AUTOMATING EXPECTATIONS: THE IMPACT OF AI ON PSYCHOLOGICAL CONTRACTS

by

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ABSTRACT

CURTIS EDWARD POLLARD II. Automating expectations: The impact of AI on psychological contracts. (Under the direction of DR. LAURA STANLEY)

Psychological contracts (PCs) are a set of reciprocal promises, obligations, and expectations between two or more parties and often occur between employees and employers within the employee-employer relationship. This dissertation investigates how advanced technologies may disrupt the reciprocal expectations within PCs by specifically threatening future employability and promoting job insecurity. As society breaks new ground in the field of automation and artificial intelligence (AI), concerns regarding future career mobility can emerge. The empirical study herein assesses the degree to which advanced technologies affect psychological contracts and whether job complexity, resilience, and self-efficacy play a role in weakening these effects.

DEDICATION

This paper is dedicated to the memory of my mother, a woman whose life was a testament to resilience in the face of hardship. Her unconquerable determination and unwavering spirit continue to shape my understanding of resilience and inspire me to pursue my goals with an equal, relentless passion.

Mom, your strength and sacrificial love in times of hardship have left an enduring mark on my life. Your love, perseverance, and resilience have imbued me with the confidence, tenacity, and grit to reach the personal, academic, and professional heights you dreamed for me. Thank you for your boundless support, endless patience, and selfless love.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence			
AVE	Average Variance Extracted			
DV	Dependent Variable			
GPT	Generative Pretrained Transformer			
HRM	Human Resource Management			
IV	Independent Variable			
LLM	Large Language Model			
NLP	Natural Language Processing			
OID	Organizational Identification			
PC	Psychological Contract			
PCB	Psychological Contract Breach			
PCF	Psychological Contract Fulfillment			
РСТ	Psychological Contract Theory			

STARA Smart Technology, artificial intelligence, robotics, and algorithms

CHAPTER 1: INTRODUCTION

Psychological contracts play a critically important role in influencing employees' sentiments toward their employers, which can substantially affect their job attitudes, behaviors, and overall outcomes. As such, it is equally important to understand how broader contextual factors like technological advancements and worker employability can disrupt psychological contracts, resulting in breach or violation. While certain employees might be able to effectively deal with career obstacles by leveraging intrinsic resources like resilience and efficacy, others may face greater challenges, particularly in cases where employees are engaged in less complex roles. Fulfilled psychological contracts (PCs) have a wide range of positive influences on employees, such as job satisfaction, loyalty, commitment, organizational citizenship behaviors, and organizational identification. Therefore, it becomes imperative to understand factors that contribute to perceived psychological contract breaches (PCB), which can drive negative consequences such as deviant behaviors, turnover intent, and withdrawal. Knowing that both job security and employability are two salient components of PCs, it is important to study how recent, widespread technological advancements may disrupt sentiments of career planning and employability, thus contributing to an increased likelihood of breaches of psychological contracts.

To understand how psychological contracts may be disrupted by advanced technology, it is important to understand what PCs are and how breaches occur. Psychological contracts were initially defined as psychological work contracts based only on employees' need for monetary return on their efforts (Argyris, 1960). This definition was later refined to refer to "the perception of an exchange agreement between oneself and another party" (Rousseau, 1989, p. 665). PCs are based on perceived mutuality and reciprocity rather than on legal agreements; as such, subjectivity and perception become paramount in evaluating whether a PC has been fulfilled. For example, through the organizational socialization process of new employees, individuals may identify an implied promise from their employer to provide career development and competitive compensation arrangements in exchange for hard work and dedication (Rousseau, 1989). After the initial onboarding, if the employer fails to provide coaching, training, and mentoring, then the implied promises may be perceived as being reneged. When employees respond negatively to these situations, a psychological contract breach will likely occur (Rosseau et al., 2018; Topa et al., 2022). Whereas breaches are largely a cognitive realization of unfulfilled promises and obligations, violations are described as "an intense and negative emotional reaction of anger and distress and feelings of having been betrayed" (Topa et al., 2022). Both breaches and violations of psychological contracts typically result in diminished organizational trust, commitment, job satisfaction, and job performance (Topa & Palaci, 2004; Bal et al., 2008; Topa et al., 2008; Kutaula et al., 2020) with heightened sensitivity to additional potential disruptions (Robinson & Morrison, 2000). Turnover intent, in-role job performance, and organizational citizenship behaviors have also been shown to decline following a psychological contract breach (Topa et al., 2008; Zhao et al., 2007). Drivers of psychological contract breach can be categorized into three factors – organizational factors, individual or person-based factors, and broader contextual factors. Organizational factors encompass organizational culture, history of restructuring, leadership styles, communication styles, and HRM policies and practices (Epitropaki, 2013; Guest, 2004; Cavanaugh & Noe, 1999). Individual or person-based factors refer to an employee's personality attributes like extraversion, neuroticism, and conscientiousness, cognitive abilities such as resilience and perceived self-efficacy, or perceptions of individual job characteristics like job complexity. Neuroticism and low levels of extraversion,

conscientiousness, and lack of perceived control all show an increase in the likelihood of a psychological contract breach occurring.

Turning attention to advanced technology, psychological contracts are disrupted through job tension, increased job demands, changes in employees' job conditions, and diminished future job opportunities (Brougham & Haar, 2017; Kang et al., 2023), especially when those changes that are brought about due to technology implementation and digital transformation. Smart technology, artificial intelligence (AI), robotics, and algorithms (STARA) are a combination of advanced technologies that have largely appeared in industries in the last decade. In contrast, the most advanced technologies – Generative AI, large language modeling, and natural language processing (NLPs) – have only emerged in the last five (Brougham & Haar, 2017). While not directly tied to psychological contracts, STARA has been shown to increase job tension through increased availability demands and work-life balance disruptions through telecommuting (Carson et al., 2017). Smart technologies have also been shown to increase job demands by requiring employees to learn new skills to increase productivity and diminish future job opportunities through task and job elimination (Brougham & Haar, 2017; Kang et al., 2023). However, not all those affected by disrupted PCs experience psychological contract breach.

Both job characteristics and individuals' intrinsic cognitive and emotional resources can mitigate the effects of technology-driven job concerns and employability upon PCs. Employees with higher levels of extraversion, emotional stability, confidence, and perceived control will likely demonstrate fewer psychological contract breaches due to adverse working conditions (Cavanaugh & Noe, 1999). This has been supported by the literature on early computerization adoption in the late 1980s and early 1990s (Murrell & Sprinkle, 1993) and again in more recent studies (Raja et al., 2004; Tomprou et al., 2015). Job characteristics also play a role; for example, those who believe their jobs are less secure will likely respond with greater vigilance in identifying psychological contract breaches (Robinson & Morrison, 2000).

The theory used to integrate these concepts – psychological contract breach, technologydriven job insecurity and employability (i.e., STARA awareness), intrinsic resources such as efficacy and resilience, and job characteristics like job complexity - is Psychological Contract Theory. Psychological contract theory (PCT) is used to understand the reciprocal nature of employment relationships (Rousseau, 1989). The breach and fulfillment of psychological contracts rest on the notion of reciprocity between employee and employer (Morrison & Robinson, 1997). One important aspect of psychological contracts is that promises, expectations, and obligations are future-oriented (Rousseau, 1989). Psychological contracts are not based on current returns, but on future returns on services (Rousseau, 1989). Farnsworth (1982) further sheds light on this by stating that contracts are promises that dictate and describe future behavior. In other words, for psychological contracts, "future intent" is that which the receiving party (i.e., employee) is chiefly concerned. For example, this may manifest as the expectation for continuing benefits, employment, and development within the employee-employer relationship. Psychological contracts are defined as future expectations of employer obligations in light of an exchange relationship (Morrison & Robinson, 1997).

1.1 Research Objective

Therefore, by applying psychological contract theory, I intend to address the important question of how technology-driven job insecurities and employability concerns (i.e., STARA awareness) disrupt psychological contracts (i.e., psychological contract breach) and how employees' internal resources (e.g., self-efficacy and resilience), and job characteristics (e.g., job complexity), help employees self-regulate and minimize or exacerbate this effect.

To accomplish this, I first intend to research the relationship between technology-driven job insecurity and employability concerns that affect breaches of psychological contracts. STARA awareness is a metric of worry that includes current job insecurities and future employability concerns, both due to advanced technologies. As employers adopt or signal to adopt in STARA, what is being signaled may include the potential for work environment changes, task and process changes, job elimination, and diminished future job opportunities (i.e., diminished employability). As a response, employees can feel that their employer has breached their psychological contract to promote job mobility and secure future employability, whether through internal job mobility or external marketability.

Second, I intend to assess how higher and lower levels of perceived job complexity strengthen or weaken this effect. Job complexity has been largely defined as the degree to which job tasks require higher-order levels of thinking and are difficult to perform (Frey & Osborn, 2013. Job complexity has been shown to have a positive relationship with employee motivation, job involvement and engagement, and expectancy and instrumentality (Humphrey et al., 2007; Kopelman, 1976). As such, job complexity is closely linked with PCT due to the role of employees' expectations. For example, in exchange for taking on more difficult work, employees often expect higher wages and more organizational support and resources. Higher levels of perceived job complexity should accompany increased obligations from employers (Shore & Barksdale, 1998). Shore and Barksdale (1998) demonstrate the notion of balanced obligations, such that either party's level of obligation to one another increases, so should the other's obligation. Without this parity, PCs become unbalanced (Shore & Barksdale, 1998). With regard to STARA, smart technologies tend to automate low-complex and highly repetitive tasks more often, creating a perception that low-complex jobs are more likely to be impacted by smart technologies than high-complex jobs. Therefore, I expect job complexity to moderate the relationship between STARA awareness and breach of psychological contract.

Third, employees have demonstrated a significant ability to bounce back from adverse work conditions; therefore, I assess how higher and lower levels of intrinsic resources, such as employee resilience can reduce the effects of STARA awareness on psychological contract breach. Employee resilience refers to the degree to which they can adapt to barriers (Ferrari et al., 2017) and overcome obstacles within the workplace (King, 1997). The formation of psychological contracts requires a stable work environment within which repeatedly communicated promises transition are internalized as obligations and culminate into expectations (Sharpe, 2002). When psychological contracts lose their ability to predict the terms and conditions of the employee-employer relationship, a breach can occur (Rosseau et al., 2018). However, this study assesses the ability for resilience to lessen the effects of disruption as employees leverage cognitive tools to adapt and begin a process of renegotiating and repairing the psychological contract breach (Rosseau et al., 2018).

Fourth, I assess how higher and lower levels of employee self-efficacy can reduce the effects of STARA awareness on psychological contract breach. Self-efficacy has been defined as one's belief to be able to affect an outcome (Bandura, 1994), adapt and cope during hardship (Trenerry et al., 2021), or confidence to mobilize resources to execute a desired task (Stajkovic & Luthans, 1998). Psychological contracts include the expectation from employees for employers to provide job security (Braganza et al., 2020) and advancement opportunities (Savarimuthu & Rachael, 2017). Self-efficacy and PCT are linked through the expectations individuals have towards themselves to affect outcomes during hardships (e.g., psychological contract breaches) and through the expectations employees have towards their employers to

reward their effectiveness, offer support for career opportunities, and provide job security. Those with higher levels of perceived self-efficacy should respond to technology-driven disruptions more positively as an opportunity rather than an obstacle, while those with lower levels of perceived self-efficacy may view these disruptions as an obstruction and interruption of PCs.

The adoption of STARA by organizations has been seen as a holy grail. Employees may have a different view. STARA continues to be a significant focus in industry as organizations seek to gain a competitive advantage amid tightening labor markets, increases in globalized competition, and greater stakeholder expectations for efficiency, value, and ease of use (Cukier, 2020). A technological arms race commenced in November 2022 at the unveiling of ChatGPT. This chatbot uses large language modeling and natural language processing (NPL) to create humanlike responses to users' prompts. The importance of harnessing emerging technology within the business landscape cannot be easily overstated. This was made evident when a minor error in Alphabet's unveiling of Bard, a Google-owned Generative AI bot, erased over \$100 billion in market value in one day (NPR, 2023). The importance of STARA is also clearly seen in the impact AI adoption has on the labor force, even at the start of this technology race. Large organizations have sizably reduced headcount in anticipation of and pursuit of AI and other smart technologies. For example, Google, Microsoft, Meta, and Amazon have laid off over 150,000 workers combined in pursuit of AI (Forbes, 2023). Small and medium-sized businesses are making similar moves as news agencies report businesses like Chegg and Dropbox have reduced headcount by four percent (4%) and sixteen percent (16%), respectively, due to AI (CNN, 2023). Over 212,000 workers within the technology industry alone have been laid off in the first half of 2023, up from 164,000 in the year prior (CNN, 2023). As organizations adopt

technology that disrupts job environments, job tasks, and future career planning, psychological contracts between employees and employers also face disruption.

Opportunities for research remain given the advancement of technology and the absence of empirical studies on how new technology impacts employees within the employee-employer relationship. For example, first, researchers have yet to consider the significant emergence of new technologies and their propensity to influence psychological contracts due to evoking current job insecurity and future employability concerns. While calls for this type of research exist (Avey et al., 2011; Huang & Rust, 2018; Li et al., 2016; Kang et al., 2023), very few empirical studies have assessed, within psychological contract theory, the effects of STARA awareness on psychological contracts. Second, little research has been devoted to applying individual-based, intrinsic resources as coping mechanisms to these technology-driven disruptions and accounting for job characteristics such as job complexity.

These gaps in extant literature provide an opportunity to make three significant academic contributions and contribute to practitioners and leaders. First, this research evaluates the impact of STARA on psychological contracts due to both current and future job insecurities. Literature to date has not recognized the bifurcated time dimensions contained in this construct, i.e., that STARA awareness measures disruption of current job tasks, environments, and mobility while diminishing future employability, thus generating psychological contract breach. Second, this study contributes to the literature by adding balance to the conversations on the adoption and implementation of AI, automation, and robotics by drawing attention to negative implications. Third, literature and practitioners will benefit from this study by better understanding the intrinsic and extrinsic resources available to buffer adverse impacts on employees and the

importance of mobilizing organizational resources and managing broader contextual factors to avoid negative consequences and promote positive responses to change.

1.2 Structure of the Dissertation

This dissertation is organized in the following manner: Chapter 1 introduces the importance of psychological contracts, the relevance of STARA, and the role of technologydriven perceptions of job insecurity and employability concerns (i.e., STARA awareness). Chapter I also provides a high-level overview of important findings, opportunities to contribute to extant literature, and an overview of how this study will be executed. Chapter 2 reviews the literature on these concepts, beginning with psychological contract theory (PCT) and psychological contract breach (PCB), followed by previous digital transformations and STARA. Next, the moderating role of job complexity, employee resilience, and self-efficacy are reviewed, culminating in an overview of the research model used in this study. Chapter 3 outlines the methodology used to examine the research model. Chapter 4 outlines the results of the analysis. Finally, Chapter 5 concludes this study with a thorough discussion of the results, including its limitations and suggestions for continued research.

CHAPTER 2: LITERATURE REVIEW

This literature review is divided into four sections. First, drawing upon Psychological Contract Theory (PCT), the initial section provides a comprehensive review of the literature regarding antecedents and outcomes of psychological contract (PC) fulfillment and breaches. Career planning is an important factor within psychological contracts theory. Therefore, I review additional literature on the intersection of career management and PCT. Second, I present a chronological review of the emergence of digital transformations and how these transformations affected career planning and employee attitudes. Previous digital transformations have eliminated certain manual tasks and shifted previous job markets without using smart technologies. Therefore, much can be learned from previous digital transformation research. Additionally, literature on career planning and digital transformations discusses the importance of coping mechanisms available to employees during adverse workplace experiences. These coping mechanisms are employee resilience, self-efficacy, and trust. Therefore, in this section, I will also review relevant literature concerning the role of self-efficacy during workplace disruptions, employee resiliency as a response to stress, and general trust in technology. Third, within Industry 4.0, disruptive events to career planning have largely been driven by the advent of smart technologies, AI, robotics, and algorithms (STARA) in the workplace. Disruptive events often provoke worry and anxiety about future career planning and career management. Therefore, I will review these technologies chronologically as they intersect with career planning and human resource management. Finally, I present the research model through hypothesis building, delineating why higher and lower levels of employee resilience, self-efficacy, and perceptions of job complexity influence the relationship between STARA Awareness and perceptions of psychological contract breach.

2.1 Psychological Contract Theory

Psychological Contract Theory (PCT) began early in the mid-20th century as a general concept describing an implied understanding between workers and their managers (Rousseau et al., 2013). PCT emerged alongside shifts in labor and job markets as organizations responded to the expanse of globalization, economic turbulence, and the economic deregulation of the early 1990s (Morrison & Robinson, 1997; Rousseau, 2013). Research into PCT was catalyzed as businesses underwent restructuring and implemented workforce optimization strategies. In light of this, PCT has its founding within the context of a general disruption of career planning, including job elimination and the resulting job insecurity felt among the workforce. As labor markets and job markets continued to be disrupted – whether by economic downturns, digital transformation, or the later emergence of smart technologies, AI, and robotics – researchers shifted focus toward psychological contracts as a crucial aspect of understanding the employment relationship (Morrison & Robinson, 1997).

The breadth of literature on psychological contracts is expansive. In order to gain an initial understanding of the breadth of PCT literature and key concepts, I conducted a brief word analysis of the abstracts and titles of PCT articles appearing within top tiered journals. The following is a broad illustration of key concepts discussed in this literature review. To accomplish this, I first, searched EBSCO for psychological contracts through the keyword string: "psychology* contract*" returns 2,218 publications. Next I filtered for peer-reviewed articles in English, the search yielded 1,641 peer-reviewed articles. Following the same steps for ABI/INFORM databases, I searched "psychological contract" yields 7,634 publications. Next, I further filtered results down by finding only articles with mention of "breach*" OR "fullfil* in any field other than the full text, yielding 3,955 articles. Next, I included only articles from the

ERIM P and P star journal list. This reduced the results of peer-reviewed articles to 685 after the removal of duplicates. To better understand the expanse of this research, using MS Excel, I extracted database and author-provided keywords to derive phrases with the highest occurrence. Some keywords were combined to create categories of concepts. For example, CSR includes words such as "pro-social behaviors," "environmentalism," and "sustainability." The phrases illustrated in Figure 2.1 are the top (15%) used phrases, keywords, or categories with PC research using the abovementioned methods.



Figure 2.1 Top 15% Occurring Keywords / Concepts

Keywords	Count	Frequency
Meaningfulness	606	9.670%
Leadership	296	2.713%
Ethics	267	2.521%
Deviance	207	2.314%
Employment	170	2.282%
CSR	158	2.282%
OCB	145	2.106%
Cynicism	143	1.979%
HRM	143	1.787%
Knowledge Management	132	1.675%
Finances	124	1.644%
Careers	112	1.596%
Marketing	105	1.596%
Economy	103	1.404%
Personality	100	1.324%
Time	100	1.308%
Education	88	1.197%
Morality	83	1.021%
Justice	82	0.973%
Roles	75	0.862%
Organizational Commitment	64	0.830%
Job Performance	61	0.766%
Labor Force	59	0.686%
Sales Industry	59	0.686%
Technology	54	0.670%

 Table 2.0 Top 15% Occurring Keywords / Concepts

VOSviewer is a tool for analyzing occurrences of keywords in texts and is traditionally applied to bibliometric data (Van Eck & Waltman, 2013). Using VOSviewer, I analyzed keywords occurring in titles and abstracts and the strength of relationships between keywords. Binary counting was used to assess each word's strength and relevance. This method allows for relevance to be determined by the number of occurrences based on both the presence and absence of a word. The strength between words and phrases depends on how many paper words appear in proximity. This is illustrated through the distance between each word and by the weight of the lines connecting them. Of 9,668 terms, I considered only terms with a minimum of 20 occurrences. This yields 285 items within five clusters. Figure 2.2 displays a visualization of the results.



Figure 2.1 Title and Abstract Network Visualization

Figure 2.1 is the network visualization of keywords that appear in the title and abstract of the 685 articles mentioned above. The weight of each keyword determines the size of the labels and circles. Five clusters were identified in this analysis.

Cluster 1 (red/framework) revolves around the keywords "management," "work," and "process" and includes 98 items, representing nearly one-third of the items. Cluster 2 (green/employees) is made up of 70 items and centers around the employee relationship, with items such as "organizational citizenship behavior," "engagement," "job satisfaction," "performance," and "affect." Connecting these two clusters is Cluster 3 (purple/antecedents). This cluster includes terms such as "ethical behavior," "CSR," "ethical climate," and "training." These terms focus on organizational culture and factors that may shape psychological contracts, i.e., antecedents. Cluster 4 (blue/outcomes) consists of 43 items and is made up of keywords such as "commitment," "absenteeism," and "attitude." Adjacent to this cluster is Cluster 5 (yellow/PCT). This cluster centers around "psychological contract theory" with the keywords of "obligation," "exchange," and "breach." It is within Cluster 3 that this study is contextualized.

As shown in Figure 2.2, psychological contract theory is an expansive field that includes the intricate interplay of perceptions, expectations, and mutual obligations between employers and employees (Conway & Briner, 2005). Contrasted with the explicit terms and conditions of formal employment contracts, psychological contracts encapsulate implied expectations and obligations that employees often hold regarding their employers, often based on promises made during the recruitment process and re-enforced during an employee's tenure with the organization (Conway & Briner, 2005; Rousseau et al., 2018). The importance of psychological contracts is clear, given their pivotal role in navigating the reciprocal relationship between employee and employer. The internalized and personalized beliefs of the employment relationship, especially during periods of job uncertainty, make PCT the appropriate arena in which this paper seeks to understand the disruptive potential of smart technologies on employee sentiments. The following sections present literature on types of psychological contracts, how they are formed, and the antecedents and outcomes of breaches and fulfillment, two of which are career management and career planning.

Early iterations of the concept rooted the relationship between employee effort and employee performance within the context of mutual expectations (Argyris, 1960). In this early iteration, psychological contracts were comprised of mutual expectations based on employees' needs and were primarily transactional and economically driven due to employees' financial need for employment (Argyris, 1960).

Interestingly, in her seminal work in psychological contract theory, Rousseau (1989) omits this element in reconceptualizing psychological work contracts into psychological contracts. Rousseau (1989) reconceptualized the initial iteration of psychological contracts as an individual's belief system. An individual's belief system includes the terms and conditions of any unstated, reciprocal arrangement with another person (Rousseau, 1989). These changes culminated in the widely used definition of psychological contracts, which "refers to an individual's beliefs regarding the terms and conditions of a reciprocal exchange agreement between that focal person and another party" (Rousseau, 1989, p. 123). Rousseau further characterized psychological contracts as an individual-level phenomenon and expanded the theory to include concepts such as psychological contract violations and maintenance (Rousseau, 1989).

Breach of psychological contracts is not added to PCT until nearly a decade later by Morrison and Robinson (1997). Another key distinction in Rousseau's (1989) seminal work and earlier iterations is the differentiation between reciprocal obligations and simple expectations. The early conception of psychological work contracts and psychological contracts is that the former theorized psychological contracts as simple expectations (Argyris, 1960).

As this theory evolved, Rousseau (1989) expanded the concept from simple expectations to promissory agreements. Conway and Briner (2005) unpack this notion of promissory agreements and theorize how implied or explicit promises become obligations and then expectations. Rousseau et al. (2018) continue this work and introduce the necessity for promises to be consistent with an employee's personal goals. This is discussed more in the Formation of Psychological Contracts section. These later advancements of PCT, i.e., promises, obligations, and expectations, are believed to be the antecedents that precede employee behaviors, e.g., accepting a job offer and performing job tasks (Savarimuthu & Rachael, 2017; Rousseau et al., 2018).

As mentioned, Morrison and Robinson (1997) focused on how violations of psychological contracts emerge and introduced the concept of perceived breach of psychological contracts. Perceived breach of psychological contracts "refer to the cognition that one's organization has failed to meet one or more obligations within one's psychological contract (Morrison & Robinson, 1997, p. 230). A perceived breach of a psychological contract is distinct from an actual breach of a psychological contract. Whether obligations were unfulfilled does not determine whether an employee perceives such to be the case. At this point, research into breaches and violations of psychological contracts grew rapidly. By and large, most scholars understand breaches of psychological contracts to be a cognitive function to assess whether obligations are unfulfilled. Violations are associated with emotional responses such as anger and frustration (Atkinson, 2006; Morrison & Robbinson, 1997).

Rousseau (2018) recognizes perceived breaches of contract but treats violations and breaches as different levels of disruptions. Specific antecedents and outcomes of breaches are discussed below. Nonetheless, it is here that the question reemerges regarding why employees enter into some contracts and not others. Psychological contracts must be aligned with the individual's goals; this is referred to as goal-consistent promises (Rousseau et al., 2018). Nearly three decades later, Rousseau et al. (2018) introduce goal achievement and goal consistency as key catalysts that motivate employees to enter psychological contracts – as opposed to the originally theorized catalyst, i.e., economic need (Argyris, 1960). Rousseau et al. (2018) expand PCT through the addition of goal-consistent promises as an attempt to explain how contracts are formed and why employees choose to enter some contracts and not others. Rousseau et al. (2018) propose that personal goals "are a key mechanism in understanding how perceived obligations are created and changed" (Rousseau et al., 2018, p. 1085). In other words, employees will only enter contracts if the terms are consistent with advancing their personal goals. Goal cues include signals, communications, and activities that are either goal-consistent, goal-inconsistent, or goal-irrelevant (Rousseau, 2018).

After discussing the roots and evolution of psychological contract theory and the concept of psychological contracts, the following sections delve into key topics and themes within PCT. This includes an in-depth review of the types of psychological contracts, their content, and how these contracts are formed. The section will conclude with a review of empirical research that analyzes the outcomes of breaches, violations, and fulfillment of psychological contracts.

2.1.1 Psychological Contract Typology

Originally, psychological work contracts were conceptualized as general psychological contracts and implied contracts (Rousseau, 1989). First, the notion of general psychological contracts as a subjective belief in an exchange of benefits or something of value. For example, an employee may believe their performance will result in great pay despite a formal work contract stating this. This aspect of psychological contracts is transactional, similar to a quid-pro-quo arrangement. As employees promote and serve their self-interests, exchanging economic currency becomes more important and forms transactional psychological contracts. Therefore, from this dimension, the first type of psychological contract emerges, i.e., the transactional psychological contracts is the

implied contract, which is a mutual obligation between two parties within the context of a relationship (Rousseau, 1989). For example, an employee may believe that their long-time tenure or seniority at an organization will protect them from downsizing and layoffs. In this example, the relationship between the employee and employer is the focal point of the implied contract. As Thompson and Bunderson (2003) stated, "if, however, the employment relationship is based on the exchange of primarily socioemotional currency," the contract is primarily relational. Other examples of relational contracts include employee loyalty for career development and job retention (Thompson & Bunderson, 2003). This belief is observed, maintained, and strengthened through a series of interactions between the employee and the employer. The initial dichotomized concept of psychological contracts – transactional and relational – bifurcated psychological underpinnings into two distinct currency exchanges – socioeconomic and economic currencies (Thompson & Bunderson, 2003).

Having identified the importance of currencies being exchanged within transactional and relational psychological contracts, Thompson and Bunderson (2003) argued for the inclusion of "ideological currency" within PCT. They developed the concept of ideological psychological contracts (Thompson & Bunderson, 2003, p. 571). Ideological currency was defined early on as intrinsic benefits (e.g., feeling good about reducing an organization's carbon footprint) that are bestowed onto employees due to the employment relationship because the organization is pursuing pro-social ideals or causes. As organizations pursue their ideals, e.g., narrowing the gender wage gap, employees receive intrinsic value from supporting the organization. For example, an employee may work overtime or take on more projects if the employer's mission is partly ideological.

Thompson and Bunderson (2003) expanded PCT to include two significant concepts. First, their research identified a third dimension of PCs: ideological psychological contracts. Ideological contracts are the exchange of value-based currency within the employee-employer relationship (Thompson & Bunderson, 2003). For example, employees may volunteer personal time to engage in prosocial activities that their organization sponsors. Employees may subsequently feel a sense of self-fulfillment or have other positive affective responses (Thompson & Bunderson, 2003). This expansion of PCT provides an additional lens through which employee-employer expectations and obligations are reciprocated. Second, Thompson and Bunderson (2003) identified that different types of value are exchanged within the employeeemployer relationship. For example, within the transactional contract, monetary value is often exchanged. Within relational psychological contracts, employers may expect to receive belongingness and commitment from employees as employers provide benefits like managerial support and career coaching (Thompson & Bunderson, 2003).

Concluding the progression of psychological contract theory, and introducing the intersection of technology and PCs, a fourth dimension was identified in 2020. Alienational psychological contracts emerged out of research into the intersection of AI and psychological contracts (Braganza et al., 2020). Their research supported this dimension, having analyzed 232 survey responses (Braganza et al., 2020). The majority of participants – approximately eighty percent (80%) were between 18 and 34 years old. AI adoption was not specifically defined in the study. Still, the authors reasoned that advancements in technology, e.g., AI, increase autonomy in the workplace, resulting in feelings of loneliness, isolation, and alienation (Braganza et al., 2020). Unfortunately, the authors did not define AI, leading to an operationalization that focused specifically on isolation. operationalize AI adoption using questions specific to autonomy in the

workplace. Results empirically support AI adoption may decrease positive employee affect responses such as trust; additionally, results show lower levels of engagement (Braganza et al., 2020).

Some limitations to this study suggest additional work needs to be done to better validate alienational contracts as a distinct construct. First, while composite reliability and average variance extracted (AVE) in this study both indicated acceptable levels for convergent validity and reliability, a potential limitation of this study is apparent in the absence of a clear definition of AI adoption and an unclear theory supporting AI adoption being operationalized as autonomous work arrangements. The survey items included seem to measure autonomous work arrangements rather than AI adoption. Literature has traditionally operationalized AI adoption by analyzing single firms implementing specific AI artifacts, such as chatbots or robotics, as discussed below. Second, relational, transactional, and ideological contracts have demonstrated an exchange of currency – economic, socioemotional, and ideological currency, respectively. Research to date has not identified an exchange of any additional currency within alienational contracts. Third, one outcome of this study is that AI adoption may hurt job trust and employee engagement. These outcomes are relational; as such, this contract may be a dimension of relational psychological contracts. Nonetheless, the results of this study produced a fourth type of psychological contract despite some potential methodological and theoretical issues.

Drawing from the literature of founding researchers, the four types of psychological contracts – transactional, relational, ideological, and alienational- are illustrated below. While there are no specific, concrete definitions for each type of psychological contract, I have included keywords from seminal pieces. Additionally, I included examples of the types of obligations employees and employers may have within each contract.

Dimensions	Transactional Contract	Relational Contract	Ideological Contract	Alienational Contract	Source
Definition	Short-term arrangements, driven by economic exchange	Open-ended arrangements, with exchanges based on relationships	Commitment to pursue pro-social activities	Ad-hoc arrangement s focused on technology and autonomy	Braganza et al., 2020; Savarimut hu & Rachael,
Currency Exchanged	Economic	Socioemotional	Ideological	Undefined	2017; Rousseau, 1989;
Potential Employee Obligations	Performance, labor, quality of work	Employee loyalty, commitment, organizational citizenship behaviors	Higher performance, volunteerism	Virtual interactions with limited contact with people	Rousseau, 1990; Aggarwal and Bhargava, 2009;
Potential Employer Obligations	Compensation, performance management	Career development, job security, job training	Provide meaningful work/job tasks	Employees interacting with technology only	Vantilbor gh et al., 2014;
Supporting Theory	Equity Theory	Social Exchange Theory	Motivation theory; attribution theory	Human Capital Theory	
Tangibility	Observable	Subjective	Mixed	Subjective	

Two additional aspects of psychological contracts should also be discussed. Transitional contracts and balanced contracts are not their own specific contracts and are not distinguishable from transactional, relational, or ideological contracts. Rather, transitional contracts and balanced contracts describe aspects of the content of the previous three psychological contracts. Transitional contracts refer to a lack of commitment between parties, sometimes due to organizational restructuring or downsizing. It is described as a "passing phase" that refers to an "absence of commitments regarding future employment" (Aggarwal & Bhargava, 2009, p. 238).

Balanced psychological contracts were first considered by Shore and Barksdale (1998). Balanced psychological contracts refer to employer and employee obligations and the degree to which obligations are balanced along a scale from low to high.

		Employer Obligations		
		High	Moderate to Low	
Employee	High	Mutual High	Employee Over-	
Obligations		Obligations	obligation	
	Moderate to Low	Employee Under-	Mutual Low	
		obligation	Obligations	

 Table 2.2 Exchange Relationships. (Source: Shore & Barksdale, 1998)

Table 2.2 demonstrates this concept in a two-by-two chart. When obligations to and from the employee are high, then this is a strong, balanced social exchange. When the employer's obligations are perceived as low, and the obligations to the employer are high, unbalance occurs. This balance can be within transactional, relational, or ideological psychological contracts. Therefore, a balanced psychological contract is simply a PC with congruent levels of obligations between the parties (Shore & Barksdale, 1998; Botha & Steyn, 2021). Having discussed the types of psychological contracts within PCT, it is important also to consider the content of these contracts and along which fault lines breaches can occur.

2.1.2 Content of Psychological Contracts

Sels et al. (2004) identified six dimensions of psychological contracts, namely, tangibility, scope, stability, time, symmetry, and level. The first four were introduced by Macneil's (1985) investigation of contracts within legal and social development. Sels et al. (2004) integrated industrial relationships and added symmetry and level in their quantitative, survey-based study of 1,106 employees. Tangibility references the clarity of psychological contracts and is considered to be on a spectrum ranging from specificity to ambiguity (Sels et al., 2004). The more tangible a psychological contract, the more codified the terms will be, i.e., the terms will be contained in memos, legal documents, or laws. Within human resource management (HRM), the tangibility of psychological contracts is most clearly displayed in the formality or informality of performance evaluations, reward and recognition programs, and organizational trust (Sels et al., 2004). The more intangible the terms of the contract, the greater the need for trust. When trust erodes, breaches of psychological, intangible contracts emerge (Sels et al., 2004). Organizational trust is diminished when organizations adopt AI-based technologies as job insecurity increases (Richter & Naswall, 2019). Team restructuring, employee downsizing, and redistribution of work are all common outcomes of AI adoption in the workplace. Therefore, within the tangible dimension of psychological contracts, as STARA awareness increases, breaches may also increase as trust erodes.

A second dimension of psychological contracts includes the degree to which contracts are narrow or broad (Macneil, 1985). This dimension refers to work-life balance. In other words, the degree to which an employee's personal life is separate and distinct from their employment. Non-STARA technologies have been shown to diminish work-life balance as job activities can often be completed or monitored via employer-provided mobile devices, laptops, and workfrom-home job arrangements (Nam, 2014). Depending upon how an individual uses certain types of technology (e.g., mobile devices), various aspects of work-life balance can be disrupted, such as the compartmentalization of work activities and personal activities (Nam, 2014). As AI-based technologies enable employers to increase monitoring and supervision of employees, we may expect a change in psychological contracts within the narrow-broad dimension.
The third dimension of psychological contracts is known as stability. It is defined as the extent to which terms of the agreement can change without invoking a breach or an internal renegotiation by either party (Macneil, 1985). This dimension was renamed flexibility in more recent literature (Sels, 2004). Highly stable or flexible psychological contracts include contracts where strict rules exist. For example, the process by which employees are eligible for tuition reimbursement is often highly regulated by employers and includes several steps and specific forms of documentation. This highly stable agreement between the employee and employer is often inflexible, i.e., highly stable.

Power distance, or exchange symmetry, more commonly describes Hofstede's (1980) cultural dimensions. However, within the context of psychological contract research, power distance is also known as exchange symmetry and describes the degree to which the terms of the contract are supported by management and the degree to which the terms are equitable and fair (Macneil, 1985; Sels, 2004). Akin to this dimension is the individualization of psychological contracts. Individualization is on a spectrum from individualism to collectivism. The former references the extent to which employees can self-regulate the terms and outcomes of psychological contracts. For example, within HRM, variable compensation arrangements that are based on employee performance are more individualistic than compensation arrangements based on organizational performance, i.e., a collective contract.

Lastly, psychological contracts operate on a specific time frame, ranging from long-term to short-term. This dimension revolves around the notion of job security and employee loyalty. An example of this contract would be the employee's expectation of job security in exchange for loyalty. Recalling that psychological contract theory emerged during a time of economic downturn and job loss; it is understandable why job insecurity and career planning is a theme throughout the literature – regardless of whether job loss is due to digital transformations, economic downturn, or the adoption of smart technologies, AI, robotics, and algorithms (STARA). Nonetheless, as job insecurity increases, this dimension of psychological contracts is activated. In other words, breaches of psychological contracts due to job insecurity may fall along the lines of this dimension.

Dimensions	Transactional Contract	Relational Contract	Ideological Contract	Alienational Contract	Source
Tangibility	Observable	Subjective	Mixed	Subjective	Jensen et al.,
Scope	Narrow	Broad	Broad	Narrow	2010; Shore, Rousse
Stability	Stable	Flexible	Flexible	Stable	au, and
Time frame	Short-term	Long-term	Long-term	Short-term	McLean Parks,
Exchange Symmetry	Unequal	Equal	Equal	Unequal	Blau, Roussea u, 1990;
Contract Level	Individual	Individual	Collective	Undefined	Aggarwal and Bhargava, 2009

 Table 2.3 Content of Psychological Contracts

Having discussed the broad dimensions of psychological contracts and the implied obligations often found within various types of contracts, it becomes imperative to understand how these contracts form. Transitioning from discussing the types of psychological contracts found within PCT and the intricate content found within these constructs, the following section delves into the formation of these contracts.

2.1.3 Formation & Maintenance of Psychological Contracts

Researchers have categorized key antecedents of psychological contracts in multiple ways. Recalling that psychological contracts are ultimately a set of beliefs, those beliefs vary from person to person and are highly subjective (Rousseau, 1989). Given the subjective nature of psychological contracts, the terms and conditions of PCs are largely unique to each individual. To deal with the high degree of variability of individuals' psychological contracts and to create a more comprehensive model of the lifecycle of a psychological contract, Rousseau et al. (2018) created a dynamic process. Rousseau et al. (2018) expanded PCT by focusing on psychological contracts as a dynamic phased process. During this process, employees pass through three different phases – the creation phase, the maintenance phase, and the repair/renegotiation phase.

The creation phase deals most directly with the antecedents of psychological contracts, specifically, the socialization of values, beliefs, and goals of an organization, the communication of promises, obligations, and expectations. Rousseau et al. (2008) recognized that obligations are derived from employer-made promises and normative expectations based on previous experiences. When employees are onboarded into the organization, they experience a socialization process in order to become acclimated to the work processes, organizational values, and general norms of the organization (Ashforth et al., 2007; Rousseau et al., 2018). This socialization process is one of the first times that promises are communicated or signaled to the employee. Promises in this context were defined by Rousseau and Parks (1993) as a commitment to perform a certain action. For example, employees may believe they will receive a reward in exchange for producing higher quality work simply because that commitment and action was promised. These promises may be made by direct managers in close proximity to the employee, upper management with more distant proximity, colleagues, or talent recruiters (Rousseau et al., 2018). Rousseau et al. (2018) understand that promises must be aligned with an employee's goals for them to become obligations and expectations. As these promises are internalized and believed, and as employees recognize the utility of these promises in satisfying their own goals, then those promises become obligations (Conway & Briner, 2005). This is proposed, given the rationale that an employee must accept an employer's promise in order to reciprocate an

obligation to the employer. As those promises are communicated more often, and when previous experiences have validated the probability of receiving the stated benefits, then those obligations become expectations (Conway & Briner, 2005; Rousseau et al., 2018). Guest (2004) focuses specifically on the creation phase and provides a more detailed view of the psychological processes unfolding with this phase. Guest (2004) creates four categories of factors that contribute to the creation phase of psychological contract formation. These four categories are individual factors, contract-related factors, and organizational factors. Individual factors refer to items such as employee tenure, age, gender, and level of education. Contract-related factors include factors such as the type of contract, specific promises made by organizations, and specific obligations. Organizational factors include organizational culture, human resource practices, and employee job design.

While the creation phase thus far has largely focused on new entrants into the organization, the creation phase itself is dynamic, and obligations and expectations change as employees are exposed to new information. This socialization process, however, does slow down, and the resulting psychological contract begins to stabilize and solidify (Rousseau et al., 2018). After this, the employee transitions into the second phase – maintenance.

The second phase in this dynamic process is the maintenance phase of psychological contracts. The maintenance phase is defined by Rousseau (2018) as the period after the creation phase, where the employee and employer reciprocate obligations and deliver on promises made. This phase assumes psychological contract fulfillment is occurring, during which employees are continuously evaluating the value of the exchanges being made, including the exchange of different currencies. For example, transactional contracts will exchange economic currencies, within

transactional psychological contracts, may appear as increasing job performance and receiving a merit increase in salary. Socioemotional currencies within the relational contract may mean an employee may take on a new work project to develop a certain skill as part of their career development plan while their direct supervisor provides coaching and development in exchange. Ideological psychological contracts would involve employees volunteering their time for a prosocial activity, such as planting trees during non-business hours, in exchange for the organization pursuing a zero-net carbon footprint. The currency exchanged here is referred to as ideological currency (Vantilborgh et al., 2012). All things being equal, as both parties continue to respond to PC fulfillment positively, then the maintenance phase can last indefinitely. However, goals and values often change, as do employee needs and organizational culture. When these events occur, there can be a disruption in the reciprocity process. Disruption is described as an event provoking an affective response (Beal & Ghandour, 2011). Disruption in this context refers to a discrepancy between expected rewards based on obligations made and delivered. Depending on the size of the disruption and whether an employee's goals are impacted, a stronger affective response may be triggered, moving the employee to the renegotiation/repair phase.

The renegotiation/repair phase is a period of time in which employees must reevaluate new promises, obligations, and expectations (Rousseau et al., 2018) due to a disruption of the reciprocal relationship. Rousseau et al. (2018) refer to breaches and violations of psychological contracts more often as disruptions.

How employees respond to the disruption – whether with positive affect or negative affect – influences whether the employee begins the renegotiation process or the repair process (Rousseau et al., 2018). For renegotiation, this may be done through interactions with the employer or by the employee reevaluating and readjusting their intrinsic goals. For example, within an ideological contract, an employer may discontinue a certain philanthropic program to a charity. An employee may find this to be a breach of an ideological contract and respond with strong negative affect. The employee must then enter the renegotiation/repair phase in which the employee can speak with their employer to request that they resume the philanthropic program, redirect charitable donations to another charity, or adjust their ideology to align with the discontinuance of the organization's philanthropic program. According to Rousseau et al. (2001), the renegotiation phase is expected to be shorter than the creation phase, given that there is already a relationship within which new promises, obligations, and expectations can form quickly.

In the preceding sections, the intricate process of how psychological contracts are created, maintained, and renegotiated/repaired was discussed. This understanding is important for considering what empirical research supports psychological contract breaches and consequential outcomes.

2.1.4 Psychological Contract Breach

Recalling the original article list of 685 peer-reviewed articles, publishing dates for these articles range from 1977 – 2024, with most publications occurring after 2010. As depicted in Figure 2.1 Publications by Year, research has been accelerating, as illustrated by the dotted trendline.



Figure 2.2 Publications by Year

Note. Line graph illustrating the positive trend in PCT publications.

To further focus specifically on relevant articles, I filtered for mention of "psychological contract" within the abstract, specifically removing those with PC listed only in titles and keywords provided by authors. This reduced the list to 149.

Interestingly, Figure 2.1 showed an upward trend in the number of articles published each year with any mention of "psychological contract." However, when filtering for articles mentioning "psychological contract" within titles and abstracts, the trendline reverses and shows a decline, as illustrated in Figure 2.3. This may suggest that psychological contract theory is given increasing importance despite specific studies not being entirely within this paradigm.



Figure 2.3 Publications by Year (with PC mentioned in abstract) *Note.* Line graph illustrating the decline in publications mentioning PC in abstracts.

Also, based on a keyword search of the 149 abstracts included in this body of literature thus far, keywords associated with a disruption of the reciprocal relationship (e.g., breach, violation) occurred the overwhelming majority (82%) of the time, while keywords associated with fulfillment occurred 18% of the time. These results may indicate that there is a substantial emphasis on the disruption of psychological contracts rather than their fulfillment. To capture the emphasis on disruption, I included the keywords breach, breaches, breached, violate, violates, and violation. To capture the occurrence of fulfilled obligations, I included the keywords fulfill, fulfillment, and fulfilled. However, given that there are more synonyms for disruption than fulfillment, this may naturally skew toward PC disruption.

Keywords in	Occurrences	
Abstracts		
Breach	90	
Breaches	6	
Breached	1	
Violate	1	
Violates	0	
Violation	67	
Total Disruptions	165 (82%)	
Fulfill	8	
Fulfillment	23	
Fulfilled	5	
Total	36 (18%)	

 Table 2.4 Disruption vs Fulfillment in Abstracts

Next, I filtered for mention of employees within the title or abstract, resulting in the remaining 97 articles. Lastly, for special consideration, I further focused on articles with specific mention of keywords listed above that signify disruptions or fulfillment. This resulted in a final list of 44 articles from top-tier journals with a discussion of employees and disrupted or fulfilled psychological contracts within titles and abstracts.

Breaches, violations, and fulfillment of psychological contracts are attempts to understand the mechanisms involved in the dynamics of workplace relationships between employees and employers. Given that this relationship is based on reciprocity of different types of currencies (e.g., socioemotional currency), psychological contract breaches arise when an employee perceives that their organization has inadequately fulfilled its obligations (Jardat & de Rozario, 2012; Morrison & Robinson, 1997). The employee expectation of reciprocity is a critical mechanism in the formation, maintenance, and renegotiation/repair of psychological contracts that have been disrupted (Topa et al., 2022). For example, lack of reciprocity often leads to a psychological contract breach, resulting in negative reciprocity in the form of deviant behaviors such as knowledge hiding (Ghani et al., 2020), increased conflict with colleagues (Jiang et al., 2017), and counterproductive work behaviors (CWB) (Ma et al., 2019). Studies also found support that psychological contract breach carries a substantial negative impact on employee attitudes such as organizational trust (Bal et al., 2010; Zhao et al., 2007), job satisfaction (Bal et al., 2010; Zhao et al., 2007; Itani et al., 2019; Johnson & O'Leary-Kelly, 2003; Cavanaugh & Raymond, 1999; Scandura & Lankau, 1997;), and commitment (Bal et al., 2010; Bunderson, 2001). See below for a comprehensive discussion of the outcomes of psychological contract breaches.

2.1.5 Resolving Psychological Contract Breach

When employees respond negatively to disruptions, they shift into the renegotiation/repair phase (Rosseau, 2018). During this phase, employees seek to reestablish goal-consistent obligations from the employer and reduce their negative emotional responses through self-regulatory processes (Sels, 2004; Tomprou et al., 2015). These responses are theorized to fall into these four categories: problem-focused coping, emotion-focused coping, mental disengagement, and behavioral disengagement (Tomprou et al., 2015). However, organizations can also minimize the impact of perceived breaches by acknowledging fault and communicating efforts to repair relationships (Robinson & Wolfe Morrison, 2000; Tekleab & Taylor, 2003; Tomprou et al., 2015). While these responses can help resolve disruptions, the decision for employees to engage or disengage at work depends upon the resources employees have available to leverage (Tomprou et al., 2015). These resources fall into three categories: organizational responsiveness, organizational resources, and self-based resources, which are discussed below.

Tomprou et al. (2015) outlined three categories in which various resources are available for repairing PCB. Organizational responsiveness refers to the velocity at which an organization reacts to the occurrence of a breach or violation. Organizations that acknowledge and admit to not delivering on their promises or obligations quickly may positively shape an affected employee's belief that resolution will be possible. These acknowledgments may be formal communications, such as the issuance of apologies, or indirect communications, such as changes in HRM policies. Additionally, organizational responsiveness includes an attempt for employers to conduct repair efforts. This includes the employer taking steps to improve employee experiences, form new promises and obligations, or provide restitution (Kramer & Lewicki, 2010; Tomlinson et al., 2004). A lack of organizational responsiveness may signal to the affected party that a resolution is unlikely.

Tomprou et al. (2015) defined organizational resources as referring to relationships that employees have available to receive support and engage in resolving workplace challenges. These relationships may be direct supervisors, internal human relation partners, or coworkers. Those without a support system may expect a resolution to be less likely when compared to those with a support system. Research supports this theory by finding that transformational and transactional leadership may create stronger relational psychological contracts (Epitropaki, 2013). Epitropaki (2013) utilized hierarchical linear modeling to analyze group-level data from a sample of 864 employees. Results indicated that psychological contract breaches had a negative influence on employees' organizational identification (Epitropaki, 2013). Additionally, the study found transformational and transactional leadership decreased levels of psychological contract breach. The rationale is that transformational leadership helps employees feel more aligned with organizational values, goals, and overall mission. This is an important part of organizational socialization during the creation phase of psychological contracts. Transformational leadership can also enhance the value being derived by employment with the organization, building trust and employee participation (Lavaysee, 2018; Epitropaki, 2013). Organizational trust (Braganza et al., 2020; Guest, 2004), support (Yan et al., 2018), and social networks (Bal et al., 2010) have all been found to influence psychological contract breach. Findings here included the use of age and the availability of social exchanges as moderators, showing that higher and lower levels affected the primary effect (Bal et al., 2010).

Returning to Tomprou et al.'s (2015) theory for resolving breaches of psychological contracts, personal resources, or self-based resources refers to internal cognitive and emotional faculties that enable employees to respond to adverse situations. Much less empirical research has been done to identify personal resources such as resilience and self-efficacy. Research supporting the effectiveness of personal resources to lower levels of perceived breaches of psychological contracts includes perceived job control (Elst et al., 2014) and mindfulness (Afshan, 2022).

Elst et al. (2014) study regarding job control provides empirical support to Carver and Scheier's (2002) theory that employees who perceive a low level of control of their environment have more challenges in coping with adverse experiences and disruptions. Those with higher levels of perceived control tend to be more optimistic and demonstrate more positive coping mechanisms. Supporting this notion, Elst et al. (2014) conducted a 2,413-employee study by administering a quantitative survey to understand the relationships between job insecurity, perceived job control, and coping reactions. Breach of psychological contract was considered a partial mediator in their model, and results supported that both an employee's perceived control and levels of psychological contract breach partially mediated the relationship between job insecurity and coping reactions.

In keeping with personal resources to lower perceptions of psychological contract breach, Afshan (2022) found that higher levels of mindfulness decrease the effect of psychological contract breach and employee attitudes. This empirical study used survey data from 239 employees in the banking industry. The mechanism by which mindfulness moderates psychological contract breach is due to mindfulness acting as a self-regulating tool that lowers negative affect. As discussed by Brougham & Haar (2017) and Rousseau et al. (2018), employees who respond to disruption with lower levels of negative affect tend to avoid perceptions of psychological contract breach. Other researchers used different dimensions of individual-based resources to understand psychological contract breaches, including the role of personality traits such as confidence, extraversion, and conscientiousness (Raja et al., 2004). Raja et al. (2004) also found neuroticism, external locus of control, and equity sensitivity are positively associated with transactional contracts, while extraversion, confidence, and conscientiousness are most associated with relational psychological contracts. Lastly, resilience was explored as moderating the relationship between job insecurity and psychological contract breach (Shoss et al., 2018). In a study spanning 1,071 employees, Shoss et al. (2017) found job insecurity is associated positively with job insecurity. Employees who experienced elevated levels of job insecurity also experienced elevated levels of psychological contract breach. Additionally, employee resilience was shown to attenuate this relationship, whereas the relationship between job insecurity and psychological contract breach was weaker in respondents who exhibited elevated levels of resilience (Shoss et al., 2018).

2.1.6 Outcomes of Breaches: Employee affect, attitudes, and behaviors

Unfortunately, parties are not always able to repair relationships within the workplace. Therefore, organizations must be aware of the outcomes and impact of psychological contract breaches. Given the significance of psychological contracts and their effects on employee attitudes, behaviors, and job outcomes, research on the effects of breaches on PCs has been rapidly increasing since its introduction by Morrison and Robinson (1997). When employeeemployer expectations are unfulfilled, the perceived breach results in a range of consequences that impact both employees and the employer. Therefore, the following sections will review the outcomes of unresolved breaches of psychological contracts.

Outcomes of psychological contract breach can be classified into three categories: employee attitudes, employee behaviors, and employee job outcomes. I follow this section with a discussion on common moderators found and recent developments in PC research.

When employees perceive that their organization has failed to fulfill its obligations and meet their expectations, a psychological contract breach can occur. Perceived psychological contract breaches have been shown to impact employees' attitudes thereafter adversely. The relationship between psychological contract breach and employee attitudes toward their employer highlights an important aspect of the employee-employer relationship. While the preceding section focused on ways employees and organizations may resolve a perceived psychological contract breach, failure to resolve it has profound implications for the employee going forward.

Organizational trust. Decreased organizational trust was found to be a significant outcome of perceived psychological contract breach (Bal et al., 2010; Zhao et al., 2007; Topa & Palaci, 2004). Organizational trust has been defined as "expectations individuals have about

networks of organizational relationships and behaviors" (Shockley-Zalabak et al., 2000). Expectations are a key component of psychological contracts; it is reasonable to reason that their disruption can also disrupt expectations, thus leading to decreased levels of organizational trust. Additionally, part of the mechanism driving this outcome is the role of negative affect. Employees who respond with negative affect to a disruption in reciprocal obligations will move toward psychological contract breach unless there is an intervening mechanism. Thus, psychological contract breach includes a negative affective response. Without a negative affective response, then a psychological contract breach cannot occur. Furthermore, negative emotions (affect) have been shown to foster negative job attitudes (Dunn & Schweitzer, 2005; Thoresen et al., 2003). Therefore, it is reasonable to see how psychological contract breach will also negatively affect job attitudes. Zhao et al. (2007) support this notion in their meta-analysis, demonstrating the role of affective events and psychological contract breach. It is worth stating, however, that preceding levels of organizational trust have been considered an antecedent to psychological contract breach in some studies (Morrison & Robinson, 1997).

Organizational identification. Bal et al. (2010) and Zagenczyk et al. (2013) have demonstrated that psychological contract breach is positively associated with lower levels of organizational identification and commitment. Organizational identification is described as a psychological process through which employees derive part of their self-concept in reference to feeling a sense of attachment or membership to an organization based on the perceived identity of the organization (Kreiner & Ashforth, 2003). This involves employees' perception of themselves in relation to an employee's perception of the organization (Kreiner & Ashforth, 2003). Zagenczyk et al. (2013) found to support that psychological contract breach negatively influences levels of organizational identification and is positively associated with levels of organizational disidentification. This is believed to be due to the alienating effects of psychological contract breach (Zagenczyk et al., 2013). Interestingly, this is aligned with the theory work by Braganza et al. (2020), who suggest that AI adoption can alienate employees and create a new psychological contract – an alienational psychological contract.

Organizational commitment. Organizational commitment has been defined as a multidimensional construct comprised of instrumental commitment based on expectations of desired exchanges; continuance commitment, which is based on opportunity costs of leaving or staying with an organization; normative commitment, which is based on moral ideology; and affective commitment - based on socioemotional value (Cohen, 2007). Conceptually, the similarities between types of psychological contracts and types of organizational commitment are striking. Instrumental and continuance commitment appears to be similar to transactional psychological contracts. Normative commitment is based on values and ideals, which is also the content of ideological psychological contracts. Nonetheless, the meta-analysis provided by Bal et al. (2010) demonstrated a significant association between psychological contract breach and decreased levels of organizational commitment and job satisfaction.

Organizational justice. Perceptions of psychological contract breach can lead to higher levels of perceived procedural injustice (Shen et al., 2019). As employees begin to believe that the implied promises, obligations, and expectations that constitute their psychological contracts have been disrupted, employees see this as unfair. Psychological contract breach increases perceptions of unfairness, which can erode trust and loyalty (Zhao et al., 2007; Salin & Netelaers, 2017; Costa & Neves, 2017; Welander et al., 2017). When obligations and expectations regarding psychological contracts are unmet, employees can perceive this as a disregard for fair procedures (Welander et al., 2017). As a related outcome, feelings of unfair treatment and distrust have been shown to fuel an increase in turnover intent (Zhao et al., 2007; Salin & Netelaers, 2017; Costa & Neves, 2017; Welander et al., 2017). Turnover intent refers to an employee's attitude towards exiting their job or organization. However, while some researchers have found that while turnover intent increases after a psychological contract breach, actual turnover appears to be unaffected (Costa & Neves, 2017; Welander et al., 2017). This can be attributed to two possibilities. First, behavior is preceded by behavior intentions. While psychological contract breach may be strongly associated with the attitudes behind turnover intent, breaches may be weakly associated with behavioral intentions. Second, several factors impact actual turnover, including job market conditions and economic conditions. While

Other attitudes. Research into psychological contract breach shows support for increasing job insecurity (Koen et al., 2019; Niesen et al., 2018). Job insecurity has been found as a driver of psychological contract breach (Ma et al., 2019) and as an outcome (Koen et al., 2019; Niesen et al., 2018). However, even as an outcome, some studies show inconsistent relationships. For example, Jiang et al. (2017) found support that psychological contract breach can decrease job insecurity. A meta-analysis provided by Jiang et al. (2017) theorizes that this may be due to an employee's response to unpredictability – some employees may work more diligently in order to avoid termination.

Other findings suggest an increase in conflict and burnout (Jiang et al., 2017) and decreased job satisfaction (Bal et al., 2010; Zhao et al., 2007; Itani et al., 2019; Johnson & O'Leary-Kelly, 2003; Cavanaugh & Raymond, 1999; Scandura & Lankau, 1997).

Deviant behaviors. Regarding employee behaviors, breaches of psychological contracts again have a broad impact on employee behaviors, including deviant and defiant behaviors. For example, perceptions of psychological contract breach have been shown to lower workplace bullying behaviors (Liang, 2022). In this study, 302 employee-employer pairings were surveyed at two different points in time. Psychological contract breach was treated as a moderator between facades of conformity and workplace bullying. Those with higher levels of psychological contract breach tend to conform more to their leaders in order to avoid termination. By conforming to their leaders' behaviors and values, they suppress their own values, including deviant behaviors such as bullying (Liang, 2022). Additional research into workplace bullying includes Salin and Netelaers (2017), while other deviant behavioral studies include abusive supervisory practices (Ghani et al., 2020) and knowledge hiding (Ghani et al., 2020), dealignment for shared organizational goals (Shen et al., 2019), a decline in innovative work behavior (Niesen et al., 2018), diminished employee effort (Koen et al., 2019), and decline in organizational citizenship behaviors (Cam, 2011; Coyle-Shapiro, 2002; Van Dyne & Ang, 1998; Turner & Feldman, 2000; Zhao et al., 2007) and depression (Priesemuth & Taylor, 2016)

Employee Performance. Lastly, employee job outcomes have the lowest levels of effect and show the most inconsistencies across research. Organizations are more likely to hold employees accountable for performance goals rather than organizational citizenship behaviors. Similar to turnover intent versus actual turnover, actual behaviors that result from psychological contract breach are less likely to transpire despite certain attitudes. However, there has been consistency in how psychological contract breach impacts job performance (Bal et al., 2010; Bunderson, 2001; Costa & Neves, 2017; Hekman, 2009; Shen et al., 2019; Zhao et al., 2007). For example, Costa & Neves's (2017) key findings include psychological contract breach to lower job performance due to job insecurity. In their research, job performance was evaluated by the employee's direct supervisor. In this 362-participant study, paper surveys were provided to matching employees and supervisors. This study also showed job insecurity as an antecedent of psychological contract breach.

Additional research. Research continues to expand into other industries and disciplines while being considered in non-work arrangements. Additional research in PCB includes evaluating work arrangements in which there are multiple parties (Schuster et al., 2022). To accomplish this, Schuster et al. (2022) surveyed 221 expatriates, i.e., individuals working abroad in a host office/organization and away from their home office. These work arrangements have multiple parties – host counterparts and home counterparts – thus allowing for the study to evaluate better the impact of psychological contract breach and violation with multiple parties present. The significance of this study is that work arrangements with multiple parties may lead to targeting negative affective responses towards individuals not responsible for the breach. Key findings supported this potential, showing that psychological contract breach in these work arrangements shifts negative affective responses onto innocent parties. These "spillover effects" reduce commitment towards those less distal in expatriate relationships.

Other studies have changed the corporate setting to focus on academic settings. This includes students and universities (Dabos & Rousseau, 2013; Snyman et al., 2022; Lam & Campos, 2014). Lam and Campos (2014) leveraged the academic setting to evaluate the role of employee agency and career management. Recalling that career planning and management is a critical component of psychological contracts, Lam and Campos (2014) found that career studies are under-researched in PCT. This qualitative study included 40 students and 16 professors, of which the majority (80%) of participants created a dyad of doctoral students and committee

chairs. The study found that psychological contract breach in this context evoked entrepreneurial efforts among younger participants, while older participants were more settled into their careers and opted to continue the status quo, which is attributable to continuance commitment and affective commitment. This is in line with findings from Bal et al. (2010) and the role of continuance commitment, having found diminished instrumental commitment but unaffected continuance and affective commitment. The role of affective commitment within the academic setting is supported by Sambrook (2016), as the study assessed different types of expectations and obligations within doctoral relationships.

2.1.7 Antecedents of Psychological Contract Breach

Less is known regarding antecedents to psychological contract breach as this area has not been as heavily researched. Recalling that psychological contracts are sets of subjective beliefs formed over years of socialization and various experiences, causes of psychological contract breach could result from a number of factors (Rosseau et al., 2018). Rousseau et al. (2018) expanded PCT as they introduced a dynamic phased process as the lifecycle of psychological contracts. Employees transition through these phases - the creation phase, the maintenance phase, and the repair/renegotiation phase – continuously as new information is consumed by employees. Guest (2004) focused specifically on the creation phase of psychological contracts and delineated four categories that form psychological contracts - individual factors, contractrelated factors, organizational factors, and broader contextual factors. These categories are similar to a violation model proposed by Tomprou et al. (2015). This model shows organizational resources and self-based resources as two categories of factors relevant to perceiving psychological contract violations (Tomprou et al., 2015). Borrowing from these models, I have categorized antecedents of psychological contract breach into three categories: organizational factors, individual or person-based factors, and broader contextual factors.

Organizational factors. Organizational factors refer to the aspects and characteristics of an organization. These factors include aspects of its culture, such as its values, beliefs, and practices. Prevalent management and leadership styles, HRM practices, and communication practices – including levels of transparency, maternalistic/paternalistic tones, and effectiveness – are all various factors within this category. Many of these factors relate to psychological contracts as mechanisms for creating, maintaining, and breaching or fulfilling obligations. With regard to leadership styles, transformational and transactional leadership have been shown to strengthen psychological contracts through value attribution mechanisms (Epitropaki, 2013). Cavanaugh and Noe (1999) considered the role of organizational change management practices and their impact on future career opportunities and employability. In this context, Cavanaugh and Noe (1999) defined organizational changes as downsizing and restructuring that result in job loss. This change requires employees to renegotiate psychological contracts or face psychological contract breaches or violations (Cavanaugh & Noe, 1999). The impact on employees' careers has been shown to make employees feel more job insecurity in the later stages of their careers, even in different organizations (Cavanaugh & Roe, 1999). Additionally, the study concluded that the expectation for job security has been replaced by expectations for career development, training, and coaching in order to enhance external marketability and employability. While some recent research disagrees that job insecurity has been displaced (Costa & Neves, 2017; Richter & Näswall, 2019), these findings do support the notion that disruption of employability can lead to psychological contract breach (Cavanaugh & Roe, 1999). Therefore, it is important to consider the role of employability within the context of psychological contracts.

Given the salience of employability within psychological contracts, it is important to understand the particulars that make up this concept. Employability has been defined as the ability to obtain employment, whether within the current organization or in the external job market (Yeves et al., 2019). The forward-looking orientation of employability, as well as the shared nature of employability, was explained by Cavanaugh and Noe, 1999. Additionally, Sok et al. (2013) determined that employability may be considered a consequence of strong relational psychological contracts, given the resources organizations provide, namely, training and development, coaching, and mentoring. The degree to which employees see future job opportunities, i.e., employability, is a key antecedent to psychological contract breach. This is distinctively different from job insecurity, which is defined as a perception of powerlessness regarding maintaining current job conditions (Greenhalgh & Rosenblatt, 1984). The key distinction is the future orientation of future employability. It has been suggested that employability, both internally and employee marketability externally, falls within most psychological contracts (Jepsen & Rodwell, 2012).

Individual, person-based factors. Person-based factors are personality traits and attitudes at the employee level. Antecedents within this category focus on an individual's prior experience, personality traits, and demographics such as age and gender. This also includes coping mechanisms that employees leverage during adversity.

Morrison and Robinson (1997) found that levels of organizational trust that preceded PCB diminished its intensity. Trust is defined as the degree to which employees expect a favorable impact from others' actions (Morrison & Robinson, 1997). Similar to trust, job insecurity has been treated as an antecedent to psychological contract breach as well (Ma et al., 2019). Understandably, job insecurity is a negative emotional response, which is a mechanism for PCB. Other research shows that perceived organizational support, perceived procedural justice, and job resources and demands are additional antecedents of psychological contract breach (Robinson, 1996; Dulac et al., 2008; Vantilborgh et al., 2016). The undercurrent of these concepts remains to be trust and negative affect—organizational commitment, of which procedural justice is a factor (Yan et al., 2018).

Considering antecedents regarding cognitive styles, Suazo et al. (2008) found that cognition similarities between managers and employees diminish perceptions of psychological contract breach by minimizing miscommunications and misunderstandings. With regard to neuroticism, a personality trait involving negative personalities and sensitivity to adversity, neurotic employees have demonstrated lower levels of organizational trust. This leads to higher levels of psychological contract breach. On the other end of the spectrum, Raja et al. (2004) found that employees with elevated levels of conscientiousness are less likely to perceive PCB. This mechanism between the two is that conscientious employees tend to be high performers with higher levels of job satisfaction (Raja et al., 2004).

Broader contextual factors. Broader contextual factors are factors that exist outside of the organization. For example, prior work experience has been shown to increase awareness of potential breaches, thus leading to higher perceptions of psychological contract breach in employees holding roles in the future (Robinson & Morrison, 2000). Additional factors include changes in job markets and the availability of roles. At the organizational level, employability obligations include HRM resources for career development, skills development, and professional development (Jepsen & Rodwell, 2012). Broader contextual factors regarding employability

include the availability of jobs. In a similar study, Chambel and Fontinha (2009) looked at employability through the lens of temporary work and assessed its impact on psychological contract fulfillment. Results did not support a relationship between PCF and employability. However, the study did not consider the impact of employability on psychological breach of contract.

Given the close association between job insecurity and future employability, there is good reason to consider the role technology plays in changing broader contextual factors of PCB. As labor markets shift and the demand for specific skills changes, employability is affected, and thus, psychological contract breach may occur. Literature in PCB rarely mentions the role of technology, with a few recent exceptions, including Braganza et al. (2020). Given the potential psychological contracts to be affected by these broader contextual factors, it is important to consider how previous technological developments have impacted perceptions of psychological contract breach.

2.2 STARA, Technology, & Job Attitudes

Broader contextual factors within psychological contract theory include country cultures, job industry, and economic conditions - all three of which have been found to impact psychological contract breach through job insecurity. Generally, job insecurity refers to the "sense of powerlessness to maintain desired continuity in a threatened job situation" (Greenhalgh & Rosenblatt, 1984, p. 438). Expectedly, employees may be led to perceive job insecurity due to the adoption of STARA, including technologies such as AI and Generative AI. STARA awareness is a measurement of worry developed by Brougham and Haar (2017) to measure the degree to which employees feel a sense of powerlessness over maintaining their current level of employment. Not covered in prior literature, STARA awareness also includes an element of forward-oriented concern regarding employability. Regarding job insecurity, this measurement asks questions such as, "I am worried that what I do *now* will be able to be replaced by STARA." Regarding employability, items imply a future orientation; for example, "I am worried about the future of the industry I work in due to STARA replacing employees."

Employability is a newer concept with a distinct difference from job insecurity (Shoss, 2017). Job insecurity focuses on the ability of employees to maintain current job conditions (Greenhalgh & Rosenblatt, 1984), whereas employability focuses on future job opportunities and security (Jepsen & Rodwell, 2012). Theoretically, recalling the six dimensions of PCs, the time dimension of contracts is a factor to consider (Sels et al. (2004). The longer individuals feel they need employment, the more sensitive to employability they may be. As sensitivity levels increase, so would the potential for psychological contract breach. According to some scholars, the effects of digital technology and smart technology on societal change come from innovation theory (Schumpeter, 1940; Aljohani et al., 2022). From Schumpeter's work, it is clear how technology has automated skills – whether physical or cognitive, activities and machinery (Aljohani et al., 2022). Figure 2.4 illustrates this progression. As technology advances industry forward, production, manufacturing, and information systems change over time, resulting in the automation of activities and diminished demand for certain skills (Szabo-Szentgroti et al., 2021).



Figure 2.4 Progression of Technology: Schumpeterian Waves (Source: Hilbert, 2022). *Note.* Timeline depicting technological advancements.

This is illustrated in the figure above, starting with the emergence of mechanization, proceeding to the use of steam-powered technology, and ending with the appearance of computers. While mechanization replaced physical activities by using the flow of water, steam-powered technology changed methods of transportation. More recently, the advancement of computers led to the computerization of tasks, the digitalization of information, and, again, changes in labor demands for certain skills. Currently, with the wide-scale emergence of smart technologies, artificial intelligence, robotics, and algorithms (STARA), employees are grappling with the effects of the automation of decision-making and cognitive skills (Brougham & Haar, 2017).

Artificial intelligence (AI) has been defined as technology designed to imitate human behavior, including judgment, motor function, decision-making, and other cognitive behaviors (Munoko et al., 2020). A subfield of AI includes natural language processing (NLP), which analyzes large sets of text in order to structure language-based data and perform a number of functions, such as sentiment analysis, text generation, text summarization, and language modeling (Kumar & Thakur, 2012). Robotics is also viewed as a subset of AI in that software and hardware are combined in order to replicate human activity including decision-making (Kumar & Thakur, 2012). Smart technologies that use AI, robotics, and algorithms include smartphone applications, driverless vehicles, self-checkout machines, interactive voice response (IVR) systems, closed caption services, and more (Brougham & Haar, 2017). As tasks, job features, and jobs are eliminated, perceptions of job insecurity often rise, impacting job outcomes, employee commitment, turnover intentions, and job satisfaction. (Hellgren et al. 1999). Job insecurity has been treated as a multidimensional construct that includes the elimination or modification of specific conditions of work environments, job tasks, and how tasks are completed through the standardization of practices, procedures, and policies. While software robotics have been seen to replace mundane tasks, higher complex tasks have been more recently impacted through machine learning (Kaplan & Haenlein, 2019). Machine learning (ML) is defined as another subset of AI with an emphasis on computing power and the ability to execute more complex tasks by iteratively creating new connections between data without the need for reprogramming or human intervention (Huang & Rust, 2018). Similarly, deep learning (DL) is a subset of ML with a critical distinction between the amount of data consumed to generate new artificial neural clusters within a machine with the added ability to make predictions and use sensory data (Huang & Rust, 2018). The ability to execute more complex tasks is an adjacent concept to the type of tasks AI is able to complete, i.e., mechanical, analytical, intuitive, or empathetic (Huang & Rust, 2018). In other words, as AI programs continue to advance in complexity, the type of tasks these programs execute will move from mechanical to empathetic. These leaps in technology can be exciting or threatening to

employees. Continuing to draw from psychological contract theory, both breaches and fulfillment of psychological contracts

2.2.1 Outcomes of Technology Advancement on Employees

While the technological advancements of today are more likely to affect employability and career planning more substantially, it is important to consider the impact of previous technology advancements. However, transactional and relational contracts were not formalized until the mid-1990s by Rosseau (1995). Ideological psychological contracts were not conceptualized until the late 1990s, introduced by Morrison and Robinson (1997). Literature on non-STARA impact on employee attitudes and other job attitudes such as trust and job insecurity would be more appropriate for pre-2000 studies.

Employee Attitudes. Non-STARA technology, i.e., technology not included in smart technology, AI, robotics, or algorithmic-based technologies, has been shown to affect employee attitudes. Within the banking industry, early implementation of computers increased job insecurity of bank tellers, specifically due to potential changes in job content, i.e., job tasks and work conditions (Shenkar, 1987). The survey included 84 bank employees after a large economic downturn, which may have impacted results. Interestingly, not all participants in this study had operational computer systems installed. Other studies have shown that engagement with computers helps to alleviate concerns (Rafaeli, 1986). Rafaeli (1986) focused on attitudes toward technology acceptance and drew correlations between job involvement and user acceptance of computers (Rafaeli, 1986). Rafaeli (1986) measured employee attitudes based on a 284-sample size composed of manufacturing employees with recent, new exposure to computers. Key results suggested that higher levels of engagement with technology appeared to produce lower levels of anxiety (Rafaeli, 1986). Regarding STARA, Brougham & Haar (2017) suggested limitations of

their study, including that survey respondents might be unaware of the potential for AI and other smart technologies to replace jobs in the future. A similar finding was made in the early 1990s regarding competency levels concerning computers (Murrell & Sprinkle, 1993). This may suggest that interaction with technology may alleviate concerns, supporting Colaiacovo et al. 's (2020) findings. As employees engage with technology, there may be a greater likelihood of positive responses. Unfortunately, with regard to AI adoption, most implementations happen within operations and are out of the view of the average employee (Grover et al., 2022). Colaiacovo et al. (2020) found that attribution perceptions can be positive or negative. Negative attributions emerge when technology is adopted out of profit or control; positive attributions emerge when technology is adopted to increase job resources, productivity, or other improvements (Colaiacovo et al., 2020).

Employee hazards. Much research has been done on the ergonomics of technology, such as the health hazards of visual display units (VDUs) (Brown, 1986). Additionally, with the rise of data entry jobs, repetitive stress injuries (RSIs) also increased and warranted research (McGraw, 1985). As information technology became more prevalent, job insecurity concerns began to emerge (Deery, 1982).

There is a dearth of research on the effects of pre-STARA technologies and psychological contracts, job insecurity, and employee attitudes. However, some common themes have emerged. First, empirical evidence supports the notion that exposure to technology reduces anxiety (Rafaeli, 1986). As employees interact with machinery and computers, the interaction reduces the effects of the unknown. This may be for two reasons. One reason may be that engagement in decision-making and organizational change has been shown to invoke positive employee attitudes such as organizational identification (Epitropaki, 2013). As employees engage with and are involved with organizational changes, levels of organizational commitment and identification increase, as do supportive attitudes toward their employer (Epitropaki, 2013). Second, by engaging with and learning about new technology, employees may feel a sense of accomplishment and an increase in self-efficacy. This combination may limit negative attitudes (Bernacki et al., 2015). However, technology continues to advance and create more widespread challenges and disruptions to industries. Smart technologies, AI, robotics, and algorithms will continue to accelerate that advancement and pose new challenges to organizations and their employees. As they do, businesses will be forced to grapple even more with the effects of job concerns, just as employees will continue to grapple with the effects of diminished employability in certain jobs. Therefore, it is important to consider STARA and the more recent impact of technology on psychological contract breach.

2.3 STARA and Psychological Contract Breach

Career planning and future employability are themes within psychological contract theory that were present in its early development (Rousseau, 1989). Of the original 47 articles initially reviewed on psychological contract, breach, violation, and fulfillment, only one article discusses "employability," even though psychological contract theory was founded during times of economic turbulence, organizational restructuring and downsizing, and job elimination (Grame et al., 1998; Rousseau, 1989). Most of the research on PCT and job insecurity has focused on organizational tactics and HRM policies to help increase employee marketability both internally and externally (Sok et al., 2013; Forrier et al., 2015; Aggarwal & Bhargava, 2009). However, few studies consider the effects of diminished employability on psychological contract breach.

While career planning has been discussed throughout the PC literature, STARA has presented unique challenges to organizations and individuals when considering employability,

the future labor market, and preventing psychological contract breach – especially given that the criteria of PCs often include career development and employability (Jepsen & Rodwell, 2012). Technological advancement has been, and will continue to be, a significant driver of disruption of skill availability within job markets and changes in employability (Szabo-Szentgroti et al., 2021; Schumpeter, 1940). Therefore, the following section reviews STARA and its impact on employees.

The overall purpose of this research is to understand the effects of smart technologydriven employability concerns and psychological contract breach. Since the task at hand focuses on concerns regarding employability and smart technology, I structure this section first by defining STARA and its components, including types of AI intelligence, the phenomenon at hand, and its outcomes. Using this approach, I review literature that explains the types of technology being adopted (e.g., smart technology, automation, robotics, AI) and STARA awareness and the perceived ability for job and task replacement, and lastly, the consequences of such adoption on employee outcomes.

2.3.1 STARA

Synonymous with STARA is the notion of the computerization of tasks and the digitalization transformation of tasks (Brougham & Haar, 2017; Frey & Osborne, 2013). Instances of such technologies include adopting self-checkout systems in retail spaces, the prolific spread of smartphone applications, the automation of processes throughout various industries, advances in automotive technologies, and the Internet of Things (IoT) (Brougham & Haar, 2017). Computerization of tasks integrates computer systems and technologies into work processes to reduce or eliminate manually performed tasks. This transformation can enhance efficiency, accuracy, and speed in a wide range of tasks and processes and within numerous

industries. The digitalization of tasks involves transforming analog and physical processes into digital formats. For example, shifting physical storage to electronic storage. Similarly, the Internet of Things created a network of interconnected devices to allow storage, retrieval, and exchange of digitalized information over the Internet via devices ranging from smartphones to home appliances and other devices with Internet connectivity functionality. The combination of computerization of tasks, digitization of information, and the interconnectedness of information over broad networks is encapsulated by STARA. One critical component of STARA is artificial intelligence.

Research in AI can be viewed as leveraging at least one of three broad approaches. The first approach is the theoretical treatment of AI for theory building through propositional arguments and qualitative research within specific domains such as cybersecurity (Ansari et al., 2022; Stoianov & Ivanov, 2020; Trappe & Straub, 2018) and supply chain management (Toorajipour et al., 2021), e-commerce (Bawack et al., 2022), HRM (Palos-Sanchez et al., 2022), public governance and readiness (Montoya & Rivas, 2019; Zuiderwijk et al., 2021), and healthcare (Ali et al., 2023; Kamboj & Rahman, 2015). The results of this work have been the delineation of different types of artificial intelligence and different levels of AI functionality and anthropomorphism (Huang & Rust, 2018; Pelau et al., 2021). For example, when considering the role of AI in the service industry regarding job replacement, Huang and Rust (2018) created a widely used framework identifying four intelligences within AI adoption. These intelligences are aligned with specific tasks and skills within the service workforce. These types of intelligence include Mechanical Intelligence, Analytical Intelligence, Intuitive Intelligence, and Empathetic Intelligence (Huang & Rust, 2018).

Mechanical intelligence relates to simple, repetitive tasks that do not require a high-order level of thinking (Huang & Rust, 2018). For example, customers of financial institutions are often greeted with an interactive virtual response system used to intercept repetitive, lowcomplex inquiries. These virtual bots can answer simple inquiries from customers, such as balance inquiries, without the need for human interference (Colby et al., 2016).

Analytical knowledge is one step up in degree of complexity and requires the use of logic and rule-based learning (Huang & Rust, 2018). Technical skills such as auto service technicians, engineers, and data scientists are included in this type of intelligence. For example, many accountant tasks are included in H&R Block's tax preparation software, which is designed to be a self-service program (Davenport & Kirby, 2015).

Intuitive knowledge requires the use of neural networks and large libraries of data to create an environment of continuous learning and adaptation to scenarios (Huang & Rust, 2018). This level of knowledge describes machine learning, a subset of AI. Technical roles such as medical physicians, dermatologists, and skin cancer diagnostics are examples of this higherorder level of thinking (Esteva et al., 2017).

Lastly, empathetic knowledge may best be described as deep learning, a subset of machine learning, which involves additional learning and adaptation. This type of programming can infer a customer's internal emotional state (Xiao & Ding, 2014) or mimic the emotions of consumers (Rafaeli et al., 2017). For example, the empathetic skill set of AI programs can help chatbots appear more human, compassionate, and charismatic. This is most notably seen in Replika, an AI-based interface that provides talk therapy and counseling services (n.d. Replika). Additionally, by analyzing facial features, empathetically skilled AI programs can use neural networks to analyze large data libraries of facial features.

Another outcome of this approach has included business strategies for capturing value, driving innovation, and achieving cost competitiveness through AI (Ibarra et al., 2017). In other words, how organizations configure their business model around AI and other smart technologies may determine what value is captured, created, and delivered to the organization and its stakeholders (Ibarra et al., 2018). The availability of skills and products, the centralization and standardization of data within an organization, and the legal risk tolerance of organizations all influence how business strategies to use AI are formed. For example, businesses with nonstructured, non-standardized data may have difficulty in leveraging generative AI given the need for large databases of structured data. Organizations that adopt cloud computing and augmented reality, such as Metaverse, may be seeking to increase efficiency and performance through reducing data storage costs and employee training.

A second approach focuses on the technical artifacts that are included in the broad definition of AI technology, such as Natural Language Processing (Kumar & Thakur, 2012), deep learning (Samek et al., 2018), Internet of Things (IoT) (Ghosh et al., 2018), and a host of others such as robotics, virtual reality, and machine learning. This second approach is largely out of scope for this research as it focuses on the actual hardware, software, and coding of AI and other smart technologies that make up STARA.

The last approach observed in AI literature is the assessment of how AI impacts a firm's employees and performance within the HRM space. Employee awareness of AI is widely operationalized using STARA for job replacement (Brougham & Haar, 2018). Other approaches to operationalization include "perceptions of AI" using semi-structured qualitative interviews and surveys prompted with hypothetical scenarios (Kelley, 2022; Chowdhury et al., 2022). Regarding job outcomes, AI research primarily focuses on job attitudes and job performance. AI

awareness has been shown to influence employee job attitudes in a number of ways, including turnover intent (Chui et al., 2015), employee career dissatisfaction (Brougham & Haar, 2017; Chowdhury, 2022), collaboration (Chowdhury, 2022), organizational commitment (Brougham & Haar, 2017), and job burnout (Kong et al., 2020).

Chui et al. (2015) researched the role of AI and showed that nearly half of the job activities could be automated using existing AI-based technologies. The automation of such a significant degree of job activities will lead to job redesign and a redefinition of business processes. The redesign and redefinition of business processes may lead to higher turnover intent as the nature of the work individuals perform changes (Brougham & Haar, 2017; Chui et al., 2015). The scope of this research was focused on the US labor market and included 2,000 individual work activities defined by O*NET (Chui et al., 2015). In partnership with the Department of Labor, O*NET provides information regarding employment and occupations across the United States. Across 800 US-based occupations, 2,000 individual work activities were isolated. For example, activities such as employees greeting customers, answering questions concerning products, cleaning and maintaining an individual's work area, and processing financial transactions were included. These activities were segmented into three different categories of AI capabilities. These three categories include social capabilities, cognitive capabilities, and physical capabilities. First, social AI-based capabilities include emotional sensing and social and emotional reasoning. Second, cognitive AI-based capabilities include natural language processing, retrieving data and information, identifying patterns in data, and creativity. Last, physical AI-based capabilities include gross motor skills, navigation, sensory perception, and mobility (Chui et al., 2015).

Brougham and Haar (2017) have determined similar effects on employee outcomes, specifically organizational commitment and career satisfaction. AI adoption can cause employees to feel undervalued, leading to lower levels of organizational commitment (Brougham and Harr, 2017). Additionally, AI adoption has affected long-term career planning by affecting job characteristics, job availability, and future job opportunities. Brougham and Haar's (2017) qualitative study using 120 participants supported the idea that STARA awareness is positively correlated to diminished levels of career satisfaction and organizational commitment. Chowdurry (2017) adds to these findings by showing that it is through reduced collaboration, coordination, and role clarity (i.e., knowledge sharing) that career dissatisfaction emerges. While Brougham and Haar (2017) found only a low level of concern regarding job replacement, they could not determine if a proper understanding of AI capabilities influenced the results. Employees understanding the capabilities of smart technologies may be of more concern. Brougham and Haar (2017) also do not take into consideration employees' perceptions of their job complexity and the level of emerging technology being introduced in their workplace.

STARA has been shown to replace low complex jobs such as construction- and production-based roles with low cognitive skill demands, but also high-skill tasks with high cognitive demands (Frey & Osborn, 2013). For example, AI has been used to research legal documents, analyze large libraries of documents, and write legal reports based on these documents using generative AI technology (Frey & Osborn, 2013). Coupled with the lowering costs of robotics, the threat to career planning and job mobility becomes apparent. Nonetheless, AI literature and PsyCap literature have still considered the impact of job complexity within their individual domains (Brougham & Haar, 2017; Newman et al., 2014; Nolzen, 2018). Job insecurity has been defined as the inability to maintain the continuity of an individual's job and
job conditions. This multidimensional concept consists of five dimensions, including job features, the importance of job features, perceived threat to the job itself (e.g., loss of job), the degree to which the prior two concepts are important, and lastly, the degree to which a person feels the inability to control, influence, or prevent the external threat (Ashford et al., 1989). Ashford et al. (1989) have also demonstrated a relationship between job insecurity and employee job attitudes, including organizational commitment, trust, and satisfaction.

Kong et al. (2020) found an additional employee outcome negatively impacted by AI awareness, i.e., job burnout. Job burnout is defined as a "psychological reaction to stresses at work" and involves three different dimensions (Kong et al., 2020, p. 719). These dimensions include depersonalization, emotional exhaustion, and reduced personal accomplishment. Using STARA awareness as the measurement in their model, 500 questionnaires were used to identify the effects of STARA awareness on job burnout, specifically regarding emotional exhaustion. Their findings supported the notion that concerns regarding job replacement due to AI (i.e., STARA awareness) create stress from job insecurity. This uncertainty provokes emotional exhaustion, leading to job burnout. Kong et al. (2020) also found support for the idea that this relationship – STARA awareness and job burnout – is mediated by organizational commitment.

Regarding the phenomenon at hand, task and job replacement are made up of both physical and mental taskwork (Huang & Rust, 2018). In general, smart technologies can be viewed as impacting each dimension differently in accordance with the level of human intelligence (HI) needed for the job and tasks. For example, mechanical jobs such as fast-food front-line workers (e.g., McDonald's order takers) have been impacted greatly by the advent of touchscreen kiosks (Johnson, 2016). "AI replacement at this stage shifts the demand for human labor from mechanical skills to higher intelligence skills" (Huang & Rust, 2018, p. 163). However, when considering empathetic intelligence, there is less risk associated with replacing jobs of this level of intelligence (Huang & Rust, 2018). The following figure demonstrates how AI may grow to replace increasingly complex cognitive functions over time.



Figure 2.5 Advancements of AI Intelligences (Source: Huange & Rust, 2018) *Note.* AI advancements over time increase higher-order levels of thinking.

Given the figure above, it is understandable that there is a growing concern over smart technologies, AI, robotics, and algorithms. The concept and measurement of STARA awareness operationalize the degree to which employees are aware that task replacement and job replacement are possible through these technologies. Therefore, I will now discuss the literature regarding STARA awareness and the phenomenon at hand.

2.3.2 STARA awareness & employee outcomes

STARA awareness focuses on how aware employees are of smart technologies, AI, robotics, and algorithms (STARA) being able to reduce or eliminate job tasks and impact future career planning, including opportunities, retention, and attrition (Brougham & Haar, 2018). Frey and Osborne (2017) draw attention to the impact of robots on the construction industry, while

Yang et al. (2020) demonstrate the impact on service occupations within retail businesses. However, these swim lanes focus on the macro-level impacts of AI. These impacts are on entire industries, such as the automotive industry and labor forces, such as the availability of future job prospects for automotive mechanics. On the individual level of analysis, Brougham and Haar (2018) theorize that STARA may have a negative impact on job outcomes such as organizational commitment, career satisfaction, and turnover intent. On the organizational level, organizational changes due to the adoption of AI threaten not only career planning on the individual level but also change the psychological climate of organizations as a whole, according to Hartmann and Rutherford (2015). The outcome of this is an increased level of job insecurity due to AI, i.e., STARA awareness.

As STARA is expected to modify the proficiencies required for future jobs and change the conditions of existing jobs, it should be expected that employees can feel their career opportunities in jeopardy. Chen, Change, and Yeh (2004) researched the potential relationship between career development programs and turnover intent and the relationship between career development programs and organizational commitment. As employers invested less in career development, turnover intent increased (Chen et al., 2004). Therefore, given that STARA impacts career development opportunities, it stands to reason that employee outcomes may also be in jeopardy.

In addition to the impact of STARA awareness on perceptions of job outlook, Kang et al. (2023) took a different approach within this field and assessed the employee outcomes as they related to job performance and pressure. When considering performance pressure, STARA awareness is shown to increase the pressure to perform well out of concerns for job loss and a bleak perception of future job opportunities (Kang et al., 2023). Other research includes

antecedents of employees forming an awareness of STARA. For example, Brougham and Haar (2018) researched the impact of automation on employees' existing roles to assess whether STAARA could give the impression that their employment is redundant. Their quantitative, cross-sectional study included 196 employees and found that job repetition, job control, and job complexity were all associated with the formation of redundant perspectives due to STARA adoption. The outcomes of these perspectives affect long-term career planning, a key component that may disrupt both organizational identification and produce a breach of psychological contracts. Lingmont and Alexiou (2020) looked at near-job impact rather than future career planning. This empirical study investigated how organizational culture impacts perspectives on job insecurity that are provoked by STARA awareness. This study was conducted with over 291 employees, largely based in the United States and India industries. Lingmont and Alexiou (2020) focused on authoritative cultures, which were measured using a scale developed by Grunig et al. (2002). The findings support a positive relationship such that authoritative cultures strengthen the relationship between STARA awareness and job insecurity.

STARA awareness is found to be associated with other attitudes, such as employee competition (Ding, 2021) and higher levels of cynicism and depression (Brougham & Haar, 2018). Ding (2021) investigated two perspectives of STARA awareness among employees – a challenge perspective and a hindrance perspective. This dichotomized approach to STARA awareness is based on the two-dimensional framework of work stressors, introduced by Cavanaugh et al. (2000). This approach was taken in order to better understand how STARA awareness and the stress it produces can be viewed as a challenge for employees to overcome or a hindrance that may interfere with employees' performance. Stress, brought on as a challenge, can lead to positive outcomes, such as job satisfaction; this satisfaction is due to achieving

greater levels of performance (Ding, 2021). Conversely, hindrance stress often results in negative outcomes such as lower levels of job satisfaction (Ding, 2021). This empirical study was performed online and included 190 respondents within the United States fast-food industry. When viewed as a challenge, STARA awareness has been shown to improve employee performance; when viewed as a hindrance, there was no significant influence on performance (Ding, 2021).

As discussed above, Brougham and Haar (2017) also found a positive relationship between STARA awareness and lower levels of organizational commitment and career satisfaction, and elevated levels of turnover intent. Regarding more positive behaviors, job crafting is defined as "an employee's discretionary behavior to alter the scope of work and work relationships" (Kang et al., 2023, p. 103282). As such, job crafting is believed to be positively influenced by STARA awareness as a coping mechanism and protective mechanism against job loss (Wrzesniewski & Dutton, 2001). Still, there is a dearth amount of research on the individual employee level of analysis. As such, literature on STARA awareness is silent on how employees both cope and overcome disruptions to work environments. However, as observed in studies on career planning disruptions and previous digital transformations, some personality traits emerged as likely candidates that will allow employees to bounce back from adverse organizational changes – employee resilience and self-efficacy (King, 1997).

2.4 Resilience and Self-Efficacy

Theoretically, based on studies concerning career planning and digital disruption, employee resilience and self-efficacy appear as two personality traits that may reduce the effects of career disruption on psychological contract breach. For example, King (1997) studied the effect of self-efficacy, employee resiliency, and motivation. As individuals move from low to high levels of self-identity saliency, individual resiliency, and self-efficacy, then affective career commitment emerges. King defined resilience as "the magnitude or extent to which the individual resists career barriers or disruptions affecting their work" (King, 1997, p. 293). The mechanism found here is the perception of control – both job control and control over internal, individual impulses (i.e., self-control). London (1990) also found that individuals with high levels of resilience tend to view themselves as having high levels of control over their job outcomes. Higher levels of perceived control are important, given the inverse relationship between job control and psychological contract breach. The relationship between adverse work conditions and psychological contract breach is weaker in those with higher levels of control, while it has a stronger relationship among those with lower levels of control. Results of a study by Elst et al. (2014) also indicate that perceptions of psychological contract breach are less likely to occur during poor work conditions in individuals with high levels of perceived job control. King (1997) found similar results when assessing self-efficacy and career motivation. Selfefficacy has been defined as "the dynamic process of adapting and coping during significant adversity (Trenerry et al., 2021, p. 8). There is a close relationship between self-efficacy and resilience, given that both involve an internal locus of control (Lyons et al., 2015) and the utility to enable individuals to overcome job-related stressors (Yang and Danes, 2015). The catalyst behind these interactions appears to be the role of control, confidence, and motivation – knowing that self-efficacy and the ability to accomplish one's goals increase motivation due to the positive reinforcement of successful outcomes (Bandura, 1997; Keye & Pidgeon, 2013). Similarly, empirical studies support the idea that self-efficacy and resilience are different constructs (Bullough et al., 2014; Keye & Pidgeon, 2013). While resilience emerges during

adverse experiences, self-efficacy is a more static belief in one's capabilities to affect goals and outcomes.

Resilience, like conscientiousness mentioned above (Raja et al., 2004), can affect whether an individual is more likely to respond positively or negatively to a situation due to its regulation of affective responses (Trenerry et al., 2021). This is important because positive and negative responses to disruption partially determine whether a psychological contract breach will be experienced (Rosseau et al., 2017). Regarding adverse job conditions, employee resilience has been shown to decrease the effects on employee outcomes. For example, in high-stressed project teams, employee resilience seems to buffer the impacts of stress on job outcomes in a quantitative study by Kimura et al. (2018). In this 336-participant study, the authors assessed how resilience moderates adverse working conditions and performance outcomes. Kimura et al. (2018) found that employees with higher levels of resilience tend to not allow job pressure to negatively affect job performance. Similarly, employee resilience has been shown to decrease the effects of workplace hazing on affective organizational commitment (Zong & Tsaur, 2023). In this 441-participant study within the hospitality industry, key findings supported resilience as an effective coping mechanism during adverse work conditions. Other studies demonstrate the effective role of employee resilience in moderating similar relationships, such as the effects of job insecurity and emotional exhaustion, and counterproductive work behaviors (Shoss et al., 2018). Interestingly, studies on psychological contract break found this type of disruption can lead to counterproductive work behaviors (Conway & Briner, 2005). Other studies support the positive association between resilience and job insecurity.

Similarly, self-efficacy has been defined as confidence in one's abilities to affect an outcome (Bandura, 1994). Stajkovic and Luthans (1998) later define self-efficacy as an

employee's "conviction or confidence about his or her abilities to mobilize the motivation, cognitive resources or courses of action needed to successfully execute a specific task within a given context" (Stajkovic & Luthans, 1998, p. 66). This later definition is less task-specific and emphasizes the mediating factors needed to affect a desired effect, such as motivation and cognitive resources (e.g., problem-solving and abstract thinking). This definition includes the process by which outcomes are achieved and the resources needed to achieve them. Employee self-efficacy has been seen as a component of employee resilience, understanding that the ability to bounce back is unlikely without the belief that one can manifest their desired outcomes (Luthans & Youssef, 2017). As such, employees with high levels of self-efficacy may respond with less negativity during uncertainty, given their ability to recalibrate goals and acquire the resources – confidence – to pivot. Thus, higher levels of self-efficacy may diminish observations of psychological contract breach. Self-efficacy also includes an internal locus of control (Gonzalez et al., 2022). Recalling that job control has been shown to diminish perceptions of psychological contract breach (Elst et al., 2014), internal locus of control may also perform similar functions. Other studies show the impact of self-efficacy on similar job attitudes and outcomes as both resilience and psychological contract fulfillment. For example, in a study on perceived employability and turnover intent, 295 employees were surveyed. Key results indicated that employability and turnover intent were positively affected by higher levels of selfefficacy as moderating the relationship. Interestingly, these effects were highest when employees believed their organization would maintain their employment (Khalid, 2021). Studies support a positive relationship between self-efficacy and job satisfaction, job performance, and commitment and a negative relationship with job insecurity (Rigotti et al., 2008).

While employee self-efficacy has shown similar outcomes to resilience, there is little research on how either of these traits influences employee attitudes toward broader context factors that impact psychological contracts. Specifically, psychological contracts face pressure from internal organizational factors, e.g., employers adopting STARA, and external industry factors, such as the effects of STARA on future employability.

2.5 Literature Gap

The literature reviewed thus far reveals a significant opportunity to better understand the interconnectedness of psychological contract breach and technology-driven job insecurity and employability concerns and how they are influenced by employee attributes such as resilience and self-efficacy and job traits such as job complexity. While employee resilience, self-efficacy, and job complexity have been studied concerning their influences on some employee job attitudes, job performance, and employee behaviors, the recent monumental shifts in broader contextual factors have not been explored. One contributing factor to this is the recent emergence of large language models, as explained above. The utilization of large language models (LLMs) only first emerged in 2017. LLMs are the engine behind the recent advancements in Generative AI (GenAI) and natural language processing (NLP). As such, they represent the mechanism behind the most disruptive advancements in AI, robotics, and automation (Kasneci et al., 2023). Given the recent emergence of LLMs, little research has been done on psychological contract theory to assess their effects on employee attitudes regarding employability and job security. These more advanced technologies are resulting in shifts in industries by changing the demand for skills and changes in job tasks, as seen in earlier non-STARA technology advancements (Shenkar, 1987; Rafaeli, 1986; Murrell & Sprinkle, 1993). These shifts call for understanding how these factors will impact organizations and their most important resources, i.e., their people.

Sok et al. (2013) and Thijssen et al. (2008) recognize that more research is needed on the relationship between employability and psychological contracts. As Thijssen et al. (2008) point out, employability and career management within the context of psychological contracts have changed, as have individuals' orientations toward employability and job security (Thijssen et al., 2008; Gubler et al., 2014).

Both parties – employees and employers – continue to modify their understandings of careers and occupations, career development, professional and career development, and employability in the context of psychological contracts (Thijssen et al., 2008). For example, newer employability expectations focus on employees' belief to experience internal job mobility in the future or the degree to which employees feel confident in their external marketability. Both are catalyzed by training and development, learning, coaching and mentoring, and other mechanisms (Thijssen et al., 2008). However, the acceleration of technology may outpace the ability for effective employer-led upskilling and reskilling programs, thus causing concerns regarding internal job mobility and or external employability.

2.6 Hypothesis Building

This paper investigates the question: How do technology-driven insecurities (e.g., job insecurity and employability concerns) affect perceptions of psychological contract breach, and do employees' internal resources, i.e., self-efficacy and resilience, and job traits, i.e., complexity, help employees self-regulate and decrease or increase these effects. Figure 2.7 below illustrates the model used to answer this research question.



Figure 2.7 Research Model of STARA Awareness Impact on PCB

Table 2.5 Hypothesized Relationships

Direct Effect:

STARA Awareness & Psychological Contract Break

H1 STARA awareness will be positively associated with a perceived breach of psychological contract.

Moderating Relationships:

Job Complexity, Resilience, & Self-Efficacy

- **H2** The effects of STARA awareness on psychological contract breach are greater among employees with lower levels of perceived job complexity versus with higher levels of perceived job complexity.
- **H3** The effects of STARA awareness on psychological contract breach are moderated by employee resilience, such that the relationship is stronger for individuals with lower levels of resilience versus higher levels of resilience.
- **H4** The influence of STARA awareness on psychological contract breach is moderated by employee self-efficacy, such that the relationship is stronger for individuals with lower levels of self-efficacy versus higher levels of self-efficacy.

Figure 2.7 Research Model of STARA Awareness Impact on PCB illustrates the

investigative purposes of this study - to understand the relationship between technology-driven

concerns regarding employability and psychological contracts. The model also assesses how

person-based resources and job characteristics aid in self-regulation by employees, potentially diminishing or exacerbating perceived disruptions in psychological contracts.

2.6.1 Disruption of Psychological Contracts: STARA & PCB

Psychological contract breach should be expected when employers and industries are associated with adopting technology designed to eliminate work tasks, change work conditions, and reduce employability. Advanced technologies such as smart technology, AI, robotics, and algorithms (STARA) are intended to do just that, i.e., automate repetitive tasks and processes, change work environments, and replace decision-making processes with AI programs (Brougham & Haar, 2017). Therefore, as employees are more aware of STARAs' capabilities, it should be expected that they will experience psychological contract breach.

STARA awareness is a measurement of worry regarding technology's ability to disrupt future employability and job security. Psychological contract breaches arise when an employee perceives that their organization has inadequately fulfilled its commitments, regardless of whether these commitments were stated or unstated (Jardat & de Rozario, 2012). Since most modern psychological contracts include expectations for employability (Costa & Neves, 2017; Richter & Näswall, 2019), technology-driven concerns regarding these disruptions (i.e., STARA awareness) should lead to perceived psychological contract breach.

This relationship is important to investigate since disruptions to the reciprocal process of exchanging currencies (e.g., economic and socioemotional currencies) between organizations and their employees can affect employees' attitudes and behaviors (Cropanzano et al., 2016; Rosseau et al., 2018; Abubakar et al., 2019). On the individual side, employees provide job performance, completion of tasks, and other physical and cognitive labor in order to receive benefits from the employer within the context of a transactional psychological contract). Within

relational psychological contracts, employees exchange affect in the form of loyalty and organizational commitment with the expectation of receiving coaching, mentoring, training and development, job mobility, and employability. As stated, disruption may occur as organizations adopt STARA technologies, which may render training and development less relevant for future job opportunities, and therefore, diminish employability and internal job mobility. Furthermore, disruption in career planning and career success has been shown to impact levels of psychological distress (Presbitero et al., 2022), which is an antecedent to psychological contract breach.

As technology-driven job insecurity and future employability concerns increase (i.e., STARA awareness), there is an increased likelihood that a psychological contract breach will occur. Therefore, I propose the following hypothesis:

H1: STARA awareness will be positively associated with a perceived breach of psychological contract.

2.6.2 Job Characteristics: The Moderating Role of Job Complexity

Job complexity can affect the relationship between STARA awareness and psychological contract breach for a number of reasons and has also been treated as a moderator within previous STARA literature (Brougham & Haar, 2017). Job complexity has been defined as the employee's perception of the degree of difficulty in accomplishing tasks, the degree to which tasks require higher-order thinking, coupled with the need for skilled work (Acemoglu & Autor, 2011). Other researchers have defined job complexity as "the level of skill that an employee needs to carry out their job successfully" (Brougham & Haar, 2017, p. 215). Given historical observations that technological advancements in automation tend to replace primarily low-complex tasks and activities, it is reasonable to expect employees with higher levels of perceived job complexity to

feel less threatened and experience lower levels of emotional responses, thereby avoiding forming perceptions of psychological contract breach. Conversely, employees with lower levels of perceived job complexity should see greater interaction between STARA awareness and psychological contract breach.

Low-complex processes and highly repetitive job tasks have been the focus of automation for years and are often thought of as the first to be affected by automation, robotics, and AIbased algorithms. Employees who view their jobs as more susceptible to automation would likely be more sensitive to employers not meeting their obligations toward supporting employability and providing training and career development. Conversely, those with higher levels of perceived job complexity may feel as if STARA technologies will not impact their employability or current job characteristics. The effects of STARA awareness on PCB would therefore be diminished in those with less worry due to feelings of immunity to job replacement.

Additionally, workers with lower levels of perceived job complexity may be more vigilant in monitoring disruptions to the obligations from employers, i.e., PCs. Robinson and Morrison (2000) identified vigilance as an important factor in identifying psychological contract breach and that vigilance can increase sensitivity to breaches. This sensitivity can be increased by a number of factors, including organizational performance decline, increased organizational change, and previous experiences with psychological contract breaches. Applying their understanding of vigilance, employees with lower levels of perceived job complexity may be more sensitive to identifying psychological contract breaches while those with higher levels of perceived job complexity may feel less worry and anxiety toward STARA technologies. The outcome of such would be a lesser effect of STARA awareness on PCB.

Therefore, I intend to look at the impact that higher and lower levels of perceived job complexity have on the relationship between STARA awareness and psychological contract breach. I propose the following hypothesis:

H2: The effects of STARA awareness on psychological contract breach are greater among employees with lower levels of perceived job complexity; alternatively, the effects of STARA awareness on psychological contract breach are weaker among employees with higher levels of perceived job complexity.

2.6.3 Intrinsic Resources for Self-Regulating: Moderating Roles of Resilience & Selfefficacy

Resilience. Higher levels of employee resilience are expected to decrease the impact of STARA awareness on psychological contract breaches due to its ability to enable adaptability in the midst of challenge by relying upon an internal locus of control and mobilizing positive affect rather than negative affect, which is a key antecedent to psychological contract break.

Employee resilience supports career adaptability and refers to the process by which individuals are able to overcome hardships, i.e., bounce back (Luthans, 2002). Examples of these hardships include "loss of attachments in the workplace, loss of security, ambiguity about career paths, work-life balance, stress, and difficulties" (Ferrari et al., 2017, p. 401). Employee resilience enables individuals to recover after challenges and adversity, even within the context of psychological contracts due to the perceptions of control. Those with higher levels of resilience tend to do better in self-regulating emotions and managing internal emotional responses, and recovering from setbacks more effectively (Nota et al., 2004). Within the context of psychological contracts, this involves responding with positive affect rather than negative affect, thus reducing psychological contract breach. Those with higher levels of resilience may also be less inclined to find the disruptive capabilities of STARA technologies to be a threat. Having demonstrated the ability to bounce back in other adverse circumstances, individuals with higher levels of resilience may view STARA technologies as an opportunity for growth, rather than an obstacle to overcome. Conversely, those with lower levels of resilience may be more likely to view disruption as an obstacle and see its adoption by their employer as PCB, strengthening then the effects of STARA awareness on PCB.

Therefore, in light of the control mechanisms found with resilience, and due to the empirical support provided by previous literature, I propose the following hypothesis:

H3: The effects of STARA awareness on psychological contract breach is moderated by employee resilience, such that the relationship is stronger for individuals with lower levels of resilience and stronger for individuals with lower levels of resilience.

Self-Efficacy. The influence of STARA awareness on psychological contract breach should be more pronounced in employees with lower levels of self-efficacy, while it is weaker among employees with higher levels of self-efficacy. Self-efficacy has been defined as one's ability to employ both internal and external resources in order to affect a desired outcome (Stajkovic & Luthans, 1998, p. 66). This definition includes an individual's capacity to leverage resources such as emotional resources – positive and negative affect – and cognitive resources such as problem-solving and critical thinking and direct them towards achieving their goals (Tobin et al., 1989). Tobin et al. (1989) dichotomized this response into problem engagement and emotion engagement.

Regarding problem engagement, as individuals with higher levels of self-efficacy engage with the changes taking place around them, they are more likely to respond with either a problem-solving orientation or participate in cognitive restructuring, i.e., substituting negative patterns of thinking into positive patterns of thinking (Tobin et al., 1989). Positive engagement such as this has been shown to decrease concern and worry over changes. This was also demonstrated earlier during the emergence of computers in the workplace (Rafaeli, 1986), while antithetically, those who do not engage with change are more likely to experience worry and insecurity (Shenkar, 1987). Therefore, it is reasonable to expect that higher levels of self-efficacy will reduce the effects of STARA awareness on psychological contract breach because employees with higher levels of self-efficacy have a tendency towards engagement rather than withdrawal.

Regarding emotional engagement, this, too, is expected, given that self-efficacy, like resilience, involves confidence in the effectiveness of internal controls (e.g., self-control) and self-regulation of positive and negative emotions (Elst et al., 2014; Yang & Danes, 2015). When individuals respond with positive emotional engagement, they express positive emotions and leverage social networks. As discussed above, increased social networks have been shown to help individuals regulate emotions and respond with positive affect (Bal et al., 2010).

Therefore, it is expected that the effects of STARA awareness on psychological contract breach will be lower in individuals with greater capabilities to self-regulate emotional responses and "mobilize motivation, cognitive resources or courses of action" in order to "resist barriers or disruptions affecting their work" (Stajkovic & Luthans, 1998, p. 66; King, 1997, p. 293, respectively). Therefore, in light of the mechanisms for self-regulation of emotional responses and the confidence to be resilient during adversity, I propose the following hypothesis:

H4: The influence of STARA awareness on psychological contract breach is moderated by employee self-efficacy, such that the relationship is stronger for individuals with lower levels of self-efficacy and weaker for individuals with higher levels of self-efficacy.

CHAPTER 3: METHODOLOGY

The following chapter outlines the methodological approach used to test the hypotheses delineated from the research model illustrated in Chapter II, Figure 2.7. The following chapter is organized into four sections. Section I, Data Collection, provides an overview of the research study, with a focus on data collection. Section II, Measures, outlines the measures by which I used to test the hypotheses contained within my research model. Section III, Analytical Procedures, details the steps I used to test the measures in the preceding section.

3.1 Data Collection

This study collected data by leveraging the collection services of a third-party vendor, Prolific, an online platform widely used by researchers to facilitate data collection. Douglas et al. (2023) studied the attentiveness of participants using different types of online data collection platforms and found respondents passed more attention checks, followed more instructions, and had improved recall of previously presented survey material when compared to other means of data collection, including undergraduate student samples. The survey was administered randomly via e-mail using a database of Prolific participants. Respondents cover a wide range of industries and organizations. The sample size obtained includes 403 respondents with work experience within the United States. The Qualtrics platform was used to create the survey, administer the consent form, and check eligibility for participation in the study. The dataset obtained represents cross-sectional data, given that data was collected at only one point in time. The survey instrument required each question to be answered, reducing the risk of missing data. This study was approved on January 29th, 2024, by the UNC Charlotte IRB (Study #: 23-0562).

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3.2 Measures

3.2.1 Independent Variable

STARA Awareness. STARA Awareness was measured using a four-question instrument developed by Brougham and Haar (2017). In this original study, STARA awareness was used to understand employee perceptions of technological advancements within the context of career planning. The researchers found a negative relationship between STARA awareness and employee attitudes, such as career satisfaction and organizational commitment. A positive relationship was also found between STARA awareness and turnover intentions, depression, and cynicism (Brougham & Haar, 2017). Brougham and Haar (2018) also found in an additional study a negative relationship between STARA-associated redundancy and STARA awareness. STARA redundancy is the degree to which an employee believes their job or job tasks are able to be replaced by smart technologies (Brougham & Haar, 2018). The relationship between STARA awareness and STARA redundancy may be interpreted as employees not understanding the capabilities for technology to replace jobs and/or automate job tasks. However, as artificial intelligence and other smart technologies are developed, and as education, understanding, and awareness spread, this negative relationship may be diminished over time. Other scholars using STARA awareness found similar positive relationships with career exploration behaviors, job insecurity, and psychological distress (Presbitero & Teng-Calleja, 2022), and individual competitive behaviors (Ding, 2021). In keeping with this seminal piece, items will be measured using a five-point Likert scale. This instrument includes questions such as "I am personally worried that what I do now in my job will be able to be replaced by STARA" (Brougham & Haar, 2017). Anchors for the scale include Strongly Disagree (SD) to Strongly Agree (SA), e.g., 1 =strongly disagree, 2 =disagree, 3 =neutral, 4 =agree, and 5 =strongly agree.

Smart Technology, artificial intelligence, robotics, and algorithms (STARA) are expected to change some workplaces and jobs within the next ten years.

Thinking of your current job, please indicate the extent to which you agree or disagree with the following: (1 = Strongly Disagree; 5 = Strongly Agree)

- 1. I think my job could be replaced by STARA.
- 2. I am personally worried that what I do now in my job will be able to be replaced by STARA.
- 3. I am personally worried about my future in my organization due to STARA replacing employees.
- 4. I am personally worried about my future in my industry due to STARA replacing employees.

3.2.2 Dependent Variable

Psychological Contract Breach. Perceived breach of psychological contract is an

individual-level construct used to capture employees' feelings and beliefs regarding their perceptions of a disruption in an implied reciprocal relationship between employer and employee (Coyle-Shapiro et al., 2019). This measurement does not investigate actual breaches and draws a distinction between a perceived violation and a perceived breach of contract (Robinson & Morrison, 2000). Breach of psychological contract will be measured using a 5-question survey developed by Robinson and Morrison (2000). An example of an item from this instrument is, "Almost all the promises made by my employer during recruitment have been kept so far." Anchors will be consistent throughout the survey, using SD (1) and SA (5).

PCB1, PCB 2, and PCB3 were reverse-scored, and the variable was transformed and recorded into PCB1R, PCB2R, and PCB3R. These items include, 'Almost all the promises made by my employer during recruitment have been kept so far (PCB1), 'I feel that my employer has come through in fulfilling the promises made to me when I was hired' (PCB2), and 'So far, my

employer has done an excellent job of fulfilling its promises to me' (PCB3). These have been

reversed-scored so that the higher the number represents greater perceptions of PCB.

Table 3.2 Psychological Contract Breach(Source: Robinson & Morrison, 2000)

In the employee-employer relationship, there is an implied agreement to exchange labor (employee's work) for goods and services (for example, compensation, benefits, and development) from the employer.

Thinking of your current job, please indicate the extent to which you agree or disagree with the following (1 = Strongly Disagree; 5 = Strongly Agree)

- 1. Almost all the promises made by my employer during recruitment have been kept so far. (R)
- 2. I feel that my employer has come through in fulfilling the promises made to me when I was hired. (R)
- 3. So far, my employer has done an excellent job of fulfilling its promises to me. (R)
- 4. I have not received everything promised to me in exchange for my contributions.
- 5. My employer has broken many of its promises to me even though I've upheld my side of the deal.

3.2.3 Moderators

Job Complexity. Perceived job complexity comes from Semmer (1982) and has largely been defined as the degree of difficulty exerted by the employee, coupled with the requirement for cognitive demands and high skill (Zacher & Frese, 2011). Perceived job complexity will be measured using a 4-item instrument developed by Semmer (1982) and adapted by Zacher and Frese (2011). The four items are designed to capture perceptions of how complex an employee views their role. Complexity is measured on a 5-point Likert scale ranging from 1 = very little to 5 = very much. An example of an item from this instrument is, "Do you often have to make very complicated decisions in your work?" This survey will be unchanged from the adapted version of Zacher and Frese (2011).

Table 3.3 Job Complexity(Source: Zacher & Frese, 2011)

	Please indicate the extent to which you agree or disagree with the
	following:
	(1 = Very Little; 5 = Very Much)
1.	I receive tasks that are extraordinary and particularly difficult.
2.	I have to make very complicated decisions in my work.
3.	I use all my knowledge and skills in your work.

4. I can learn new things in my work.

Employee Resilience. Perceived employee resilience Smith et al. (2008) is defined as the

degree to which an individual is able to recover after hardships or bounce back. Perceived

resilience is measured using a 6-item instrument developed by Smith et al. (2008). The six items

are designed to capture perceptions of resilience and are measured on a 5-point Likert scale

ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Three questions are reversed scored

as illustrated in Table 3.4 and noted with (R), RES2, RES4, and RES6.

Table 3.4 Employee Resilience(Source: Smith et al., 2008)

Please indicate the extent to which you agree or disagree with the following: (1 = Strongly Disagree; 5 = Strongly Agree)

- 1. I tend to bounce back quickly after hard times.
- 2. I have a hard time making it through stressful events. (R)
- 3. It does not take me long to recover from a stressful event.
- 4. It is hard for me to snap back when something bad happens. (R)
- 5. I usually come through difficult times with little trouble.
- 6. I tend to take a long time to get over setbacks in my life. (R)

Employee Self-Efficacy. Employee self-efficacy was measured using the 4-item New

General Self-Efficacy Scale developed by Chen et al. (2001). The NGSE scale has been used

widely throughout the literature due to its high reliability (Chen et al., 2001). Employee self-

efficacy captures the extent to which an individual is confident to effect an intended outcome.

This 4-item scale was presented with responses available along a 5-point Likert scale ranging

from 1 = very little to 5 = very much.

Table 3.5 General Self-Efficacy Scale(Source: Chen et al., 2001)

Please indicate the extent to which you agree or disagree with the following: (1 = Strongly Disagree; 5 = Strongly Agree)

- 1. I will be able to achieve most of the goals that I have set for myself.
- 2. When facing difficult tasks, I am certain that I will accomplish them.
- 3. In general, I think that I can obtain outcomes that are important to me.
- 4. I believe I can succeed at almost any endeavor to which I set my mind.
- 5. I will be able to successfully overcome many challenges.
- 6. I am confident that I can perform effectively on many different tasks.
- 7. Compared to other people, I can do most tasks very well.
- 8. Even when things are tough, I can perform quite well.

3.2.4 Control Variables

I used control variables consistent with PCT literature and STARA literature. Controls include job insecurity, age (as a continuous variable), tenure with the organization (as a continuous variable), and gender (male, female, transman, transwoman, non-binary). Other data were collected, including the number of years since the respondent's organization's last round of layoffs, years until retirement, employment type (e.g., full-time, part-time), and job tenure.

Job insecurity. General job insecurity, i.e., insecurity not induced by technology adoption, has been shown to influence job performance (Darvishmotevali & Ali, 2020). As such, I control this variable to distinguish between job insecurity due to technology and general job insecurity. All items in this scale have been reversed scored so that higher levels of job insecurity are represented by the higher responses, i.e., 4 or 5 while low levels of job insecurity are represented by lower responses, i.e., 1 or 2. **Table 3.6** General Job Insecurity Scale(Source: Darvishmotevali & Ali, 2020)

Please indicate the extent to which you feel certain or uncertain with the following: (1 =Very Uncertain; 5 = Very Certain)

- 1. How certain are you about what your future career picture looks like?
- 2. How certain are you about whether your job skills will be of use and value five years from now?
- 3. How certain are you that opportunities for promotion and advancement will exist in the next few years?
- 4. How certain are you about what your responsibilities will be six months from now?

Age. This variable is representative of the employee's age, measured in years. I control for age due to the potential effects of stress (Baron et al., 2016). Age also allows for controlling the time dimension of psychological contract breach. As employees get older, they may become more or less sensitive to PCB.

Organizational Tenure. This variable represents the amount of time, measured in years,

that the employee has been with the organization. Organizational tenure can play a role in how secure employees feel in their roles, regardless of technological disruption.

Gender. This variable represents self-identification in regard to gender and includes several options from which respondents can choose one. Options include male and female along with transgender options (i.e., trans-male and trans-female) and non-binary, per Magliozzi et al. (2016).

Measure	Role in Model / Item	Scale	Reference		
Job insecurity	 I will likely lose my job very soon, and it makes me anxious. I am not sure I will be able to keep my job. I think I may lose my job in the near future. I feel insecure regarding the future of my job. 	Likert scale (1 = Strongly Disagree to 5 = Strongly Agree	Darvishmotevali, M. and Ali, Faizan. (2020). Job insecurity, subjective well- being, and job performance: The moderating role of psychological capital. International Journal of Hospitality Management, 87, 102462		
Age	What is your age (in years)?	In number of years	NA		
History of Layoffs	How many years has it been since your company's last round of layoffs? If you are unsure, please write "Unsure."	In number of years	NA		
Organizational Tenure	With regard to your current employer, how many years have you worked for that specific employer?	In number of years	NA		
Job Tenure	With regard to your current employment, how many years have you worked in that specific job?				
Gender	Male, Female, Trans-Male, Trans-Female, Non-binary	Select One	NA		
Years since the employer's last restructuring	How many years has it been since your company's last round of layoffs? If you are unsure, please write "Unsure."	Text field			
Years Until Retirement	How many years until you expect to retire?	Text field			
Employment Type	Full-time, Part-time, Unemployed looking for work, Unemployed not looking for work, Retired, Student, Disabled, Temporary Worker	Select One			

 Table 3.7 Control Variables

3.3 Analytical Procedures

The hypotheses outlined in Table 2.5 were tested using IBM SPSS Statistics, version 28. Data was downloaded from Qualtrics in numerical format and downloaded as a .CVS file. Respondents with missing values were deleted; however, the survey required responses and eliminated the need for this. The items comprising each construct were relabeled. Dichotomous items were coded as 0 or 1, and all categorical items were dummy-coded. Missing values were analyzed using a Missing Values Analysis in SPSS. The variable History of Layoffs was dichotomized as 0 and 1, to indicate whether the respondent has knowledge of previous layoffs at their organization.

I conducted an exploratory factor analysis and confirmatory factor analysis and calculated the reliability of each variable. The reliability of the data was assessed using Cronbach's alpha (α) (Cronbach, 1951). Research suggests Cronbach's alpha (α) should be above 0.70 to support consistency (Hair et al., 2020). The constructs and composite variables created resulted in alphas greater than .70 reliability ($\alpha > .70$) except for Job Complexity which returned $\alpha > .651$. For standardization, I created z-scores for the independent variable (STARA awareness) and all moderators (job complexity, resilience, and self-efficacy). Next, I created interaction variables between moderators and the IV to create interaction variables.

I performed descriptive statistics and tested for normality, i.e., skewness and kurtosis. I used Pearson correlations and hierarchical regressions with control variables, predictors, moderators, and interaction terms. VIF was also observed.

CHAPTER 4: RESULTS

Chapter IV outlines the results of the study, including the results regarding the hypotheses presented in Table 2.5. For analysis, IBM SPSS Statistics, Version 28 was used. Descriptive statistics, exploratory factor analysis (EFA), Pearson's correlation, collinearity diagnostics, and hierarchical moderated regression were used for hypothesis testing.

4.1 Preliminary Analysis

The final sample size of the dataset was 402 respondents. I assessed missing values by computing a missing data variable on survey items. The results are below in Table 4.1 and demonstrate negligible missing data. For this reason, no responses were dropped, nor were any values imputed.

					Cumulative
_		Frequency	Percent	Valid Percent	Percent
Valid	.00	400	99.5	99.5	99.5
	1.00	1	.2	.2	99.8
	2.00	1	.2	.2	99.8
	40.00	1	.2	.2	100.0
	Total	402	100.0	100.0	

Table 4.1 Missing Data

Demographic descriptors of the dataset were limited to age and gender. Demographics were limited to ensure a higher completion rate of the survey and are in line with PC research. To participate in this study, respondents must be at least 18 years of age and have worked within the United States. Both age and gender follow a normal standard distribution, as depicted in Figure 4.1 and Figure 4.2. All variables had acceptable levels of Kurtosis (< 10) and Skewness (< 2.0), as shown in Table 4.2 with the exception of Job Tenure. Therefore, I used log transformation to decrease skewness to 1.475.



Figure 4.1 Distribution of Sample Age



Figure 4.2 Distribution of Sample Gender e 4.3



Figure 4.3 Distribution of Sample Job Insecurity



Figure 4.4 Distribution of Sample Organizational Tenure



Figure 4.5 Distribution of Sample Years to Retirement



Figure 4.6 Distribution of Sample Job Tenure

		Gender	Yrs to Retire.	Org Tenure	Job Insecurity	Job Tenure	Age
Ν	Valid	401	397	399	401	391	401
	Missing	1	5	3	1	5	1
Mean		1.53	24.618	7.003	2.564	1.22	40.66
Median		1.00	25.000	5.000	2.500	1.00	38.00
Mode		1	30.0	1.000	2.00	1	36
Std. Deviation		.587	11.188	6.139	.920	.453	10.369
Variance		.345	125.160	37.689	.846	.205	107.511
Skewness		1.126	067	1.663	.319	2.264	.637
Std. Error of Skewness		.122	.122	.122	.122	.122	.122
Kurtosis		3.418	709	3.367	603	6.706	237
Std. Error of Kurtosis		.243	.244	.244	.243	.244	.243
Range		4	49.5	35.000	4.00	3	52
Minimum		1	.5	.000	1.00	1	20
Maximum	L	5	50.0	35.0000	5.00	4	72

Table 4.2 Descriptive Statistics and Normality – Control Variables

4.2 Reliability

4.2.1 Internal Consistency

Reliability is the measure of the internal consistency of the constructs in the study. Construct reliability was assessed using Cronbach's Alpha, and research supports that when the Alpha (α) value is greater than .70 (Hair et al., 2013) a construct is deemed to be reliable. STARA Awareness had a Cronbach's Alpha of 0.93. PCB had a Cronbach's Alpha of 0.948. This scale includes five items and the STARA Awareness scale includes four items. Job complexity had a Cronbach's Alpha of 0.651 and included four items. No item could be removed to increase reliability; however, between .60 and .70 has been viewed as acceptable (Bernardi, 1994). The results also revealed the Self-Efficacy had a Cronbach's Alpha of 0.917 and is comprised of eight items. and the Job Insecurity scale with four items (α = .819) were found reliable. Lastly, Resilience with six items resulted in ($\alpha = .918$). When testing reliability with all items included, results showed 31 items and ($\alpha = .873$). Reliability results are summarized in Table 4.3.

Constructs	No. of Items	Alpha
РСВ	5	0.948
STARA Awareness	4	0.930
Resilience	6	0.918
Self-Efficacy	8	0.917
Job Complexity	4	0.651
Job Insecurity	4	0.819
Total Model	31	0.873

 Table 4.3 Scale Reliability Analysis

The composite reliability and average variance extracted (AVE) were both above acceptable levels of .70 and .50, respectively. Job Insecurity AVE returned a score of .488, slightly below .50. However, this level is acceptable since the composite reliability is greater than .60. The composite reliability for Job Insecurity returned a score of .792.

	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
PCB	.948	.939	.754
STARA	.930	.940	.798
Resilience	.918	.905	.614
Self-Efficacy	.917	.892	.544
Job Complexity	.651	.779	.547
Job Insecurity	.873	.792	.488

Table 4.4 Cronbach's Alpha, CR, AVE

4.2.2 Exploratory Factor Analysis.

Despite using previously validated scales, an Exploratory Factor Analysis test (EFA) was performed due to the potential for common method bias. Common method bias was tested due to the inability to diversify the data collection method. Data was collected from the same source, i.e., individual respondents. Therefore, an exploratory factor analysis (EFA) was performed. Recent studies show that performing an EFA and Confirmatory Factor Analysis (CFA) is redundant when the goal is to detect common method bias (Kock et al., 2021).

I used Principal Component Analysis (PCA) factoring with Varimax rotation, which studies suggest acceptable levels of communalities are those above .400 (Osborne et al., 2008). PCA was used given the differences in loading factors and assumes there are relationships among the factors. Principal component analysis was used also because psychological constructs like worry and anxiety are a combination of latent factors and residuals (Jolliffe & Cadima, 2016). Extraction values for all constructs were above .4. Job Complexity, item 4 returned a loading factor less than .50, suggesting poor alignment with other items of the construct. This item was removed from the composite measurement. The communality of the scale is included to identify the amount of variance represented in the model. The results returned communalities above or approximately .50. Job Complexity, item four, returned .411. These items were retained despite slightly lower communalities.

	Initial	Extraction
STARA1	1.000	.707
STARA2	1.000	.891
STARA3	1.000	.864
STARA4	1.000	.894
PCB1	1.000	.895
PCB2	1.000	.909
PCB3	1.000	.873
PCB4	1.000	.690
PCB5	1.000	.816
SE1	1.000	.708
SE2	1.000	.648

I able 4.5 Communatione	Table	.5 Communa	lities
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Tal	ble 4.5	5 Communa	lities	(continued))
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SE3	1.000	.649
SE4	1.000	.769
SE5	1.000	.700
SE6	1.000	.726
SE7	1.000	.506
SE8	1.000	.652
JC1	1.000	.739
JC2	1.000	.751
JC3	1.000	.519
JC4	1.000	.411
RES1	1.000	.811
RES2	1.000	.712
RES3	1.000	.735
RES4	1.000	.820
RES5	1.000	.632
RES6	1.000	.817
JI1	1.000	.751
JI2	1.000	.745
JI3	1.000	.649
JI4	1.000	.574

Extraction Method: Principal Component Analysis.

Next, I considered Bartlett's Test of Sphericity to measure the statistical probability of significance in the correlation matrix to confirm whether the variables in the dataset are uncorrelated. The Kaiser-Meyer-Olkin measure of sampling adequacy (MSA) and Bartlett's Test of Sphericity support the suitability for this data factor analysis, with an MSA return of .902. The results were significant and demonstrated suitability for factor analysis, as depicted in Table 4.6.

Kaiser-Meyer-Olkin	.902	
Adequacy.		
Bartlett's Test of	Approx. Chi-Square	7079.008
Sphericity	Df	465
	Sig.	.000

Table 4.6 KMO and Bartlett's Test

Finally, derived from this analysis are six factors that account for the majority (72%) of

the variation in the data, as shown in Table 4.7.

			Extraction Sums of Squared			Rota	tion Sum	s of	
	Initia	al Eigenv	alues	Loadings			Squared Loadings		
		% of	Cum					% of	Cum
Item	Total	Var	%	Total	% of Var	Cum %	Total	Var	%
1	10.282	33.167	33.167	10.282	33.167	33.167	5.406	17.437	17.437
2	4.048	13.059	46.226	4.048	13.059	46.226	4.576	14.760	32.198
3	3.156	10.180	56.406	3.156	10.180	56.406	4.502	14.522	46.720
4	2.166	6.986	63.393	2.166	6.986	63.393	3.524	11.367	58.087
5	1.757	5.667	69.060	1.757	5.667	69.060	2.654	8.560	66.646
6	1.149	3.705	72.765	1.149	3.705	72.765	1.897	6.118	72.765
7	.878	2.832	75.597						
8	.780	2.515	78.112						
9	.682	2.199	80.310						
10	.539	1.740	82.050						
11	.516	1.665	83.716						
12	.487	1.571	85.286						
13	.407	1.312	86.598						
14	.391	1.261	87.859						
15	.377	1.215	89.074						
16	.345	1.113	90.187						
17	.327	1.054	91.241						
18	.316	1.018	92.259						
19	.308	.995	93.254						
20	.285	.919	94.172						

 Table 4.7 Factors and Cumulative Variance

21	.279	.901	95.074			
22	.253	.816	95.889			
23	.238	.767	96.656			
24	.209	.676	97.332			
25	.180	.581	97.912			
26	.159	.513	98.425			
27	.138	.446	98.871			
28	.121	.391	99.262			
29	.089	.288	99.550			
30	.078	.252	99.802			
31	.061	.198	100.00			
			0			

Table 4.7 Factors and Cumulative Variance (continued)

Extraction Method: Principal Component Analysis.

Job Complexity, JC4, failed to load on any dimension with significance. This item was removed from further analysis. A repeated EFA was performed, excluding JC4, with results confirming a six-dimensional structure. The six dimensions explain slightly more (74%) of the variance included in this model. Additionally, Bartlett's Test of sphericity also showed significance, along with communalities over the required value of .50 (with the exception of JC4). The six factors found during EFA testing align with the research model above.

Factor 1 includes items SE1 – SE8, referring to Self-Efficacy (SE). Factor 2 gathers items RES1 – RES6, which represents resilience. Factor 3 includes items PCB1 – PCB 5, referring to psychological contract breach. Factor 4 gathers items STARA1 - STARA4, representing STARA awareness. Factor 5 includes items JI1 – JI4, referring to general job insecurity. Lastly, Factor 6 includes JC1, JC2, and JC3, representing job complexity. Factor Loadings are presented in Table 4.8.
	Component						
	1	2	3	4	5	6	
STARAR1				.710			
STARA2				.795			
STARA3				.731			
STARA4				.770			
PCB1R			.927				
PCB2R			.721				
PCB3R			.706				
PCB4			.655				
PCB5			.718				
SE1	.727						
SE2	.705						
SE3	.696						
SE4	.729						
SE5	.717						
SE6	.717						
SE7	.587						
SE8	.730						
JC1						.527	
JC2						.626	
JC3						.561	
JC4							
RES1		.745					
RES2		.655					
RES3		.644					
RES4		.650					
RES5		.686					
RES6		.718					
JI1					.745		
JI2					.688		
JI3					.681		
JI4					.679		

Table 4.8 Rotated Component Matrix^a

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

4.3 Regression Results

Bivariate correlations are provided in Table 4.9. From this analysis, Resilience and Self-Efficacy variables showed the highest correlation with other variables. With regards to the IV, STARA showed the highest correlation with resilience and self-efficacy, respectively, r(398) = -.130, p < .217 and r(398) = -.165, p <.001. Job Insecurity was correlated with STARA as well, r (398) = .332, p <.001. Similarly, PCB (DV) showed the highest correlation with STARA (IV), as r(398) = .220, p <.001, two moderators, resilience r(398) = -.185, p <.001 and self-efficacy r(398) = -.259, p <.001, and one control variable, Job Insecurity r(398) = .326, p <.001. These results are reproduced in Table 4.10.

Additionally, a Variance Inflation Factor test was performed to determine whether multicollinearity is present. VIF values above ten suggests multicollinearity (Hair et al., 2010). No measures returned a VIF above ten, suggesting that multicollinearity is not a concern.

Table 4.9 Bivariate Correlations

		Mean	Std. Dev	1	2	3	Δ	5	6	7	8	9	10	11
1	PCB	3.732	.954		2	5	-	5	0	,	0)	10	11
2	STARA	2.448	1.08	.220**										
3	Self- efficacy	4.100	.578	259**	- .165**									
4	Resilience	3.485	.919	185**	-	.601**								
5	Job Complexity	3.505	.816	.022	.016	.175**	.126*							
6	Job Insecurity	2.563	0.199	.326**	.343**	545**	436**	215**	· 					
7	Layoffs	.24	.427	.054	.073	.000	.068	.147**	055					
8	Org Tenure	7.00	6.139	080	.045	.142**	.136**	.200**	138**	·.148 ^{**}				
9	Age	40.66	10.369	.032	.051	.049	.111*	.127*	035	.148**	.410**			
10	Job Tenure	1.22	.453	.017	.071	166**	100*	198**	.252**	127*	144**	*.096		
11	Yrs to Retire	24.518	11.188	001	095	019	067	098	.110*	151**	276**	*603**	088	
12	Gender	1.53	.587	.029	025	203**	178**	110*	.165**	135**	042	.067	.202**	.007

4.4 Summary

Hierarchical regression analysis explains changes in variance based on iterative changes in the model as control variables, the IV, and interaction variables are considered (Jeger et al., 2014). Table 4.9 displays the results.

4.4.1 Model 1

As indicated in Table 4.10, Model 1 includes control variable Age, Gender, Years to Retirement, History of Layoffs, Job Insecurity, Job Tenure, and Organizational Tenure. Results suggest that Age ($\beta = .007$, p = .348), Gender ($\beta = .004$, p = .964), Years to Retirement ($\beta = .003$, p = .693), History of Layoffs ($\beta = .135$, p = .255), Organizational Tenure ($\beta = -.016$, p = .063), and Job Tenure ($\beta = -.235$, p = .057) were not significant in the model. The model indicates that Job Insecurity is significant, ($\beta = .390$, p < .001). Therefore, results for Model 1 suggest that these items were predictors of PCB, R² = .132, F (7, 388) = 8.313, p < .001), with explanatory power statistically significant explanatory power.

4.4.2 Model 2

As indicated in Table 4.10, this model includes the control variables from the previous model and STARA awareness (IV). STARA awareness showed a statistically significant coefficient (β = .113, p <.05). Results returned an R² = .143, F (8, 388) = 7.945, p < .05 and Δ R² = .11, increasing R² from Model 1 from .132 to .143. This indicates that the predictor variable accounts for additional variance in the dependent variable PCB. Therefore, (H1) is supported by this model.

4.4.3 Model 3

Model 3 includes all previous variables in Model 1 and Model 2 and adds the moderating variables. These variables are Resilience (β =.041, p < 0.474), Self-Efficacy (β =.096, p < .122),

and Job Complexity (β =.078, p < .103). Results returned an R² = .154, F(3, 388) = 5.579, p < .185 and ΔR^2 = .11, increasing R² from Model 2 from .143 to .154. These findings were not statistically significant.

4.4.4 Model 4

Model 4 includes all previous variables in Models 1 - 3 and also includes the interaction variables demonstrating the effects between STARA Awareness and Resilience ($\beta = .029$, p < .609), STARA Awareness and Self-Efficacy ($\beta = .004$, p < .949), and STARA Awareness and Job Complexity (β =.010, p < .817). Results returned an R² =, F(3, 388) = .155, p < .967 and ΔR^2 = .001, increasing R^2 from Model 2 from .154 to .155. Therefore, this model does not support (H2), stating that the effects of STARA awareness on psychological contract breach are greater among employees with lower levels of perceived job complexity, nor that the effects of STARA awareness on psychological contract breach is weaker among employees with higher levels of perceived job complexity. This model also does not support (H3), stating that the effects of STARA awareness on psychological contract breach are moderated by employee resilience, such that the relationship is stronger for individuals with lower levels of resilience and stronger for individuals with lower levels of resilience. Finally, this model also does not support (H4) in that the influence of STARA awareness on psychological contract breach is moderated by employee self-efficacy, such that the relationship is stronger for individuals with lower levels of selfefficacy and weaker for individuals with higher levels of self-efficacy.

Below, Table 4.10 presents the results of hypothesis testing. This study did not find evidence to support the hypotheses stated above and, therefore, fails to reject the null hypotheses.

	Model 1	Model 2	Model 3	Model 4
Model 1: Controls				
Age	.007	.008	.009	.009
Gender	004	.010	019	.019
Years to Retirement	003	002	002	002
History of Layoffs (Y/N)	.135	.120	.114	.112
Organizational Tenure	016*	018*	.016	.016
Job Insecurity	.390**	.342**	.264**	.262**
Job Tenure	.782	$.774^{*}$.682	.684
Step 2: Independent Variable				
STARA Awareness		.113*	.115*	.117*
Step 3: Moderators				
Resilience			.083	.041
Self-Efficacy			.097	.006
Job Complexity			075	073
Step 4: Interaction Variables				
STARA Awareness * Resilience				.006
STARA Awareness * Self-				.030
Efficacy				
STARA Awareness * Job				.009
Complexity				
R^2	.132**	.143*	.154	.155
Adjusted R ²	.117**	.125*	.129	.123
ΔR^2		.011*	.011	.001
F	8.313**	7.945**	6.247**	4.892**
ΔF		4.793*	1.616	.087

 Table 4.10 Results of Hierarchical Regression Analysis

*Statistically significant at p <.05 **Statistically significant at p <.01

Table 4.11 Hypothesis Testing Summary

H1	STARA awareness will be positively associated with a perceived breach of psychological contract.	Supported
H2	The effects of STARA awareness on psychological contract breach are greater among employees with lower levels of perceived job complexity; alternatively, the effects of STARA awareness on psychological contract breach are weaker among employees with higher levels of perceived job complexity.	Not Supported
H3	The effects of STARA awareness on psychological contract breach are moderated by employee resilience, such that the relationship is stronger for individuals with lower levels of resilience and stronger for individuals with lower levels of resilience.	Not Supported
H4	The influence of STARA awareness on psychological contract breach is moderated by employee self-efficacy, such that the relationship is stronger for individuals with lower levels of self- efficacy and weaker for individuals with higher levels of self- efficacy.	Not Supported



Figure 4.7 Summary of Hypothesis Testing

CHAPTER V: DISCUSSION & CONCLUSION

This chapter includes a discussion of findings from Chapter IV, along with detailing the limitations of this study. Suggestions for future research are provided, as well as overall conclusions.

5.1 Overview

The objectives of this study were multipurpose. First, this paper sought to provide a comprehensive review of Psychological Contract Theory and PCB. Since psychological contracts are held within any relationship where an exchange is taking place, I specifically focused on psychological contracts between employees and employers within the employee-employer relationship. I sought to understand the literature on smart technologies and psychological contracts by reviewing the literature on previous technology advancements, specifically focusing on their disruptions, and then transitioning to smart technologies such as AI and robotics, i.e., STARA. Second, individuals have highly effective coping mechanisms that can be leveraged during hardships such as career or job disruption. Therefore, this study sought to understand the influences of different levels of self-efficacy and resilience on the relationship between STARA and PCB. Since context is important, this study also contextualized these interactions within the employee's job by considering the impact of job complexity on the primary relationship examined.

The interaction between worry due to smart technologies within the employee-employer relationship, as well as its influences on job attitudes, outcomes, and behaviors continues to be critically important. Psychological Contract Theory and its antecedents, mechanisms, and outcomes will continue to be an important component of the employee-work relationship. PCT conceptualizes impactful dynamics within the employee-employee relationship that can have

reverberating effects on employee expectations, job satisfaction and engagement, turnover intent, and conflict resolution due to organizational changes (Topa & Palaci, 2004; Bal et al., 2008). Technology also continues to impact society, industry, organizations, and individuals in a multitude of ways, both positively and negatively. On the one hand, technology has been a driver of employee well-being, ease of experience, job satisfaction, and commitment and loyalty to one's organization (Topa et al., 2008; Kutaula et al., 2020). On the other hand, technology has also increased job demands and created resource scarcity (Carson et al., 2017), causing concerns for job insecurity as organizations restructure and downsize (Kang et al., 2023) while also creating a more alienated workforce due to telecommuting and other virtual platforms (Braganza et al., 2020). Given the fundamental function of the employee-employer relationship in our society and the criticality of the relationship within an individual's life, this field of research remains valuable as the goal continues to be understanding the dynamics and interplay between two important domains - psychological contracts and technological influences. Therefore, if technology continues to advance, understanding its interaction with this fundamental employeeemployer relationship will continue to be a growing and dynamic field. The important role of self-efficacy and resilience in overcoming hardships. Job design by HRM and job crafting by employees with change in mind are important. The following discusses the results of these objectives.

5.2 Research Findings

5.2.1 STARA Awareness & PCB

PCB is the cognitive experience of recognizing a disruption in the exchange of obligated responsibilities to and from the employee; as such, when employees perceive their employer to fail in fulfilling their responsibilities, a breach is observed, including adopting technology that may disrupt career planning and the job environment. This research was situated within Psychological Contract Theory, a framework for understanding the mechanisms within any exchange relationship, such as the employee-employer, professor-student, and doctor-patient relationship. Within this context, this research explored the potential impact of technologydriven job insecurity (STARA Awareness) on psychological contracts. Previous studies demonstrate a relationship between STARA and turnover intention and job engagement (Brougham & Haar, 2018; Wright & Schultz, 2018). Other studies found that the perceived threat of technology-based disruption has a positive relationship with turnover intentions mediated by job insecurity. As perceptions of these threats increase, so do levels of job insecurity, the outcome of which includes turnover intent. Other studies assessed the moderating roles of STARA and turnover intent, including the role of perceived organizational support and level of competition within the workplace (Li et al., 2019). In line with the literature, this study found evidence to support a direct effect of STARA awareness on psychological contract breach. Results demonstrated that STARA awareness accounted for 14% of the variance occurring in PCB, $(R^2 = .143, p < .05)$.

5.2.2 Job Insecurity

Results demonstrated a statistically significant regression coefficient for job insecurity, β = .390, p < .001. Job insecurity is also correlated with PCB, r = .326, p < .001. As job insecurity increases so does PCB. Similarly, STARA awareness is positively correlated with PCB, r = .218, p < .001. As STARA awareness increases so does PCB. Due to the similarities between STARA awareness and job insecurity, I controlled for job insecurity in order to assess the degree of worry that can be attributed to STARA technology. By controlling for general job insecurity, it removes the degree of worry from STARA awareness that may be attributed to non-technology

reasons. This is likely why the correlation and effect of STARA awareness is much lower than job insecurity. Job insecurity includes numerous drivers besides technology, e.g., economic conditions and firm performance.

5.2.3 Resilience & Self-Efficacy

Regarding intrinsic coping mechanisms – Resilience and Self-Efficacy – this research did not support the moderating effects of either construct. King (1997) found self-efficacy and resilience as coping mechanisms due to the enablement of individuals to adapt and pivot during hardships, as well as due to their internal locus of control (King, 1997). Lyons et al. (2015) found that both self-efficacy and resilience give the utility to enable individuals to overcome jobrelated stressors (Lyons et al., 2015; Yang & Danes, 2015). The component of positive affect within self-efficacy spurs motivation and confidence (Bandura, 1997; Keye & Pidgeon, 2013), potentially reducing the impact of negative effects (e.g., STARA Awareness) and PCB. However, the data presented in this study failed to demonstrate significance to support this theory.

5.2.4 Job Complexity

While resilience and self-efficacy represent intrinsic tools available to individuals to affect internal regulation (e.g., emotional stability and internal control), job complexity represents how extrinsic environments may impact these relationships. Artificial intelligence and robotics have long since targeted low-skill, repetitive job tasks for automation (Bhargava et al., 2020). Employees who perceived their job as being very low in complexity could be more vigilant in identifying breaches and fulfillment of PCs, i.e., ensuring or seeking out training and development to safeguard their own personal job mobility and employability. Additionally, employees in low-complex roles may face heightened sensitivity to the adoption of technology with the functionality to automate job tasks. Despite other research demonstrating the importance of job complexity within the context of trust and technology, the research findings presented in Chapter 4 do not support (H2).

5.2.5 Overall Findings

As stated above, this study found support for the main effect (H1) and did not support the moderating variables contained therein, i.e., H2, H3, and H4. Job insecurity brought on by technology can be observed as employers reneging upon employee perceived obligations.

However, results of this study did not support with statistical significance H2, H3, and H4, perhaps due to the dynamism of psychological contracts. Breaches of psychological contracts are transient in nature, change over time, vary in intensity, and can often be brief (Rosseau et al., 2018). Since there is no way to control the recency of these moments, respondents may have difficulty recalling work arrangements where disruptions took place. This may have reduced the variability in responses in STARA awareness, requiring a larger sample size to identify a smaller effect.

Regarding resilience, perceived resiliency is considered both a trait and a state. The Brief Resilience Scale measures resilience over time (Jefferies, 2021). Trait resilience can change over time such that individuals may be more or less resilient at the time of answering this study than when the PCB occurred. This study asks participants to recall a current, or their most recent, work arrangement and the degree to which their employer delivered on their perceived obligations. Since this study could not control the recency of PCB, the level of trait resilience may have changed since the PCB occurred.

Similarly, perceived self-efficacy can change over time depending on a number of factors, including whether the outcomes an individual is working to transpire due to their efforts

(Bandura, 1977). Similar to that of resilience, levels of perceived self-efficacy may have been higher at the time of the actual PCB.

Additional studies on smart technology, artificial intelligence, robotics, and algorithms are still in dire need. Disruption can have a sizable effect on employee-employer relationships both on an economic level and on a socioemotional level. Of particular interest is the effects of AI on the employee experience during implementation.

5.3 Limitations

It is important to recognize and address the limitations of this study. First, data was collected from a single source and with the same instrument. This increases the probability of common method bias. Common method bias refers to the bias that is possible due to collecting data from one source or from collecting data from multiple sources but using only one instrument (Chin et al., 2012).

An additional limitation of this study is the transitory nature of PCB. Psychological contract breaches are short-lived experiences during which individuals enter into a repair or renegotiation phase. It is possible that due to the short duration of these lived experiences, the effects of PCB are not as readily on the surface and able to be recalled. Individuals may have already reconciled with their employers; thus, this study may require a higher sampling size to identify a lower effect.

A third limitation involves the control variables. Job insecurity has been found to be an antecedent of PCB (Ma et al., 2019). Both job insecurity and STARA awareness are measurements of worry (Brougham and Haar, 2018). By controlling for job insecurity, a key component of STARA awareness is being controlled, limiting the effect of the IV (STARA awareness) on the DV (PCB), along with interaction effects. It is possible that the effects of

STARA awareness on PCB are mediated by job insecurity. Additionally, regarding the demographics for which the study controlled, adding socioeconomic status and level of education may have provided additional insights.

Lastly, job complexity was measured using four items with a Cronbach's Alpha of 0.651. Unfortunately, there were no items that could be removed to increase reliability.

5.4 Future Research

Future research should continue to explore the role of disruptive technology in employees' sentiment toward their employer. Specifically, organizational identification is an important psychological underpinning in the workplace. Organizational identification (OID) represents the degree to which employees internalize the goals, values, and norms of the organization. As those goals and values are internalized, employees can feel a stronger sense of belonging and loyalty and experience less PCB (Zagenczyk et al., 2013). OID also can play a role in psychological contract saliency. Employees with higher levels of OID can experience stronger PC saliency and have a greater internalization of the promises, expectations, and obligations of their employer (Cassar & Briner, 2011). This may make employees sensitive to disruption. OID may also diminish negative affective responses as those with higher levels of OID seek to conform to organizational standards, i.e., matching prototypical values, attitudes, and behaviors (Hornsey, 2008).

While the moderating effects hypothesized in this study were not supported with significance, additional research might find more interaction through a qualitative research method. Qualitative studies allow for more exploratory research when studying new phenomena. The effects of newly emerged AI-based technologies, such as Generative AI, may be better explored by contextualizing questions and adding subjective and personal perspectives that explore employee beliefs, attitudes, and perceptions. Additionally, a mixed method approach with a more robust sampling frame and larger sample size may also find different results.

Lastly, additional research may consider the role of general job insecurity when considering STARA awareness. As a metric of worry, controlling for perceived job insecurity was a major limitation. Changing where this measure is within the model may generate different results.

5.5 Conclusion

This dissertation assessed the influence of technology-driven job insecurity and employability concerns while also considering the implication of internal resources – resilience and self-efficacy – and external influences, such as job complexity. A thorough literature review demonstrated more empirical research is needed to understand individuals' sentiments toward emerging technology, which has been predicted to disrupt industries, organizations, and society. Results supported the effect of STARA awareness upon PCB. While the moderating hypotheses are not supported, this paper provides a different perspective on STARA awareness as a metric of worry regarding technology and psychological contracts. Nonetheless, despite the rapid advancement of technology, people will remain to be the most important asset of any organization. For that reason, much focus should be given to the promises made, broken, and kept within and beyond work relationships to ensure the well-being of employees and their managers and to affect a thriving, technology-rich society.

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APPENDIX A: CONSENT FORM



Consent to Participate in a Research Study

Title of the Project: The effects of smart technology on employees: The moderating role of resilience, self-efficacy, and job complexity Principal Investigator: Curtis Pollard, Doctoral Candidate, UNC Charlotte Faculty Advisor: Dr. Laura Stanley, Faculty Advisor

You are invited to participate in a research study. Participation in this research study is voluntary. The information provided is to help you decide whether or not to participate. If you have any questions, please ask.

Important Information You Need to Know

- The purpose of this study is to explore the relationship between perceptions of smart technologies and employee experiences.
- You will be asked to complete an online survey.
- If you choose to participate, it will require 10-15 minutes of your time.
- The only potential risk is a breach of confidentiality due to a data breach. This is rare.
- There are no anticipated risks or discomfort because of this survey.
- There is no direct benefit to participants for responding to this survey.
- Societal benefits of this research include providing empirical research focused on the individual sentiment and the adoption of smart technologies and psychological contracts
- This study will also provide business leaders with a greater understanding of how employees may view technological advancements and their impact on career planning.
- Societal benefits include providing organizations and people managers with a better understanding of the potential adverse effects of implementing smart technologies that may disrupt career planning.
- If you choose not to participate, you need only not to take the survey.

Please read this form and ask any questions you may have before you decide whether to participate in this study.

Why are we doing this study?

The purpose of this study is to explore the relationship between how employees perceive smart technologies such as artificial intelligence and automation, with employees' experiences.

Businesses that adopt artificial intelligence, automation, and other smart technologies may disrupt career longevity, job environments, and future career opportunities. Researchers have studied how artificial intelligence can impact business' performance, but little research has been done to assess the impact of perceptions of artificial intelligence on employees. Therefore, this research will contribute to how researchers and businesses approach smart technologies like artificial intelligence in order to bring them into the workplace.

Why are you being asked to be in this research study?

You are being asked to be in this study because you have been identified as someone who is 18 years or older and has been employed by a United States-based business or organization.

What will happen if I take part in this study?

If you choose to take part in this study, you will complete a 10–15-minute online survey related to how you feel regarding smart technologies, including artificial intelligence, automation, and robotics within the workplace, and how you feel about your employer investing in the adoption of such technologies.

What are the benefits of this study?

Benefits to participants in this study may include increased awareness of smart technologies and ways by which to approach adverse changes within the workplace. Societal benefits of this study include providing employers and people managers with an increased understanding of employee perceptions regarding smart technologies and their perceived impact on career planning.

What risks might I experience?

There are no anticipated risks to participants as a result of this survey.

How will my information be protected?

We will do our best to keep study data safe and confidential, but we cannot make any absolute promises. We will protect the data in the following way:

To protect your privacy, your identifying information will not be collected as a part of this survey. You will not be identified in any publication from this study and your responses and data will never be identifiable.

How will my information be used after the study is over?

We might use the survey data for future research studies, and we might share the non-identifiable survey data with other researchers for future research studies without additional consent from you.

Will I receive an incentive for taking part in this study?

Participants eligible for an incentive are those that receive this invitation from Prolific membership system for survey respondents. Eligible participants can expect an incentive in the amount of \$5. Participants will only be able to receive this incentive if they are 18 years or older,

are have been employed by a U.S.-based business or organization, and complete the survey in its totality. If the participant stops the survey at any time or does not complete the survey in its entirety, no incentive will be given.

What are my rights if I take part in this study?

It is up to you to decide to be in this research study. Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. If you do change your mind and stop this survey, no data will be submitted from this survey and will not be used in this research.

Who can answer my questions about this study and my rights as a participant?

If you have questions concerning the study, contact the principal investigator, Curtis Pollard, Doctoral Candidate at (704) 572-0276 or by email at cepollar@charlotte.edu, or contact the faculty advisor, Dr. Laura Stanley at (704) 687-7682 or by email at lstanl11@charlotte.edu. If you have further questions or concerns about your rights as a participant in this study, contact the Office of Research Protections and Integrity at (704) 687-1871 or uncc-irb@charlotte.edu.

Consent to Participate

By selecting "accept and proceed with the survey", you are agreeing to be in this study. Make sure you understand what the study is about before continuing on in this survey. If you have any questions about the study after moving forward in this survey, you can contact the study team using the information provided above.

If you are 18 years of age or older, have read and understand the information provided and freely consent to participate in the study, you may proceed to the online survey.

APPENDIX B: SURVEY

Do you have work experience at a United States-based organization?

- Yes and proceed with the survey
- O Reject survey request

Smart Technology, AI, robotics, and algorithms (STARA) are expected to change some workplaces and jobs within the next 10 years. Thinking of your current job, please answer the following questions:

I think my job could be replaced by STARA

O Strongly Disagree

○ Disagree

O Neither agree nor disagree

O Agree

O Strongly Agree

I am personally worried that what I do now in my job will be able to be replaced by STARA

O Strongly Disagree

O Disagree

- O Neither agree nor disagree
- O Agree

I am personally worried about my future in my organization due to STARA replacing employees

O Strongly Disagree

Disagree

O Neither agree nor disagree

○ Agree

○ Strongly Agree

I am personally worried about my future in my industry due to STARA replacing employees

O Strongly Disagree

O Disagree

O Neither agree nor disagree

○ Agree

○ Strongly Agree

In the employee-employer relationship, there is an implied agreement to exchange labor (employee's work) for goods and services (for example, compensation, benefits, and development) from the employer. Please complete the following section to indicate your feelings toward how this agreement has been fulfilled in light of your employer investing organizational resources in artificial intelligence and automation.

Almost all the promises made by my employer during recruitment have been kept so far.

O Strongly Disagree

O Disagree

O Neither agree nor disagree

○ Agree

○ Strongly Agree

I feel that my employer has come through in fulfilling the promises made to me when I was hired.

○ Strongly Disagree

○ Disagree

 \bigcirc Neither agree nor disagree

○ Agree

○ Strongly Agree

So far my employer has done an excellent job of fulfilling its promises to me.

○ Strongly Disagree

O Disagree

○ Neither agree nor disagree

○ Agree

O Strongly Agree

I have not received everything promised to me in exchange for my contributions.

Strongly Disagree
Disagree
Neither agree nor disagree
Agree
Strongly Agree

My employer has broken many of its promises to me even though I've upheld myside of the deal.

O Strongly Disagree

O Disagree

○ Neither agree nor disagree

○ Agree

○ Strongly Agree

My employer has broken many of its promises to me even though I've upheld my side of the deal.

O Strongly Disagree

○ Disagree

 \bigcirc Neither agree nor disagree

○ Agree

The following section will ask questions about how you perceive yourself.

I will be able to achieve most of the goals that I have set for myself.

O Strongly Disagree

○ Disagree

- Neither agree nor disagree
- Agree

○ Strongly Agree

When facing difficult tasks, I am certain that I will accomplish them.

\bigcirc	Strong	ly D	isagree
<u> </u>	~	5 -	12.09.00

○ Disagree

\bigcirc	Neither	agree	nor	disagree
\sim	1 vortiner	agree	1101	aibagiee

○ Agree

In general, I think that I can obtain outcomes that are important to me.

○ Strongly Disagree

O Disagree

O Neither agree nor disagree

○ Agree

O Strongly Agree

I believe I can succeed at most any endeavor to which I set my mind.

Strongly DisagreeDisagree

O Neither agree nor disagree

O Agree

I will be able to successfully overcome many challenges.

○ Strongly Disagree

O Disagree

O Neither agree nor disagree

○ Agree

O Strongly Agree

I am confident that I can perform effectively on many different tasks.

O Strongly Disagree

○ Disagree

O Neither agree nor disagree

○ Agree

Compared to other people, I can do most tasks very well.

O Strongly Disagree

O Disagree

O Neither agree nor disagree

O Agree

○ Strongly Agree

Even when things are tough, I can perform quite well.

O Strongly Disagree

O Disagree

O Neither agree nor disagree

○ Agree

The following section will ask you questions concerning characteristics related to your job. If you are currently not working, please use your most recent work experience to answer.

I receive tasks that are extraordinary and particularly difficult.

O Strongly Disagree

O Disagree

○ Neither agree nor disagree

○ Agree

O Strongly Agree

I often have to make very complicated decisions in my work.

Strongly Disagree
Disagree
Neither agree nor disagree
Agree

I use all my knowledge and skills in my work.

○ Strongly Disagree

O Disagree

○ Neither agree nor disagree

○ Agree

O Strongly Agree

I can learn new things in your work.

○ Strongly Disagree

O Disagree

○ Neither agree nor disagree

O Agree

The following section will ask questions about how you perceive yourself.

I tend to bounce back quickly after hard times.

O Strongly Disagree

○ Disagree

- Neither agree nor disagree
- O Agree
- Strongly Agree

I have a hard time making it through stressful events.

O Strongly Disagree
O Disagree
O Neither agree nor disagree
O Agree
O Strongly Agree

It does not take me long to recover from a stressful event.

○ Strongly Disagree

O Disagree

O Neither agree nor disagree

○ Agree

O Strongly Agree

t is hard for me to snap back when something bad happens.

○ Strongly Disagree

O Disagree

O Neither agree nor disagree

O Agree

I usually come through difficult times with little trouble.

O Strongly Disagree

O Disagree

 \bigcirc Neither agree nor disagree

○ Agree

○ Strongly Agree

I tend to take a long time to get over set-backs in my life.

O Strongly Disagree

O Disagree

O Neither agree nor disagree

○ Agree

The following section asks questions about yourself. Please answer the following:

How certain are you about what your future career picture looks like?

O Very Uncertain

O Uncertain

○ Neither certain or Uncertain

O Certain

O Very Certain

How certain are you about whether your job skills will be of use and value five years from now?

O Very Uncertain

O Uncertain

\bigcirc	Neither	certain	or	Uncertain

O Certain

O Very Certain

How certain are you that opportunities for promotion and advancement will exist in the next few years?

What is your current age?	
O Very Certain	
○ Certain	
O Neither certain or Uncertain	
○ Uncertain	
O Very Uncertain	
How certain are you about what your responsibilities will be six months from now?	
O Very Certain	
O Certain	
O Neither certain or Uncertain	
○ Uncertain	
O Very Uncertain	

With regard to your most recent employment, how many years have you worked in that specific job?

With regard to your current employment, how many years have you worked in that specific job? If you are currently not working, please answer based on your most recent job.

O Employed full time

O Employed part time

O Unemployed looking for work

O Unemployed not looking for work

O Retired

O Student

O Disabled

○ Employed, temporary worker

How many years do you have until you expect to retire? If you are already retired, please enter, 'Retired."

How many years has it been since your company's last round of layoffs? If you are unsure, please write "Unsure."

What is your gender?

○ Male

○ Female

 \bigcirc Non-binary / third gender

○ Transmale

○ Transfemale