance that the respondent will think about each question independently.

Social Utility

The focal point of the social utility sub constructs can be interpersonal and person to group. The interpersonal focus can be colleagues in general, and the relationship with the supervisor which as we discussed earlier we expect to be a bit different due to the power relationship and the sense that the boss represents the formal representation of the organization to the worker. The person to group focus can refer to the team, the organization or whatever work group the respondent considers himself to be part of. We use the terms “my team”, “at my organization” and “at work”. Related to the team we considered the possibility of eudaimonic utility as well as hedonic. We did not consider delayed utility as, at the time of the evaluation, it didn’t seem likely

people would be driven by “the future opportunity of better social connection”. We did not yet explore the concept of self as that will relate to the transformational utility.

Transformational Utility

In transformational utility the focal point is always the self, but a difference lies in the concept of the self. As discussed before, there can be a different degree of “broadness” in the self definition. With broadness we refer to a communal identity within a large social group. The utility is mostly eudaimonic but, as discussed before, it can also be hedonic in cases of flow and intrinsic motivation. Here we also consider the possibility of delayed gratification, working today for better outcomes in the future.

Step 3: Determine the Format for Measurement

We chose to use a Likert scale as the literature is widely supportive of its use in organizational psychology, (Croasmun & Ostrom, 2011; DeVilles 2016; Albaum, 1997) and it seems the most adequate tool considering the type of questions at hand. We established a 5 point scale from strongly disagree to strongly agree in order to allow for a neutral answer. We also allowed respondents not to answer questions if they didn’t want to or didn’t feel like they could. This is done to avoid the neutral answer to be used in these cases, because when we later mean center the responses neutral is no longer neutral.

Step 4: Have Initial Item Pool Reviewed by Experts

As mentioned earlier in this chapter this scale builds on earlier work at the Geneva Business School where several rounds of expert consultations were held within the research team in order to define an exhaustive list of items and sub constructs. The team at the Geneva Business School consisted of:

Nicola Jackman

Dr. Roy Mouawad

Dr. Oliver Elliott

Laurent Huot

Dag Flachet (current author)

After the theoretical reevaluation a final list of items was built and finally reviewed and discussed between Dag Flachet and Dr. Aline Masuda. The final review trimmed the list down somewhat and reworded some statements. For example, there initially were items on “belonging to the team” and “feeling accepted by the team” however, it was decided that these measure the same subcontract so belonging to the team was scrapped in favor of “feeling accepted by the team”.

The final selection of items was:

Label	**Questions**	**Focus**	**Time**
M1	B1. I believe I get paid a lot for my work. B6. I am paid well for my contributions.	Contribution	present
M2	B2. Other employers would pay me more. B7. I could make more money at another organization	Market	present
M3	B3. I get paid more than my colleagues. B8. I have a larger income from the job than others at our organizations.	Internal comparison	present
M4	B4. My job provides me with a large income compared to the jobs of people I interact with outside of work. B9. I make more money from my job than my friends do from theirs.	External comparison	present
M5	B5. I will make a lot more money in the future working for this employer. B10. My income will go up significantly working for this organization.	unspecified	delayed

Table 5: Initial Items Material Utility Scale (Maslow, 1932), (Alderfer, 1969), (Herzberg, 1959), (Deci & Ryan 1985), (Kahn, 1990), (Sirota et al., 2005), (Max-Neef 2019), (Schwartz, 1987 & 1992), (Fiske, 1991), (Ryan et al. 2008),

Label	Questions	Focus	Hedo or Euda
S1	B11. I enjoy interacting with my current colleagues at work. B16. I like working with the people I work with.	Colleagues	Hedonic
S2	B12. I enjoy interacting with my boss(es). B17. I like working with my boss(es)	Boss	Hedonic
S3	B13. At work I feel like I am part of a team. B18. I feel accepted by my colleagues.	Group acceptance	Hedonic
S4	B14. I am proud of my team. B19. I tend to talk positively about my team.	Group	Eudaimonic
S5	B15. There is a good atmosphere at my organization. B20. There is a good vibe at work.	Group enjoyment	Hedonic

Table 6: Initial Items Social Utility Scale (Maslow, 1932), (Alderfer, 1969), (Herzberg, 1959), (Deci & Ryan 1985), (Kahn, 1990), (Sirota et al., 2005), (Max-Neef 2019), (Schwartz, 1987 & 1992), (Fiske, 1991), (Ryan et al. 2008), (Edmondson, 1999, 2014), (McClelland, 1961)

Label	Questions	Self construct	OIT status	Hedo or Euda
T1: Meaning	B21. My work is meaningful. B28. My work projects are useful.	(more) Communal	Integrated	Eudaimonic
T2: Flow	B22. My work is fun. B29. I currently enjoy the work itself.	Individual	Intrinsic	Hedonic
T3: Learning	B23. I learn new things on this job. B30. I am learning new things working here.	Individual	Unspecified	Eudaimonic
T4: Growth	B24. Thanks to my job I'm growing as a person. B31. The job enables my personal growth.	Individual	Identified or integrated	Eudaimonic
T5: Pride status	B25. I am proud of my position. B32. I like the identity associated with my function.	Individual	Introjected	Eudaimonic
T6: Pride of work	B26. I am proud of the work itself. B33. I am proud of what we/I do.	unspecified	Integrated	Eudaimonic
T7: Career	B27. My career is advancing rapidly with this organization. B34. Working here is the right career move.	Individual	Introjected or identified	Eudaimonic

Table 7: Initial Items Transformational Utility Scale (Maslow, 1932), (Alderfer, 1969), (Herzberg, 1959), (Deci & Ryan 1985), (Kahn, 1990), (Sirota et al., 2005), (Max-Neef 2019), (Schwartz, 1987 & 1992), (Fiske, 1991), (Ryan et al. 2008), (McClelland, 1961)

Step 5: Consider Inclusion of Validation Items

As part of the validation process of the proposed scales we analyzed their relationship to existing validated scales. The criteria for these scales are:

1: They must measure a construct that is either conceptually close to our construct (construct validity) or have a clear theoretical relationship with our construct (criterion validity)

2: The scale must be found to be reliable and valid in prior research.

3: The scale must be reasonable in size and in cognitive strain on the respondent.

4: It must be administrable on a Likert scale. (Likert, 1932) Or a similar multiple choice scale.

The scales used for validation are:

IFDFW Scale InCharge Financial Distress/Financial Well-Being Scale, (Prawitz et al. 2006). The scale consists of 8 questions self evaluating a continuum from financial stress to financial well being. Financial stress being the opposite of financial well being in this perspective. The scale was independently validated in later research by, amongst others, Gutter and Copur in study about financial well being in college students. (Gutter & Copur, 2011)

The IFDFW scale is interesting for our study because it steers away from the equity approach. It does not ask “is your pay fair”, but it asks about the real life psychological consequences of the financial situation and should be linked to the utility of pay.

We find validated scales on payment satisfaction and benefit satisfaction in Williams et al. **Comprehensive Compensation Satisfaction Model (CCSM).** (Williams et al. 2008) The full model has 5 parameters on payment and 3 on benefits. The benefit components are; A: Benefit Level Satisfaction B: Benefit Determination Satisfaction and C: Benefit Administration Satisfaction. The latter two can be linked to distributive justice and procedural justice respectively, they are therefore part of equity rather than utility. Hence, we only use component A of the scale in our study.

Similarly the payment satisfaction construct has 5 components in the scale: A: Pay Level Satisfaction B: Pay Structure Satisfaction C: Pay Raises

Satisfaction D: Variable Pay Procedures Satisfaction E: Pay Administration Satisfaction. We again discard the components B to E as they relate to equity via procedural and distributive justice. However, we need to adjust component A in order to include the full payment package. We do this by asking respondents at the top of the survey page with these questions to consider their full salary package in their answers to the questions.

BPNES: Basic Psychological Need in Exercise Scale was developed by Vlachopoulos & Michailidou (Vlachopoulou & Michailidou, 2006) based on Self Determination Theory (SDT). It consists of 12 statements administered on a Likert scale, 4 questions on autonomy, 4 questions on competence and 4 questions on relatedness. As the name suggests the scale was initially developed to measure these needs in the context of performing an exercise, in order to use the scale in our study the wording was changed from “other exercise participants" to “colleagues” we used the component on relatedness which we expect to be linked to social utility.

W-BNS: Work Related Basic Need Satisfaction Scale (Van den Broeck et al. 2010) is another scale based on Self Determination Theory (SDT). As the name suggests this scale was specifically designed for the work related context. The scale consists of 18 questions 3 for each basic need of SDT. Here we use the six questions measuring relatedness, of which three are worded negatively with an inverse Likert scale. The scale was validated by, amongst others, Colledani et al. in 2018. (Colledani et al. 2018)

WAMI: Work as Meaning Inventory(Steger et al. 2012) is a 10 item scale measuring the degree to which the individual experiences his or her job to be meaningful. The scale contains one item on an inverted scale. The scale has been validated in different languages and cultures, for example in Turkey, Israel and Korea (Akin et al. 2013, Steger et al. 2013, Kim 2014). We use the original 10 item scale to validate transformational utility and the “meaning” items on it.

Personal growth is measured by Wright et al. (Wright et al. 2006) in medical professionals in residency training. The subsequent scale has 9 items of which one is specific to the profession as it asks about the humanistic approach to patients. We retained the eight other items. This scale has two factors: Self Assurance (4 questions) and Sensitive To Self and Others (4 questions). This division resonates with the social-emotional maturity models of personal growth such as those of Kegan (Kegan, 1982) and Barrett (Barrett, 2011). We expect this scale to be related to our Transformative Utility and it's "growth" component.

Career utility. Bedeian et al. (Bedeian et al., 1991) developed a two question scale to measure "expected utility of the present job", despite the broadly labeled utility the questions only measure career utility. "My present job is relevant to the growth and development in my career." and "I feel that my present job will lead to future attainment of my career goals." We therefore use the scale for validation but label it career utility. We expect career utility to relate to Transformational Utility and specifically the Career component as well as the income progress component in Material Utility.

Turnover Intention (TI). We operationalized turnover intention using Michael & Spectors turnover intention scale. (Michaels & Spector, 1982) (Spector et al. 1988) The three item scale asks direct questions about intent to leave the current position. We prefer this scale to the popular TIS-6 (Turnover Intention Scale, 6 items) (Bothma & Roodt, 2013) because the later seems to measure too broadly including causes of the turnover intentions (eg. "How satisfying is your job in fulfilling your personal needs?"). As we look at the needs as predictors we want turnover intention to be measured more restrictively. We expect turnover intentions to be negatively related to job utility.

MOAQ-JSS: Michigan Organizational Assessment Questionnaire Job Satisfaction Subscale (Camman et al., 1997) was validated by Bowling and

Hammond (Bowling & Hammond, 2008). We appreciate the concise and direct nature of the questions to measure job satisfaction. Job satisfaction would theoretically be a consequence of at least certain types of job utility. We would like to explore this relationship and also its effects on the relationship between job utility and turnover intentions. As with the turnover intention scale we want to clearly separate causes from outcomes. We therefore do not want to use broader alternatives scales such as the Job Satisfaction Scale (JSS & JSS2) by Spector (Spector 1985 & 1997), because they measure the concept too broadly including different factors that lead to overall satisfaction. This has too much conceptual overlap with our utility constructs. The JSS scale with its 36 questions is also too large to be practical in our survey. We therefore prefer the concise, direct and affective nature of the MOAQ-JSS.

Step 6: Administer Items to a Development Sample

The required minimum sample size needed depends on the statistical power or the required precision.

The simplest rule of thumb is presented by Conway (1988) and quoted by Nunnally (1978), DeVellis (2016), Kyriazos (2018), Costello & Osborne (2005) Williams et al. (2010) and many more. It expresses an absolute number of N ad prescribes:

> "...a factor analysis sample of 50 as very poor, 100 as poor, 200 as fair, 300 as good, 500 as very good, and 1000 as excellent" (Conway, 1988)

More nuanced rules of thumb look at the number of items, parameters and factors. N per item ranges from 5 to 10 and with N > 300 this ratio can become progressively lower (Kyriazos, 2018). Per parameter the range is also 5 to 10 N per parameter unless the data is highly kurtotic then the ratio may need to go upto 20. We start off with 34 items for 17 parameters and expect 3 factors. This means that the recommended minimum samples for our study

ranges from 85 to 340, so we set N comfortably past this range. (Kyriazos, 2018), (DeVellis 2016)

We used a pay for response platform called Prolific, Prolific is based in the UK but has respondents from all over the world, you can limit the respondents to certain countries but we chose not to do so as we are looking for universal factors we expect to be present in different cultures and we will later test for significant differences between cultures. This is a cross section sample with one self reported measurement per individual. We also had some additional criteria such as having a job (employment, internship or self employed). Respondents are paid to complete the survey, possibly some would quickly and inattentively respond to surveys in order to cash as much as possible. In order to prevent inattentive responses tainting the results we incorporated an attention check, this implies some respondents were rejected. Considering all this we set out with a target to collect at least 500 respondents. Collection was done on two different moments, one on a Sunday morning, and one on a Wednesday morning in case the time of collection (during or outside of most people's working hours) would have a significant effect.

Step 7: Evaluate the Items

We started the evaluation by reverse scoring question B2 and question B7 the new reverse scored items are labeled B2R and B7R. We then looked at the internal reliability within the parameter and within the construct. We first evaluated the mean and variances to evaluate whether the use of Cronbach Alpha is warranted. We then used Cronbach's Alpha to determine internal reliability and look for scores of 0.7 or higher. We then looked at the item-scale correlations for which we use the standardized coefficient and look for values of 0.7 or higher.

Before the next step we mean centered the data on each question, mean centered items are labeled with a C so for example question B1 becomes

B1C. Mean centering shifts the Y axis but does not affect slopes or relative relationships, it therefore does not affect the outcomes of CFA, SEM or linear regression but it can A: Make the raw data more readable, B: make the Y intercept meaningful, C: decrease collinearity later on when doing other analysis, such as moderator analysis on the data. (Iacobucci et al, 2016).

We first did exploratory factor analysis (EFA) to confirm whether the items do load onto the three factors as expected. For the exploratory factor analysis we used Promax rotation because of the large sample size and the expected correlation of latent variables (Watkins, 2018). We then applied confirmatory factor analysis (CFA) and structural equation modeling (SEM) to explore improvements to the model. In this methodology we followed Bryne (Bryne, 2001, 2013). Because of the large sample size we looked at the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Square error of Approximation (RMSEA). We accept a CFI and TLI of 0.9 and above, a value of 0.95 would express excellent fit, for RMSEA we accept a value below 0.08, a value below 0.06 would indicate an excellent fit.

We explored alternative models, first to see if the data supports the three factor model or whether a different number of factors would be relevant. Thereafter we explored refinement of the model and the selection of items.

Step 8: Optimize Scale Length

A good item has a mean not too far from the middle of the scale so as to be normally distributed, items that are very close to either side may be worded in a way that everyone tends to agree or disagree and hence not be worded at the right strength in order to grasp the variance on the factor in the population. (DeVellis, 2016)) Such a problem is also manifested in a lack of variance in the answers. Good items evidently also have a strong loading onto their construct and sub construct. By selecting the best items the simple scale of job utility can be formed.

Cleaning of data

In the conditional question flow individuals were first asked if they have a job. There are 4 possible answers, 1: No 2: Yes, I'm an employee 3: Yes, I'm an intern 4: Yes, I'm self employed. Those who answered "no" were diverted and did not generate any data, all others were allowed to complete the survey. Later checks are done on specific questions whether the inclusion interns and the self employed affected the results. For example question B12 that was retained in the final survey. The question states "I enjoy interacting with my boss(es)." This question may or may not cause a problem for the self-employed as some freelance work does have a de facto boss who is then a representation of the customer for whom the freelance work is done. However if one runs a multiple customer facing business their likely interpretation would be that they do not have a boss. Such issues are evaluated by filtering the findings group per group.

More pressingly at this point, as subjects were paid to respond to the survey some may have clicked through quickly just to collect the payment, there were also respondents from many different countries, even though Prolific, the platform assures us that everyone has a good dominion of the English language we have found this to be otherwise in open questions on previous surveys. So in order to filter inattentive responses and poor understanding we implemented an attention check on questions C29 and C32 which are part of the WAMI scale.

C29. My work really makes no difference to the world.

C32. I know my work makes a positive difference in the world.

On a scoring scale where "1" is strongly disagree and "5" is strongly agree, if the sum of these two responses is 9 or 10 we automatically reject the

response and these responses are flagged in Prolific as having failed an attention check, in order to help other researchers who use the platform.

If the sum of these responses is 2, 3, or 8 we manually look at the submission, we look at time to complete the survey, and look for other signs of incoherent answers or in-attentive answering. Specifically negatively and positively worded questions around the same validated scales, and similar questions.

Of the first data collection, 315 candidates presented themselves, 5 were rejected upon entry because they did not currently have a job. After completion in total 20 submissions were rejected based on the attention and understanding filter mentioned above. Leaving 290 subjects in the sample.

In the second batch there were 234 submissions of which 15 were rejected based on the attention test and 4 were rejected based on not having a job, leaving 215.

In total there were 505 submissions retained for analysis.

Analysis of normality

The values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2010). Hair et al. (2010) and Bryne (2013) argued that data is considered to be normal if skewness is between -2 to +2 and kurtosis is between -7 to +7.

Because of the large sample size (N=504) we did not use the Shapiro-Wilk test nor the Kolmogorov-Smirnov test (Steinskog et al. 2007).

Reliability

There are 17 parameters intended to be measured in the initial selection of items. In order to ascertain the alpha reliability each parameter is measured

with two questions that are worded differently but intend to measure the same substance. Cronbach Alpha was used to measure the internal consistency of these pairs of questions. This gives us an indication of the reliability of the responses, should a subject not understand the questions or not read them properly we would expect a low Cronbach Alpha especially as some questions were negatively worded in order to reverse the scales. (Gliem & Gliem, 2013). We reversed the scores on the reverse scales and mean centered the scores for further analysis.

To evaluate the factor loading we started with Exploratory Factor Analysis first on the full list of items and later on the final selection of the scale. We followed the eigenvalue rule (Kaiser 1960) to establish the cut-off point for factors at 1.1. We then continued with Confirmatory Factor Analysis (CFA) to confirm the model fit and with Structural Equation Modeling (SEM), as mentioned before this is done with SPSS Amos and with JASP. In JASP we rely on Lavaan, an R package for structural equation modeling from the University of Gent. (Rosseel, 2012, 2014; Goss-Sampson, 2019). SEM is used to fine tune the model and explore possible alternatives, here we look for models with significant improvement in Chi-Square, but because of the large sample differences are quickly significant, we therefore predominantly look at the combination of the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA) (Bryne, 2012). The CFI and the TLI are indicators of how well the model represents the data whereas RMSEA is an indicator of error left in the system after applying the model. Here we followed the Normal-Theory Maximum Likelihood method (Xia & Yang, 2019) and established a reasonable model fit at RMSEA <0.08 and TLI>0.9 following Bentler and Bonett (Bentler & Bonett, 1980). We established a good model fit at RMSEA<0.06, CFI>0.95 and TLI>0.95 following Hu and Bentler (Hu & Bentler, 1999). Of course not all models with an improvement in these parameters are better models, whenever dropping

items we also want to evaluate the theoretical implication towards the content validity of the constructs.

Finally the length of the scale was optimized picking the best question in each retained parameter. If the Cronbach Alpha is above 0.9 then we looked further to see if there is any redundancy, specifically across items that have a high covariance, if there is a plausible theoretical explanation of conceptual overlap one more item may be dropped. Any dropping of items was revised with SEM to evaluate its effect on the overall model fit.

Validity

As mentioned in step 5 of the scale development process outlined previously we use 9 existing scales to assess the validity of our new scales. 7 for construct validity and 2 for criterion validity. All of these scales have been previously validated by several researchers. Wel evaluated their internal reliability in our data set. In order to do this items were first reversed where necessary. Item scores were also mean centered.

Construct Validity

The IFDFW scale (InCharge Financial Distress/Financial Well-Being Scale) measures financial stress on a scale from financial stress to financial wellbeing, this scale should then be inversely correlated with the construct of material utility. Because we expect quite a bit of covariance between the types of utility, if IFDFW correlates strongly with M then it will also correlate with S and T but less strongly. This would suggest an effect via M

The CCSM (Comprehensive Compensation Satisfaction Model) subscale measures satisfaction with pay and benefits. This should theoretically be correlated with Material Utility and analogous with IFDFW to a lesser degree to Social and Transformational Utility.

The adapted BPNS (Basic Psychological Need in Exercise Scale) subscale on relatedness is expected to be linked to Social Utility. In a secondary effect it should be related to Material and Transformational Utility but less strongly than with Social Utility.

The W-BNS (Work Related Basic Need Satisfaction Scale) subscale on relatedness is expected to correlate withSocial Utility. In a secondary effect it should be related to Material and Transformational Utility but less strongly than with Social Utility.

The WAMI (Work As Meaning Inventory) scale is theoretically related to Transformational Utility, specifically via purpose, meaning and the broader conception of the self. We expect WAMI to be positively related to T and to have a stronger relationship with T than with either M or S.

The Personal Growth scale is theoretically related to Transformational Utility, we expect Personal Growth to be positively related to T and the correlation with T to be stronger than the correlation with M or S.

The Career Utility Scale is expected to be related to Transformational Utility, we expect the Career Utility Scale to be positively correlated to T and the correlation with T to be stronger than the correlation with M or S.

Criterion-Related Validity

Following the theoretical foundations and the purpose of this research the three dimensions of utility identified should up to some extent predict turnover intention. We first controlled for age, sex, time at the company and education level as we suspect these may affect turnover intentions. We expected turnover intention (TI) as measured on the Michael and Spector scale to be predicted by M, S and T such that the three types of utility will be negatively related to turnover intentions. Individuals who perceive having higher material

utility, transformation utility and social utility are less likely to report intentions to quit the company.

Similarly Job Satisfaction as measured by MOAQ-JSS (Michigan Organizational Assessment Questionnaire Job Satisfaction Subscale) would be a function of M, S and T, where all standardized beta coefficients are positive and significant. This would mean that the evidence supports Job Satisfaction being a function of Material, Social and Transformational Utility.

Predictive Value

We compared the new scale to the existing scales used to validate the scale in order to see if there is any improvement in the amount of variance in turnover intention that can be explained by the factors. We expect the M, S and T scales to add to the prediction of turnover intentions beyond the existing related scales.

Overview

In this chapter we outlined the methodology and established how the proposed theory and survey was tested. In the next chapter we explored the core findings of the study. Chapter 6 covers limitations which led us to suggestions for further research expressed in chapter 7. Special attention is paid, in chapters 8, to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice. Finally we conclude with the managerial impact, (chapter 9) and the high level conclusions (chapter 10).

This chapter is somewhat symmetrical to the methodology chapter as it reports on the findings according to those methods. The data collected supports the propositions and the model and a robust Simple Present Job Utility scale is created that predicts turnover intention. The scale is reliable, validated and the model has an excellent fit on the data.

Analysis of normality

The answers on the 34 questions are found to be within the bounds of acceptable skewness and kurtosis.

The largest positive skewness of 0.596 was found in statement B3 “I get paid more than my colleagues” the largest negative skewness of -0.988 was found in statement B11 “I enjoy interacting with my current colleagues at work.”.

The largest positive measured kurtosis was 0.832 and was found in statement B18 “I feel accepted by my colleagues” the largest negative kurtosis, -0.975, was found in statement B5 “I will make a lot more money in the future working for this organization”.

For a closer look at the analysis of normality please refer to annex 1.2, here we conclude that the data is sufficiently normally distributed to be treated as such statistically.

Reliability

Parameter pairs

We follow Bland (Bland 1997) in establishing the benchmark for Cronbach Alpha in alpha reliability to “$\alpha < 0.5$ is unacceptable, $0.5 < \alpha < 0.6$ is poor, $0.6 < \alpha < 0.7$ is questionable, $0.7 < \alpha < 0.8$ is acceptable, and everything > 0.8 is good or excellent.”

Of the 17 statement pairs in our study 11 are good or excellent and 6 are acceptable. The weakest Cronbach Alpha of 0.752 was found in the following pair:

B3: “ I get paid more than my colleagues”

B8: ” I have a larger income from the job than others at our organizations.”

For the detailed results please refer to annex 1.3. These results suggest that there is internal reliability in the measurement of our parameter items.

Per Construct

The Cronbach’s Alpha of the 10 items on the Material utility scale is 0.849. For the 10 items on the Social utility scale the indicator is 0.934. For the 14 items on the transformational utility scale the Cronbach’s Alpha is 0.954. Hence we can conclude that, at least with the long list of items, there is strong internal reliability in the measurements at all constructs.

Establishing model fit

We did initial exploratory factor analysis with Promax rotation and maximum likelihood as discussed in the methodology section. As there are pairs of questions in parameters and the parameters form the constructs it is possible that EFA would extract some factors from these different levels. We first ran EFAs on all the items to check for bad items that may be cross loading. No clear issues were found on this level except that pairs of questions tend to load together. In the next stage so as to look at the overall construct level first we took the average scores of both questions to represent the score on the parameter. We labeled these average scores M1 to M5, S1 to S5 and T1 tot T7. With a cutoff point at Eigenvalue of 1.1 this EFA delivers the following rotated component matrix where values lower than 0.4 are omitted (Yong & Pearce):

Pattern Matrix[a]

	Factor		
	1	2	3
M1Contribution			.848
M2BMarketflipped			.417
M3RelInt			.626
M4RelExt			.764
M5progress			.551
S1HColleagues		.924	
S2Hboss		.511	
S3Belonging		.878	
S4ETeam		.860	
S5Atmosphere		.734	
T1Meaning	.871		
T2Flow	.782		
T3Learning	.763		
T4Growth	.837		
T5EudaIntroject	.881		
T6Eudaintegrated	.955		
T7Carreer	.631		

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Table 8: EFA of full survey with merged subsconstructs. Data from our study.

All items load into their respective constructs as predicted.

We can now do the same type of analysis for the full set of questions limiting the analysis to the three most likely factors. The rotated component matrix is the following:

Pattern Matrix[a]

	Factor		
	1	2	3
B1C			.816
B2RC			
B3C			.557
B4C			.741
B5C			.513
B6C			.788
B8C			.599
B7RC			.456
B9C			.679
B10C			.506
B11C		.889	
B12C		.521	
B13C		.713	
B14C		.718	
B15C		.724	
B16C		.934	
B17C		.530	
B18C		.809	
B19C		.826	
B20C		.796	
B21C	.775		
B22C	.696		
B23C	.777		
B24C	.873		
B25C	.790		
B26C	.901		
B27C	.565		
B28C	.783		
B29C	.749		
B30C	.813		
B31C	.796		
B32C	.811		
B33C	.865		
B34C	.600		

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 9: EFA of all items, Data from our study.

Notice that one question B2RC did not make the cutoff point of 0.4 factor loading, In fact the factor loading was 0.399, its pair question B7RC is also close to the cutoff point.

We can represent the model schematically and computationally look at the model fit, note that the variable label “e” for example the estimation of M is Me. (figure 9)

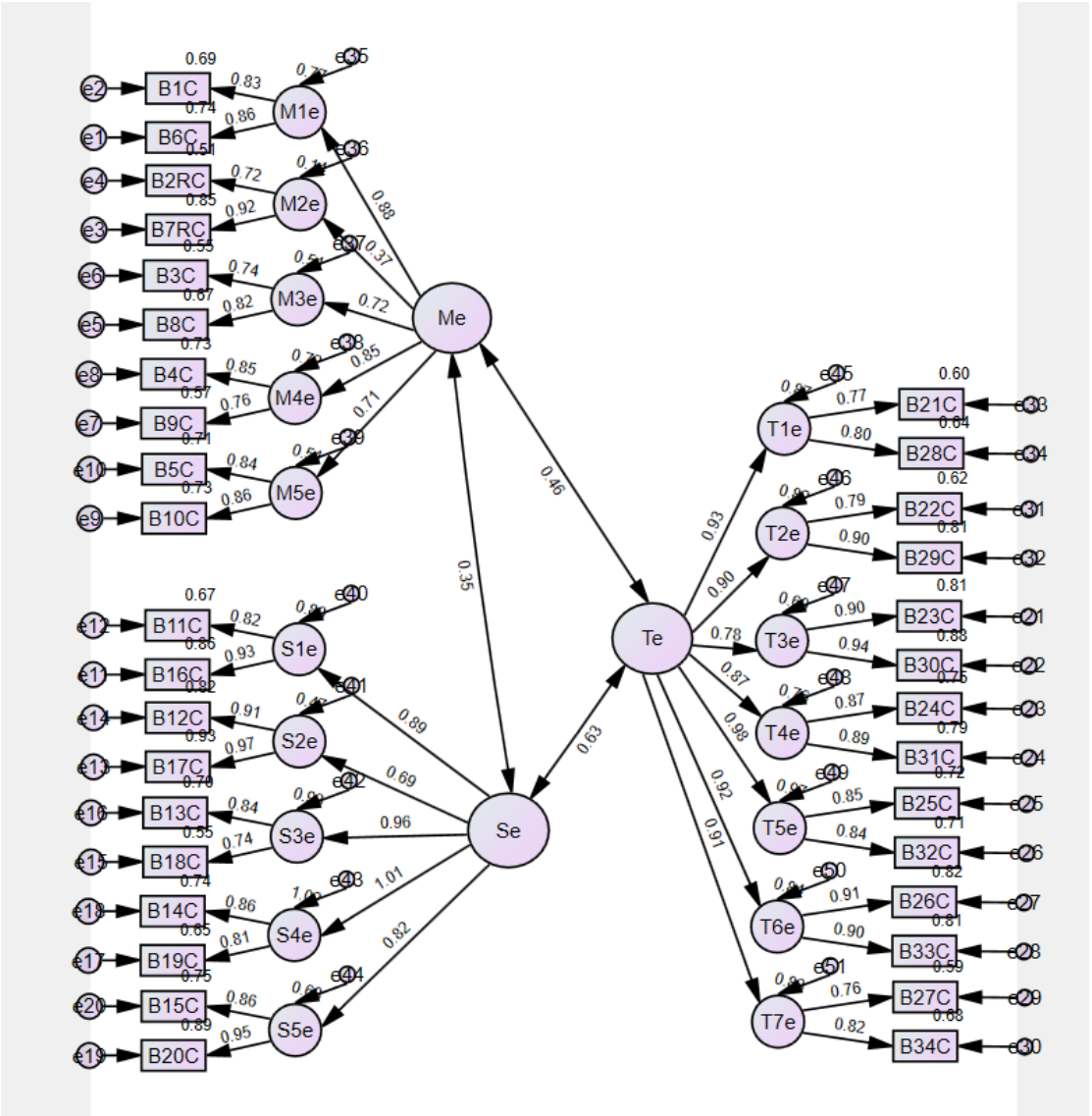

Figure 9: Initial model, Model 1, Data from our study.

(Me: Material utility estimation, Te: transformational utility estimation, Se: Social Utility estimation)

In this initial model (model1) the CFI is .920 and the TLI is .911 and RMSEA is 0.064 indicating a reasonable fit according to the thresholds set out in the methodology section.

First we checked whether the three factor model does indeed fit the data better than alternative structures. Secondly we finetuned the model and the

selection of questions to optimize the fit following the DeVellis (DeVellis, 2016) methodology.

Model Structure

Based on the literature review and the arguments set out in the theory development chapter we believe there to be three factors within the job utility. However cases could be made for several different model structures.

The theoretical case for the single factor model (figure 10): Becker ((Becker, 1965; 1976)) would argue that there is only one type of utility and potentially an infinite array of ways to experience utility, there is no categorical difference between one unit of utility and another. In fact this is the prevalent perception of utility from an economic perspective. If this is the case then all questions should load into a single factor better than in the three factors we proposed. We label this model B1 and explore the model fit.

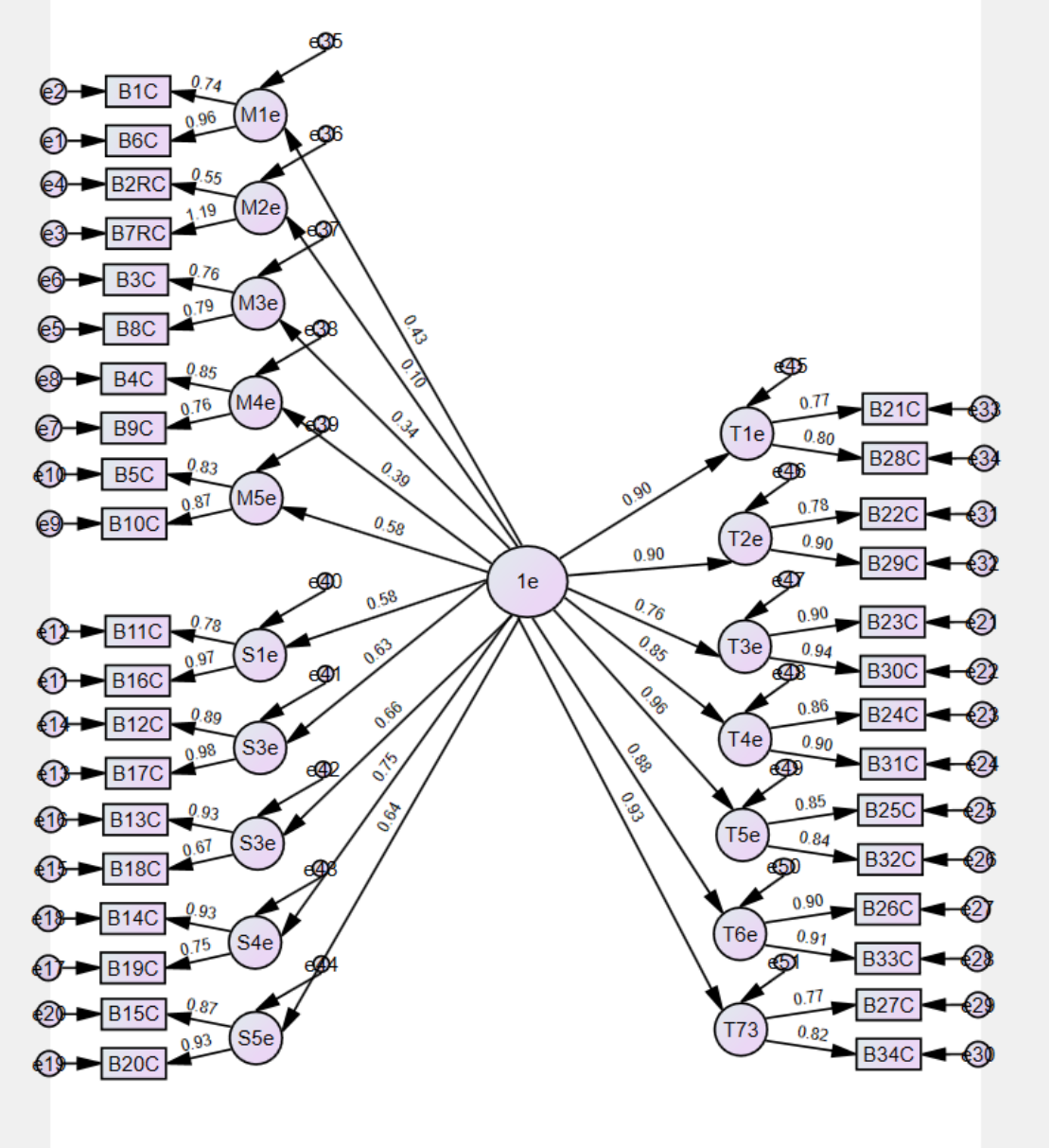

Figure 10: Model B1, Data from our study.

The theoretical case for a 2 factor model (figure 11): both transformational and social utility are psychological utility, it could therefore be argued that there should be only two dimensions to the model, material and psychological. We will label this model C1 and explore the model fit.

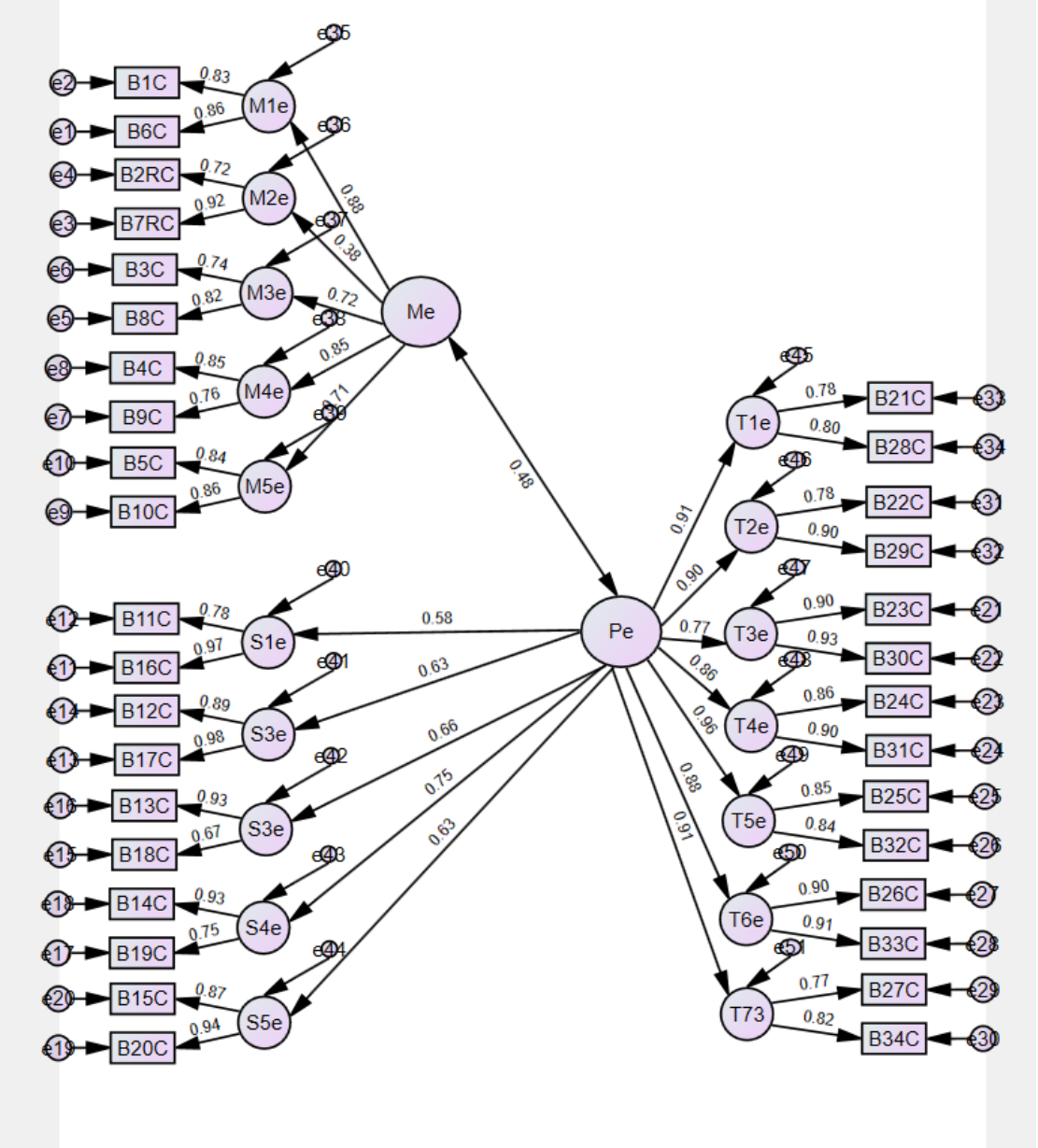

Figure 11: Model C1, Data from our study.

(Me: Material utility estimation, Pe: Psychological Utility estimation)

The theoretical case for 4 factors (figure 12): It has been shown in the Leader-Member Exchange (LMX) literature (Matin et al. 2016) that the relationship between the leader, in our model we see this as a component of the social utility, together with the horizontal relationships. But maybe these are categorically different and should be split into two, the horizontal

relationship that comes to represent the relationship between the organization and the individual and the horizontal relationship and camaraderie at the firm. We explore this possibility with model D1.

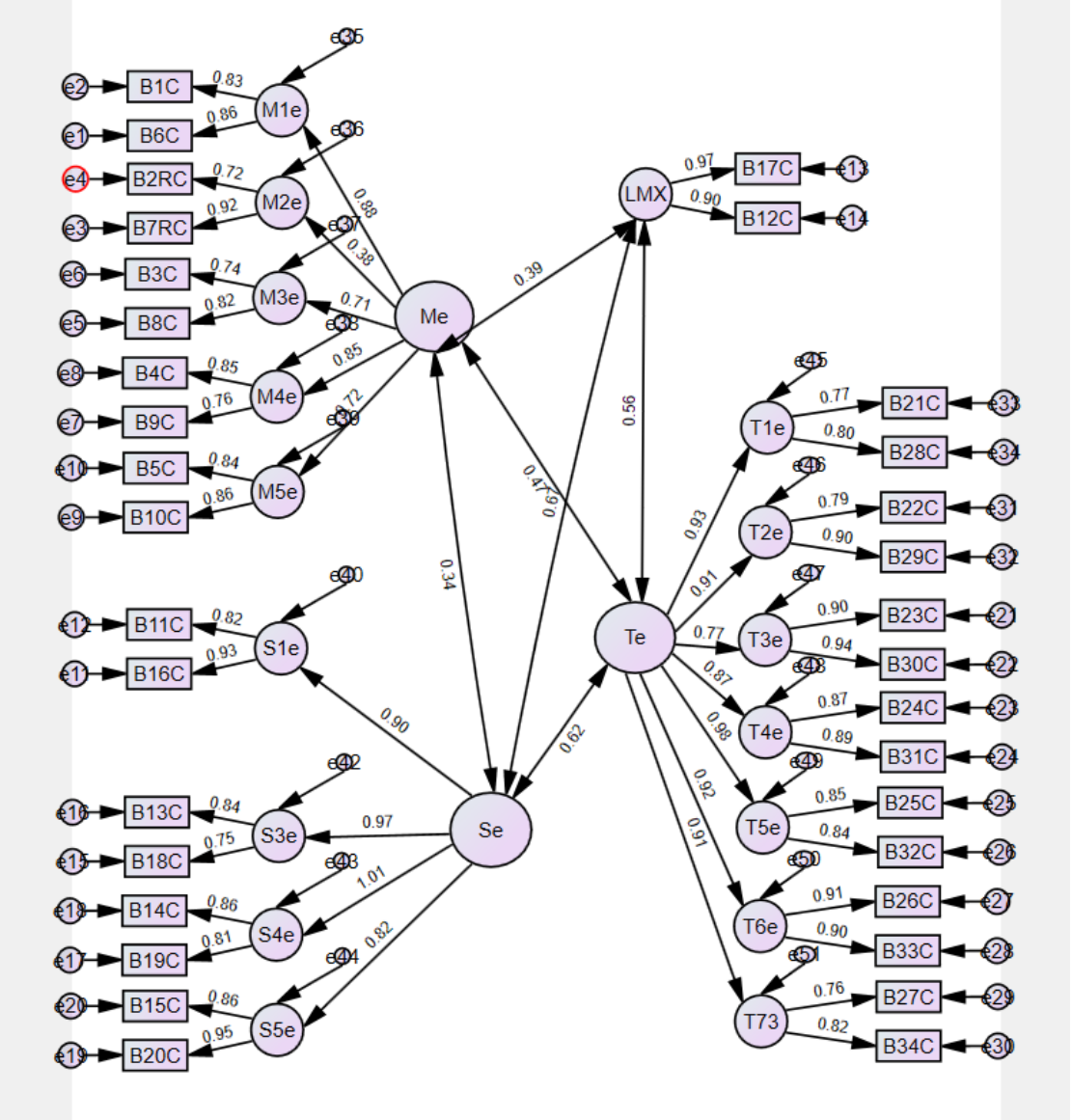

Figure 12: Model D1, Data from our study.

(Me:Material utility estimation, Te: transformational utility estimation, Se: Social Utility estimation, LMX: Leader Member Exchange)

Model fit

				Baseline test			Difference test		
	AIC	BIC	n	χ^2	df	p	$\Delta\chi^2$	Δdf	p
D1	40334.849	40858.695	505	1524.051	505	< .001			
Model 1	40363.197	40878.593	505	1556.398	507	< .001	32.347	2	< .001
C1	41296.864	41803.811	505	2494.066	509	< .001	937.668	2	< .001
B1	41741.916	42244.638	505	2941.117	510	< .001	447.051	1	< .001

Table 10: Model fit comparison models 1, B1, C1 and D1, Data from our study.

Fit indices

Index	Model 1	B1	C1	D1
Comparative Fit Index (CFI)	0.920	0.814	0.848	0.922
Tucker-Lewis Index (TLI)	0.911	0.795	0.832	0.913
Bentler-Bonett Non-normed Fit Index (NNFI)	0.911	0.795	0.832	0.913
Bentler-Bonett Normed Fit Index (NFI)	0.886	0.784	0.817	0.888
Parsimony Normed Fit Index (PNFI)	0.800	0.713	0.741	0.799
Bollen's Relative Fit Index (RFI)	0.873	0.762	0.798	0.876
Bollen's Incremental Fit Index (IFI)	0.920	0.814	0.848	0.922
Relative Noncentrality Index (RNI)	0.920	0.814	0.848	0.922

Table 11: Additional fit indices models 1, B1, C1 and D1, Data from our study.

Both model B1 and model C1 represent a large deterioration of the model fit compared to Model 1, this implies that we can discard the one factor model and the two factor model. (table 10 and 11)

Model D1 represents a small but significant improvement of the model fit, this suggests that Social Utility may need to be split into two. However the factor loading the two questions with relationship to the boss still load reasonably well into the broader Social Utility construct, (0.521 and 0.530) and the Cronbach alpha of the 10 statements together is very high 0.934. So further research will be needed to establish whether or not Social Utility can be considered as one factor. For now we continue the exploration of the three factor model, noting that a possible four factor model is not excluded and we will return to this question in the limitation and the design for it to be resolved in the next study. (table 10 and 11)

Refining the three factor model

We started from Model 1 and following DeVellis' methodology refine the model and the list of items on the survey to achieve the optimal scale length and effectiveness. In total we explored 8 models to reach the final outcome: the Simple Present Job Utility Scale.

Model fit

				Baseline test			Difference test		
	AIC	BIC	n	χ^2	df	p	$\Delta\chi^2$	Δdf	p
Model 8	17714.449	17917.227	505	173.889	71	< .001			
Model 7	32129.723	32607.098	505	776.638	321	< .001	602.749	250	< .001
Model 6	37338.119	37891.536	505	1068.758	429	< .001	292.120	108	< .001
Model 5	37406.365	37942.884	505	1145.004	433	< .001	76.246	4	< .001
Model 4	37483.167	38002.788	505	1229.807	437	< .001	84.802	4	< .001
Model 3	37535.644	38038.366	505	1290.284	441	< .001	60.477	4	< .001
Model 2	37662.543	38148.367	505	1425.183	445	< .001	134.899	4	< .001
Model 1	40363.197	40878.593	505	1556.398	507	< .001	131.216	62	< .001

Note. some models are based on a different set of observed variables

Table 12: Model fit comparison models 1-8, Data from our study.

Additional model fit indicators

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Comparative fit index (CFI)	0.920	0.922	0.933	0.937	0.944	0.949	0.959	0.974
Tucker-Lewis Index (TLI)	0.911	0.914	0.924	0.929	0.935	0.941	0.952	0.966
RMSEA	0.064	0.066	0.062	0.06	0.057	0.054	0.053	0.054

Table 13: Additional model fit indicators summary: models 1-8 , Data from our study.

The extensive tables with fit statistics is in annex 1.4

First of all, the pair of questions B2 and B7 score poorly on all accounts. These questions refer to parameter M2 that is trying to measure material utility seen from a "relative to market value" perspective. Specifically people are asked:

B2. Other employers would pay me more.

B7. I could make more money at another organization.

These are also questions with reversed scoring and unfortunately the only question in our scales with reverse scoring. A possible explanation for the poor performance within the model of these questions is that people are not paying attention and did not notice this question was reversed, however in other parts of the survey, the part with the third party validation scales, many more questions had a reversed scale and we did not find evidence of similar issues there. Additionally there is a quite robust attention check on reversed questions C29 and C32, see the “cleaning of data” section for more details about this check. Another possible explanation is that many subjects don’t have a clear picture of what the other company would pay them, so it is difficult for them to answer this question. Additionally, the question can be understood as a “how is the market for your work” rather than directly related to the utility of the pay received. In the consideration of whether or not to drop the question we evaluate the theoretical implication of dropping this question to the construct measured. The relative to market perception of pay seems at face value an important component of the perception of pay level. But this is likely already covered at least in part by question B1 “I believe I get paid a lot for my work.” and B6 “I am paid well for my contributions.” In B1 and B6 no reference point is specified, and it is likely that perceived market value is at least part of the heuristics used to form an answer to the question. We therefore conclude to drop parameter M2 and it's questions from the model. This new model is labeled Model 2. (tables 12 & 13)

Another candidate for omission is the parameter S2 which relates to the relationship with the boss(es). The relationship with the bosses is different to the general relationships at work because there is a power component and a component of representation of the organization, it is therefore not surprising

that it is not a perfect fit with the other social utility sub-construct, however it is a very important component of the social experience at work, dropping it would leave the Social Utility scale incomplete. So it is not dropped from the scale.

Two related items that have large covariance are T3 relating to learning and T4 related to personal growth. Flowing Mezirow (Mezirow, 2018) personal growth can be seen as transformational learning, hence personal growth is a form of learning but not all learning is personal growth as there is also technical and practical learning. From that perspective personal growth could be redundant as it is covered in learning. However it is questionable whether the respondent of the survey sees it that way. There may possibly be an important part of personal development that doesn't fall under the respondents definition of learning. So here we choose to keep both components but draw the covariances. This is model 3. (tables 12 & 13)

Within the same realm of transformational utility there is significant covariance between T1 Meaning and T6 Pride. This also makes sense logically, you are likely to be proud of meaningful work. Both are important components of Transformational Utility and fit the model wel so we resolve some residual error by drawing the covariences. This is model 4. (tables 12 & 13)

There is a similar story for the hedonic and eudaimonic enjoyment of the team. We can reduce errors in the model by establishing their covariance which is supported by the underlying theory. This is model 5. (tables 12 & 13)

There is significant covariance between M5 the expectation of income growth at this employer and T7 the expectation of future career progression at the organization. This is theoretically evident as both concepts are closely related even though the one is about money and the other about career progress. But maybe currently utility and expected future utility should be treated separately? Dropping these questions would make the scale more precise

about present job utility. Drawing the covariances could be labeled as present+. The “+” indicates a limited component of expected future utility. This is model 6. (tables 12 & 13) (figure 13)

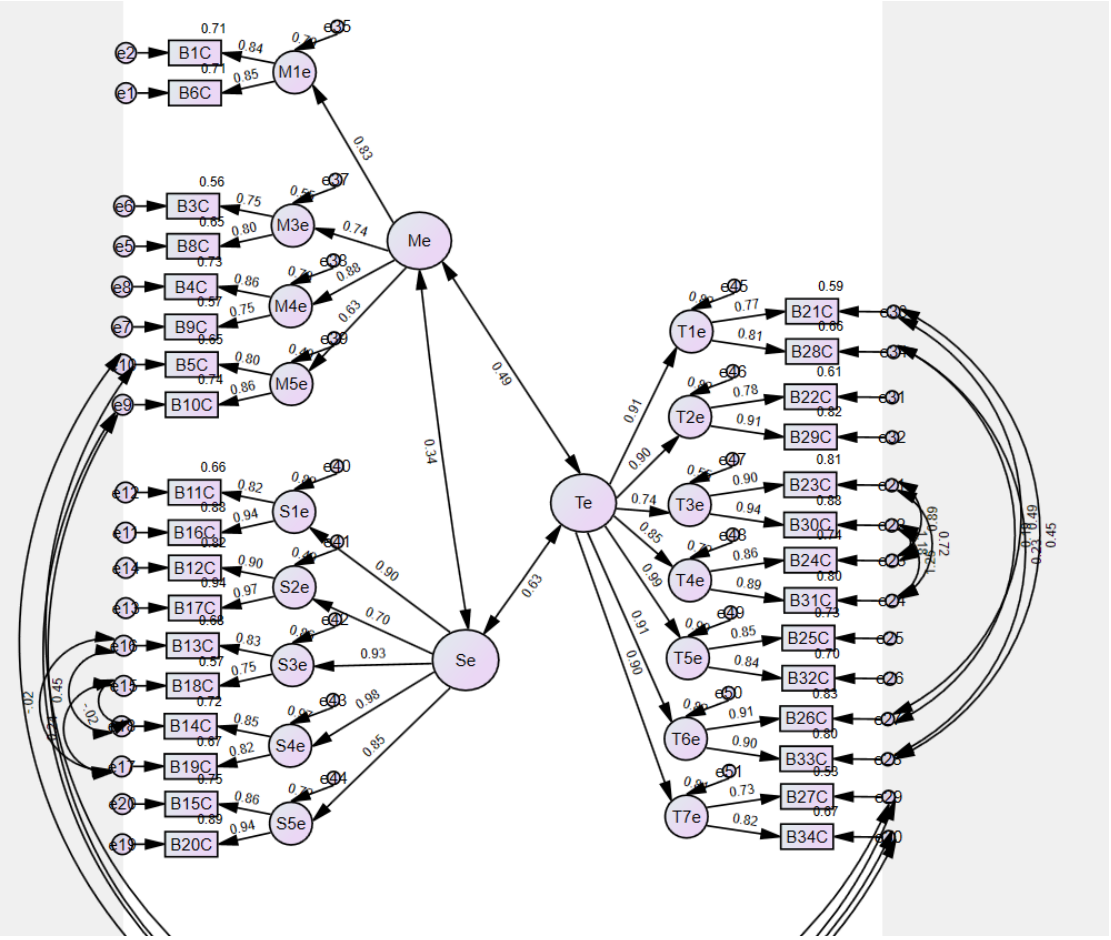

Figure 13: Present+ Job Utility Model (model 6), Data from our study.

(Me: Material utility estimation, Te: transformational utility estimation, Se: Social Utility estimation)

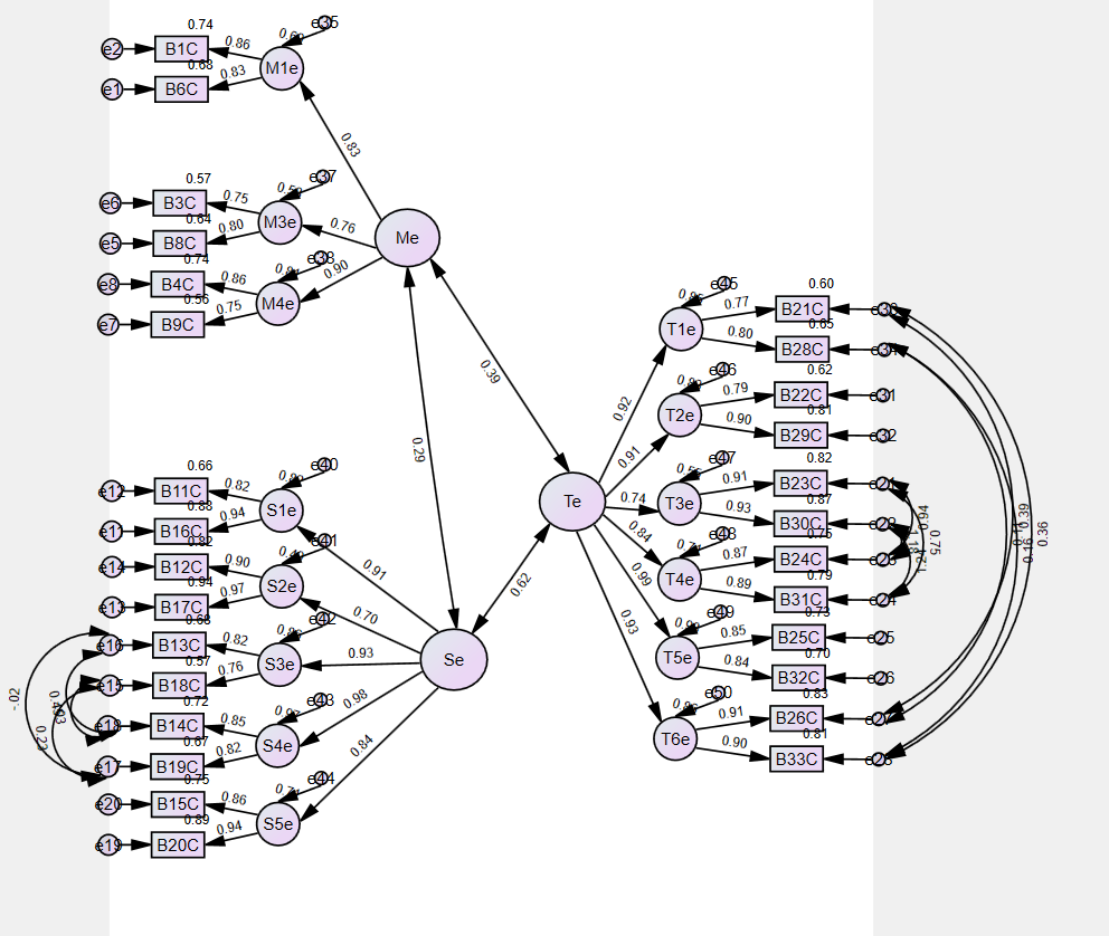

Figure 14: Present Job Utility Model (model 7) Data from our study.

(Me: Material utility estimation, Te: transformational utility estimation, Se: Social Utility estimation)

This present job utility model now has 28 questions, 14 pairs of two. However the pairs are redundant once apha reliability is established. Looking at each one of the pairs we select the best question of the two, here we look at item to construct loading, the mean and variance as described in the methodology section. We can simplify the model by having the best 14 questions load directly into the factors of Social, Material and Transformational Utility. The simplified model looks thus: (figure 15) (tables 12 & 13)

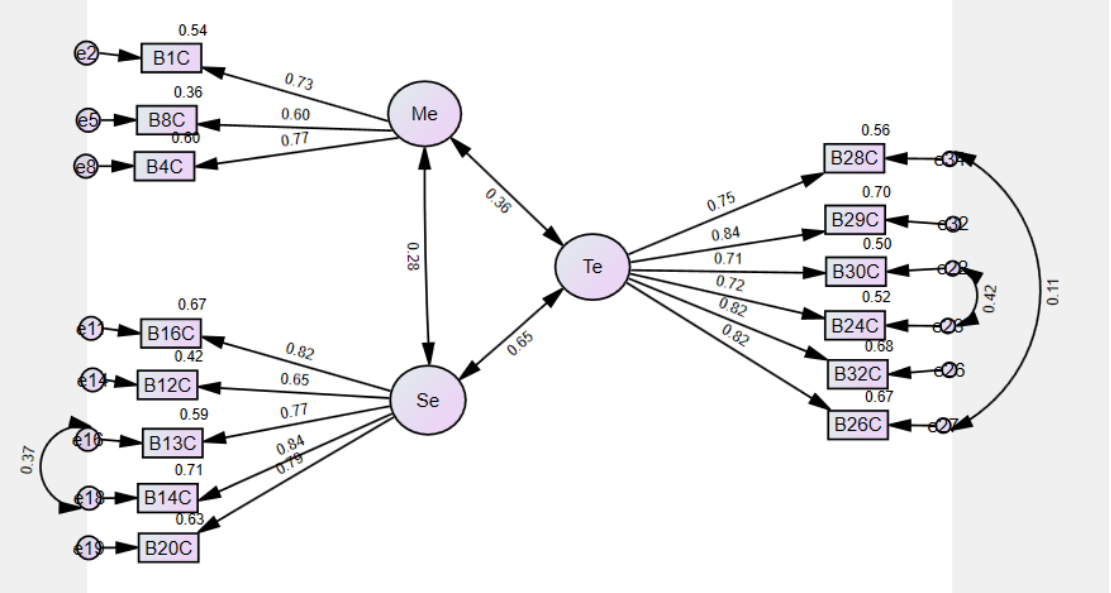

Figure 15: Simple Present Job Utility Scale. (Model 8) Data from our study.

(Me: Material utility estimation, Te: transformational utility estimation, Se: Social Utility estimation)

The Simple Present Job Utility Scale consists of 14 questions measuring the three factors. The model fit in our sample is TLI: 0.966 CFI: 0.974 and RMSEA: 0.054. This represents an excellent model fit (Bryne, 2001, 2013). We review the internal reliability of the question groups and find Crobach's Alpha to be 0.741 for the 3 questions in the Material scale, 0.884 for the 5 questions on the Social utility scale, and 0.908 for the 6 questions of the Transformational Utility Scale. The score higher than .9 suggests that there may be some redundancy in questions, in fact if we drop B24 (the personal growth question) Cronbach's Alpha drops to 0.891. However we do not want to drop B24 because of it's theoretical implication discussed previously.

Running EFA again with these 14 questions they clearly load into their respective factors without any significant cross loading. In fact the most significant cross loading at 0.132 whereas the poorest factor loading is at 0.536.

Pattern Matrix[a]

	Factor		
	1	2	3
B1C			.738
B4C			.771
B8C			.589
B12C		.536	.109
B13C		.824	
B14C		.847	
B16C		.870	
B20C		.773	
B24C	.828		-.127
B26C	.825		
B28C	.763		
B29C	.718	.132	
B30C	.778		
B32C	.758		

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 14: EFA on Simple Present Job Utility Scale, Data from our study.

We concluded that the current set of 14 questions is a reliable way of measuring three constructs, then we looked at the validity analysis to see if it is indeed measuring Material, Social and Transformational Utility.

The Simple Present Utility Scale

B1. I believe I get paid a lot for my work.

B8. I have a larger income from the job than others at our organizations.

B4. My job provides me with a large income compared to the jobs of people I interact with outside of work.

B12. I enjoy interacting with my boss(es).

B13. At work I feel like I am part of a team.

B14. I am proud of my team.

B16. I like working with the people I work with.

B20. There is a good vibe at work.

B24. Thanks to my job I'm growing as a person.

B26. I am proud of the work itself.

B28. My work projects are useful.

B29. I currently enjoy the work itself.

B30. I am learning new things working here.

B32. I like the identity associated with my function.

Validity of the Scale

We have already established with EFA that all the perceived parameters load into their respective constructs, this is the first indication of content validity. We then looked at construct and criterion validity relating the measured variance in relationship to known validated scales with theoretically related constructs as described in the methodology section.

Correlations

		TI	SAT	M	S	T	PaySAT	BenfitSAT	IFDFW	RELATE_BPNS	RELATE_WBNS	WAMI	PersGrowth	CareerUtil	SumSATs	avgSATs	PG_Sense	PG_SelfA
TI	Pearson Correlation	1	-.628**	-.296**	-.430**	-.524**	-.392**	-.319**	.267**	-.276**	-.227**	-.393**	-.285**	-.373**	-.395**	-.395**	-.251**	-.274**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
SAT	Pearson Correlation	-.628**	1	.286**	.580**	.732**	.327**	.297**	-.231**	.400**	.402**	.616**	.499**	.575**	.348**	.348**	.416**	.503**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
M	Pearson Correlation	-.296**	.286**	1	.243**	.275**	.729**	.503**	-.382**	.187**	.188**	.263**	.176**	.263**	.683**	.682**	.165**	.161**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	504	504	504	504	504	504	503	504	504	504	504	504	504	503	504	504	504
S	Pearson Correlation	-.430**	.580**	.243**	1	.577**	.299**	.356**	-.212**	.744**	.686**	.436**	.486**	.459**	.367**	.367**	.443**	.453**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
T	Pearson Correlation	-.524**	.732**	.275**	.577**	1	.296**	.285**	-.176**	.447**	.440**	.817**	.560**	.777**	.324**	.324**	.493**	.540**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
PaySAT	Pearson Correlation	-.392**	.327**	.729**	.299**	.296**	1	.605**	-.487**	.199**	.181**	.246**	.183**	.282**	.887**	.887**	.189**	.150**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
BenfitSAT	Pearson Correlation	-.319**	.297**	.503**	.356**	.285**	.605**	1	-.349**	.228**	.206**	.245**	.214**	.264**	.904**	.904**	.211**	.186**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	504	504	503	504	504	504	504	504	504	504	504	504	504	504	504	504	504
IFDFW	Pearson Correlation	.267**	-.231**	-.382**	-.212**	-.176**	-.487**	-.349**	1	-.160**	-.163**	-.101*	-.085	-.156**	-.464**	-.462**	-.063	-.090*
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.023	.058	.000	.000	.000	.156	.042
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
RELATE_BPNS	Pearson Correlation	-.276**	.400**	.187**	.744**	.447**	.199**	.228**	-.160**	1	.771**	.365**	.459**	.343**	.240**	.238**	.412**	.436**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
RELATE_WBNS	Pearson Correlation	-.227**	.402**	.188**	.686**	.440**	.181**	.206**	-.163**	.771**	1	.421**	.463**	.368**	.216**	.216**	.413**	.443**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
WAMI	Pearson Correlation	-.393**	.616**	.263**	.436**	.817**	.246**	.245**	-.101*	.365**	.421**	1	.566**	.756**	.274**	.274**	.510**	.537**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.023	.000	.000		.000	.000	.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
PersGrowth	Pearson Correlation	-.285**	.499**	.176**	.486**	.560**	.183**	.214**	-.085	.459**	.463**	.566**	1	.487**	.222**	.222**	.915**	.934**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.058	.000	.000	.000		.000	.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
CareerUtil	Pearson Correlation	-.373**	.575**	.263**	.459**	.777**	.282**	.264**	-.156**	.343**	.368**	.756**	.487**	1	.304**	.304**	.430**	.469**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
SumSATs	Pearson Correlation	-.395**	.348**	.683**	.367**	.324**	.887**	.904**	-.464**	.240**	.216**	.274**	.222**	.304**	1	1.000**	.224**	.188**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	504	504	503	504	504	504	504	504	504	504	504	504	504	504	504	504	504
avgSATs	Pearson Correlation	-.395**	.348**	.682**	.367**	.324**	.887**	.904**	-.462**	.238**	.216**	.274**	.222**	.304**	1.000**	1	.224**	.188**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
PG_Sense	Pearson Correlation	-.251**	.416**	.165**	.443**	.493**	.189**	.211**	-.063	.412**	.413**	.510**	.915**	.430**	.224**	.224**	1	.711**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.156	.000	.000	.000	.000	.000	.000	.000		.000
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505
PG_SelfA	Pearson Correlation	-.274**	.503**	.161**	.453**	.540**	.150**	.186**	-.090*	.436**	.443**	.537**	.934**	.469**	.188**	.188**	.711**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.001	.000	.042	.000	.000	.000	.000	.000	.000	.000	.000	
	N	505	505	504	505	505	505	504	505	505	505	505	505	505	504	505	505	505

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 15: Correlation matrix with related scales. Data from our study.

The IFDFW scale on financial stress and well being.

We find the IFDFW scale to correlate with Material Utility (M) at a Pearson correlation coefficient of -0.382 with $p<0.001$. Social Utility (S) and Transformational Utility (T) Correlate at -0.212 and -0.176 both with $p<0.001$. We find support for the construct validity of Material Utility in these results.

The CCSM Subscale on pay and benefit satisfaction

We find the CCSM subscale to correlate with M with a ($r= 0.682$, $p<0.001$). The CCSM subscale correlates with S and T at $r= 0.367$ and $r=0.324$ respectively, both with $p<0.001$. We find support for the construct validity of Material Utility in these results.

The adapted BPNS subscale on relatedness

We find the adapted BPNS subscale on relatedness to be correlated with S at a Pearson correlation coefficient of 0.744 with $p<0.001$, T and M correlate at 0.447 and 0.187 respectively, both with $p<0.001$. We find support for the construct validity of Social Utility in these results.

The W-BNS subscale on relatedness

We find the W-BNS subscale on relatedness to be correlated with S at a Pearson correlation coefficient of 0.686 with $p<0.001$, T and M correlate at 0.440 and 0.188 respectively, both with $p<0.001$. We find support for the construct validity of Social Utility in these results.

The WAMI scale on meaning

We find the WAMI scale to be positively related to T at a Pearson correlation coefficient of 0.817 with $p<0.001$ and with M and S at 0.263 and 0.436

respectively. Both with p<0.001. We find support for the construct validity of Material Utility in these results.

The Personal Growth Scale

We find the Personal Growth scale to be positively related to T at a Pearson correlation coefficient of 0.560 with p<0.001 and with M and S at 0.176 and 0.486 respectively. Both with p<0.001. We find support for the construct validity of Material Utility in these results.

The Career Utility Scale

We find the Career Utility scale to be positively related to T at a Pearson correlation coefficient of 0.777 with p<0.001 and with M and S at 0.263 and 0.459 respectively. Both with p<0.001. We find support for the construct validity of Material Utility in these results.

Culture and Controls

We controlled with an independent T test whether the outcomes on our core measurements were affected by the timing of the different data collections. There was one data collection on a Sunday, likely to be in private time, and one on a Wednesday morning likely to be during office hours for most respondents. However there was no significant difference between the batches.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TI	Equal variances assumed	.435	.510	1.766	503	.078	.19659	.11135	-.02218	.41536
	Equal variances not assumed			1.769	464.817	.077	.19659	.11111	-.02175	.41493
M	Equal variances assumed	1.596	.207	.183	502	.855	.01489	.08145	-.14513	.17492
	Equal variances not assumed			.185	475.876	.853	.01489	.08058	-.14344	.17322
S	Equal variances assumed	.022	.882	.103	503	.918	.00818	.07913	-.14729	.16365
	Equal variances not assumed			.104	467.999	.917	.00818	.07881	-.14668	.16304
T	Equal variances assumed	1.311	.253	-.232	503	.816	-.01990	.08568	-.18824	.14845
	Equal variances not assumed			-.235	481.253	.814	-.01990	.08457	-.18606	.14627
SAT	Equal variances assumed	1.974	.161	-.319	503	.750	-.02864	.08981	-.20510	.14781
	Equal variances not assumed			-.323	478.936	.747	-.02864	.08879	-.20311	.14583

Table 16: Independent T test between sample batches, Data from our study.

We also controlled with one-way anova for cultural differences to the extent that we could within our sample. In the survey we both asked where the individual lived and what nationality he or she considered herself. There was only a minor difference between these two answers with the latter one having marginally more significant values (slightly higher F-values). We found that there was only a significant difference for the reported levels of Transformational Utility.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
TI	Between Groups	99.765	53	1.882	1.258	.115
	Within Groups	675.030	451	1.497		
	Total	774.796	504			
SAT	Between Groups	65.640	53	1.238	1.283	.096
	Within Groups	435.417	451	.965		
	Total	501.057	504			
M	Between Groups	52.542	53	.991	1.248	.123
	Within Groups	357.565	450	.795		
	Total	410.107	503			
S	Between Groups	44.314	53	.836	1.094	.309
	Within Groups	344.582	451	.764		
	Total	388.896	504			
T	Between Groups	82.267	53	1.552	1.873	.000
	Within Groups	373.733	451	.829		
	Total	456.000	504			

Table 17: One-way anova between 53 cultural identities. Data from our study.

In total there are 53 self identified nationalities in our sample, there are many of these with very small sample sizes (see Annex 1.5 for the full list) in order to look a bit closer we cluster the nationalities into 6 groups. The vast majority of our respondents are Europeans, some Africans (mostly South Africans), some Americans (mostly USA), and few others. Following the academic consensus that culture is closely intertwined with language we split the European group into 3 groups: 1: Germanics 2: Latin & Greek 3: Slavic and Finno-Ugric.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
TI	Between Groups	9.738	5	1.948	1.270	.275
	Within Groups	765.058	499	1.533		
	Total	774.796	504			
M	Between Groups	12.436	5	2.487	3.115	.009
	Within Groups	397.671	498	.799		
	Total	410.107	503			
S	Between Groups	2.108	5	.422	.544	.743
	Within Groups	386.788	499	.775		
	Total	388.896	504			
T	Between Groups	14.714	5	2.943	3.328	.006
	Within Groups	441.286	499	.884		
	Total	456.000	504			
SAT	Between Groups	4.525	5	.905	.910	.474
	Within Groups	496.532	499	.995		
	Total	501.057	504			

Table 18: One-way anova between 6 cultural clusters. Data from our study.

Analyzing these 6 groups across three dimensions of utility, turnover intention and job satisfaction, what we don't find is again more interesting than what we do find. There is no significant difference between any of these groups in terms of turnover intention, job satisfaction and social utility. Looking at a Tukey post hoc analysis for transformational and material utility we see that the only significant differences are: 1: Americans (mostly USA in our sample) report a significantly higher material utility than Africans, Latin & Greek Europeans and Slavic and Finno-Ugric Europeans. Which is not surprising considering the different economic realities in these regions. 2: Africans (mostly South Africans in our sample) report higher transformational utility than Slavic and Finno-Ugric Europeans (mostly Poles in our sample). This is more surprising as the GDP per capita in Poland is more than 3 times higher than that of South Africa. One would assume that a stronger economy allows for more transformative and fulfilling jobs. The difference here may be

allocated to cultural differences. In future research it would be interesting to map transformational utility against Hofstede's or Schwartz' cultural values.

For our research we conclude that we can proceed to analyze the whole sample as one, as there is more that unites us than that divides us. We follow Schwartz in that the universal structure of values are the same, what changes is the level of experiences and expectations (Schwartz, 1992). We follow Holtschlag et al.'s (2020) research design in the cross cultural data collection.

Criterion Related Validity

Turnover Intention

We also looked at the controlling variables of gender, age, time at the company and educational level. Somewhat surprisingly only age and time at the company showed to have a significant influence on Turnover Intention (TI), older people were less likely to express turnover intention whereas people who had been at the company for longer expressed higher turnover intention.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.798	.191		14.622	.000
	SexCoded	-.109	.112	-.044	-.976	.330
	Agegroup	-.253	.084	-.157	-2.995	.003
	Timeatcompany	.099	.043	.123	2.330	.020
	Education	.006	.038	.007	.152	.879
2	(Constant)	2.549	.162		15.719	.000
	SexCoded	-.116	.094	-.047	-1.230	.219
	Agegroup	-.177	.070	-.110	-2.525	.012
	Timeatcompany	.102	.036	.126	2.863	.004
	Education	.041	.032	.048	1.289	.198
	M	-.204	.055	-.148	-3.703	.000
	S	-.222	.065	-.157	-3.426	.001
	T	-.516	.060	-.396	-8.535	.000

a. Dependent Variable: TI

Table 19: Linear regression to Turnover Intention.Data from our study.

Controlling for these four factors the remaining relationship between the three types of utility and turnover intention is: M: B = -0.148 with p<0.001, S: standardized B = -0157 p=0.001 and T: standardized B=, -0.396 with p<0.001.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.245	.155		-1.587	.113
	SexCoded	-.102	.091	-.051	-1.132	.258
	Agegroup	.164	.068	.126	2.403	.017
	Timeatcompany	-.018	.035	-.028	-.529	.597
	Education	.029	.031	.042	.936	.350
2	(Constant)	-.060	.104		-.576	.565
	SexCoded	-.055	.060	-.028	-.914	.361
	Agegroup	.088	.045	.068	1.966	.050
	Timeatcompany	-.009	.023	-.014	-.408	.683
	Education	-.005	.021	-.007	-.246	.806
	M	.078	.035	.070	2.223	.027
	S	.264	.041	.231	6.355	.000
	T	.602	.039	.573	15.546	.000

a. Dependent Variable: SATc

Table 20: Linear regression to Job Satisfaction. Data from our study.

For the relationship between the three utility factors and Job Satisfaction according to MAOQ-JSS, also corrected for the four contextual variables we find the following in our data set: M: B = 0.70 with p= 0.027 S: B = 0.231 with p<0.001 and T: B =0.573 and p<0.001. The relationship between M and job satisfaction is light but significant. This will be further analyzed in the post-hoc analysis.

Predictive value

We can express TI as a function of M, S and T, this function gives us, in this sample, controlling for gender, age group, time at the company and education level. an adjusted delta R^2 of 0.326 whereas using the existing scales, Pay

Satisfaction, Benefit Satisfaction, BPNS relatedness, WBNS Relatedness, WAMI, Career Utility, Personal Growth, IFDFW, as predictors the adjusted delta R^2 is only 0.273.

The delta R of adding M, S and T to the model with the existing predictors is 0.096 and is significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.146[a]	.021	.013	1.23103
2	.579[b]	.335	.326	1.01771

a. Predictors: (Constant), Education, Timeatcompany, SexCoded, Agegroup

b. Predictors: (Constant), Education, Timeatcompany, SexCoded, Agegroup, S, M, T

Table 21: The predictive value of M, S and T for turnover intention. Data from our study.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.147[a]	.022	.014	1.23121	.022	2.732	4	492	.029
2	.539[b]	.291	.273	1.05678	.269	22.978	8	484	.000
3	.622[c]	.387	.368	.98594	.096	25.014	3	481	.000

a. Predictors: (Constant), Education, SexCoded, Agegroup, Timeatcompany

b. Predictors: (Constant), Education, SexCoded, Agegroup, Timeatcompany, RELATE_BPNS, PaySAT, WAMI, IFDFW, BenifitSAT, PersGrowth, CarreerUtil, RELATE_WBNS

c. Predictors: (Constant), Education, SexCoded, Agegroup, Timeatcompany, RELATE_BPNS, PaySAT, WAMI, IFDFW, BenifitSAT, PersGrowth, CarreerUtil, RELATE_WBNS, M, S, T

Table 22: The predictive value of M, S and T, beyond other predictors for Turnover Intention Data from our study.

Relating to Job Satisfaction controlling for the 4 demographic variables the delta R^2 for the model with M, S and T is 0.575 whereas the same indicator for the model with the other 8 scales is 0.470.

The delta R of adding M, S and T to the model with the existing predictors is 0.117 and is significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.130[a]	.017	.009	.99538
2	.762[b]	.581	.575	.65169

a. Predictors: (Constant), Education, Timeatcompany, SexCoded, Agegroup

b. Predictors: (Constant), Education, Timeatcompany, SexCoded, Agegroup, S, M, T

Table 23: The predictive value of M, S and T for job satisfaction. Data from our study.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.130[a]	.017	.009	.99639	.017	2.112	4	492	.078
2	.695[b]	.483	.470	.72879	.466	54.454	8	484	.000
3	.774[c]	.599	.587	.64324	.117	46.770	3	481	.000

a. Predictors: (Constant), Education, SexCoded, Agegroup, Timeatcompany

b. Predictors: (Constant), Education, SexCoded, Agegroup, Timeatcompany, RELATE_BPNS, PaySAT, WAMI, IFDFW, BenifitSAT, PersGrowth, CarreerUtil, RELATE_WBNS

c. Predictors: (Constant), Education, SexCoded, Agegroup, Timeatcompany, RELATE_BPNS, PaySAT, WAMI, IFDFW, BenifitSAT, PersGrowth, CarreerUtil, RELATE_WBNS, M, S, T

Table 24: Predictive value of M, S and T beyond other scales for job satisfaction. Data from our study.

To conclude we can say that the three dimensions of present job utility as measured in the 14 questions of the Simple Present Job Utility Scale predict turnover intention and job satisfaction beyond that predicted by the other related scales evaluated in this study. However the other related scales are a scattershot of concepts that are conceptually related to the constructs looked at in this study. In a followup study we could evaluate more complete other scales such as the Job Descriptive Index (JDI) and the Self Determination Scale. On the other hand as Kahneman points out (Kahneman, 2011) it is the future expected utility that is considered in behavioral choices not the present experience utility hence the scale would likely have a stronger predictive value if it were reworded into a Simple Future Job Utility Scale. Both of these matters will be discussed in the future research section.

At this point we conclude that job utility has three dimensions, material, social and transformational, that they can reliably be measured with the 14 item Present Job Utility Scale and we have reason to believe that this simple scale provides a parsimonious understanding of utility and have a strong predictive value towards Turnover Intention and Job Satisfaction.

Overview

In this chapter we explored the core findings of the study. In the next chapter we explored limitations to the research, after that we provide suggestions for further research expressed in chapter 7. Special attention is paid, in chapter 8, to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice. Finally we conclude with the managerial impact, (chapter 9) and the high level conclusions (chapter 10).

6. Limitations

This chapter outlines some limitations of the study. Points of reasonable critique are covered as well as choices which can be improved upon in future studies. Some extra tests are done, for example, to exclude the critique of common method bias. Limitations around the cross sectional design are important. The possibility of a 4th dimension of job utility is also discussed here. The design of the study did not properly exclude the possibility of a fourth dimension.

Methodological Limitations

This is a cross-sectional study where every individual answers at one moment in time, it is therefore not possible to infer causation.

In this study data was collected using a pay for response platform. There are a few limitations to the use of this platform and the use of a single method of collection. The Common Method Bias (CMB) occurs when variation of responses are caused by the instrument rather than by the underlying factors intended to measure. We follow Podsakoff & co (2012) in testing for CMB with the Harman Single Factor Score. This method is a single dimension CFA to extract uniformness of answers, if more than 50% of the variance is explained by the single factor then the sample is subject to CMB. Our sample, that is, the long list of 34 items on our initial scale only has a Harman score of 37.73% which suggests that there is no CMB in this sample. However there can still be problems with the sample. As these individuals were paid 1 GBP to respond to the surveys there may be a self-selection bias, people who spend their time responding to surveys for 1 GBP may be more sensitive to pay than the general population. An additional factor is the opportunity cost of the time, to mitigate this the survey was taken in two batches, one on a Sunday and one on a Tuesday, so that it is either private/social time people

are giving up, or most likely work related time. We did not see a significant difference in the means of the M, S, T, Turnover Intention or Job Satisfaction.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TI	Equal variances assumed	.435	.510	1.766	503	.078	.19659	.11135	-.02218	.41536
	Equal variances not assumed			1.769	464.817	.077	.19659	.11111	-.02175	.41493
M	Equal variances assumed	1.596	.207	.183	502	.855	.01489	.08145	-.14513	.17492
	Equal variances not assumed			.185	475.876	.853	.01489	.08058	-.14344	.17322
S	Equal variances assumed	.022	.882	.103	503	.918	.00818	.07913	-.14729	.16365
	Equal variances not assumed			.104	467.999	.917	.00818	.07881	-.14668	.16304
T	Equal variances assumed	1.311	.253	-.232	503	.816	-.01990	.08568	-.18824	.14845
	Equal variances not assumed			-.235	481.253	.814	-.01990	.08457	-.18606	.14627
SATc	Equal variances assumed	1.974	.161	-.319	503	.750	-.02864	.08981	-.20510	.14781
	Equal variances not assumed			-.323	478.936	.747	-.02864	.08879	-.20311	.14583

Table 25: T-Test of different batches. Data from our study.

However if we split the group into two groups doing the regression to turnover intention we do find significant differences. The people who responded on a Sunday morning had higher beta for T and a lower beta for S, in fact for that sample the relationship between S and Turnover intention was not significant. A possible explanation of this is the personal predisposition of individuals and the self selection bias at the given time. It could be that individuals that choose to spend their Sunday morning responding to surveys have a relatively low predisposition to relatedness and a relatively high predisposition to abstract curiosity. For the weekday respondents S actually had the highest beta of all three dimensions.

Coefficients[a]

Batch	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
1	1	(Constant)	3.093	.246		12.593	.000
		SexCoded	-.243	.149	-.098	-1.632	.104
		Agegroup	-.221	.124	-.122	-1.786	.075
		Timeatcompany	.051	.056	.062	.907	.365
		Education	-.017	.049	-.020	-.345	.731
	2	(Constant)	2.646	.205		12.905	.000
		SexCoded	-.256	.121	-.102	-2.106	.036
		Agegroup	-.104	.100	-.058	-1.040	.299
		Timeatcompany	.069	.046	.085	1.512	.132
		Education	.049	.041	.059	1.217	.225
		M	-.156	.069	-.116	-2.252	.025
		S	-.087	.084	-.062	-1.039	.300
		T	-.650	.077	-.518	-8.488	.000
2	1	(Constant)	2.144	.328		6.544	.000
		SexCoded	.126	.171	.051	.739	.461
		Agegroup	-.271	.117	-.184	-2.309	.022
		Timeatcompany	.176	.065	.215	2.687	.008
		Education	.059	.062	.064	.942	.347
	2	(Constant)	2.064	.284		7.279	.000
		SexCoded	.164	.149	.065	1.098	.273
		Agegroup	-.203	.099	-.138	-2.044	.042
		Timeatcompany	.162	.055	.198	2.919	.004
		Education	.057	.052	.062	1.089	.277
		M	-.318	.089	-.224	-3.559	.000
		S	-.392	.099	-.275	-3.959	.000
		T	-.298	.097	-.218	-3.080	.002

a. Dependent Variable: TI

Table 26: Linear regression to turnover intention per batch. Data from our study.

Whatever the reason is, there is a clear difference between Sunday respondents and weekday respondents, this implies that there is some kind of self selection bias at hand. The survey would need to be replicated in different settings before any generalizations can be made about the magnitude of the different relationships.

Looking at the relationship between S, M and T and Job Satisfaction we find that neither batch shows a significant relationship between M and Job Satisfaction, this is because for the full study the relationship was barely past

the significance threshold, halving the sample size there is not enough evidence to support the relationship for each one of the groups. This was further explored in the post hoc analysis where we evaluate moderators and mediators in these relationships.

Coefficients[a]

Batch	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
1	1	(Constant)	-.549	.204		-2.696	.007
		SexCoded	-.073	.124	-.035	-.588	.557
		Agegroup	.206	.103	.136	2.007	.046
		Timeatcompany	.016	.047	.023	.336	.737
		Education	.068	.041	.098	1.659	.098
	2	(Constant)	-.156	.136		-1.150	.251
		SexCoded	-.050	.080	-.024	-.626	.532
		Agegroup	.080	.067	.053	1.198	.232
		Timeatcompany	.008	.030	.012	.279	.781
		Education	.010	.027	.014	.372	.710
		M	.059	.046	.052	1.279	.202
		S	.237	.056	.203	4.249	.000
		T	.636	.051	.609	12.537	.000
2	1	(Constant)	.234	.257		.911	.363
		SexCoded	-.151	.134	-.078	-1.123	.263
		Agegroup	.140	.092	.123	1.519	.130
		Timeatcompany	-.068	.051	-.107	-1.324	.187
		Education	-.033	.049	-.047	-.683	.496
	2	(Constant)	.135	.180		.751	.454
		SexCoded	-.076	.094	-.039	-.800	.424
		Agegroup	.094	.063	.083	1.498	.136
		Timeatcompany	-.035	.035	-.055	-.991	.323
		Education	-.031	.033	-.044	-.941	.348
		M	.108	.057	.099	1.912	.057
		S	.301	.063	.273	4.801	.000
		T	.538	.061	.509	8.774	.000

a. Dependent Variable: SATc

Table 27: Linear regression to job satisfaction per batch. Data from our study.

In our 34 item list of questions there were only two reversed questions B2 and B7. Both of these questions were dropped because they performed badly within the model. An alternative explanation is that they performed badly because they were reversed questions. However there were other reversed

questions in other parts of the survey and a very robust attention check based on reversed questions. We therefore have reason to believe that the bad performance of these items is not caused by a lack of attention. However the subsequent 14 item Simple Present Job Utility scale does not have reversed questions, in the future it may be desirable to reverse the wording of one or more of the items in order to have a more visibility on reliability in future usage of the scale, especially when it is not surrounded by an abundance of other scales.

We have measured turnover intention with a single blast, albeit with a double barrel shotgun. There are two measurement moments but each respondent has answered only once. We have already seen that the timing of the response affects the relationships of the utility dimension and the dependent variables, especially turnover intention. An alternative explanation for the differences is that the mood of the moment affects the responses, this would imply a reliability issue. However all other reliability indicators are good and it doesn't seem likely that mood can affect relationships between factors without having a significant effect on the means. Notice that the mean responses do not change between the two batches. However a longitudinal experiment would have another benefit, namely the problem with turnover intention. Previous studies have pointed out that there is quite a lot of slippage between Turnover Intention and actual turnover (Rubenstein et al., 2018). In future research we would advise to actually measure the real turnover and whether it was voluntary. A longitudinal study would generally be more robust and would help to support these findings in the future.

Theoretical Limitations

Reciprocity plays an important role in Social Exchange Theory (Fehr & Gächter, 2000). When we effectively evaluate our interpersonal relationships we do not only look at the cost and benefits of relationships but we also police the relationships for fair treatment. To the extent that we are willing to sacrifice

some material well being for an abstract notion of justice. For Sirota et al., (2005), equity is the most important factor in their model, in the sense that it has the highest correlation with employment behavior. Our model does not cover equity. Is this a problem? Are we missing something important? Or would it be covered in T, M and S in its respective forms. If someone is not treated fairly we would expect them to score their relationship with the organization less highly. The question then is, to what extent is the organization an entity psychologically for the subject or is it a collection of individuals? If we are treated unfairly would we be angry at the organization or at the people who represent the organization in our view? There is evidence it is the latter. Masterson and her colleagues studied the relationships between procedural and interactional justice and behavioral outcomes such as organizational citizenship behavior (OCB) and turnover intentions. They found the effects to be mediated by perceived organizational support (POS) and leader-member exchange (LMX) (Masterson et al. 2000). Wayne et al. (1997) explored up to what extent POS is related to LMX. They found the concept to be closely related but distinct, having different antecedents and outcomes. Looking at the way POS is operationalized with the SPOS scale (Worley et al. 2009) we see that this is operational with a series of questions that ask about management of the organization, for example “[name of company] management really cares about my well being”. It does not ask if the firm cares, but it asks whether the managers at the firm care. Relationships with superiors affect POS and LMX but general relationships at work also mediate the relationship between POS and turnover intention (Madden et al. 2015).

If the organization is considered as a psychological entity towards which we can have affective states independent of the people in it, then likely there is something else missing in our model. But we see in the way POS is operationalized with SPOS that it is always via “the management”. We asked questions about relationships with colleagues and boss(es), but maybe we should have asked an additional question about “the management” of the

organization as there may be individuals that represent POS but are not perceived as bosses. The research around social exchange theory, justice and perceived organizational support imply that equity and justice are a component in social utility. (DeConinck & Johnson, 2009)

In that light we also notice that the vertical relationship with the boss(es) has a relatively low factor loading into S as it is constructed now. Possibly S should be split into two parts, the vertical and organization to individual parts that would be very close to POS and the relatedness part that relates the horizontal relationships. For now the Cronbach alpha's suggest we can still consider S one factor. However this is only one item in a 5 item scale referring to the vertical relationships, the others referring to the team, the colleagues and the general atmosphere. Possibly the vertical relationship is underweight in our model and S should be operationalized with more weight to the vertical relationships. To test this we ran regressions of alternative models where the boss question B12 has double or triple weight. We find that the triple weighted version has a worse predictive value than the original one but the double weighted one improves adjusted delta R^2 by 0.05.

In light of these two issues it would make sense to add a question to S something in the direction of "I am well treated by the people who represent the organization".

In the initial sub dimensions we had a dimension for the timing of the rewards, whether they were instant or delayed. These items did not survive the SEM procedure as they were too different from the others, however as mentioned before we are more likely to act on expected future utility than experienced past utility (Mongin 1998). It would make sense therefore in a future survey to explore a rewording of all the questions into future oriented questions, then there would be Simple Present Job Utility Scale and a Simple Future Job Utility Scale, were the first would most accurately measure utility but the latter

should, based on expected utility theory, best predict behavior such as turnover.

In this study we have looked at linear regression between the dimensions of utility and Turnover intention and Job Satisfaction. But is that the best approach? We expect diminishing marginal utility, should the utility graph then not be concave downwards. If that is so we would expect a function with fractional powers. We ran curve estimation analysis in SPSS to evaluate if non linear models would fit the relationship better, yet this is not the case. The relationship is linear. This is because we are measuring utility output and relating it to behavior and attitude, diminishing marginal utility states that the amount of inputs needed to achieve the same delta in output increases as values go up. We are not looking at inputs here, we are only looking at outputs. Yet reflecting on the questions we could wonder if this is always the case? Yes we ask affective evaluation questions with verbs as “like” and “enjoy” but maybe in some items this could be questioned, specifically in Material utility. Statements such as “ I believe I get paid a lot for my work.” are not so clear cut. Arguably this is an input question not an outcome question. Maybe we should have asked, “I am happy about my income” however this could be measuring something else as the utility of money is more than the affective relationship to it. I’m not yet sure what the solution should be here, but I see that there can be a valid point of critique.

Limitations in Findings

Categorically the findings support the proposed theory, there were no surprises at that end. Magnitude wise there are some surprising outcomes, for which we first of all have to take into account the methodological limitation expressed above. We cannot yet generalize to the wider population because of the self selection bias in the sample and the large differences between batch one and batch two.

What we do see however is that Transformational Utility factors seem to play a much larger role than they did in the past (Rubenstein et al., 2018). This is in line with the evolution seen in the Global Millennial Surveys of Deloitte (Deloitte Touche, 2018, 2019, 2020), the new workforce cares more about second order abstractions such as meaning and purpose, but the findings in our sample seem too spectacular to be generalizable. A replication in a different setting will tell us more about that. As well as the seeming contradiction between batch one and batch 2 around Social Utility, for one batch this was very highly linked with Turnover intention, for the other not at all. If anything this tells us that there is likely a high level of differences in dispositions to relatedness, something in line with McClelland motive disposition theory. (McClelland, 1961)

Discriminatory Validity

Some scales used for content validity correlate very highly with our utility constructs. For example Transformational Utility correlates with Work as Meaning Inventory (WAMI) with a pearson correlation of 0.82. This raises the question whether it is of added value to create an additional construct as it is not very different from the existing ones. However the theoretical foundation in utility and the improved predictive value do support this. However more research around the discriminant validity of these utilities is warranted.

Overview

In this chapter we looked at the limitation which led us to the suggestions for further research expressed in the next chapter. Special attention is paid, in chapters 8, to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice. Finally we conclude with the managerial impact, (chapter 9) and the high level conclusions (chapter 10).

7. Future Research

This chapter covers future research of which one part is intended to be done by the current author and some is suggested for others in the field. The follow up study will look at some of the weaknesses covered in the previous chapter as well as introducing Future Job Utility. Our behavior is guided by expected future utility not by passed utility therefore Future Job Utility should be a better predictor of turnover intention. And ultimately more useful to the industry. This chapter also covers some other things that can be built on top of this model, such as benchmarking and profiling. Finally a longitudinal study is suggested to address the limitations of the cross sectional study.

Follow up study

Considering the outcomes and limitations of this study there is reason to propose a follow up study. The three dimensional job utility model is very promising and the constructs have proven reliable and valid based in this research, however a follow up study, labeled “study 2” would be of added value to:

To address the self selection bias, the next study will also rely on volunteers but they will not be paid for participating, specifically they will be recruited via my personal Linkedin Network, my personal Linkedin Network is of course also not an adequate representation of the wider population but as a setting significantly different to the pay-for-survey website used before. The validity of the study should be replicated and the magnitude of the interactions between constructs is likely to be different. However I would still expect Transformational Utility to be the driving force as most of my network is relatively young, highly educated and mostly in the technology and education industries. (Deloitte Touche Tohmatsu, 2018, 2019, 2020)

The second objective of study 2 is to further explore the added value of this model compared to the other existing models out there and what its relationship is to other constructs identified to play a role in turnover and turnover cognition. Specifically we would like to look at our model in relation to the Job Descriptive Index (JDI) (Kinicki et al., 2002) which is a widely used measurement of job satisfaction we covered in the literature review. We will use the Arc's Self Determination Scale (Wehmeyer, 1995) and the the full Work Related Basic Need Satisfaction Scale (W-BNS) (Van den Broeck et al., 2010) of which we used the relatedness component already in this study, to represent SDT. To compare with job engagement theory we will use the Job Engagement Scale (Rich et al., 2010), the Utrecht Work Engagement Scale (Schaufeli et al., 2006).

The third objective of study two is to develop an alternative Simple Future Job Utility Scale which would measure the expected future utility for the individuals and thereby be closer related to turnover intention and turnover.

In the second study we will also look closer at the composition of social utility, adding at least one more question about the vertical relationships at work, that is the humans relationships which also represent the formal power relationship at the organization and will be related to perceived organizational support and Leader Member Exchange (LMX) (Wayne et al. 1997). We can then explore whether Social Utility should be split into two parts, the social dimension of work and the relationship between employer and the employee (LMX).

We will take the opportunity to make sure that some questions are reverse scaled, to test the reliability of respondents.

The study shall be designed to allow for a follow up study later down the line, turning the study into a longitudinal study, this is interesting for several

reasons. First of all we will get more than one data point on individuals. We may also explore to what extent turnover intention actually becomes turnover. In Rubenstein's meta analysis we see a significant slippage between turnover and turnover intention (Rubenstein et al, 2018). So then are all turnover intentions the same? Or are some utility compositions more prone to slippage than others?

The new study aims to have at least 200 respondents and run on Codific's brand new SARA platform design to automate survey based reporting. This platform allows each participant to automatically receive a personalized report based on the underlying methodology and other responses.

Future research

What we have done in this study and what we hope to achieve in the follow up study is only the beginning of what can be done with the three dimensional job utility model.There are several directions we could go from here.

Relationships to other constructs and theories

It would be interesting to explore how these factors may be mediated or moderated by each other in relationship to turnover intention an job satisfaction. But what about other relevant constructs?

Job Engagement Theory

How do the three types of utility relate to job engagement? We will have a first look at that in our second study, but there is a lot more to look at. How do the job utility dimensions relate to Kahn's psychological conditions of meaningfulness, safety and availability (Kahn, 1990). We would expect meaningfulness to be related to transformational utility, and safety to be related to social utility, but then what is the role of availability? Is it in any way linked to material utility? Are Kahn's psychological conditions antecedents of the utility categories, or are they moderators or mediators?

Self Determination Theory and Organismic integration Theory

SDT and OIT play an important role in our understanding of the spectrum of motivation (Deci & Ryan, 2008a) (Deci & Ryan 1985). The requisites are autonomy, competence and relatedness. Relatedness should clearly be linked to social utility, competence to transformational utility, especially for the individual self. But where does autonomy fit in? Is autonomy instrumental in the development of ownership over an activity or is autonomy a goal in itself. If it is instrumental it should be found to be a mediator of transformational utility. If it is a goal in itself it should be a direct precedent of transformational utility. What about material utility, the overjustification effect suggests that (Tang & Hall, 1995) material utility would undermine intrinsic motivation. Can we replicate this effect using the three dimensions of utility? Would we experience less social and transformational utility as material utility goes up?

Benchmarking

It would be highly interesting to benchmark the score of jobs on the three types of utilities. This would allow us to make comparisons across industries, age groups, culture, jobs and many more. From our study we found that of the four control variables; education level, gender, time at the company and age only the last two had a significant effect on turnover intention. Little more than 2% in the variance of turnover intention could be attributed to the control variables. Looking at the relationship between age and time at the company and M, S and T we only find a significant relationship between both age and M and time at the company and M. However, controlling for time at the company age group no longer has a significant relationship with M.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.354	.092		-3.871	.000
	Timeatcompany	.112	.026	.190	4.329	.000
2	(Constant)	-.423	.101		-4.191	.000
	Timeatcompany	.086	.030	.147	2.849	.005
	Agegroup	.097	.060	.082	1.603	.110

a. Dependent Variable: M

Table 28: Linear regression between age and material utility controlling for time at the company. Data from our study.

So we didn't find a lot of evidence of differences amongst different demographics. However we would expect to find this in future research. Particularly interesting may be the different utility mixes experienced in different industries. Another interesting approach would be to make cultural benchmarks and see how the experienced utility and the relationship between utility and turnover intentions relates to Hostede's cultural dimensions (Hofstede, 2011) and Schwartz universal values content (Schwartz & Bilsky, 1987).

We evaluated the predictive values of M, S and T for turnover intention (see annex 1.6 for the full output). However the groups were too small to find significant results on all dimensions. The data does suggest some differences between the groups, and future research could explore that further.

Profiling

The dimensions could also be used to map out individual differences. Motive disposition theory (MDT) (McClelland, 1961) (Schönbrodt et al, 2021) suggests we can differentiate between people by measuring their disposition to the motives of achievement, power and affiliation. Achievement and power are theoretically related to transformational utility where achievement is more

integrated and power is more instrumental. Affiliation would relate to social utility. If any, power is the most likely to relate to material utility from a scorekeeping perspective. So if we could measure the motive disposition of people and group them accordingly we would expect the different types of utility to have a stronger or weaker relationship to turnover intention and other behavioral outcomes. The next step would be to leave behind MDT and create a utility disposition theory, where we measure not so much how much utility you are experiencing but rather your disposition to them. One of the most robust critiques of MDT is that it relies heavily on unreliable measurements of implicit motives (Fiedler et al, 2006). The projection of subconscious motives on blurry images and suggestive drawings did not age well. Experiments could be designed to link different types of utility to behavior in order to profile individuals. This cannot be done in single situation surveys because, as we assume personal differences we cannot know the relative role of each type of utility in the behavior. However we could design an experiment, let's say a videogame that has a social component, a competitive component and cash reward. As we tweak the game across these types of utilities different players will respond differently.

Personal profiling is of course also the most dangerous use of the three dimensional utility model. Please refer to the chapter on ethical considerations and specifically the privacy and mind policing issues that would be very real if the model were to be used as an identifier of personality. All further research in this context and specially practitioners use in this light should be preceded by an ethical evaluation to establish its moral grounds and limitations.

Elaboration on the parameters

Arguably our exploration of the parameters leading into each one of the utility categories is incomplete and the sub constructs could be explored further. Did we miss anything important that drives experienced utility for employees? The three types of utility interact differently with organizational behavior. Behavior

such as turnover is driven by a function of the three types of utilities, not simply by the sum of them. Now why then do we assume that each one of these utilities can be measured as the sum of its components and not the linear function of its components? It would be interesting to explore possible models with more elaborate functions for each one of the utilities. This would be a trade-off between complexity and accuracy, a minor marginal increase in accuracy would not justify a significant increase in complexity of the model. Aside from the danger of overfitting the model (Hawkins, 2004) there are also rhetorical and practical concerns with overly complex models. Complex models are harders to grasp and harder to use. An analogy I used in the introduction is that a model is like a compression algorithm like jpg, mpeg or mp3. It depends on the proposition of compression to quality loss. We want a simple model that explains a lot, not a complex model that explains a little. And between a complex and a simple model that explains more or less the same we prefer the simpler version. From an academic perspective surely the thing that really matters is the quest for an objective truth, the complexity of the answer is not a qualification for its correctness or truthfulness. But look from the practitioners perspective, if the model is easy to grasp and easy to use it will be used more and have a greater impact on the industry.

You may argue that ease of use is irrelevant, as we are anyway aided by computers and software in use of the models, therefore the model can be as complex as we want. But there is an ethical risk to black box solutions, as will be further elaborated on in the chapter of ethical considerations. From that we would like to highlight that the pillars of ethical use of artificial intelligence are transparency, interpretability, and explainability, (Roscher et al. 2020). The complexity of the model has a price in interpretability and explainability. Again this could be aided by good software design.

Considering the tradeoffs, there is definitely still plenty of room for the refinement of the model and specifically the parameters and their

relationships to the constructs. A possible track would be to explore the best possible predictive model ignoring complexity to approximate truth and then in a next step to simplify it again to make it usable.

Longitudinal studies

The linkage between cognition and behavior.

It seems evident that turnover intention should be firmly linked to actual turnover behavior. But, at least on an organizational level this is questionable. Cohen et al. (2016) found in a survey of 263,475 people across 180 U.S. federal agencies that only 4% of actual turnover was explained by turnover intention. However it has to be taken into account that this was a single blast study, meaning that Cohen and his colleagues really correlated the intention to leave of the people that hadn't left to the amount of people that actually left. Turnover is contagious (Porter & Rigby, 2021), hence it happens in waves. You could think of turnover waves as fires breaking out. Everyone who has a high enough turnover intention will move from intention to action, this means that after the wave the recorded actual turnover is high but turnover intention across the team is relatively low. When the fire hasn't broken out yet there may be low actual turnover but a lot of people waiting for a spark i.e. with high turnover intention. It is therefore better to measure the transition from turnover intention to actual turnover longitudinally. At an individual level the correlations between turnover intention and actual turnover are found to be between 0.31 and 0.52.(Dalton et al., 1999). So either way the relationship between turnover intention and actual turnover is debated. Doing a longitudinal study we could contribute to this debate. It could also be explored whether all three types of utility have the same slippage between intention and action. A possible outcome is that the more rational factors such as pay and career development have a different transition from intention to behavior than the more emotional factors such as social utility. Emotional intention may fade as our emotional state evolves but rational intention may remain constant over

time. In a reaction to strain individuals self regulate. We do this by leveraging the organizational resources, such as support from HR and the leadership and our own resources such as emotional intelligence and sense of agency (Bakker & de Vries, 2021). The nature of challenges also affect the process of self regulation and the ability to self regulate. So a theory could be developed to categorize our psychological regulatory reaction to specific imbalances in job utility.

How does utility change over time?

In Fisher's study that developed the Job Emotions Scale (JES) (Fisher , 2000) an experience sampling technique was implemented to explore how existing job satisfaction indicators, such as the Job Descriptive Index (JDI), are lacking in the measurements of affective states. They found that, within their study, more than half of the variance was within persons over time rather than between persons (61% for mood, 77% for negative emotions and 53% for positive emotions). So the variance within a person over time is larger than the variance between people. This begs for a more contextual approach and our job utility model could be used for this. How do the different types of utility evolve over time, how are they affected by mood and emotions? Does utility cause positive emotions or do positive emotions create utility? What other factors are at play? Are the dynamics the same for all three types of utilities or are they categorically different in the way they interact with emotions and hence behavior?

Adaptation Level Theory (ALT) (Helson, 1964) describes the way we become saturated by constant stimuli. It is the psychological process behind diminishing marginal utilities. This implies there is a roll back to a baseline over time. It would be interesting to quantify this effect for the different types of utility.

As Daniel Gilbert eloquently delineated in his work (Gilbert et al. 1998) (Gilbert, 2009) we tend to overestimate the durability of an affective reaction to a positive or negative change. Suh and his team (Suh et al., 1996) did a 2 year long longitudinal study on the subjective well-being and the effect of events on them. They found that anything that happened more than 3 months ago does not have an influence on your current well being. This is because our psychological immune system rebalances the baseline and our affective experiences are movements from this baseline (Mandelbaum, 2019). In another corner of the behavioral ring we have norm theory by Kahneman and Miller (1986) there is a similar dynamic where only the divergence from the baseline has an affective effect, but here the baseline is set by internalized norms. Our ability to measure different dimensions of utility may contribute to this discussion and further develop the nuances between these seemingly conflicting visions as well as elaborating on the durability of affective reactions and possible moderating conditions.

Overview

In this chapter we explored some venues for future research. In the next chapter special attention is paid to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice. Finally we conclude with the managerial impact, (chapter 9) and the high level conclusions (chapter 10).

8. Ethical Considerations

This chapter takes a broad look at the future of data driven HR. This study contributes to the methodologies of data driven HR. There are a series of ethical concerns and potentially dystopian futures that may arise from this, some of those are explained in detail. It is an appeal for responsible use, but also some practical guidance to that responsible use of this and other psychometric models. Ethical guidance in an emerging technological field.

To simplify the mind is to deny its beauty.

Humanity is blessed with a colorful and chaotic spectrum of individual differences. While it is worthy to try to understand the depths of the mind, the creation of models denies many dimensions of individuality in the name of large numbers. Yet we cannot wrap our head around our head without models and simplifications, whilst the models are useful we may be opening the door to a world of problems, not for the majority but for the minorities, those ill represented by the models. Especially if these models are to be used for data driven HR practices related to activities such as, recruitment, retention and talent development, deciding over the careers and lives of real people, there are serious ethical considerations and pitfalls to be aware of. We shall discuss five mayor pitfalls in this sections, discrimination by AI, opportunity inequality, dehumanization, privacy concerns, and mind policing.

Discrimination by AI

In 1991 at a high water mark of pop culture and a lasting memory for many in my age cohort Arnold Schwarzenegger said “hasta la vista baby” to the evil AI bot before overly dramatically terminating him. Rogue AI’s set to destroy us are long time hollywood favorites with movies from The Matrix to the Space Odyssey and many more. But catastrophic effects of AI are just around the

corner, are much more subtle, and do not require the computer to become sentient, nor any kind of ill intentions or rebellion.

In 2015 Amazon said “hasta la vista baby” to their CV vetting algorithm (Dastin, 2018) after it insisted on discriminating agains women in the CV selection process, even when manual interventions were done to hide gender and correct for bias in the machine. This AI did not like women and would downgrade the CV when it could identify via secondary clues that the candidate was likely female.

COMPAS, stands for Correctional Offender Management Profiling for Alternative Sanctions. It is a case management and decision support tool used by US courts to assess the likelihood of a defendant becoming a recidivist. Basically the AI tells judges whether it thinks the individual in question would get in trouble again if the judge let’s him go early or offers an alternative sanction (Brennan et al.2009). Sounds great, but …, investigative journalists for ProPublica analyzed the outcomes of the engine and found widespread Machine Bias against minorities, especially against black people. (Allen & Masters, 2021) (ProbPublica, 2020). If you are black the AI would evaluate your chances to be recidivist higher. Basically the judge’s computer is racist.

So how is this possible? How do neutral algorithms becomes engines of discrimination. It is because the machine looks for correlation not causality. Causality is complicated to establish statistically. Correlation is very straightforward. Specifically in machine learning we need massive amounts of data in order for the machine to find patterns and develop a predictive model. Typically, as well as in both Amazon’s CV selection AI and in COMPAS historical data was used. But the history is tainted by inequality and discrimination. If we have been hiring mostly wealthy white males in the past, and wealthy white males have better education, better connections and more career opportunities, the AI will learn that being a wealthy white male is the

proxy for success. So it will start looking for clues of who the wealthy white males are. In this way our next batch would have even more wealthy white males and the problem exacerbates. You may think the solution is as easy as hiding race, gender or anything that could be discriminatory from the AI, but here the AI will outsmart you. It will find patterns in other clues by which it will discriminate. For example an HR recruitment engine was found to use the postal codes of Chicago to estimate effectiveness at a certain job. Chicago is a very segregated city with different neighborhoods representing different ethnicities and social economical classes. Obviously those from less fortunate neighborhoods have had less opportunities for education and career development than those from the wealthy neighborhoods. So the AI in the name of the numbers will avoid those neighborhoods. Which of course isn't fair, if I score well on objective criteria but come from a disadvantaged neighborhood I should at least have the same likelihood to do well at the job than someone from a more pampered background.

Now I hear you thinking, "well we should obviously not allow the AI to judge based on the address" but again, it is not that straight forward. What if, in our research, by creating a taxonomy of experienced utility, we are building weapons for mass discrimination in AI. Some of our affective preferences are cultural and may be related to ethnicity or social class. This would be reflected in a survey such as ours. We are psychometrically looking into the mind, once the door is open computers and machine learning will be used to optimize outcomes, that is unavoidable. The AI will then develop psychometric patterns or fingerprints of the profiles which in the past have been successful for whatever purpose the AI is employed. This means that it will discriminate on ethnicity, race, culture, social class, religion and even philosophical convictions.

So how do we mitigate this problem? Well the jury is still out on it, as Kochling & Wehner (2020) point out in their meta analysis of 36 papers on

discrimination by algorithms. There is no silver bullet but the answer builds on three pillars: transparency, interpretability, and explainability. We want to avoid any “black box” and create a “glass box” as Roscher et al. (2020) illustrates. Transparency, interpretability and explainability are really about keeping a human at the helm. But will this remain realistic as automation and economic pressures push people away? I wonder.

Another possible approach to the problem is to look at the three computational steps and address each individually input, processing and output. If the input is biased the machine will exacerbate this bias, so we should try to have non-biased inputs. However, curated datasets are costlier and smaller. This would also mean the AI can not continuously learn about its environment because the inputs have to be curated first. For the processing we should follow Roshcer’s advice regarding transparency and have an active role for humans in the process.

And lastly there may be a place for affirmative action in setting the objectives for the AI, maybe the AI should have quotas to fill based on each discriminatable characteristic. If the outputs are locked on certain quotas then the AI will adjust accordingly. However, is that fair? Both sides of the argument invoke Rawls’ Theory of Justice (Rawls, 1999). “Rawlsian Affirmative Action” (Taylor, 2009) refers to the interpretation of modern libertarian ideas of Rawls in the context of affirmative action. Rawls is a highly influential philosopher in the American political and ethical zeitgeist. Samuel Freeman reads his views as follows:

> “So-called “affirmative action,” or giving preferential treatment for socially disadvantaged minorities, is not part of FEO [Fair Equality of Opportunity] for Rawls, and is perhaps incompatible with it. This does not mean that Rawls never regarded preferential treatment in hiring and education as appropriate. In lectures he indicated that it may be a proper corrective for remedying the present effects of past

> discrimination. But this assumes it is temporary. Under the ideal conditions of a "well-ordered society," Rawls did not regard preferential treatment as compatible with fair equality of opportunity. It does not fit with the emphasis on individuals and individual rights, rather than groups or group rights, that is central to liberalism." (Freeman, 2007)

Suffice to say we are not going to resolve the debate on affirmative action in this paper. What is important to note is that, all academics and professionals dealing with AI and predictive modeling of behavior have to be aware of the prevalence of Machine Bias and to be well versed in its dynamics and remedies, even as the remedies are still being cooked up. The coming decades will bring an ongoing battle to fight discrimination by algortihms and we have to try to not make things worse with our work. Because if we let the machine loose on our minds it will be "hasta la vista baby" for any hope of a fair society.

Opportunity inequality

Our work contributes to the emergent practice of data driven HR by providing taxonomy and dimensions on which to analyze. Some describe the advent of data driven HR practices as an integral part of the so called "industry 4.0" (Sivathanu & Pillai, 2018). Also in 2018 the futurist Bernard Marr wrote a book on data driven HR (Marr, 2018). In it he identifies four purposes for the use of data:

> "1: Using data to make better decisions
>
> 2: Using data to improve operations
>
> 3: Using data to better understand your employees[1]
>
> 4: Monetization of data" (Marr, 2018)

[1] The actual text says "Using data to better understand customers" but later it is explained that in Marr's perspective the customer for the HR department is the employee.

Our work would be used in the third category, to better understand employees" but subsequently also in the first one "to make better decision". Right now decision making in HR is messy and inefficient, there are a myriad of selection criteria and clues to look for a handful of attributes such as conscientiousness, motivation and intelligence. The fact that this is messy means that the outcomes are noisy. Let's do a thought experiment: Let's say hypothetically we are looking for conscientiousness and intelligence. Imagine three candidates: one, candidate A, who would if we could perfectly measure these attributes score high on them, candidate B, who would score a bit lower and candidate C the lowest. Based on an interview and the CV we may have 50% chance of selecting candidate A, 30% chance of selecting candidate B and 20% chance of candidate C (I'm making up reasonable numbers for the sake of the thought experiment). Suppose we get better at measuring, maybe with an IQ test and Big 5 personality analysis. Then the percentages would shift to maybe, A: 70 %, B: 20%, and C: 10%. Suppose we become really good at psychometric analysis and we measure things near perfection. Then we will hire A 100% of the times. B and C have no chance. If all companies do this all companies will be going after the same employees and C will never get a job. Of course in this simplified example with arbitrary criteria of selection, intelligence and conscientiousness. But we could also apply big data analysis to learn exactly what are the ideal psychometric attributes of the employee for a given function. Initially there may be some discrepancy within the algorithmic models but as they get better they will become more and more uniform identifying the ideal psychometric profile. For a while there will be a competitive advantage to the recruiters that have the best models. But like everything in tech in a short while the access to the technology will democratize. Soon everyone will have the same excellent open source model. At some point only one specific profile can get a specific type of job. This would mean that B and C never get the job, only the A types.

I guess most of us recognize that at some point in our careers we have been offered an opportunity that was a bit of a jump for us, that may have been offered because someone subjectively believed in us. Hopefully this belief became a self-fulfilling prophecy and we grew into the new role. This dynamic of imperfect selection scatters opportunity for everyone, and yes, sometimes we hire the wrong person for the job, but these exceptional opportunities also create growth and opportunity. If all of these decisions are made by data driven algorithms there will be massive opportunity inequality and individuals will lose the freedom to try to “wing it” at different roles. This wn those recruiters who do will have a competitive advantage.

A side effect of this will be that future participants of the labor market will train or be trained on profiling themselves to match the desired profile of the algorithms. This would cause extensive social desirability bias in all psychometric tests. And if subjects are not at all honestly answering the questions but rather trying to guess what the algorithm wants to hear, the tests lose all their value.

I would therefore argue that we may be aided in the decision making process by data driven tools but we should allow some room for human intuition, messy as it may be, it will create opportunities for individuals and companies and will hopefully keep respondents humane and fight the gaming of the algorithm.

Of course subjective intuition is highly biased, and maybe letting the computer decide is more objective and more meritocratic. But maybe a little bit of chaos gives everyone a chance?

Dehumanization

It is a widespread urban legend that exceptional entrepreneurs often performed exceptionally badly at school (Denin, 2021). This is an indication

that whatever we do in education may work less well for the edge cases than for the median case. Some people's minds work differently, they think differently and they "tick" differently. Yet it is those exceptional people that change the world.

In our models we are modeling for the vast majority of people, $p = 0.05$ is our usual cutoff point to say that something is statistically significant. But that doesn't mean it applies to all people, especially exceptional people, the outliers. Arguably the human mind can never be understood quantitatively, to try to do so is to strip humanity of its beauty. The edge cases should be analyzed qualitatively because the dimensions and parameters may be fundamentally different to the rest of the group.

But then is it fair to throw all the "average Joe's" by buckets into our quantitative models? Maybe everyone is exceptional in a way, we are just not very good at identifying all the ways. So if we are going to analyze the outliers qualitatively, why do other people get reduced to a series of parameters?

We are herd animals, and, whether we are conscious of it or not, we are used to communicating, managing relationships and managing our position in a group. We expect our social groups, including our work teams, to communicate with us and to signal when there may be issues. Our brain has been trained for thousands of years in social communication. But now an algorithm trained in the last few months may define my future role in the social group or even terminate my membership of the group. This feels unfair, unhuman and damages my trust relationship with the social group. It will feel arbitrary because it is not in line with what our social senses tell us about our functioning in the group.

The more my relationship to the organization is managed by algorithms the more I am alienated from the social fabric of the organization. The social utility

I derive from the job will be damaged as well as my sense of loyalty and belonging.

So how can we mitigate the dehumanization caused by data driven HR practices? Well again transparency goes a long way, Lepri and his colleagues at MIT (Lepri et al. 2018) explored the requisites for fair, transparent and accountable algorithmic decision making. It is important that the rationale of the algorithm can be explained and understood. Ideally the subjects have access to the algorithms and their parameters at all times so they can manage their performance in the system. When dealing with outcomes of the job, this makes sense and essentially becomes gamified KPI's. Gamification has its challenges but may generally be considered to be effective to drive behavior. (Chou, 2019)

However when we are dealing with affective states and predispositions this becomes problematic, as we want to measure the real affective states and predisposition without subjects gamifying their parameters. In the context of affective states this would lead to absurd and terrifying scenarios of mind policing.

Mind Policing

I once bought a new car from a car dealer. The salesman was OK, a bit pushy and a bit annoying, but overall he did his job, I knew what I wanted so it was an easy sale. At the end of the process he tells me that I will receive a call from the brand polling the quality of his service. It is very important that I give him a five star rating otherwise he will get in trouble. He literally said (translated from Spanish) "I prefer you punch me in the face now than that you give me anything other than 5 stars". I was feeling a bit of reactance, i.e. rebellion to go along with it. Clearly such pressure to rate highly undermines the feedback mechanism and makes the net promoter score (NPS) useless. Should I tell the reviewer, if it is not a bot, that he pressured me into giving a

high review? If it were my company I would hope this would happen. However I still rely on this garage for warranty and maintenance, so I need to have a good relationship with them. So it is not in my best interest to flag this behavior. So I rated the OK service 5 stars. This event left me curious to see how widespread this issue is with the NPS and I nosed around a bit online. Turns out this is a widespread problem (Fisher & Kordupleski 2019), (Shevlin, 2021).

There is also an employee net promoter score (eNPS) that is used to gauge whether employees would recommend the employer to family and friends, or to whoever. Another critique of the NPS and the eNPS use however is that it doesn't say why someone would recommend or dissuade. (Stahlkopf, 2019). Here we hope that our Job Utility Survey can help, but by doing so it will inherit the problems around pressured reviewers. In a sense the social utility dimension of our survey is a review of the leader's soft skill and ability to create a positive supportive work environment, the outcome of the survey would soon become one of the KPIs monitored by their Managers-once-Removed (MoRs) or the algorithm that is evaluating the leader. When the employee scores lowly on transformational utility it could be argued that there is a lack of transformational leadership. If the employee scores low on material utility the manager could be blamed for doing a bad job at managing salary expectations and growth trajectories.

So generally the manager will be held accountable, now think back to the car dealership. There is an important difference here, the manager has a formal power relationship over the employee. I rely on the dealership for service and warranty, the employee relies on the manager for his employment, career development, performance reviews etc… It would be easy for the boss to pressure his team into certain answers. Yes I know, the surveys are anonymous, but are they really? If you have less than ten direct reports I bet you know who was the bastard that gave a bad rating.

There is an additional problem, the honest answers to the survey are not compatible with our social interaction. I don't tell the card dealer he is mildly annoying. You don't tell the boss you don't like working with him/her. So if the boss asks whether you like them personally or you like working on the team the social etiquette is always to say yes, only the most well spoken expert is feedback would dare to try to find a tactful way to communicate such a thing. Most people would just let it slide, especially if the dislike is personal and not function related.

So the manager will be pressuring the team into getting positive answers on all aspects that may reflect on their leadership. They will also start micromanaging the emotional state of employees, making sure everybody is happy, everyone gets along and any tensions are resolved. This will create an Orwellian hunt on negative emotions within the team.

Imagine coming in to work on a Monday morning and your boss saying "Are you happy? You have no reason to be unhappy right? I need you to smile!…."

And with that image in your head we segway onto the issue of privacy.

Privacy

> "What Orwell failed to predict was that we'd buy the cameras ourselves, and that our biggest fear would be that nobody was watching." Keith Lowell Jensen (Jensen, 2020)

I know it feels somewhat ironic to talk about privacy when most of us have unceremoniously given up our privacy rights to the digital realm. But still, there is a difference. The privacy was yours to give up and you traded it for a bunch of tools and access to your friends on social media. But do you have to give up your privacy to your employer? You can choose not to use social media, but can you choose not to be employed?

One day when he wasn't laying the foundation for our utilitarian philosophy Jeremy Bentham designed a prison called the "Panopticon". The design was set up so that the guards could easily look into all cells but the inmates cannot see whether they are being watched (Semple, 1993). As the inmates cannot see whether the guard is watching or not, they must assume at all times that the guard could be watching and hence behave accordingly. Because of this reason the Panopticon would require less guards to operate. Around 300 prisons around the world have been built following this model. The social philosopher Michel Foucault in "Discipline and Punish" (Foucault, 2012) uses Panopticon as an analogy for all power relationships between social institutions and individuals. Foucault highlighted the transition from repressive power, the threat of punishment, to "dynamic normalization" or to put it in our jargon, the internalization of social norms. For Foucault, the possibility of social scrutiny, combined with the inability to know when you are being watched are essential in this internalization process. He describes "le regard" (the glance) from the institution as essential. The outcomes are docile compliant citizens. The downside is a lack of individuality, creativity, diversity and risk taking.

Now, would not our surveys become "le regard" in the relationship between the employee and the organization? Yes surveys should be anonymous, but as was mentioned before, anonymity is questionable in small teams.

The question arises, in this context, what may we ethically ask about? Arguably the employer should only be granted insight into behavior that is directly related to the job (Bhave et al. 2020). As an employer we may not ethically request information that is to be considered private. John Stuart Mill, the disciple of Jeremy Bentham pointed out that part of the individual's life is private and only subject to self management. Furthermore the mind of the individual is private and may not be coerced or molded (Mill, 1978).

> “Human nature is not a machine to be built after a model, and set to do exactly the work prescribed for it, but a tree, which requires to grow and develop itself on all sides, according to the tendency of the inward forces which make it a living thing.” John Stuart Mill

In our psychometric analysis we are peering into the minds of employees. Many of the questions in our survey are not directly behaviorally related to function of the job. Many questions are affective in nature, they may start with “I like…”, “I enjoy…” etc. Evidently employees should not be pressured into answering these questions.

So what does that mean for our surveys? Are they rendered useless? Well, no. First of all for our research there are three key factors that mitigate the privacy concerns: 1: This research is not done in association with the employers in fact, our sample is random selection of employees across the world, we don’t even know who they work for an whether there is more than one of them working for the same employers, employers will never find out whether any of their employees answered these surveys. 2: our dataset is rather big with around 500 respondents, responses are anonymised and agreggated and no individual data is ever shared. 3: respondents volunteered to submit their answers, they were allowed to leave questions blank if they felt uncomfortable with a question. The only pressure upon them is the pressure to make 1 pound, which was our compensation awarded for responding.

But the ultimate goal here is to make a tool that is useful for companies to manage their talent retention efforts. In that case any use should be subject to strict requisites to guarantee individuals privacy. These guarantees should cover 3 main aspects.

1: The process should be managed by external professional, HR consultants that are not part of the organization and that are well versed in privacy

requisites and place ethical compliance above incidental pressure from their customer. It is their responsibility to set up the process so no identifiable information will reach the customer (the management). And they may not report on teams smaller than a certain number as this jeopardizes anonymity.

2: Participation should be voluntary, at the level of participating, and at individual question level.

3: The technological infrastructure on which the process runs must be best off class privacy by design infrastructure that undergoes regular privacy threat modeling analysis, so as to minimize risk of accidental, or not so accidental unauthorized access to data. This should be operated by a third party data security expert.

Synthesizing reflections

In cybersecurity we say security is a journey not a destination. This is said because 100% security can never be achieved and the environment is in constant change. It is therefore important not only to do a deep analysis on a regular basis, but also to continuously monitor, reevaluate and reassess. The same is true for the ethical implementation of new technologies used to decide over peoples careers and lives. This chapter contains a deep analysis concerning the ethical consideration of implementing such models and tools dated early 2022, by the time you read this it is already outdated. Threats mutate and new threats emerge. We therefore advise for a structural procedural way of implementing regular deep dives such as this in the moral implication and continuous monitoring of early signals of issues arising. Resources to do this should be allocated by industry practitioners when using these tools.

Overview

In this chapter special attention was paid to the ethical implementation of the study and the broader impact the development of models for data-driven HR practices have on society, equality, privacy and justice. Finally we conclude with the managerial impact,and the high level conclusions.

9. Managerial Impact

This chapter covers how the model will be used by the current author in the HR industry supply chain.

We live in a world of limited resources, and the most limited resource of them all is our short stretch of cognitive existence, a blink of an eye in cosmic time, yet a lifetime of experiences. So how to spend that time should be of major concern to individuals and by extension to those competing for our time. The three dimensional utility model is useful in better understanding what it is that makes work useful or desirable. So how can it be implemented and how can it make the world a better place?

It is not a coincidence but I happen to be co-owner of a company called Codific. Codific flagship product is a medtech solution that is not terribly relevant for this research, but we have a second emerging flagship called SARA. SARA stands for Survey Analysis and Reporting Automation, it is the third generation of survey tools developed for HR consultancy firms. More than 300.000 individuals have been surveyed on our systems. The third generation represents the launching of the full fledged SaaS offering of the platform. This position in the supply chain of HR consultants means that I have access and influence on the industry. Another project in the pipeline around SARA is a marketplace for surveys. Until now we did not get involved in the actual content of the surveys, we only provided the technological layer, but in 2022 we intend to swim downstream and set up a marketplace for surveys. Initially a lot of things will be for free on this platform as it will be used to create visibility for SARA. Amongst the things that will be offered for free are standard 360 degree questionnaires, default Self Determination Questionnaires, possibly the Work Related Basic Need Satisfaction Scale (W-BNS) (Van den Broeck et al., 2010), culture surveys, and job engagement questionnaires, whenever of course the license of the questionnaires allows

this. And of course the Simple Present Job Utility Scale and Simple Future Job Utility Scale will have a prominent place at the fingertips of HR professionals. Having direct access to the industry and owning a marketplace for surveys puts the current research in an entirely different situation than most academic endeavors that find themself decoupled from the industry. Our proximity to the industry and our agile philosophy allows for fast iterations to find the apex of industry utility.

Our customers are HR consultants and their customers are major corporations. So how could our model contribute to the customers of our customers? We can look at the contributions through the lens of the different stakeholders. Even though we cover them one by one it is important to note that they all live in an ecosystem and everyone benefits from each other's health. If employees are doing better, companies are doing better, customers are doing better, governments are doing better and society is doing better.

The customer of our customer is the first one to benefit. They can analyze the utility experienced and expected by their employees. A good understanding of this will have three positive outputs: the lowering of turnover, the reduction of costs and the increased productivity. The most obvious is the reduction of turnover. Pundits are having a field day with the “great resignation” and the “resignation epidemic”, each month representing new records in resignation numbers (Bureau of Labor Statistics, 2021). Yes the world is changing and loyalty is dead (Flachet, 2021). But there is another problem, the management at large corporations is not in sync with the psyche of the modern worker, people are misunderstood and misappreciated. Having a clear understandable picture of what employees really want will allow companies to cater to that better and thereby lowering turnover rates and abolishing wasteful retention strategies and activities. Hence lowering costs and decreasing turnover. Additionally there is plenty of evidence that happy employees are more productive, there is a clear negative correlation between

job withdrawal and positive job behavior such as task performance and organizational citizenship behavior (OCB). So assuming our model is of added value in this understanding there are a myriad of advantages in its use.

For the individual the advantages are obviously great, in the first place if employers become better at creating utile jobs then they can expect more utility from their job. More utility by masses of people is the utilitarian dream. But there is also a reflective value to the model, if the individual partakes in such surveys and he is mapped on different benchmarks he comes to some realizations about his own predispositions and preferences he had not consciously thought about. This is valuable in knowing yourself and making the right choices, hence the individual would become better at selecting options in the future. Additionally metacognition, that is thinking about how you think, has shown to be fundamental in social-emotional maturity development (Blaschke, 2012). This development makes people more autotelic (Blaschke, 2012), have better career opportunities (Jaques, 2017) and become better team players and better leaders (Barrett, 2011).

In the relationship between the companies and employees and possible employee organizations the model provides clear taxonomy to aid in the labeling of things as well as an opportunity to quantify outcomes. This can make social negotiation more transparent and effective.

For our customers the HR consultants, better tools means more added value, so a better business. Specifically the pragmatic cross disciplinary approach combining economical and psychological perspectives would be highly appreciated by the industry. Overall the industry is rotating to what is called data driven HR where adequate collection of data is essential and the model on which the data is analyzed even more so.

10. Conclusions

This chapter reiterates the greater purpose of this work and transitions back to the philosophical points made in the introduction. The chapter and thesis conclude with an existential sentence completing the circle of argumentation.

The universe is 13.8 billions years old, humanity 200.000 years and civilization as we kind of know it 6000 years. Arguably markets, and labor markets, have really come to the forefront in a society defining way ever since the industrial revolution, barely 200 years ago. So 200 years is the time these labor markets, as we kind of know them, have existed. Could it be that, 200 years down this road, we have finally reached a tipping point. From a systemic surplus of labor to a systemic shortage. The first part of that statement is not so controversial, much of the economic hardship and human suffering of the last two centuries can be attributed to dramatic imbalances in labor markets with primary effects on incomes and subsistence, and secondary effects such as the distortion of power towards the demand side of labor (“the haves”). The eloquent depiction of these secondary effects by Marx and Engels have been abundantly and excessively ruminated in our history, causing more hardship through tertiary effects along the way. Left and right, will agree that the markets have caused hardship in the past because of the imbalances, the disagreement is, of course, what to do about it and what the future will bring.

Could it really be that we are on the tipping point, and the market dynamics are categorically changing, shifting power to the employee. At the time of this writing we are in a so-called “great resignation”, inflation is peaking in the western world, job markets are the tightest they have ever been and all central banks are loading their interest rate guns to shoot at the economy. Is it a cyclical high in the labor markets or is it a categorical shift? A stock broker once told me a joke, (yes some of them have humor).

- Do you know what is the oldest joke on Wall Street?

- …

- That this time it's different!

The joke refers to the zeitgeist at the height of a wave of market frenzy, such as today, that starts to believe that the world has so categorically changed and that the party may last forever. This is then unavoidably followed by a collapse in the markets and a recession in the economy, no different than in 2008, 2000, 1987, etc…

Yet, this time, it is different! Yes there will be cyclical pullback, and unemployment will go back up in most markets. But looking at the big picture underneath cyclical waves there is a systemic trend worldwide of tightening labor markets (International Labour Organization 2022). The Great Convergence is a term used by Richard Baldwin at the Gratidate Institute of International and Development Studies in Geneva, to describe the economic convergence of the economies across the world (Baldwin, 2018). The last two decades have seen a massive economic development across the "developing" world, led by China. This means that there are less and less cheap offshore countries for labor. How much would you guess the average salary in Shanghai was in 2021? Well it's around 300K CNY per year, 285K CNY according to Payscale (2022), 393K according to Average Salary Survey (2022) and 313CNY according to Salary Explorer (2022). 300K CNY is around 48.000 dollars. That is very similar to places like Barcelona, Athens or Napoli.

At the time of this writing we are surfing the Omicron wave of the Covid-19 pandemic. Hopefully this is the last wave and it will leave us away from the spay so we can settle into the new normal. The pandemic has drastically changed the world we live and work in, the pace of digitalization has

accelerated and remote work has been normalized. This should then further accelerate convergence as being able to work from anywhere also implies that we can employ anyone anywhere. The prevalence of remote work should have a normalizing effect on salaries around the world per specific qualifications and profiles. This will be a downward pressure on salaries in places like San Francisco, New York and London and an upward pressure in large parts of the planet.

So if the future of labor markets is global and highly competitive with more and more roles having a systemic shortage of qualified candidates the power will indeed shift towards the employee. So, as entrepreneurs and employers, we have to become better at catering to the employees, we must learn to understand what aspects of the job are valuable and how this value can be maximized. In that context our research and the broader field it contributes is of great importance to the future.

From a human perspective the future is bright, the balance shifting towards the employee will make the world a better place. Employers will be forced to offer better conditions, more flexibility, more opportunity for self development and generally be nicer. The ability to attract and retain talent will be an important key competence in talent intensive industries, even more so than it already is today. And our model can hopefully contribute to the effectiveness of giving employees what they really want.

But we cannot cruise on autopilot to the bright future, because there are serious potholes in the road. We must be very attentive to the ethical considerations outlined in chapter 8. There are specific dangers related to the psychological overreach of our analysis of thoughts and affect. There will be a conflict between what is useful to know, and what we have the right to ask. Especially if the analysis is done for the employer or the institution. Foulcault's figurative Panopticon is a good illustration of this danger. We have the right to privacy, and this right is under siege from all sides. Let's not add to the siege

of personal privacy and be thoughtful of the tradeoffs we make. We have outlined some limitations in chapter 8 to manage this tension, however we rely on responsible leaders to manage these processes ethically and to fine tune the delineation of acceptable use as the models improve and the context changes.

Furthermore we have discussed, also in chapter 8, how data driven HR can actually worsen discrimination and inequality. Potentially the worst thing to do is to let the machine self learn to a local optimum and leave it alone. We need to be actively managing the process with specific attention to transparency, interpretability and explainability. The human pilot will play a fundamental role for the foreseeable future and the responsible leader will play a key agile role in the balanced and ethical use of the new technologies, especially where technologies affect people, such as HR-tech.

So what we are learning in this journey will be useful, and usable, albeit not without some ethical guardrails. But there is also a purpose beyond the practical, the most pure and beautiful goal of them all, and that is understanding. Space is the final frontier, but not outer space, inner space! Not the dead vacuum between stars, but the vivid life between our ears. Much like we would need the whole universe to make an exact and correct model of the universe, we would need all of the facilities of our brain to correctly understand our brain. This is evidently not possible, so we rely on simplifications, heuristics and rules of thumb. Because I'm a computer nerd I reiterate the analogy of file compression, think JPEG and MPEG. The smart thing about this image file compressions is that instead of storing the color of every single pixel they identify geometrical figures and can assign the color to those, there may for example a green rectangle, if there is then the formula of the green rectangle conveys the same information with less data. Along the way there are some trade-offs, the slight variation of the green in the rectangle and the few different pixels are ignored. So a little bit of quality is

lost but the file becomes more economical to handle. The quality of the compression algorithm lies in the tradeoff between the lost representativeness and the magnitude of compression.

That is the only way we can truly tackle modeling the complexities of the human mind, we need geometrical components in the optimal amount of dimension. In this research we identified three dimensions and established how they can validly and reliably be measured. Our dimensions of job utility are shown to be useful in predicting turnover intention beyond the existing concepts available to today. And we have planted the seed to further develop the models on this path including “Expected Future Job Utility” which we anticipate to be even more useful in predicting turnover intentions. We don’t quite shut the door on the 4th dimension of splitting social utility as mentioned before, future research will bring some guidance in this. Future research can also start drawing geometrical figures in our dimensions, surely there will be certain recurring shapes that will tell us more about human nature at large while again ignoring maybe individual pixels.

The true understanding of the device that shapes our world, our understanding of it and our interactions with it, is both an instrumental and a terminal goal. Instrumental as a better understanding will improve our ability to navigate ourselves and others. Terminal because in the world of the existential mind, where nothing has intrinsic value, the quest for relative truth and understanding of how the world is fabricated is the purest purpose of them all. An intrinsic goal to live by that can lead to happiness and well being (Kasser & Ryan 2001).

And if it doesn´t, then at least we had something to do for a while.

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Appendices

Appendix 1.1: Demographic breakdown sample. Full report.

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FREQUENCIES VARIABLES=Batch Doyoucurrentlyhaveajob Yoursex Howoldareyou Whe
redoyoulive
    Whichnationalitydoyouconsideryourself.Incaseofmultiple Whichindustrydoy
ouworkin
    Howlongagodidyoustartworkingforyourcurrentorganization
    Howmanyyearsofprofessionalexperiencedoyouhave Whatisyourlevelofeducatio
n
  /ORDER=ANALYSIS.
```

Frequencies

Statistics

		Batch	Doyoucurrentlyhaveajob	Yoursex	Howoldareyou	Wheredoyoulive	Whichnationalitydoyouconsideryourself.Incaseofmultiple	Whichindustrydoyouworkin	Howlongagodidyoustartworkingforyourcurrentorganization	Howmanyyearsofprofessionalexperiencedoyouhave	Whatisyourlevelofeducation
N	Valid	505	505	505	505	505	505	505	505	505	505
	Missing	0	0	0	0	0	0	0	0	0	0

Frequency Table

Batch

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	290	57.4	57.4	57.4
	2	215	42.6	42.6	100.0
	Total	505	100.0	100.0	

Doyoucurrentlyhaveajob

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, I'm an employee	450	89.1	89.1	89.1
	Yes, I'm an intern	13	2.6	2.6	91.7
	Yes, I'm self employ	42	8.3	8.3	100.0
	Total	505	100.0	100.0	

Yoursex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	.4	.4	.4
	Female	250	49.5	49.5	49.9
	Male	250	49.5	49.5	99.4
	Prefer not to say	3	.6	.6	100.0
	Total	505	100.0	100.0	

Howoldareyou

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	<30	298	59.0	59.0	59.2
	30 -40	149	29.5	29.5	88.7
	41 - 50	41	8.1	8.1	96.8
	50+	16	3.2	3.2	100.0
	Total	505	100.0	100.0	

Wheredoyoulive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Australia	9	1.8	1.8	1.8
	Belgium	7	1.4	1.4	3.2
	Canada	1	.2	.2	3.4
	Chile	1	.2	.2	3.6
	Czech Republic	8	1.6	1.6	5.1
	Estonia	9	1.8	1.8	6.9
	Finland	1	.2	.2	7.1
	France	23	4.6	4.6	11.7
	Germany	13	2.6	2.6	14.3
	Greece	19	3.8	3.8	18.0
	Hungary	8	1.6	1.6	19.6
	Iceland	1	.2	.2	19.8
	Ireland	5	1.0	1.0	20.8
	Israel	5	1.0	1.0	21.8
	Italy	21	4.2	4.2	25.9
	Japan	3	.6	.6	26.5
	Korea, South	1	.2	.2	26.7
	Latvia	2	.4	.4	27.1
	Mexico	2	.4	.4	27.5
	Netherlands	12	2.4	2.4	29.9
	Norway	1	.2	.2	30.1
	Poland	51	10.1	10.1	40.2
	Portugal	43	8.5	8.5	48.7
	Slovenia	3	.6	.6	49.3
	South Africa	108	21.4	21.4	70.7
	Spain	16	3.2	3.2	73.9
	Sweden	2	.4	.4	74.3
	Switzerland	1	.2	.2	74.5
	United Kingdom	102	20.2	20.2	94.7
	United States	27	5.3	5.3	100.0
	Total	505	100.0	100.0	

Whichnationalitydoyouconsideryourself.Incaseofmultiple

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	1.2	1.2	1.2
	American Samoa	1	.2	.2	1.4
	Angola	1	.2	.2	1.6
	Australia	7	1.4	1.4	3.0
	Belgium	5	1.0	1.0	4.0
	Brazil	1	.2	.2	4.2
	Chile	1	.2	.2	4.4
	Congo, Democratic Republic of the	2	.4	.4	4.8
	Czech Republic	8	1.6	1.6	6.3
	Estonia	8	1.6	1.6	7.9
	Finland	1	.2	.2	8.1
	France	20	4.0	4.0	12.1
	Georgia	1	.2	.2	12.3
	Germany	8	1.6	1.6	13.9
	Greece	18	3.6	3.6	17.4
	Hungary	10	2.0	2.0	19.4
	Iceland	1	.2	.2	19.6
	India	2	.4	.4	20.0
	Indonesia	1	.2	.2	20.2
	Ireland	5	1.0	1.0	21.2
	Israel	5	1.0	1.0	22.2
	Italy	24	4.8	4.8	26.9
	Jamaica	1	.2	.2	27.1
	Japan	1	.2	.2	27.3
	Kenya	1	.2	.2	27.5
	Korea, South	2	.4	.4	27.9
	Latvia	3	.6	.6	28.5
	Mexico	2	.4	.4	28.9
	Nepal	1	.2	.2	29.1
	Netherlands	10	2.0	2.0	31.1
	Nigeria	1	.2	.2	31.3
	Norway	1	.2	.2	31.5
	Philippines	1	.2	.2	31.7
	Poland	53	10.5	10.5	42.2
	Portugal	42	8.3	8.3	50.5
	Romania	1	.2	.2	50.7
	Russia	2	.4	.4	51.1
	Slovakia	2	.4	.4	51.5
	Slovenia	3	.6	.6	52.1
	Somalia	1	.2	.2	52.3
	South Africa	94	18.6	18.6	70.9

Whichnationalitydoyouconsideryourself.Incaseofmultiple

		Frequency	Percent	Valid Percent	Cumulative Percent
	Spain	13	2.6	2.6	73.5
	Sweden	1	.2	.2	73.7
	Syria	2	.4	.4	74.1
	Thailand	1	.2	.2	74.3
	Turkey	3	.6	.6	74.9
	Ukraine	1	.2	.2	75.0
	United Kingdom	89	17.6	17.6	92.7
	United States	22	4.4	4.4	97.0
	Uzbekistan	1	.2	.2	97.2
	Venezuela	2	.4	.4	97.6
	Vietnam	1	.2	.2	97.8
	Zambia	1	.2	.2	98.0
	Zimbabwe	10	2.0	2.0	100.0
	Total	505	100.0	100.0	

Whichindustrydoyouworkin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	1.2	1.2	1.2
	Accounting	13	2.6	2.6	3.8
	Airlines/Aviation	1	.2	.2	4.0
	Apparel/Fashion	1	.2	.2	4.2
	Architecture/Planning	3	.6	.6	4.8
	Arts/Crafts	3	.6	.6	5.3
	Automotive	7	1.4	1.4	6.7
	Aviation/Aerospace	2	.4	.4	7.1
	Banking/Mortgage	7	1.4	1.4	8.5
	Biotechnology/Greentech	3	.6	.6	9.1
	Broadcast Media	3	.6	.6	9.7
	Building Materials	1	.2	.2	9.9
	Business Supplies/Equipment	2	.4	.4	10.3
	Chemicals	2	.4	.4	10.7
	Civic/Social Organization	2	.4	.4	11.1
	Civil Engineering	2	.4	.4	11.5
	Commercial Real Estate	1	.2	.2	11.7
	Computer Games	5	1.0	1.0	12.7
	Computer Hardware	1	.2	.2	12.9
	Computer Networking	3	.6	.6	13.5
	Computer Software/Engineering	28	5.5	5.5	19.0

Whichindustrydoyouworkin

	Frequency	Percent	Valid Percent	Cumulative Percent
Computer/Network Security	2	.4	.4	19.4
Construction	7	1.4	1.4	20.8
Consumer Goods	4	.8	.8	21.6
Consumer Services	4	.8	.8	22.4
Cosmetics	1	.2	.2	22.6
Defense/Space	3	.6	.6	23.2
Design	1	.2	.2	23.4
E-Learning	2	.4	.4	23.8
Education	47	9.3	9.3	33.1
Electrical/Electronic Manufacturing	6	1.2	1.2	34.3
Entertainment/Movie Production	3	.6	.6	34.9
Environmental Services	3	.6	.6	35.4
Executive Office	2	.4	.4	35.8
Farming	2	.4	.4	36.2
Financial Services	15	3.0	3.0	39.2
Fine Art	1	.2	.2	39.4
Food Production	6	1.2	1.2	40.6
Food/Beverages	7	1.4	1.4	42.0
Gambling/Casinos	3	.6	.6	42.6
Government Administration	24	4.8	4.8	47.3
Government Relations	2	.4	.4	47.7
Graphic Design/Web Design	2	.4	.4	48.1
Health/Fitness	2	.4	.4	48.5
Higher Education/Acadamia	3	.6	.6	49.1
Hospital/Health Care	25	5.0	5.0	54.1
Hospitality	13	2.6	2.6	56.6
Human Resources/HR	6	1.2	1.2	57.8
Industrial Automation	1	.2	.2	58.0
Information Services	1	.2	.2	58.2
Information Technology/IT	48	9.5	9.5	67.7
Insurance	6	1.2	1.2	68.9
Internet	2	.4	.4	69.3
Law Enforcement	1	.2	.2	69.5
Law Practice/Law Firms	3	.6	.6	70.1
Legal Services	6	1.2	1.2	71.3
Leisure/Travel	2	.4	.4	71.7
Logistics/Procurement	1	.2	.2	71.9

Whichindustrydoyouworkin

	Frequency	Percent	Valid Percent	Cumulative Percent
Machinery	5	1.0	1.0	72.9
Management Consulting	1	.2	.2	73.1
Market Research	3	.6	.6	73.7
Marketing/Advertising/Sales	17	3.4	3.4	77.0
Mechanical or Industrial Engineerin	3	.6	.6	77.6
Media Production	1	.2	.2	77.8
Medical Practice	7	1.4	1.4	79.2
Mental Health Care	5	1.0	1.0	80.2
Military Industry	3	.6	.6	80.8
Mining/Metals	1	.2	.2	81.0
Museums/Institutions	1	.2	.2	81.2
Non-Profit/Volunteering	4	.8	.8	82.0
Oil/Energy/Solar/Greentech	2	.4	.4	82.4
Online Publishing	1	.2	.2	82.6
Other Industry	7	1.4	1.4	84.0
Outsourcing/Offshoring	1	.2	.2	84.2
Package/Freight Delivery	2	.4	.4	84.6
Packaging/Containers	2	.4	.4	85.0
Pharmaceuticals	3	.6	.6	85.5
Photography	1	.2	.2	85.7
Public Relations/PR	1	.2	.2	85.9
Publishing Industry	1	.2	.2	86.1
Railroad Manufacture	1	.2	.2	86.3
Real Estate/Mortgage	1	.2	.2	86.5
Recreational Facilities/Services	1	.2	.2	86.7
Research Industry	10	2.0	2.0	88.7
Restaurants	4	.8	.8	89.5
Retail Industry	27	5.3	5.3	94.9
Security/Investigations	4	.8	.8	95.6
Sports	1	.2	.2	95.8
Supermarkets	2	.4	.4	96.2
Telecommunications	5	1.0	1.0	97.2
Translation/Localization	3	.6	.6	97.8
Transportation	5	1.0	1.0	98.8
Utilities	1	.2	.2	99.0
Warehousing	2	.4	.4	99.4
Wholesale	3	.6	.6	100.0
Total	505	100.0	100.0	

Howlongagodidyoustartworkingforyourcurrentorganization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 6 months	79	15.6	15.6	15.6
	More than 10y	42	8.3	8.3	24.0
	More than 18 months and less than 3y	106	21.0	21.0	45.0
	More than 3y	91	18.0	18.0	63.0
	More than 5y	75	14.9	14.9	77.8
	More than 6 months and less than 18 months	112	22.2	22.2	100.0
	Total	505	100.0	100.0	

Howmanyyearsofprofessionalexperiencedoyouhave

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	.4	.4	.4
	<1y	71	14.1	14.1	14.5
	1 y to 5y	211	41.8	41.8	56.2
	10y to 15y	49	9.7	9.7	65.9
	15y to 30y	48	9.5	9.5	75.4
	30y+	13	2.6	2.6	78.0
	5y to 10y	111	22.0	22.0	100.0
	Total	505	100.0	100.0	

Whatisyourlevelofeducation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelors Degree	220	43.6	43.6	43.6
	Doctorate Degree	10	2.0	2.0	45.5
	Masters Degree	130	25.7	25.7	71.3
	other	8	1.6	1.6	72.9
	Secondary	84	16.6	16.6	89.5
	Technical or vocational training	53	10.5	10.5	100.0
	Total	505	100.0	100.0	

Appendix 1.2: Skewness and Kurtosis Check

Descriptive Statistics

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
B1.Ibelievelgetpaidalotformywork	504	.335	.109	-.823	.217
B2.Otheremployerswouldpaymemore	502	-.247	.109	-.703	.218
B3.Igetpaidmorethanmycolleagues	505	.596	.109	-.394	.217
B4.Myjobprovidesmewithalargeincomecomparedtothejobs	503	.297	.109	-.865	.217
B5.Iwillmakealotmoremoneyinthefutureworkingforthis	505	.218	.109	-.975	.217
B6.Iampaidwellformycontributions	505	.057	.109	-.871	.217
B7.Icouldmakemoremoneyatanotherorganization	503	-.501	.109	-.493	.217
B8.Ihavealargerincomefromthejobthanothersatourorgan	504	.465	.109	-.583	.217
B9.Imakemoremoneyfrommyjobthanmyfriendsdofromtheirs	505	.172	.109	-.918	.217
B10.Myincomewillgoupsignificantlyworkingforthisorganiz	505	.249	.109	-.758	.217
B11.Ienjoyinteractingwithmycurrentcolleaguesatwork	503	-.988	.109	.814	.217
B12.Ienjoyinteractingwithmybosses	504	-.552	.109	-.386	.217
B13.AtworkIfeellikeIampartofateam	504	-.721	.109	-.199	.217
B14.Iamproudofmyteam	504	-.599	.109	-.247	.217
B15.Thereisagoodatmosphereatmyorganization	504	-.672	.109	-.178	.217
B16.Ilikeworkingwiththepeopleiworkwith	504	-.771	.109	.247	.217
B17.Ilikeworkingwithmybosses	503	-.538	.109	-.503	.217
B18.Ifeelacceptedbymycolleagues	503	-.885	.109	.832	.217
B19.Itendtotalkpositivelyaboutmyteam	502	-.898	.109	.645	.218
B20.Thereisagoodvibeatwork	504	-.753	.109	.143	.217
B21.Myworkismeaningful	503	-.563	.109	-.466	.217
B22.Myworkisfun	503	-.162	.109	-.567	.217
B23.Ilearnnewthingsonthisjob	505	-.832	.109	.084	.217
B24.ThankstomyjobImgrowingasaperson	501	-.620	.109	-.427	.218
B25.Iamproudofmyposition	502	-.486	.109	-.535	.218
B26.Iamproudoftheworkitself	505	-.489	.109	-.508	.217
B27.Mycareerisadvancingrapidlywiththisorganization	505	.219	.109	-.861	.217
B28.Myworkprojectsareuseful	504	-.630	.109	-.361	.217
B29.Icurrentlyenjoytheworkitself	504	-.440	.109	-.527	.217
B30.Iamlearningnewthingsworkinghere	503	-.792	.109	-.133	.217
B31.Thejobenablesmypersonalgrowth	504	-.425	.109	-.712	.217
B32.Iliketheidentityassociatedwithmyfunction	504	-.401	.109	-.538	.217
B33.Iamproudofwhatweldo	505	-.618	.109	-.214	.217
B34.Workinghereistherightcareermove	503	-.266	.109	-.956	.217
Valid N (listwise)	475				

Appendix 1.3: Internal Reliability Pairs

Cronbach Alpha

B1 and B6	α = 0.831
B2 and B7	α = 0.796
B3 and B8	α = 0.752
B4 and B9	α = 0.784
B5 and B10	α = 0.836

B11 and B16	α = 0.865
B12 and B17	α = 0.933
B13 and B18	α = 0.758
B14 and B19	α = 0.817
B15 and B20	α = 0.898
B21 and B28	α = 0.767
B22 and B29	α = 0.830
B23 and B30	α = 0.915
B24 and B31	α = 0.870
B25 and B32	α = 0.833
B26 and B33	α = 0.899
B27 and B34	α = 0.772

Appendix 1.4: Model Fit Statistics models 1 to 8

Model fit

				Baseline test			Difference test		
	AIC	BIC	n	χ^2	df	p	$\Delta\chi^2$	Δdf	p
Model 8	17714.449	17917.227	505	173.889	71	< .001			
Model 7	32129.723	32607.098	505	776.638	321	< .001	602.749	250	< .001
Model 6	37338.119	37891.536	505	1068.758	429	< .001	292.120	108	< .001
Model 5	37406.365	37942.884	505	1145.004	433	< .001	76.246	4	< .001
Model 4	37483.167	38002.788	505	1229.807	437	< .001	84.802	4	< .001
Model 3	37535.644	38038.366	505	1290.284	441	< .001	60.477	4	< .001
Model 2	37662.543	38148.367	505	1425.183	445	< .001	134.899	4	< .001
Model 1	40363.197	40878.593	505	1556.398	507	< .001	131.216	62	< .001

Note. some models are based on a different set of observed variables

Fit indices

Index	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Comparative Fit Index (CFI)	0.920	0.922	0.933	0.937	0.944	0.949	0.959	0.974
Tucker-Lewis Index (TLI)	0.911	0.914	0.924	0.929	0.935	0.941	0.952	0.966
Bentler-Bonett Non-normed Fit Index (NNFI)	0.911	0.914	0.924	0.929	0.935	0.941	0.952	0.966
Bentler-Bonett Normed Fit Index (NFI)	0.886	0.891	0.902	0.906	0.913	0.919	0.932	0.957
Parsimony Normed Fit Index (PNFI)	0.800	0.800	0.802	0.799	0.797	0.795	0.792	0.746
Bollen's Relative Fit Index (RFI)	0.873	0.879	0.889	0.894	0.900	0.906	0.920	0.944
Bollen's Incremental Fit Index (IFI)	0.920	0.923	0.933	0.938	0.944	0.950	0.959	0.974
Relative Noncentrality Index (RNI)	0.920	0.922	0.933	0.937	0.944	0.949	0.959	0.974

Other fit measures

Metric	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Root mean square error of approximation (RMSEA)	0.064	0.066	0.062	0.060	0.057	0.054	0.053	0.054
RMSEA 90% CI lower bound	0.060	0.062	0.058	0.056	0.053	0.050	0.048	0.044
RMSEA 90% CI upper bound	0.068	0.070	0.066	0.064	0.061	0.058	0.058	0.064
RMSEA p-value	1.872e −10	7.782e −12	5.430e −7	2.183e −5	0.002	0.040	0.145	0.268
Standardized root mean square residual (SRMR)	0.070	0.069	0.068	0.067	0.067	0.071	0.050	0.036
Hoelter's critical N (α = .05)	182.861	176.463	193.155	200.871	213.811	226.997	237.545	267.224
Hoelter's critical N (α = .01)	190.491	184.310	201.787	209.890	223.457	237.288	249.955	296.124
Goodness of fit index (GFI)	0.840	0.844	0.857	0.864	0.873	0.879	0.899	0.952
McDonald fit index (MFI)	0.354	0.379	0.431	0.456	0.494	0.531	0.637	0.903
Expected cross validation index (ECVI)	3.565	3.278	3.026	2.922	2.770	2.635	1.985	0.534

Appendix 1.5: Transformative Utility Measurements Across Cultures

T

Countrycode	Mean	N	Std. Deviation
1	-.0706	6	1.02017
American Samoa	1.4850	1	.
Angola	.9850	1	.
Australia	-.1817	7	.62361
Belgium	-.9150	5	.60782
Brazil	-.8483	1	.
Chile	-.0150	1	.
Congo, Democratic Republic of the	-.0983	2	1.53206
Czech Republic	-.0775	8	1.46909
Estonia	.0267	8	.53266
Finland	-2.1817	1	.
France	.0440	20	.91447
Georgia	-1.0150	1	.
Germany	-.2025	8	.58035
Greece	-.1612	18	.68772
Hungary	-.0650	10	.96561
Iceland	-.1817	1	.
India	-.6817	2	1.88562
Indonesia	.4850	1	.
Ireland	-.7411	5	1.87021
Israel	.8253	5	.66518
Italy	.0683	24	.85409
Jamaica	.8183	1	.
Japan	-.0150	1	.
Kenya	1.4850	1	.
Korea, South	.4017	2	.11785
Latvia	-.0706	3	1.26198
Mexico	.3183	2	.47140
Nepal	-1.6817	1	.
Netherlands	-.3983	10	.82421
Nigeria	-.1817	1	.
Norway	-.1817	1	.
Philippines	-.0150	1	.
Poland	-.4207	53	1.04007
Portugal	.1500	42	.89431
Romania	-.0150	1	.
Russia	.4850	2	.23570
Slovakia	.8183	2	.23570
Slovenia	-.9039	3	1.07152
Somalia	-.8483	1	.
South Africa	.3214	94	.88216
Spain	-.5278	13	.79774
Sweden	-.6817	1	.
Syria	-.9317	2	.35355
Thailand	-.5150	1	.
Turkey	.7072	3	.75154
Ukraine	.4850	1	.
United Kingdom	.0337	89	.86025
United States	.5148	22	.80952
Uzbekistan	.4850	1	.
Venezuela	-1.9317	2	.11785
Vietnam	1.4850	1	.
Zambia	.8183	1	.
Zimbabwe	-.4983	10	1.21830
Total	-.0002	505	.95119

Appendix 1.6: Predictive Values per Culture Cluster

Coefficients[a]

Cluster	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Europe Germanic	1	(Constant)	2.569	.381		6.748	.000
		SexCoded	.002	.241	.001	.008	.993
		Agegroup	-.103	.143	-.080	-.720	.473
		Timeatcompany	.019	.087	.024	.216	.829
		Education	.034	.077	.041	.441	.660
	2	(Constant)	2.324	.342		6.803	.000
		SexCoded	-.132	.209	-.053	-.632	.529
		Agegroup	-.027	.122	-.021	-.222	.825
		Timeatcompany	.034	.075	.043	.452	.652
		Education	.065	.068	.079	.952	.343
		M	-.259	.117	-.189	-2.204	.030
		S	-.275	.144	-.177	-1.905	.059
		T	-.494	.133	-.352	-3.718	.000
Europe Latin & Greek	1	(Constant)	2.409	.492		4.899	.000
		SexCoded	-.025	.239	-.010	-.104	.918
		Agegroup	-.577	.197	-.302	-2.924	.004
		Timeatcompany	.225	.089	.263	2.522	.013
		Education	.082	.088	.087	.937	.351
	2	(Constant)	2.467	.411		6.001	.000
		SexCoded	-.108	.204	-.042	-.531	.596
		Agegroup	-.539	.167	-.282	-3.227	.002
		Timeatcompany	.200	.075	.235	2.675	.009
		Education	.078	.073	.082	1.065	.289
		M	-.068	.127	-.043	-.535	.594
		S	-.394	.148	-.255	-2.660	.009
		T	-.505	.138	-.344	-3.651	.000
Europe Slavic and Finno-Ugric	1	(Constant)	3.066	.453		6.769	.000
		SexCoded	-.178	.285	-.069	-.624	.534
		Agegroup	-.202	.314	-.079	-.644	.521
		Timeatcompany	.086	.102	.098	.841	.402
		Education	-.042	.090	-.051	-.471	.639
	2	(Constant)	2.210	.385		5.747	.000
		SexCoded	-.127	.230	-.049	-.551	.583
		Agegroup	.137	.253	.054	.540	.591
		Timeatcompany	.037	.086	.042	.430	.668
		Education	.053	.072	.065	.739	.462
		M	.015	.142	.011	.108	.915
		S	-.104	.159	-.075	-.655	.514
		T	-.744	.152	-.603	-4.902	.000
Africa	1	(Constant)	2.544	.444		5.729	.000
		SexCoded	-.080	.228	-.033	-.350	.727
		Agegroup	-.176	.190	-.096	-.925	.357
		Timeatcompany	.134	.096	.145	1.402	.164
		Education	.061	.089	.066	.692	.490
	2	(Constant)	2.677	.361		7.425	.000
		SexCoded	-.051	.185	-.021	-.275	.784
		Agegroup	-.009	.153	-.005	-.061	.951
		Timeatcompany	.036	.078	.039	.464	.643
		Education	.064	.070	.069	.911	.364
		M	-.366	.102	-.285	-3.586	.001
		S	-.086	.118	-.066	-.727	.469
		T	-.560	.115	-.453	-4.866	.000
Americas	1	(Constant)	2.817	.860		3.275	.003
		SexCoded	-.545	.582	-.222	-.937	.359
		Agegroup	.438	.513	.243	.855	.402
		Timeatcompany	-.409	.225	-.503	-1.817	.083
		Education	.233	.212	.255	1.102	.282
	2	(Constant)	3.178	.564		5.636	.000
		SexCoded	.209	.411	.085	.508	.617
		Agegroup	-.286	.336	-.158	-.852	.405
		Timeatcompany	-.004	.155	-.005	-.025	.981
		Education	.039	.140	.043	.278	.784
		M	-.343	.190	-.267	-1.807	.087
		S	-.638	.459	-.459	-1.390	.181
		T	-.370	.381	-.300	-.971	.344
Others	1	(Constant)	3.530	.590		5.978	.000
		SexCoded	-1.168	.474	-.560	-2.465	.022
		Agegroup	-.502	.412	-.337	-1.221	.235
		Timeatcompany	.458	.167	.739	2.743	.012
		Education	-.193	.145	-.258	-1.333	.196
	2	(Constant)	3.298	.573		5.751	.000
		SexCoded	-1.392	.460	-.667	-3.029	.007
		Agegroup	-.838	.427	-.562	-1.961	.065
		Timeatcompany	.608	.170	.982	3.576	.002
		Education	-.064	.152	-.085	-.419	.680
		M	-.109	.231	-.089	-.474	.641
		S	-.004	.211	-.004	-.018	.986
		T	-.419	.257	-.380	-1.633	.119

a. Dependent Variable: TI