



Exploring the impact of cognitive load on employee commitment, productivity, and work life balance in women centric industries in Bangladesh

Md Jahidur Rahman

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Rahman, Md Jahidur

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Abstract

The management of cognitive load in organizational settings were studied in relation to employee commitment (EC), productivity (P) and work life balance (WLB) with an objective to assess factors exerting influence on cognitive load and whether gender differences in these dynamics exist. Theorization was based on organizational behavior and stress theory, wherein evidence from previous studies has been recognized connecting WLB and EC to employee well-being. The quantitative method was used; through SEM, survey data were analyzed from 201 employees, disaggregated by gender: males (N = 41), females (N = 159) and prefer not to say(N=1).

Primarily, findings indicated that WLB ($\beta = 0.654$) and EC ($\beta = 0.461$) were predictor variables for CL, while P was not significant. Gender differences were observed, with females having a stronger WLB/EC-CL relationship; meanwhile, the male model was inadmissible due to poor fit. Covariance analyses display strong inter-correlations between WLB, EC, and P ($r = 0.552-1.195$). Nevertheless, the indicated negative error variances may point toward model misspecification. It evidenced that organizations need to focus, from a WLB and EC perspective, on reducing cognitive load, noting, however, that the approaches should be targeted into gender subgroups. Future research should tackle the limitations of this model and consider other cross-industry and cross-cultural contexts

Keywords/tags (subjects)

Work-life balance, employee commitment, cognitive load, productivity, structural equation modeling, gender differences.

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1 Introduction

In today's rapidly evolving work environment, cognitive load plays a significant role in shaping employee performance and overall organizational success. Its impact has received significant attention in academic circles, particularly within the framework of Cognitive Load Theory (Sweller, 2011). While substantial insights have been gained in educational settings, there is a noticeable gap in applying these insights in professional environments, especially those focused on female employees. This study aims to address this gap by exploring how cognitive load influences commitment and performance and work life balance in organizations that prioritize female employees.

1.1 Background

Aside from the sizeable cognitive load, which includes extra pressures that women contend with while avoiding the imbalance towards work-life integration due to balancing financial lows and emotional hard knocks, establishing a commitment to any organization and potential productivity may be lowered (Beckmann, 2010). According to the work cited, women in demanding jobs often have excess cognitive load, resulting in absenteeism, low job satisfaction, and a lack of efficiency (Aycan, 2004; Greenhaus & Beutell, 1985).

This study will focus on the cognitive load-related issues of employee commitment and total productivity in operational workplaces with a sizable proportion of women workers. Studies have established that women working in such settings frequently struggle against several challenges, such as striking a balance among work, personal responsibilities, and household chores, which all contribute to increasing levels of cognitive load (Haar et al., 2014). These challenges are associated with lower engagement levels, increased absenteeism, and decreased performance (Aycan, 2004; Greenhaus & Beutell, 1985).

The research is grounded in operations, including the industries of manufacturing, logistics, and service-oriented roles. In these settings, the operational environments create tremendous pressure, have highly repetitive tasks, and place paramount importance on performance. More so, for those industries that consider women niches, they act as both professionals and housekeepers; therefore, a great deal of work is from the home front to them in these operational sectors (Beckmann, 2010).

The subject organization is a mid-sized operational company with a predominately female employee base. Even with the available support programs, issues such as the imbalance of workload, decision fatigue, and conflicts between work and personal life have resulted in employee well-being and productivity becoming an area of concern. In the company, absenteeism has been increasing, and levels of commitment have decreased, thus warranting further investigation into the relationship between cognitive load and performance at work. Comprehending cognitive load implications in that environment will allow for well-targeted interventions geared towards enhancing employee productivity and well-being. Research indicates that organizations that provide work-life balance programs, support mental health well, and provide flexible working options will find a real solution towards alleviating this cognitive overload (OECD, 2020).

This study seeks to fill the research gaps by factoring in cognitive load in female-centered operational environments and recommending ways to enhance employee engagement, productivity and work life balance. The study considers interventions such as flexible working, mental health support, and workload management that may provide workable solutions for the organization and the industry (OECD, 2020).

1.2 Motivation for research

In today's workplace, cognitive load plays a crucial role in determining employee performance and organizational success and long-term sustainability. Cognitive load refers to the mental effort required to perform a task, with excessive cognitive load negatively impacting commitment, efficiency, and decision-making processes (Sweller et al., 2011). This issue becomes more pronounced in dynamic workplaces with a significant presence of female employees, who often balance work, personal responsibilities, and domestic tasks (Haar et al., 2014). Effectively managing cognitive load is essential in high-stress, real-world settings (BMC Medical Education, 2024). This study is motivated by observations within a particular organization that has experienced the consequences of failing to balance these demands, affecting both absenteeism and overall productivity. It is imperative for addressing cognitive load for fostering sustainable workforce, long term employee well-being and maintaining operational efficiency.

The professional experience as HR specialist in the operational industry serves personal motivation to investigate how cognitive load affects employee engagement, productivity, and work life balance

in women centric operational settings. The inability of female employees to regularly fulfil their production obligations was a persistent problem during the length of service, which consequently affected the total productivity and sustainability of the organization. Working with welfare counselors who emphasized the different aspects of cognitive load these workers experience, such as emotional, mental and decision-making difficulties, increased interest in comprehending the causes of this phenomena (Sweller, 1988). As a professional, it was frequently tasked with addressing workforce issues and safeguarding the welfare of employees, which forced one to address the particular difficulties experienced by women in the operational sector. The demanding nature of their work, financial crises, marital issues, and juggling personal and professional obligations were the main causes of many of these stresses (Aycan, 2004). This insight motivated me to learn more about how cognitive load impacts employees' capacity to stay dedicated and productive, particularly in businesses that prioritize women. The results of this study may help develop methods for reducing cognitive load, enhancing dedication, and maximizing output, which would make the workplace more encouraging and welcoming for women. This research is not only an academic endeavor but also a personal mission to address an issue that encountered firsthand in service career, with the hope of contributing to meaningful organizational change.

Societally, enhancing women's productivity in the workplace is crucial for advancing gender equality and economic growth (OECD, 2020). From an operational perspective, understanding the dynamics between cognitive load, employee engagement, and productivity can offer valuable insights for sectors predominantly staffed by women. For the organization in focus, this research could provide actionable strategies to improve employee engagement and reduce turnover, fostering a more cohesive and productive team environment. This study is driven by a commitment to deepen the understanding of how businesses can better support their female employees in maintaining productivity and well-being amidst the challenges of balancing work and personal life, focusing to sustainable workforce.

1.3 Research objectives and questions

The primary concern of this study is the adverse effects of high cognitive load on employee commitment, productivity and work life balance, especially in operational workplaces with a high proportion of female employees. Despite the availability of support and resources, the dual pressures of

work and home responsibilities can lead to cognitive overload, diminishing engagement, increasing absenteeism, and causing underperformance (Beckmann, 2010).

This study's main goal is to investigate the relationship between cognitive load and worker commitment and output. This study specifically attempts to:

- Examine the connection between cognitive load and productivity in a workplace that prioritizes women.
- Examine the relationship between cognitive load and employee commitment.
- Examine the relationship between cognitive load and work life balance.

Based on these objectives, the main research question is:

- How does cognitive load impact on employee commitment, productivity and work life balance in women centric industries in Bangladesh?

This question is concerned with possible solutions for organizations, measuring the effectiveness of interventions in terms of flexible work solutions, mental health support, workload management strategies, and cognitive training programs. The analysis will consider their applicability, sustainability, and potential unintended consequences to provide a nuanced understanding of the impact of employee well-being and performance.

Sub-questions include:

- What are the primary sources of cognitive load for female employees in an operational environment?

The question emerges from a central problem concerning cognitive overload causing performance and engagement deficits among female employees. Analyzing the above situation enables one to comprehend better how cognitive load manifests in work behaviours, decision-making, and productivity. The subsequent answers focus on uncovering underlying variables, possible mediation variables, and their overall impact on organizational workplace outcomes and sustainability.

- What interventions can help mitigate the effects of cognitive load and enhance productivity?

The analysis of this relationship will enable one to determine whether high cognitive demands lead to low productivity and job satisfaction or whether specific coping strategies and organizational

buffers can counterbalance the negative consequences of these demands. This study will examine cognitive overload, its effect on decisions, emotional robustness, and career participation within organizations that promote women's interests.

To answer the research questions above, the study will implement quantitative methods of research design. Quantitative data will come from the use of structured surveys targeting employees working in women-focused organizations.

1.4 Structure of the thesis

In the second chapter, the literature on cognitive load theory is reviewed systematically, paying particular attention to its effects on employee commitment, productivity, work-life balance, and gender. The section closes with the formulation of appropriate hypotheses. The discussion in the third chapter deals with research methodology, including samples, data collection methods and descriptions of the variables. Subsequently, the findings are summarized and presented in the results chapter. Lastly, in Chapter 5, a discussion of the major findings in relation to the research questions is presented that leads to consequences for practice, an acknowledgment of the study limitations, and recommendations for future research.

2 Literature review

This chapter systematically reviews previously conducted studies on how cognitive load affects employee commitment and overall productivity in women-centric operational workplaces. The literature review is done through various databases like the Jamk Library (Janet), ScienceDirect, Google Scholar, and ResearchGate. Articles with the highest citation counts verified by Google Scholar have been solicited. The key search terms included in the databases include Cognitive Load Theory (CLT), Employee Commitment and Productivity, Work-Life Balance, and Gender-Specific Cognitive Load. It summarizes the history of CLT, defines the three subcategories of CLT: intrinsic load, extraneous load, and germane load, and provides an overview of related theories. This chapter elaborates on the cognitive load theory, which deals with its effect on employee commitment and productivity, work-life balance, and its implications in gender-specific terms. The empirical literature section syn-

theses findings on the relationship between cognitive load theory and the effects on the above aspects, focusing on gender-specific impact. Finally, the chapter highlights research gaps and provides hypotheses formulated for the study.

2.1 Conceptual framework

2.1.1 Cognitive load theory

The ideas under CLT were brought forward by Sweller in 1988. This theory is all-grounded in what we know regarding the cognitive architecture of human beings; working memory has limitations, while long-term memory has virtually unlimited storage capabilities, as noted before (Sweller, 1988). The theory then is based on the interaction of both systems but with these main points: the construction of schemas and their automation of inefficient learning and problem-solving (Sweller, 2010). In carrying out tasks, people apply their cognitive resources according to the complexity and novelty of incoming information. As such, an excessive cognitive load would be debilitating effective decision-making in task performance. CLT transcends educational confines as it provides understanding in other areas like workforce training, where it is important to understand how cognitive load is interplayed with task demands. It identifies three categories, intrinsic, extraneous, and germane, influencing the learning process according to their interaction in the working environment (Sweller, 2010).

Intrinsic load: It is the inherent difficulty of a task or content. It is determined by the amount of information presented and the learner's proficiency (Sweller, 2010). For instance, an individual who starts learning algebra will be found to carry a higher intrinsic load than an expert when solving the same equations due to differences in the availability of schemas.

Extraneous load: The present mechanism under which learners will be affected by their learning environment and methods that have been poorly designed will be irrelevant instructional materials or poorly structured materials as burdensome inputs that would increase the extraneous load, inhibiting learning (Chandler & Sweller, 1991).

Germane load: Such preserved cognitive sources would have to be dedicated to affecting resource disbursements towards a schema design and quality scheme automation. A well-designed instructional strategy would promote germane load, thus lowering extraneous load while optimizing intrinsic load (van Merriënboer & Sweller, 2005).

CLT significantly impacts workplace training, task design, and organizational efficiency. Research has highlighted the following applications:

Training design and delivery: According to the principles of CLT, the extraneous load should be minimized, and the germane load should be maximized in workplace training. For instance, work examples and information segmentation can facilitate employees' understanding of complex systems (Kalyuga, 2009). Moreover, interactive simulations and real-world problem-solving tasks can aid schema construction. These load types help educators create instructional materials to optimize learning conditions (Aburayash et al., 2019). Therefore, research shows that students' cognitive load management mechanisms are dynamic with the progress they make up the educational ladder, whereby every level of development requires a new instructional strategy (Garvey et al., 2017). Thus, the basis from which CLT descends is found in an efficient problem-solving environment for students, largely dependent on the teachers' vision for their classrooms regarding what constitutes effective engagement and application of the information in decision-making, which ultimately carries benefits for education as a whole (Garvey et al., 2017).

Task design: Cognitive load affects not just task design and performance but applies most especially in high-pressure conditions such as crisis management (Cotton et al., 2017). Overloading information can lead to impaired decision-making, biases, and bad performance for the individual. In virtual collaboration environments, for example, seeing one's image during video calls can result in lower team effectiveness and reduced individual satisfaction, as indicated by research based on Objective Self Awareness theory, which points out the possible drawbacks of self-observation in these settings (Cotton et al., 2017). Research proves that in an era of high information overload and short deadlines, effective information presentation reduces cognitive overload and improves decision quality. Those who apply modality principles and enhance perceptual and cognitive load, which facilitate work processes in complex situations, further utilize cognitive resources more effectively and improve task performance (Cao et al., 2008).

Decision making under pressure: Decision-making under pressure will significantly affect an individual's well-being and speed of processing information. During a crisis or stressful situation, an individual begins to experience cognitive overload, which may often cause an individual to focus narrowly, as in tunnel vision (Cao et al., 2008). This increased restriction of perception often leads to misinterpretation, resulting in poor quality decisions, more evident in situations relating to crisis management, in which the correctness of the situation is vital (Cao et al., 2008). Moreover, the hindrance that comes with the inability to process complex information, for example, when reviewing CCTV footage, may create an environment for ineffective decision-making where distraction and cognitive overload affect performance (Hillstrom et al., 2008). These obstacles create a recognition of cognitive limits and the development of systems that help relieve overload to improve the fairness of decisions made in decision-induced high-pressure situations (Miller, 2020). A well-managed cognitive load enhances the speed of task execution and the accuracy of task performance. Cognitive load theory has applications in crucial emergency response or health settings, whose main aspects enhance both speed and precision in decision-making by either trimming off unnecessary information or facilitating decision-making processes (Miller, 2020). For example, standards and checklist use may reduce extraneous load and allow professionals to concentrate on the most important aspects of their service.

Technology integration: However, in modern workplaces, there is a good indication that CLT has a role in the design of digital tools and e-learning platforms. For instance, applying adaptive learning systems that dynamically adjust content complexity based on user performance can be taken as the evident practical application of CLT principles in improving workplace learning outcomes (de Jong, 2010). Another example, innovative information visualization techniques such as sparklines have been shown to reduce cognitive load and improve decision-making performance. By making prominent one or two important pieces of information while avoiding biases, such as recency bias-wise, sparklines help to prevent cognitive load that might otherwise tend to hinder financial analysis (Meheria et al., 2012). However, in virtual communication circumstances, the employment of an individual's image may exhibit cognitive overload and deteriorate regular team interactions, resulting in poorer performance and dissatisfaction (Cotton et al., 2017). So, this connection established burdens on cognitive load and decision-making, which is now an excellent case for practice-based approaches in reducing the cognitive load to improve decision clarity and accuracy across several situations. They should be appropriately structured according to employees' level of expertise; for

novices, this would be an overload, while more experienced would be bored with tasks that are too easy (Renkl & Atkinson, 2010).

Numerous empirical tests have confirmed several tenets of CLT but have raised issues with its application and generalizability. The foundations of experiments are on how reducing extraneous load through structured problem-solving affects improved learning outcomes (Chandler & Sweller, 1991). More recently, Ayres (2020) determined the impact of visual assistance and concluded that dual-modality presentations (e.g., text and images) reduce cognitive load and enhance retention. Some, however, argue that CLT oversimplifies the interrelationship of types of cognitive load and that it does not identify differences among individuals who learn (Kirschner et al., 2006). Furthermore, Moreno (2010) argues that there was insufficient evidence of whether intrinsic load interacts with germane load or vice versa. The static nature of the traditional CLT model has also been criticized for lacking in its explanation, dynamic environments of learning, and motivational role (Seufert, 2020). Newer explorations in this area are emerging. One future study will include effective and motivational factors in CLT frames, as emotional states can strongly influence cognitive load management (Plass & Kalyuga, 2019).

2.1.2 Employee commitment and productivity

It is accessible in organizational behaviour literature with a complex conceptualization of organizational commitment. According to Meyer and Allen (1991), one of the most widely applicable frameworks for understanding commitment is the Three-Component Model (TCM). Under this construction, three dimensions are represented: affective commitment, continuance commitment, and normative commitment. Affective commitment indicates an emotional attachment of employees to their organization. The continuance commitment is based on the perceived costs of leaving the organization; it is an obligation for employees to remain based on the normative commitment. Relatedly, Mowday et al. (1979) developed the Organizational Commitment Questionnaire (OCQ), which focused more on attitudinal commitment. Thus, they defined commitment as a psychological state of having a strong belief in the goals and values of the organization, a willingness to exert considerable effort on behalf of the organization, and a desire to maintain membership in the organization. Becker (1960) side-bet theory is also significant; it defends progress or investments accumulated to connect employees and organizations. Social exchange theory (Blau, 1964) commits to all contexts learned about reciprocity between employees and employers.

Employee commitment and productivity, as critical variables that influence operational workplaces, determine the effectiveness and morale of the organization in producing results. Such levels of commitment will lower employee turnover rates while improving teamwork and increasing discretionary effort (Meyer et al., 2002). Podsakoff et al. (2009) did a research experiment on the mediating role of organizational citizenship behaviours (OCBs) in the relationship between commitment and productivity. Moreover, operational work environments are often turned down with specific challenges like high turnover, lack of qualified workers, and heavy physical duties. A highly committed employee is much less likely to show resilience and adaptability in such circumstances than one who waivers (Judge & Bono, 2001). The role played by organizational support and effective leadership has also been documented as critical in determining commitment and productivity (Yukl, 2013). Employee engagement improvement programs like training and development, recognition schemes, and work-life balance policies contribute to commitment and productivity. For instance, Bakker and Demerouti, (2007) demonstrate that job resources have a negative and significant effect on burnout while promoting engagement and, thus, productivity.

For a recent document, these theories have integrated previous views with new paradigms such as psychological contract theory (Rousseau, 1995), which focuses on implicit agreements made between employees and employers and self-determination theory (Deci & Ryan, 1985), where intrinsic motivation again played a role in the commitment. Measuring productivity and satisfaction is important for assessing the effect of organizational commitment. Typical productivity metrics usually include objective measures such as output per labour hour, revenue generation, and quality control measures (Kaplan & Norton, 1992). The balanced scorecard methodology consists of financial and non-financial metrics, making it the most popular method for evaluating productivity in operational workplaces. On the contrary, the measurement of the satisfaction of employees is found-making use of tools such as survey instruments like the Job Descriptive Index or JDI for short (Smith et al., 1969) as well as the Minnesota Satisfaction Questionnaire or MSQ (Weiss et al., 1967) measuring a specific area of job satisfaction itself-the work, pay, opportunity for promotion, supervision, and colleague relationship. Besides, subjective productivity measures such as self-assessment surveys and 360-degree feedback have been found to increase application in capturing employees' perceptions of their performance and contributions. A more comprehensive evaluative framework is thus provided with hybrid approaches that incorporate subjective and objective measures.

2.1.3 Work life balance

A work-life balance is a balance between work and personal life: family, spare time, and self-care activities. Achieving this balance is very important for individual well-being and organizational productivity. However, it has hurdles to balancing professional and domestic duties, which often have huge or, at times, all-gendered implications, particularly for women (Adjei et al., 2017).

This review systematically examines the gamut of professional and domestic responsibilities and their gendered implications for women. There has been an increase in women's participation in the workforce, but there is no corresponding increase in the sharing of family responsibilities. Therefore, even after similar professional involvement, women continue to spend more time on family activities than men (Adjei et al., 2017). This double burden increases stress and work-life conflicts for women (Gutek et al., 1991). Long working hours, inflexible hours, and high job demands worsen conflict. Frone et al. (1997) posited that these last three will likely engender work-life conflict between employee types. Added to this are the societal expectations and traditional gender rules that call on a woman to give up her career for the family, thus denying her some avenues for advancement into the professional arena (Boye, 2009).

Work life balance articulates the hallmark of the women-folk workforce as they try to shuffle the loads of gender occupying one's life - professional and personal construct (Frone et al., 1997). Besides, the juggle is not entirely about time management; it also encompasses emotional and psychological dimensions, which burden women more with well-being and job satisfaction (Boye, 2009). Research published shows that women face specific challenges, including discrimination in workplaces and expectations of caregiving, which can apply more pressure with restrictions on career movement. The importance of such workplace environments cannot and should not be measured: they will nurture a culture that will allow diverse and inclusive participation.

2.1.4 Gender specific cognitive load

There is a gender-specific cognitive load resulting in mental and emotional burdens, which can be unique for individuals in terms of their gender and social, cultural, and institutional influences (Spencer et al., 2016). The cognitive load decides how much emotional and psychological attachment

employees have to their work, especially in women-oriented operational workplaces where diverse lines and multitasking responsibilities induce significant cognitive load (Spencer et al.,2016).

Mental demands, when carried to a level crossing some optimum limits, lead to the distinct sensations of being "overwhelmed" at work and low job satisfaction, and keeping away from work, thus removing the commitment of an employee towards his organization (Allen et al., 2017). Studies have shown that workers operate at higher cognitive loads and, therefore, poor investments in emotional health and working conditions would ultimately lead to an inherent decrease in incentives and motivation for carrying out operations in such workplaces. As per the findings, this is most important in operational designs that thrive on mental health and well-being (Allen et al., 2017).

Furthermore, these cognitive problems require proper integrated workplace designs and management approaches to address them effectively (Spencer et al., 2016). Thus, it is important to develop an understanding of and means of managing cognitive load regarding employees' enhanced productivity in such environments.

Psychological and social influences unique to female employees:

Stereotyping threat is said to practically confirm empirical research evidence on performance studies as a basis for cognitive load extensively among female employees, especially in male-dominant industries. Spencer et al. (2016) disclosed that any conscious cognition of gender stereotypes affected the creation and attainment of tasks by a female as well as the efficiency of decision-making.

Within Work-Life Balance Challenges Research, women face an unusual mention of their over-mental load balancing between work and home responsibilities (Allen et al., 2017). An unequal division of caregiving assistance increases stress at work and home and reduces the chances of advancement in a career.

Intersectionality and Cognitive Load Intersectionality compounds cognitive load for women belonging to marginalized groups. Crenshaw's (1991) framework underscores how over-lapping identities, such as race and socioeconomic status, intensify psychological stress.

Workplace Dynamics and Interaction with Gender Roles:

Leadership perceptions and role congruity: As suggested by Eagly and Karau (2002) in Role Congruity Theory, an individual's cognitions could also be dissonant as the prejudices against women in leadership roles lead to a social-occupational incongruity, further heightening cognitive dissonance.

Microaggressions and organizational climate: Pierce et al. (2018) bring out microaggressions, one of the significant cognitive loads for women in workplaces. Microaggressions include various subtle forms of discrimination that bobble concentration and well-being effects.

Mentorship and support systems: Studies underscore the importance of formal mentorship programs in mitigating cognitive load (Ragins & Kram, 2007). Female mentorship provides role models and strategies for navigating gendered challenges.

2.2 Empirical literature

Conversing with both the different scenarios reveals that the educational settings emphasize cognitive development processes and lead to facilitation for long-term learning retention. In contrast, the professional ones aim at immediate, often high-pressure, problem-solving and decision-making techniques within which cognitive load management focuses on maximizing efficiency and accuracy everywhere.

Cognitive load plays a part in this theoretical compendium. For example, some research done by Lee and Kalyuga (2018) acknowledged that mitigating some extraneous cognitive load and creating a setting for germane load through training, problem-solving, and carrying out more meaningful work would engage employees more in their work and make them see themselves as more competent and committed. The organization will, therefore, simplify processes, structure tasks, and the ability of employees to manage their cognitive resources to improve productivity and job satisfaction.

2.2.1 Cognitive load and employee commitment and productivity

High job satisfaction is often associated with high productivity because people who feel valued and are engaged most often tend to put in effort in their jobs. Stressors in the workplace decrease satisfaction and thereby lead to poor productivity. Organizations prioritizing employee satisfaction-reducing job-related stressors while providing adequate resources- can build a significant degree of commitment, reflecting improved operational output. Such motivational works towards designing a working system have been emphasized in the literature by raising the relevance of refining the theories of motivation to the peculiarities of job satisfaction. Consistent with this, stress-reducing interventions, such as work-life balance and adequate resources, showed evidence of stress related to the workplace enhancing productivity (Mbidoaka et al., 2017).

As recent studies indicate, motivating work design will yield considerable benefits for individuals and organizations because it enhances mental and physical health and improves control and flexibility in employee roles. Conversely, workplace stress, exacerbated especially in competitive workplaces, has been detrimental to the well-being of employees and the performance of organizations (Mbidoaka et al., 2017). For this reason, job satisfaction and productivity need to be incorporated into the organization's blueprint. With high levels of job satisfaction, employees identify strongly as committed to their organizations, thus increasing productivity.

This is empirically supported and demonstrates a relationship between cognitive load with employee commitment and productivity. Such organizations, which geographically aim for long-term performance, should take time to investigate and understand these commitment dimensions, use safe and valid indicators for assessment, and plan to respond to the different demands of operational workplaces. Simply put, the research is pessimistic because it has shown that such barriers like cognitive load can be removed through a supportive work environment, as it encourages the workforce to engage in activities while fostering job satisfaction, which can be rated as one of the most critical enablers for optimal performance (Iqbal et al., 2020).

Using cognitive load theory in operational environments such as military or factory settings involves system design to alleviate the cognitive load. For example, operations management techniques such as automation, clearly established communication protocols, and intuitive interfaces can lower the

cognitive load on Kieras and Polson (2003). Techniques involving cognitive management prove useful during high cognitive demands professionals face regarding information from system designs to real-time feedback and decision-support systems.

The cognitive load caused by an operational workplace for female employees can significantly influence the performance of their tasks and, in fact, their overall efficiency. When a person is under considerable cognitive load, he or she may use a minimal number of mental resources, which could cause him or her to be unable to focus on the work and thus not productive because one is negotiating the demands of competing tasks. This situation is heightened a lot when it is women in an environment meant for an area as it may require them to carry many roles, thus increasing the cognitive load.

Extra consideration in academia and profession-determiners of cognitive load affects how individuals effectively process and retain information. In education, cognitive load theory is the basis for design in curriculum work where the extraneous cognitive load has been reduced, and emphasis is laid on the essential material. For instance, Mayer's (2014) work on multimedia learning stresses the importance of managing cognitive load in reducing unnecessary levels of complexity in visual and auditory information in educational materials. Apart from these, professional contexts such as workplaces involve unique types of cognitive demand. Paas and van Merriënboer (1994) extended cognitive load theory to high-stakes professional environments such as aviation and healthcare. Such settings usually require optimizing decision-making, efficiency, and safety through cognitive load management, with the main priority being reducing superfluous loads. For example, personnel must manage multiple concurrent input sources in air traffic control. The tools designed to reduce cognitive load include visual aids and communications systems to streamline processing (Wilson et al., 2015)

Future research appeals to probe the emerging effects of trends like remote work and technology on commitment and productivity dynamics. Organizations can adopt strategies for enhancing levels of job satisfaction, and thus the employees will identify strongly as committed to their organizations, thus increasing productivity.

2.2.2 Work life balance and cognitive load

Studies ranging from general to specific have shown that difficulties in work-life balance can result in increased stress and burnout. Cognitive overload by these two has synergistic potential, making it even more difficult for people to focus, prioritize, and make decisions. For example, employees suffering from an imbalance in work and life showed more significant levels of stress and burnout and such stress and burnout affect cognitive functioning and decision-making in Allen et al. (2000). Also, an imbalance in work-life demands can promote cognitive fatigue, thus making individuals less capable of critical thinking and engagement in decision-making. On the contrary, it has been shown that balancing work and life obligations would create positive outcomes associated with cognitive performance. According to Greenhaus and Allen (2011), a well-balanced individual would have experienced less stress and, therefore, less cognitive load that would facilitate good focus, indicating the goodness of productivity and overall cognitive well-being.

These challenges of balancing professional and domestic responsibilities are grossly gendered, with women carrying much of a load of unpaid domestic labour and still being professional. This increases work-life conflict, which poorly reflects women's health and nourishment, especially career development and overall well-being. The challenges need interventions at an organizational and societal level towards redistribution of domestic work, supportive work policy implementation, and challenging traditional gender roles to realize equitable work-life balance opportunities for all individuals. Hochschild and Machung (2012) say that when women work far more than a day at their paid labour, they take up that other imaginary work as a second shift. The load of this situation increases the cognitive load, thus leading to stress, mental fatigue, and burnout. As also raised earlier, women are expected to be "ideal" workers and to run the home, so they have unrealistic expectations and suffer from increased mental strain.

Studies show that requirements for flexible working arrangements or extended parental leave will often be met with stigma from others, leading to serious career setbacks and increasing stress levels (Carr & Kellogg, 2022). However, most men face sociocultural pressures as primary financial providers instead of being potentially burdened with caregiving expectations. When men try to balance demanding work schedules with personal lives, this myth can end up causing cognitive overload. There are studies that state that the tide is changing, with more and more men wanting a more balanced life between work and family (Barker, 2020). This scenario creates heavier attachments,

increases demand and stereotypes, and blocks career growth. They still, however, find it hard to establish a foothold in what is otherwise called a traditional gender role, which enshrines being superior to men.

Work-life imbalance promotes people to multitask and share other tasks simultaneously, thereby increasing cognitive load. As O'Connor and McFadden (2007) explain, multitasking is commonly linked with balancing the competing demands of work and life. It involves overwhelming cognitive processes and generally results in lower levels of concentration and productivity, with an end compromise in quality at work. According to Fritz and Sonnentag (2006), the characteristics of higher demands at work combined with decreased personal time summed up the increase in cognitive load experienced by employees and resulted in fatigue and stress. Sonnentag and Bayer (2005) suggest that due to an overload of work demands with little available personal time, such individuals are expected to have low concentration, manifested in deficient performance and well-being. By contrast, work-life balance promotes resilience in cognitive functioning, that is, time dedicated to the individual to replenish their cognitive resources.

Studies also show that the chances of receiving workplace sanctions for having flexible work hours or availing of parental leave increase in women compared to men. Furthermore, the lack of supportive organizational policies and societal structures worsens the condition, preventing women's career progression and well-being (Gornick & Meyers, 2003). Dilmaghani and Tabvuma's (2019) studies indicate that women in management and education report less satisfaction with their work-life balance than their male counterparts; thus, occupational differences translate into general work-life balance experiences. Additionally, the imbalance in life, which has adverse effects on health among women, translates into stress, depression, and other forms of health impairment for them (Emslie et al., 2004).

The traditional gender roles have defined the expectations in society, which have created an inequitable burden on women to take care of household things while having a professional engagement. For example, the COVID-19 pandemic has aggravated these distinctions, depicting how well-nigh societal standards are set for the division of work at home. As apparent from the example provided in Blassing et al. (2023) there were increased household responsibilities for women during the pan-

demic and higher gaps in occupations dominated by females, implying a threat of a reversal of decades' progress toward gender equality worldwide. In this regard, stereotyping and implicit bias leave the door wide open for restrictive definitions in terms of capabilities and roles of women within a society, creating an environment wherein a large section of women is in a position to comply with traditional expectations. Addressing these biases is critical in formulating strategies towards a more equitable work-life balance that valorizes the contributions of women in both homes and the workplace.

Further, the continuous defining of normative expectations, prescribing obligations for domesticity by a woman towards work even if she is employed full-time, is supposed to entrench inequalities between both genders inside public and private spheres (Hochschild, 1989). These stereotyped images have made women do more than one job and are burdened with a very tough work-life balance. Programs that help with work-life balance in the workplace might be flexible work and all-inclusive training programs for much-needed support. Such initiatives and adoptable findings in resources for workplace diversity dictate that most organizational policies should fall into this broad category (Bormann et al., 2001). Besides that, leadership research provides facts that measure how important contextual understanding is in building efficient leadership training for women across diverse sectors (Armstrong et al., 2012). Thus, these should be tackled, ensuring equal opportunities where people work.

2.2.3 Gender specific cognitive load

Gender-specific cognitive load has been a vital yet poorly researched area in organizational research. The research states that women would experience a high cognitive load, primarily in contexts where their roles are dual careers, as they must balance and juggle work and family responsibilities. Much has shown that significant workplace interventions such as flexible scheduling, support networks, and tailored training programs reduce cognitive overload, directly affecting the performance and well-being of women in the workforce (Bakker et al., 2003). The application of CLT in such settings would consider both the environmental and many other social and cultural factors that exacerbate the mental workload of women.

CLT relates to gender differences concerning stress and multitasking in women-dominated workplaces. An analysis of work-life balance from the perspective of gender discusses how the work-life

lives of men and women have been shaped by societal expectations concerning their professional and personal behaviour. Traditional roles define the extent to which caregivers of either gender may feel pressured into juggling both work and personal lives.

Gendered workplace cultures further compound such pressures. Women in male-dominated industries may face discrimination or bias when they request flexible work arrangements or parental leave, which intensifies the cognitive burden of balancing work and life. Williams et al. (2014) suggest that organizations that do not embrace flexible work policies or fail to support gender equality often exacerbate gendered expectations and increase cognitive strain on women.

Therefore, work-life balance is perceived by men and women based on society's norms or expectations that one would have by being together. Instead, women were consistently shown to take over care-letting between the child and home chores. Such sectoring would add something extra for women that will inhibit the realization of balanced living and, in turn, elevate the cognitive load. Norms dealing with masculinity and femininity find their expression in the management of responsibilities by an individual; additionally, work is central to men, without which the personal life can be sacrificed to become the ideal provider. Wajcman (2015) posits that such expectation creates a procrustean identity, which gives work a central role while contributing to cognitive load, especially when men feel that they need better to fulfil society's standards regarding success and achievement. On the other hand, the supervision will expect their women to balance professional responsibilities with the home space; the instant deviation from the ideal of the "super-woman" would cause them to be labelled as poor performers. West and Zimmerman (1987) argue that these expectations generate uneven divisions along genders and contribute to cognitive over-load for women.

Coping strategies are critical; for example, emotion-oriented coping may improve life satisfaction and act as a buffer protecting against the adverse effects of cognitive load, which points to the fact that good stress management can minimize performance dips (Droste et al., 2012). Structuring defined interventions and supportive practices to combat cognitive load will enhance efficiency and commitment by female employees to the organization. Such studies should take an intersectional approach to ensure the experiences captured are diverse and the interventions targeted.

In many case, studies on cognitive load management benefits for the creation of equity in workplace environments continue to be of great relevance, especially in light of the increasing emphasis placed on diversity and inclusion in the workplace, such as, for instance, through the use of CLT and the designs of various workplaces for the support of diverse employees but with the reduction of cognitive demands imposed by complex systems; therefore, enabling better multitasking and decision-making (McEwen & Binkley, 2020). One example is to improve the design of technological platforms to minimize extraneous cognitive load, allowing women to juggle their jobs and personal lives productively.

Women's models in the current times indicate the sufficiency with which female employees, aside from factoring in all responsibilities, disappoint in perfect instances of career and duty. Gendered social norms influence the approach men and women adopt pre-determined work-life balance. Women juggling both worlds are thought to cope ideally in most of the stereotypically female areas. This is unattainable and results in a lot of emotional drains. While they are common, the effects are different on cognitive load for each gender. This word causes burnout and dissatisfaction. Bridging the theory-practice gap will go a long way to making female employees equitable and healthy workplace.

2.3 Hypotheses

Based on the previous literature review about the impact of cognitive load on employee performance and overall productivity, the following hypotheses are formed to be investigated:

H1: Female employees experience higher levels of cognitive overload than male.

H2: Employees who experience lower levels of cognitive overload report higher levels of productivity (Lee & Kalyuga, 2018).

H3: Employees who experience lower levels of cognitive overload report higher levels of organizational commitment (Lee & Kalyuga, 2018).

H4: Employees who report higher levels of work life balance experience lower levels of cognitive overload. (Lee & Kalyuga, 2018).

3 Methodology

This chapter dwells on the methodological approach applied to investigate related research hypotheses with respect to modern organizational environments. The overall discussion regarding data collection and sample selection, explanations of all variables, and specific methodologies employed in the exploration of the impact of cognitive load on work outcomes are dealt with in detail.

3.1 Research approach

The research methodology that has been selected for this study is mainly a quantitative approach with the data collection tool being surveys. This quantitative research design fits this study because it allows systematic gathering of data and thorough statistical analyses which are must for assessing the relationships between cognitive load, organizational commitment, and employee productivity. More to this, it is consistent with the objectives of the study about demonstrating measurable impact by cognitive load variables within a more structured women-focused workplace environment (Sweller et al., 2011). Therefore, the method uses numeric data which allow accurate assessment and hence is referable and applicable to similar organizational contexts.

Similarly, such research enables the examination of larger populations and more varied samples and carries the benefits of looking through some of those patterns and trends that are sometimes difficult to see through qualitative approaches. Surveys tend to be most suited to this body of work because they provide a standardized method of collecting data and maintain consistency between respondents (Haar et al., 2014). The survey aimed at particular cognitive load dimensions such as intrinsic, extraneous, and germane loads as suggested by CLT (Sweller, 1988), while other concerns are related to work commitment and productivity addressed with promise verified tools, which also aim to improve the precision reliability of the data collected.

This quantitative methodology selection is primarily because it fits to answering research questions and also fits to many of the literature on workplace dynamics and cognitive theories. CLT (Sweller,

1988) is the backbone of this study that provides an important perspective toward analyzing employee mental load's impact on commitment to organizational objectives as well as productivity overall. The quantitative approach here plays a good role since it helps among other things operationalize such concepts as cognitive load, organizational commitment, and productivity by providing instruments for measuring the variables and scrutinizing their relationship.

Past research puts emphasis on the necessity for quantitative methods to investigate cognitive and psychological phenomena in highly structured settings. Beckmann (2010) states that "quantitative instruments" such as surveys and statistical models allow the disintegration of complex constructs into measurable parts. Increased precision in analysis and the ability to replicate and adapt findings to other organizational settings are guaranteed by this method. This makes quantitative research an indispensable study in providing meaningful insight through the quantification of cognitive load factors and their correlation with workplace outcomes.

The other reason that complements the choice of surveys is their ability to optimally collect data from 201 participants over a relatively short period. Survey design allows for varying Likert scales and demographic profiling, which together offer a comprehensive dataset for analysis. Workplace surveys have been effectively utilized by Haar et al. (2014), Meyer, and Allen (1991) to capture employee perceptions of the workplace, making such an approach particularly suited for pursuing the objectives of this study.

The design of the survey is critical to its success in achieving the study goals. Questioning will be taken from recognized scales and pre-tested for clarity, relevance, and fit with the research objects. For example, organizational commitment will be assessed using the Meyer and Allen (1991) Three-Component Model of Commitment, whereas cognitive load factors will be assessed with frameworks derived from Cognitive Load Theory (Sweller, 1988). The stratified random sampling technique will be used to ensure a mix between both the diversity and representativeness of the sample. Concentrated on employees in a women-run workplace, it will identify differences across roles, levels of experience, and departments. This strategy reduces selection bias and ensures that results will apply to the larger population.

3.2 Research context

This research is conducted within the operational context of Bangladeshi industry where focused on providing manufacturing, telecommunication and service with a strong emphasis on empowering women in the workplace. As a women-centric organization, the company prioritizes creating inclusive environments that foster collaboration, diversity, and innovation. Industries have their own sets of challenges: very rapid technological advancement, competitive market nature, and voluminous and multilayered regulations, with resultant complexities that require employees to undergo massive cognitive processing and adaptability. In terms of operational roles, this becomes especially relevant due to task complexity and the levels of cognitive load imposed by decision-making. In fact, these are the very reasons that make the organization the best place to study the links between cognitive load and employee commitment to productivity.

Bangladesh offers unique opportunities and challenges. The region has been characterized with an increasing focus on workplace diversity and inclusion on the back of certain stimuli such as policy reforms, cultural shifts, and general awareness around gender differences. On the flip side, organizations in the region encounter structural impediments, like lack of availability of resources, very high employee turnover, and stiff market competition, which all have an impact on organizational performance.

In support of its women-centric orientation, industries have initiated numerous ventures such as day-care facilities, salary advances, mentoring programs, and leadership training; nevertheless, employee retention and sustaining high productivity in very difficult work settings remain issues for them. These challenges make such an investigation necessary to shed light on the ways in which cognitive load has affected employee performance and commitment and would, in turn, provide recommendations to improve HR practices and workplace policies.

Industries have organized modes of operation, with emphasis on time delivery, multi-layered processes, and the use of highly sophisticated technologies that may overwhelm the workers. The study becomes relevant under this perspective as it aims to develop an understanding of the interrelationships among workplace stress, cognitive load, and organizational outcomes in an environment where inclusivity and performance are key goals. The results will feed into academic insights while providing a pathway for the organization to instruct industries operating in similar situations. The

outcomes are intended to be of benefit not only to the industry undergoing scrutiny but also to other industries in Bangladesh toward creating a more favorable balance between inclusivity, employee wellness, and operational efficiency.

3.3 Data collection

The collecting data process for this research was extremely organized and very carefully done such that results come out valid and reliable. Primary data was acquired from structured questionnaires sent to employed men and women over the Webropol online survey platform. The questionnaire was disseminated among approximately 250 persons, who had been selected via professional networking from diverse industries in Bangladesh, such as RMG, telecom, manufacturing, and service sectors, with a special consideration to organizations employing large numbers of women. The final number of respondents stood at 213, with an extraordinarily high response rate of almost 85%. Respondents were motivated to participate by highlighting their input's possible role in contributing to academic research for developing industries in Bangladesh. The survey was conducted in English, and data collection was held from April 1 to 7. The participants were thus contacted through professional groups and networks on a personal level. Data from this research is generated from a structured questionnaire ([Appendix 1](#)) to get insights into the key variables: cognitive load, employee commitment, work-life balance, productivity, and satisfaction. Each part of the questionnaire was adjusted according to recognized and validated tools as a measure of the accuracy and reliability of the measurements. Among them 201 data was completed without errors. The cognitive load was assessed using the NASA-TLX items (Hart & Staveland, 1988) and the Cognitive Load Questionnaire (CLQ) developed by Leppink et al. (2013), focusing on intrinsic, extraneous, and germane cognitive load. The employee commitment measured using Meyer and Allen's (1991) Three-Component Model of Commitment: affective commitment, continuance commitment, and normative commitment. This is a model that is highly acclaimed in organizational psychology-the dimension of work-life balance measure using Fisher et al. (2009). Lastly, the study about employee productivity and satisfaction used Job Diagnostic Survey (Hackman & Oldham, 1975) and Utrecht Work Engagement Scale (UWES)-Schaufeli et al. (2006), which is some of the most popular tools used in measuring work engagement and motivation.

Webropol is a reputable online survey facility intended to collect that data safely and securely with a user-friendly design for handling large volumes of data. It has preferred to adopt this method in

conducting its data gathering. This connection was one of them to recruit participants; without this, responses would have been collected by bringing together representatives of varied voices. The action was anonymous by design, avoided taking an average of ten minutes, maximizing participation and minimizing discouragement from fatigue.

Methods of data collection were meant to follow the accepted best practices in the survey research literature (Dillman et al., 2014). The pilot study was carried out before complete distribution of the surveys, aimed at spotting unclear items or possible technical glitches. Minor remodeling to enhance clarity and fitness of the ultimate questionnaire resulted from information obtained from this pilot phase.

The questionnaire development focused on clear and impartial language instruction with the concise phraseology of questions to the intended audience. Most of the questions were in a Likert form, whereby value can be numeric to intensify statistical analysis of attitudes and perceptions (Fink 2015). All ethical guidelines were observed throughout the process. Participants were thoroughly informed about the purpose of the study, together with their rights concerning anonymity of their responses. Consent was sought based on ethical requirements for human research (Creswell & Creswell, 2018).

The justification for these choices' rests upon the validity, reliability, and ethical factors involved. Use of established and validated instruments enabled the measurement of the essential constructs- cognitive load, employee commitment, work-life balance productivity and satisfaction-all well-grounded in theory and supported by empirical evidence-with as much consistency as possible. The survey platform of choice was also determined by the effectiveness of Webropol survey, which also ensured anonymity and security of data, as it is quite crucial for organizational research. It has close adherence to confirm the reliability, validity, and generalizability of results across compatible organizational environments.

3.4 Description of variables

The proposed structural-equation model studies how three vital latent variables (Figure 1)- Work Life Balance (WLB), Employee Commitment (EC), and Productivity (P)- combine to influence Cognitive Load.

Table 1: Indicator and measured question

Indicator (Path diagram)	Question Number(Appendix 1)
EC1, EC2, EC3, and EC4	Q11- Q 14
WLB1, WLB2, WLB3	Q15-Q17
PS1, PS2, PS3	Q18-Q20
CL1, CL2, CL3, CL4, CL5	Q 6- Q 10

Work-life balance (WLB) is assessed by three observed indicators (WLB1, WLB2, WLB3), which refer to how fairly employees regard their equilibrium between professional and private life. Employee Commitment (EC) is measured by four observed indicators (EC1, EC2, EC3, and EC4), reflecting effective, normative, and continuance commitment dimensions. Productivity (P) looks at work satisfaction by using three indicators (PS1, PS2, PS3) related to employees' satisfaction with their work output and efficiency.

As the endogenous latent variable, cognitive load is influenced by WLB, EC, and P, thus indicating that employees' mental workload might be influenced by their work-life balance, organizational commitment, and productivity. Using this model, the graphical representation uses squares to denote observed or measured indicators, while latent constructs or unobserved variables are shown in circles (Figure 1). Thus, the model facilitates testing of the measurement model (relations between the latent variables and their indicators) and the structural model (hypothesized causal paths between the latent constructs).

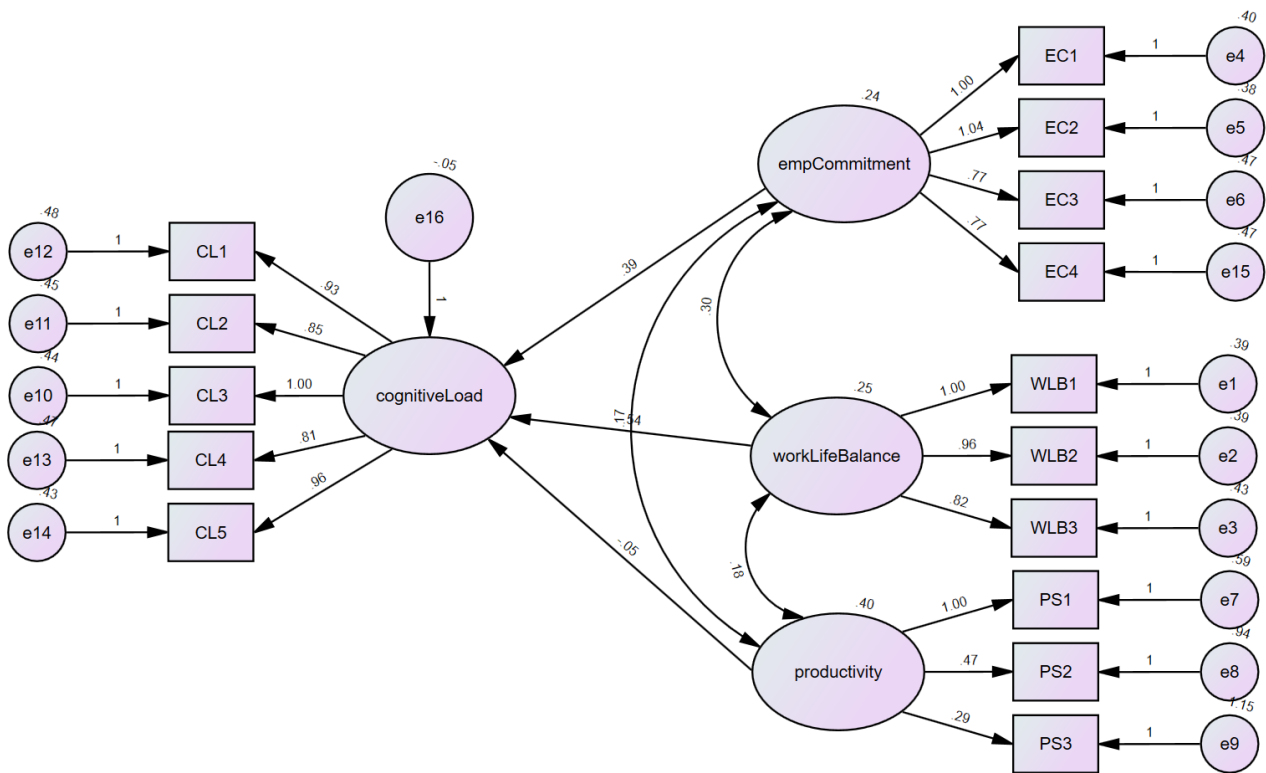


Figure 1: Path diagram

The current research examined three forms of cognitive load that were thought to be independent variables and were measured using validated scales. An example is intrinsic cognitive load, which attempts to represent the effort that the brain is expected to exert by the complexity of the tasks involved. Therefore, recognition was made using a 5-point Likert scale (1 = Very Low, 5 = Very High) by items such as "Rate your overall workload in terms of mental demand" (Paas et al., 2003), in which the background instruments are intrinsic cognitive load measures. Extrinsic cognitive load, which is created by bad task design or environmental distractions, was rated by a 5-point frequency scale (1 = Never, 5 = Always) for items like "How often do unclear instructions complicate your tasks?" (De Jong, 2010), and beyond. Whereas germane cognitive load was considered to be effort in learning or problem-solving, it was counted through agreement ratings (1 = Strongly Disagree, 5 = Strongly Agree) on statements such as "My work challenges me to develop new skills" (Paas et al., 2003).

To measure productivity, a 7-point scale of efficiency was employed, which collects employees' perceptions on the performance of their jobs in terms of efficiency and effectiveness. The scale included items like, "Rate your ability to complete tasks efficiently," and has undergone development and validation by Lee & Kalyuga (2018). The scale offers insight into individual and collective task efficiency, supplying organizations with an understanding of operational effectiveness as well as areas in need of improvement.

Employee commitment considers emotional attachment and loyalty and is assessed using the Meyer & Allen (1991) framework through items such as, "I feel a strong sense of belonging to my organization," which represent the depth of emotional and psychological relationships of employees. An understanding of employee commitment is paramount, as it has been related to reduced turnover, increased job satisfaction, and enhanced performance.

As one last dependent variable in the current study, work life balance was assessed through the widely employed Work-Life Balance Scale, developed by Fisher et al. (2009). The scale assesses individuals juggle the demands placed upon them by work and non-work life. It retains the positive and negative interferences between the two fields so that the concept of this work-balance could be apprehended from a different angle. Sample items included, "I am satisfied with the balance between my work and personal life", "My work demands interfere with my personal responsibilities" and "I often feel stressed due to conflicting demands between work and personal life". This multifaceted perspective will also create prospects for understanding how work life balance can produce good things but help with dealing later on with the bad.

Control variables were included to capture the effects of demographic and contextual characteristics that would otherwise act as confounds to the primary relationships being studied. These variables were included to examine the unique effects of cognitive load on the dependent variables. The demographic variables of interest included age, gender, level of education, and job role, all of which were examined using categorical scales. Age was measured on a 5-point scale from 1 (18–25 years) to 5 (56+ years), which may allow for the different stages of life and experience to be considered in terms of workplace behaviors and attitudes. Gender was coded as 1 (Female), 2 (Male) and 3 (Prefer not to say) in order to factor possible differences in their experience and outcomes. Education level was classified on a 4-point measurement scale from 1 (secondary education) to 4 (master's degree

or higher)-and these distinctions are important, as different levels of education can influence how individuals perceive productivity, commitment, and engagement. Job role was defined as the designation of their position across the hierarchy of the Organization; it was measured on a 4-point scale from 1 (Staff) to 4 (Executive). This acknowledges the possible influence of the responsibilities and expectations deriving from the particular job.

3.5 Data analysis

The entire analysis process for this study was well structured to technically align with the specific objectives of the research to guarantee precision and reliability in results. The most important analytical method applied was Structural Equation Modeling (SEM) because of its capacity to signify even the most complicated of relationships among both latent as well as observed variables. The analysis was performed with the help of SPSS and its AMOS extension, dedicated to path analysis and structural modeling.

SEM is actually a versatile multivariate statistical method that aims at combining factor analysis and multiple regression; hence, it is very appropriate for this particular study where most of the independent indices, for instance, cognitive load employee commitment, employability life balance, among others, are latent constructs that cannot be easily measured, which in essence means, by employing the SEM, the design study was capable of modeling the intricate relationships between the independent variable-cognitive load, dependent variables-employee commitment ,productivity, and work-life balance and several control variables-age, gender, education level, job position, and years of experience.

Two sets of analysis were undertaken: first the measurement model followed by the structural model. The measurement model was assessed first to determine the validity and reliability of the constructions, along with the fact that the observed indicators were measuring the underlying theoretical dimensions. Finally, the structural model was tested in order to examine the proposed paths and relationships between the variables. One of the most notable benefits of SEM is that it has the capability of both direct and indirect effects. This stood as important in revealing rather complicated dynamics affecting employee outcomes in the organizational context. Thus, SEM proved to be a very strong and appropriate method for answering the study's research questions and understanding the multifaceted interaction among the variables.

This research explored several factors that relate cognitive demands to employee outcomes in workplace environments. The main independent variable is cognitive load, which has been subdivided into intrinsic, extraneous, and germane components. These components were evaluated utilizing self-reported Likert-scale responses indicating task complexity, time constraints, and mental effort, based on the NASA Task Load Index (NASA-TLX) and the Cognitive Load Questionnaire (CLQ) (Hart & Staveland, 1988; Leppink et al., 2013). The dependent variables were employee commitment, employee productivity and work-life balance. Employee commitment was assessed using Meyer and Allen's (1991) Three-Component Model to measure effective, continuance, and normative commitment through 5-point Likert-scale items that measure emotional attachment, motivation, and the perceived obligation to remain committed. Work-life balance was measured using Fisher et al.'s (2009). Work-Life Balance Scale, referring to perceived balance and conflict between work life and personal life, and allocation of time for both, measured on a 5-point scale. Control variables measured include age, job role, gender, level of education, and years of work experience, so as to adjust for the possible demographic influence. All latent constructions were defined using validated scales for uniformity, reliability, and a strong theoretical foundation for measurement.

Data analysis process: Therefore, it was important thoroughly conducted to analyze all the data to ensure accurate results obtained and reliable results that the data analysis procedure contains: First, the data gathered by Webropol was transferred to SPSS for purposes of cleansing and preparing the data, where incomplete answers and outliers were identified and excluded. The author retained a final sample of 201 valid responses, which meets the sample size recommendations for Structural Equation Modeling (SEM): Kline (2015). Then, descriptive statistics were calculated to capture the distributional characteristics of the variables, as well as identify any irregularities that might have been present. To explore the underlying factor structures behind constructs, Exploratory Factor Analysis (EFA) was conducted assuming that survey items fall correctly into their appropriate corresponding factor. Following this, research was conducted using AMOS in Confirmatory Factor Analysis (CFA) to confirm the measurement model with its model fit evaluated through essential indices such as Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Tucker-Lewis Index (TLI). After validation, there were structural model tests that looked at the proposed relationships among cognitive load, employee commitment, productivity, and work-life balance with path coefficients and significance levels ingesting understanding. A moderation analysis also took place where the effect of work-life balance on the relationships between cognitive load and both employee commitment and productivity were evaluated with interaction terms being derived

within the SEM method. In addition, control measures such as age, gender, education level, job title, and years of experience considered any possible potential effects of confusion. This SEM analysis presents de-tailed insights on direct effects of cognitive load on important outputs, moderating influence of work-life balance, and differential weights of cognitive load and commitment sub-components as predictors of employee productivity and satisfaction. SPSS was used throughout for all initial analyses where, later, AMOS would conduct confirmatory factor analysis and structural equation modeling, both considered to be amazingly effective software in behavioral and organizational research (Byrne, 2016)

3.6 Verification of the results

Verification of findings is fundamental in any research study since it establishes that the results are valid, reliable, and objective, thus contributing to their acceptance in various contexts. David Silverman (2000, p. 175) supported this need for a demonstration of reliability with respect to the methods and validity concerning the conclusions: “unless you can show your audience that the procedures you used to ensure that your methods were reliable and your conclusions valid, there is little point in aiming to conclude a research dissertation.” In this study, the four aspects of internal validity, external validity, reliability, and objectivity have each been rigorously addressed to safeguard the study's findings.

Internal validity: Internal validity was established when research design elements were directly matched with the primary research questions. Constructs like cognitive load, employee commitment, work-life balance, and productivity were chosen to emphasize relevance to the study's theoretical framework. Established theories such as Meyer & Allen's (1991) Three-Component Model of Organizational Commitment and Fisher et al. (2009) Work-Life Balance Scale provided a strong theoretical basis for the constructions. There was methodological action on both complex relationships between latent variables through this modeling, addressing the research questions and confirming or rejecting the theoretical assumptions.

External validity: With respect to external validity, attention was directed toward the representativeness of the sample in data collection with several participants belonging to a variety of age groups, job roles, educational levels, and years of experience. Such divergent backgrounds bolster

the findings' generalizability. The constructions being studied- these of employee commitment, cognitive load, and work-life balance- are generalized across different industries greatly fortifying the cross-sector applicability of the results. However, the limitations of generalization have been acknowledged concerning cultural, organizational, or regional differences, and such limitations have been discussed in the discussion chapter.

The reliability of this study stems from verified instruments used in the data collection process such as the NASA-TLX for cognitive load, Meyer and Allen's Organizational Commitment Scale, and Fisher et al.'s Work-Life Balance Scale. These established instruments provided consistency and reliability in data collection. To further solidify the findings, triangulation of data was performed by collecting responses on multiple constructs. Standardized procedures were then employed to assure that all of the responses would be the same, meaning uniformity, with Webropol being used for data collection. The data collection techniques followed the best practices enumerated within the research methodology literature (Kline, 2015), thereby greatly enhancing reliability of the present study.

Objectivity was maintained by ensuring that no bias from the author came into play during data analysis. Independent checks for analysis using SPSS and AMOS limited manual calculation errors and allowed for replication by other researchers. The methodology and data analysis procedures were outlined transparently to allow anyone to duplicate the study, working from the same dataset. Therefore, subjectivity in data interpretation was substantially trimmed by leaving the big decisions to the statistical output generated from SEM. This way, conclusions were drawn objectively and supported by evidence.

3.7 Research ethics

In terms of safeguarding the rights and privacy of the participants, this investigation employed rigorous ethical standards in the protection of the informed use of data in the research process. The main objective was to protect the privacy of participants, whereas all data collected was treated under the principles of the General Data Protection Regulation (GDPR) to ensure confidentiality and anonymization wherever required. The survey data was anonymous, securely stored, and confined within the access prerogative of authorized personnel. Participation was entirely voluntary, where all participants were informed concerning the study's purpose, use of the data, and storage. Informed consent was obtained prior to data collection, and the participants were informed that they

had the right to withdraw without consequences any time during the study. A research permit was obtained, and the study made use of a comprehensive Data Management Plan ensuring ethical handling and protection of the data. The study was conducted following the ethical principles of Jamk University of Applied Sciences and re-evaluation by the ethics committee when necessary. The data were stored on a secure private encrypted drive, with access limited to the researcher and thesis supervisor. In accordance with Jamk data retention policy, data will be stored for two years after the completion of the thesis, after which it will either be permanently deleted or converted into an anonymized form.

4 Results

In this chapter, the empirical results emerging from the SEM analysis that examined relationships among work life balance, employee commitment, productivity, and cognitive load are presented. The results have been laid out into three sections: model fitness, parameter estimates for the whole sample, and subgroup analyses (male vs. female). All outcomes are merely data-driven, while statistical significance thresholds and fit indices provide the basis for their evaluation. Tables and figures, respectively, summarize the full data on standardized estimates, covariances, and squared multiple correlations without any interpretive comment.

4.1 Model fitness

Various goodness-of-fit indices were used to provide evidence of model fit and whether the proposed structural equation model fit the data. The Chi-square statistic ($\chi^2 = 326.658$, $df = 252$, $p = .001$) was significant, indicating that there was a difference between the observed and the model-implied covariance matrices. Still, such significance is not necessarily an indication of a poor model fit. Perhaps one of the best-known weaknesses of the Chi-square test is that it is sensitive to sample size. So, with moderately large samples, such as the present one ($n = 201$), even a slight deviation of the covariance matrices of the hypothesised model from the actual data can produce a significant result (Byrne, 2010; Kline, 2016). It becomes, therefore, a misleading exercise to judge the appropriateness of the model based on the Chi-square test alone.

Table 2: Model fit indices

Fit Index	Value	Threshold	Interpretation
Chi-square (χ^2)	326.658	-	Significant (p = .001)
Degrees of Freedom	252	-	-
CMIN/DF	1.296	< 3.0	Good fit
GFI	0.905	> 0.90	Good fit
AGFI	0.864	> 0.85	Acceptable fit
CFI	0.944	> 0.90	Good fit
RMSEA	0.027	< 0.08	Good fit
RMR	0.05	< 0.10	Good fit
NFI	0.801	> 0.80	Acceptable fit

Therefore, an assortment of fit indices was employed for measurement, since these indices are considered less sample-size-sensitive and provide a more holistic evaluation of the model fit. On the normed Chi-square (χ^2/df) statistics, adjustment on the Chi-square value relative to the degrees of freedom gave a value of 1.296, which lies well below the cut-off value of 3.0 (usually considered acceptable), thus describing the goodness of fit as excellent (Schumacker & Lomax, 2016). The RMSEA was used next, which was .027 with the 90 per cent confidence interval well below the maximum recommended value of .06 to indicate a very close fit of the model to the data (Hu & Bentler, 1999). Also, the CFI was .944 and the TLI was .930, and both values exceeded the cut-off value of 0.90, suggesting a good fit (Bentler, 1990; Hu & Bentler, 1999). However, the Goodness-of-Fit Index (GFI) had a value of .905, also suggesting satisfactory fit.

Furthermore, the parsimony-adjusted indices- again, the PNFI (.641) and PCFI (.755)-support the parsimony of the model and its balance between fitness and complexity (Mulaik et al., 1989). Hoelter's critical N values of 356 and 377, at p = .05 and p = .01, respectively, further point out the acceptability of a model in samples of a size similar to or even smaller than the present one (Hoelter, 1983).

These fit indices strongly support that the model is well-specified and captures, at least in part, the relationships among the latent constructs of cognitive load, employee commitment, work-life bal-

ance, and productivity. The existing lines of consistency across several different indicators of fit coalesce to demonstrate the robustness of the proposed structural model and to establish this model's use for further interpretation of path coefficients and hypothesis testing in this study.

4.2 Parameter estimates

4.2.1 Regression weights

From the perspective of standardized regression weights, significant relationships exist among the latent variables, conceptualizing complex dynamics that influence cognitive load at the workplace. Work-life balance (WLB) stood in a strong positive relation with cognitive load ($\beta = 0.654$, $p < .001$); hence, the higher the perceived levels of the work-life imbalance, the greater the increase in the level of cognitive load. It shows the possibility that an insufficiency in parent-child integration can have a psychological impact on employees, either through constant mental juggling of personal life or professional life. Accordingly, measures to reduce cognitive overload should be targeted toward supporting work-life integration, such as flexible working hours and mental health promotion.

Table 3: Standardized regression weights

Path	Estimate	S.E.	C.R.	p-value
Cognitive Load \leftarrow Productivity	-0.075	0.087	-0.573	0.567
Cognitive Load \leftarrow Work-Life Balance	0.654	0.15	3.618	<0.001
Cognitive Load \leftarrow Employee Commit	0.461	0.157	2.459	0.014

Likewise, a significant positive effect of employee commitment (EC) on cognitive load ($\beta = 0.461$; $p = .014$) was found. Whereas commitment is agreed to be a virtue, this result points to a demerit: high levels of dedication on the part of employees make them feel pressure to perform, thus increasing cognitive demand. This indeed presents the paradox of engagement and demands balanced treatment: While commitment must be nurtured, it must also be partnered with adequate levels of resources, autonomy, and workload so that commitment does not lead to burnout and cognitive exhaustion.

On the other hand, productivity (P) carried a bit negative and insignificant path coefficient to cognitive load ($\beta = -0.075$, $p = .567$), thereby implicating that really just being happy with one's output does not shield one substantially from this mental burden. This situation would mean that employees who see themselves as productive could also suffer from cognitive strain when underlying stressors- lack of time, or task complexity- are overlooked. Satisfaction with productivity can be more of a backwards-looking rating, while cognitive load is an ongoing, real-time load of mental exertion.

A relationship exists between psychological and organizational bases that shape the cognitive experiences at work. This stresses the need for a holistic approach to employee well-being that fosters work-life balance and manages the implications of high organizational commitment, besides work productivity.

4.2.2 Covariances and correlations

All correlations among the latent variables were statistically significant, signifying strong interrelationships. It also confirms the theoretical basis of the model. Work-life balance (WLB) and employee commitment (EC) were especially highly correlated ($r = 1.195$, $p < .001$), indicating strong reciprocal reinforcement between both constructs. Such an aberrant high correlation suggests that there could be some conceptual overlap between the constructions or that multicollinearity might be an issue, thereby warranting examination in future analyses. However, the results infer that employees tend to exhibit greater commitment to their organization when there is a perceived good work-life balance. This finding supports the literature that posits that work environments that support employees in balancing personal and professional roles would enhance employees' affective attachment and desire to remain with the organization (Greenhaus & Allen, 2011).

Table 4: Latent variable correlations

Covariance	Estimate	p-value
WLB ↔ Employee Commitment	1.195	<0.001
WLB ↔ Productivity	0.565	<0.001
Employee Commitment ↔ Productivity	0.552	<0.001

In addition, WLB is positively significantly correlated with productivity ($r = 0.565, p < .001$). In other words, when employees feel integrated into their work and personal domains, they feel content with their performance and outputs. According to self-determination theory, the fulfilment of basic psychological needs such as autonomy and competence should be tied to greater wellness and performance satisfaction.

In the same way, a significant relationship between commitment and productivity ($r = 0.552, p < .001$) also gives room to the idea that employees who have higher commitment to their work are more satisfied with it. This may be because they feel that their job gives them purpose, work in alignment with organizational goals, or are internally motivated to do a great job. Being reciprocal means that commitment-focused interventions could indirectly encourage productivity, satisfaction, and vice versa.

4.2.3 Group comparisons (Male vs. Female)

To explore any potential differences based on gender, the model was analyzed separately for male ($n=41$) and female ($n=159$) subsamples. The results revealed important differences in work-life balance, commitment, and satisfaction with productivity to cognitive load based on gender.

Table 5: Gender specific standardized estimates

Path	Males (β)	p-value	Females (β)	p-value
Cognitive Load \leftarrow Productivity	0.809	0.603	-0.018	0.905
Cognitive Load \leftarrow Work-Life Balance	-0.442	0.692	0.525	0.001
Cognitive Load \leftarrow Employee Commit	0.073	0.613	0.535	0.003

For males, work-life balance had a non-significant adverse effect on cognitive load ($\beta = -0.442, p = 0.692$), meaning that work-life balance might not be a major contributor to cognitive strain for men. Employee commitment also had a weak and insignificant association ($\beta = 0.073, p = 0.613$), while productivity had a strong but non-significant positive association ($\beta = 0.809, p = 0.603$). This may indicate that the cognitive load of male employees is influenced by other factors not considered in the current model.

For females, work-life balance was a significant predictor of cognitive load ($\beta = 0.525$, $p = 0.001$). This supports the notion that women may face increased cognitive load when work-life balance falters. Employee commitment also had a significant positive effect ($\beta = 0.535$, $p = 0.003$), potentially implying that very high commitment levels may be part of the reason for cognitive load among women. Productivity, in contrast, was not significant ($\beta = -0.018$, $p = 0.905$), indicating that it is unlikely to lessen the load among female workers.

5 Discussion

5.1 Answers to the research questions

For the detailed description of the present study, the intertwined relationships between WLB, EC, P, and CL in a workplace setting formed the core of three major research questions. The first question explored to what degree WLB, EC, and P fostered the stimulus of mental load in CL. The findings do show that WLB ($\beta = 0.654$, $p < .001$) and EC ($\beta = 0.461$, $p = .014$) exerted statistically significant and positive influences on cognitive load; hence employees who felt better about work-life balance and those who were highly committed to their organization were likely experiencing higher cognitive strain. Forwarding differing notions are the findings showing that P was not a significant determinant of CL ($\beta = -0.075$, $p = .567$), which suggests that providing satisfaction alone may have little or no bearing on the mental workload.

The second research question concerned gender differences in these relationships. Analysis suggested stronger correlations among female workers between WLB ($\beta = 0.525$) and EC ($\beta = 0.535$) with cognitive load. Thus, making it seem like women may be more sensitive to these workplace dynamics or, under a different light, experience pressures that intensify cognitive engagement. On the other hand, the male employee model was inadmissible because of poor fit; thus, this highlights the possibility of different or more complicated mechanisms for men, which have not been adequately modelled in this study.

Nevertheless, if someone were to establish the prime factors responsible for cognitive load in the workplace, the study states that WLB and EC are the most powerful. It was particularly observed that the extremely high covariance between the two variables ($r = 1.195$) shows the considerable overlap in their contributions toward cognitive load. In general, this may indicate that if an employee

is more committed, he or she may seek work-life balance, or vice versa. This interlinked relationship further stresses that organizations must create strategies around these two domains to tackle the various cognitive demands placed upon employees efficiently.

5.2 Answers to the hypotheses

There was mixed support for the proposed relationships through the findings from the SEM analysis. Considering the stratified gender approach, H1, which posited that female employees were subjected to more cognitive overload than male employees, was supported. However, it was seen that for females, both work-life balance and employee commitment were significant predictors of cognitive load ($\beta = 0.525$ and $\beta = 0.535$ respectively, $p < 0.01$), whereas for males, neither was a significant predictor, thereby suggesting that women are more prone to cognitive overload in these considerations.

Table 6: Hypotheses Outcomes

Hypothesis	Supported	Key Evidence
H1: Females experience higher cognitive overload.	Yes	WLB/EC effects significant only for females ($\beta = 0.525, 0.535$; $p < 0.01$).
H2: Lower CL \rightarrow Higher productivity.	No	P had no significant effect on CL ($p = 0.567$).
H3: Lower CL \rightarrow Higher commitment.	Reversed	EC increased CL ($\beta = 0.461, p = 0.014$).
H4: Higher WLB \rightarrow Lower CL.	Reversed	WLB increased CL ($\beta = 0.654, p < 0.001$).

Hypothesis 2 (H2), which argued that higher productivity is associated with lower cognitive overload, found no support on the basis that satisfaction with productivity showed no significant relation with cognitive load ($\beta = -0.075, p = 0.567$). Hypothesis 3 (H3) was refuted because high employee commitment predicted higher cognitive load ($\beta = 0.461, p = 0.014$), especially for female employees, implying that commitment could act merely as a stressor instead of a buffer. The results were also in contradiction to Hypothesis 4 (H4) but extended its partial support: poorer work-life balance was significantly related to greater cognitive load ($\beta = 0.654, p < 0.001$), implying that the term may capture work-life imbalance rather than balance. These findings underline key gender differences

in experiences of cognitive load and suggest that organizational commitment and work-life balance in relation to employee strain require reexamination.

5.3 Managerial implications

This study yields insights that will be important for managers and organizations in their efforts to promote employee well-being and diminish cognitive load at the workplace. First, the realization that WLB substantially affects cognitive loads forth the need for organizations to adopt flexible working policy initiatives. Assigned managers should be encouraged to pursue or facilitate arrangements such as flexible working hours, working from home, mental health provisions, or simply spreading the work more easily for employees so that they can meet demands without compromising their mental resilience.

Secondly, while an employee is the main factor affecting cognitive load, a company should provide all such settings that foster loyalty and engagement. Perhaps this could involve employee recognition, crystallizing and communicating clear and feasible career paths, and promoting a supportive culture that is inclusive to all. These supportive interventions increase commitment and lessen the cognitive load felt by employees in high-demand positions.

Further gender differences support what researchers state about flexible and inclusive managerial approaches. For a good percentage of women, well-being represented by WLB, EC, and the cognitive load factors may be great targets of intervention for assistance in the workplace. On the other hand, because the model was inadmissible for men, such factors may not be the most important to them. Managers should thus consider alternative paths to explore with men, such as granting task autonomy, increasing peer and team support, and providing individualized methods of stress reduction.

Finally, organizations may need to rethink how productivity is perceived and measured because of the lack of a significant relationship between productivity (P) and cognitive load. Ideally, organizations should critically assess whether their current performance mark aligns with their employees' experience and helps their mental well-being. This change must occur less into rewarding this output alone versus a broader perspective that considers the performance of the work from all angles to enable the healing environment to work.

5.4 Assessment of results in light of earlier literature

Though primarily in line with accepted generalizations, the outcome of this established research produced newer insights and stated contradictions to the available literature. The heavy linkage between WLB and reduced cognitive load has been found to correlate in the previous literature on burnout and occupational stress. For example, Allen et al. (2013) showed that integrating work-life balance well leads to lower emotional exhaustion and improves psychological outcomes, suggesting that organizational support for WLB can help reduce cognitive load.

In like manner, the relationship between EC and cognitive load is in accord with the classical ones forwarded by organizational behavior literature; Meyer and Allen's (1991) work, which stresses the psychological attachment of employees toward the organization, implies that committed employees would experience less stress and would be more resilient to workplace-related challenges. Increased EC levels have decreased cognitive strain because of increased motivation and perceived support.

At the same time, this research comes to conclusions that contrast somewhat with the present literature and open further pathways for exploration. Meeting the expectations based on Sonnentag and Fritz (2015), P was not significantly correlated with cognitive load. A possible explanation for such a discrepancy is methodological: PS3, a major key item within the P measurement model, was a nonsignificant indicator, possibly weakening the predictive power of the entire construction. This again raises the question of how productivity is defined and experienced in various roles or sectors, or if differently operationalized measures tap into its psychological consequences.

Another original insight took the form of gender differences in model fit: female employees exhibited stronger and more coherent relations between WLB, EC, and cognitive load, whereas the model for male employees was bedeviled with issues of statistical inadmissibility. This contrasts with those studies, such as Lapierre et al. (2018), which highlight more uniting experiences across genders. The variation might be caused by contextual factors, such as organizational culture or industry norms and are thereby demanding more complex intersectional inquiries to determine how workplace dynamics affect various groups of employees.

5.5 Limitations

This research gives important insight into the relationship between work-life balance, employee commitment, productivity, and cognitive load; however, there are a few limitations that should be considered for the interpretation of the results.

Internal validity: Certain findings, in fact, are less reliable given model-related issues. Negative error variances, such as e_{16} , and non-positive definite matrices, particularly those involving the male sample, speak of an inherent setting of model misspecification and a hint of multicollinearity. These statistical difficulties undermine the strength of subgroup analyses. Secondly, self-reporting is prone to inflating risky measure construction due to common-method variance and subjective bias. A participant's perception may not always reflect an objective condition, which, in turn, leads to observed relationships' distortion among variables.

External validity: However, the study is limited by a number of contextual factors, which constrain generalizability. The sample was female-heavy ($N = 159$), as against male participants, who numbered 41; hence, the results may have little application to gender-balanced or male-majority work environments. Further, the study was done in a single organizational setup in Bangladesh. Here, the findings might be constrained from a general perspective of international versus cross-cultural considerations in cultural, pecuniary, and organizational differences. Industries in other countries, especially those of high stress or those structurally different somehow like healthcare, technology, or finance, might well locate different outcomes relative to cognitive load and its predictors. Thus, future studies should compare findings in international settings for the validation and refinement of those conclusions reached here.

Time constraints: Another limitation comes from the short time within which the study was conducted. With such a short data collection time interval, an insufficient depth of response can often-times be achieved from respondents, or maybe there are enrollments into longitudinal or changing workplace dynamics. A longer-term study approach would afford the advantage of a full-scale analysis of the effect when work-life balance or commitment-related changes pop in cognitive load studies over time.

Ethical considerations: Even though anonymity and confidentiality were guaranteed, respondents might have underreported stress levels or overreported organizational commitment out of fear of losing their jobs or reprisal in their workplace. This bias would especially compromise the results in sensitive matters such as cognition and emotional well-being.

Conclusively, even though the present study offers a working knowledge of cognitive load as it pertains to workplace factors, the limitations in methodology, context, and duration call for further studies across different industries in different countries with longer duration to amplify and support the present findings.

5.6 Recommendations for future research

In order to extend the findings and address the limitations in this study, several suggestions for future research are offered:

Replicate in diverse contexts: Further studies ought to test the model in different organizational and industry contexts, particularly those characterized as male-dominated workplaces such as the areas of technology, manufacturing, and engineering, among others. This would verify if the gender differences observed are consistent and if the relationship dynamics between WLB, EC, and CL transcend occupational cultures and gender distributions.

Longitudinal design: To garner more insights into the causative mechanics of the different key variables, longitudinal studies should be employed. Following WLB, EC, and CL factors over a period would offer insight into dynamic relationships, i.e., whether an improvement in work-life balance or commitment precedes a change in cognitive strain or vice versa.

Mixed methods approach: Incorporating mixed methods will further bolster the validity of future studies. For instance, the use of self-reporting surveys could be triangulated with additional objective physiological indicators of stress such as heart rate variability, cortisol levels, or wearables, thereby providing a more comprehensive understanding of cognitive load and limiting the drawbacks of subjectivity inherent in self-reporting methods.

Cross cultural studies: Work expectations and stress reactions vary with the cultural setting. Some cross-cultural studies involving participants in both collectivist and individualist countries might shed light on how WLB and EC might carry stress under store value systems. This way, the findings will be considered more widely and facilitate notions for culture-based interventions.

Inclusion of additional variables: Future research might want to investigate other potential moderators and mediators such as emotional intelligence, autonomy in work, managerial support, or status of working remotely. This may make sense of why in the same work environment some feel more burdened with cognitive load, and some do not and can sharpen the model's estimating capabilities.

In all, this strives to broaden the perspectives, refine, and make applicable the pertinent study in the area of occupational stress and cognitive functioning with a view towards more effective organizational paradigms and employee well-being programs.

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Appendices

Appendix 1. Survey Questions

Exploring the impact of cognitive load on employee commitment and overall productivity in women centric operational workplace

1.What is your age group?

- 18-25
- 26-35
- 36-45
- 46-55
- 56+

2.What is your gender?

- Female
- Male
- Prefer not to say.

3.What is your highest level of education?

- Secondary school
- High school
- Bachelor's degree
- Master's or higher
- Below secondary school

4. How long have you been working in your current organization?

- Less than 1 year
 1-3 years
 4-6 years
 7+ years

5. What is your job role?

- Operational/Technical Staff
 Supervisor/Team Lead
 Manager
 Executive

6. Rate your overall workload in terms of mental demand

	1	2	3	4	5	
Very Low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very High

7. How often do you experience difficulty concentrating due to task complexity?

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

8. How mentally demanding are your tasks?

	1	2	3	4	5	
Very Low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very High

14. Leaving this organization would be costly for me.

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

15. I am satisfied with the balance between my work and personal life.

	1	2	3	4	5	
Very Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Easy

16. My work demands interfere with my personal responsibilities.

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

17. I often feel stressed due to conflicting demands between work and personal life.

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

18. I feel energized and enthusiastic about my work.

- Never
- Rarely
- Sometimes
- Often
- Very Often
- Always

19. I believe my work environment supports productivity

- Extremely Dissatisfied
- Very Dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied
- Extremely Satisfied

20. I am satisfied with the recognition I receive for my work

- Extremely Dissatisfied
- Very Dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied
- Extremely Satisfied