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# Psychological Treatment of Stress-Induced Exhaustion Disorder

## *Towards a Contextual Behavioral Approach*

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**Abstract**

van de Leur, J. C. 2024. Psychological Treatment of Stress-Induced Exhaustion Disorder. Towards a Contextual Behavioral Approach. *Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Social Sciences* 223. 143 pp. Uppsala: Acta Universitatis Upsaliensis. ISBN 978-91-513-2128-8.

Long-term sick leave due to stress-related disorders has been steadily increasing in Western society. A portion of these sick leave rates is attributed to severe symptoms of exhaustion, assumed to be the result of persistent work stress. In Sweden, this symptomatology is currently classified using the diagnosis of stress-induced exhaustion disorder (ED). There are, however, no evidence-based treatments for ED, nor are there any established theoretical models to guide clinical interventions. Most current treatments revolve around promoting recovery behaviors, as ED is assumed to result from depleted psychophysiological resources. This thesis discusses the merits of this assumption and whether it is compatible with contemporary theories of stress and a contextual behavioral treatment approach. Additionally, a contextual behavioral model of ED is introduced with an accompanying biopsychosocial treatment, aiming to bridge the gap between theories of stress, basic learning principles, and clinically useful methods. The model suggests that ED can be conceptualized as a crisis of engagement rather than a result of depleted psychophysiological resources.

Complementing this theoretical work are empirical studies of different aspects of multimodal interventions (MMI) for ED with the overarching aim of fostering a more theoretically coherent ED treatment that can be made accessible to more patients. Study I was an open clinical trial tracking ED patients ($N$ = 390) participating in a 24-week MMI based on cognitive behavior therapy (CBT). Study II explored sub-groups and predictors of improvements in a large cohort ($N$ = 915) of ED patients participating in the same MMI as Study I. Study III explored mediators commonly suggested to be relevant within ED treatment in the same cohort as Study II: sleep concerns, pathological worry, perfectionistic concerns, and psychological flexibility. Study IV was an uncontrolled pilot trial ($N$ = 26) of the biopsychosocial treatment for ED presented in this thesis, delivered within a 12-week online MMI.

In summary, the results of this thesis indicate that ED patients participating in CBT-based MMI benefit from treatment and report few adverse effects. Moreover, high degrees of perfectionism and high treatment credibility were identified as predictors of improvement, indicating the importance of addressing perfectionistic behaviors and treatment credibility in ED treatment. With positive results similar to those of Study I, Study IV provides preliminary support that ED can be treated more effectively with fewer clinical resources than more extensive MMIs when a more focused and theoretically stringent approach is utilized.

*Keywords:* Stress-Induced Exhaustion Disorder, Burnout, Cognitive Behavior Therapy, Contextual Behavior Science, Process-Based Therapy, Recovery

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# List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

I. **van de Leur, J. C**., Buhrman, M., Åhs, F., Rozental, A., & Jansen, G. B. (2020). Standardized multimodal intervention for stress-induced exhaustion disorder: an open trial in a clinical setting. *BMC Psychiatry*, 20(1), 526. https://doi.org/10.1186/s12888-020-02907-3

II. **van de Leur, J. C**., Johansson, F., McCracken, L. M., Åhs, F., Brodda Jansen, G., & Buhrman, M. (2023). Predictors and sub-groups in the treatment of stress-induced exhaustion disorder. *Cognitive Behaviour Therapy*, 52(4), 397–418. https://doi.org/10.1080/16506073.2023.2197148

III. **van de Leur, J. C**., Johansson, F., McCracken, L. M., Åhs, F., Brodda Jansen, G., & Buhrman, M. (2023). Mediators during a Multimodal intervention for stress-induced exhaustion disorder. *Cognitive Behaviour Therapy*, 1–19. https://doi.org/10.1080/16506073.2023.2295217

IV. **van de Leur, J. C**., Lundbäck, K., Forslund, S., Virtanen, N., Buhrman, M. (2024). *Feasibility of a Novel Biopsychosocial Treatment for Stress-Induced Exhaustion Disorder*. [Unpublished manuscript].

# Papers not Included in Thesis

**van de Leur, J. C**., Jovicic, F., Åhslund, A., McCracken, L. M., & Buhrman, M. (2023). Psychological Treatment of Exhaustion Due to Persistent Non-Traumatic Stress: A Scoping Review. *International Journal of Behavioral Medicine*. https://doi.org/10.1007/s12529-023-10185-y

**van de Leur, J. C**., Buhrman, M., Wallby, K., Karlström, A., & Johansson, F. (2023). Associations between improvements in psychological variables and subsequent sick leave among persons receiving a multimodal intervention for exhaustion disorder. *BMC Public Health*, 23(1), 1976. https://doi.org/10.1186/s12889-023-16799-x

Lindsäter, E., **van de Leur, J. C.**, Rück, C., Hedman-Lagerlöf, E., & Bianchi, R. (2023). Psychometric and structural properties of the Karolinska Exhaustion Disorder Scale: a 1,072-patient study. *BMC Psychiatry*, 23(1). https://doi.org/10.1186/s12888-023-05138-4

# Contents

# Abbreviations

| | |
|---|---|
| ACT | Acceptance and Commitment Therapy |
| CBT | Cognitive Behavior Therapy |
| DSM | Diagnostic and Statistical Manual |
| ED | Stress-Induced Exhaustion Disorder |
| HPA axis | Hypothalamic-Pituitary-Adrenocortical Axis |
| ICD | International Classification of Mental and Behavioral Disorders |
| JD-R model | Job Demands-Resources model |
| KEDS | Karolinska Exhaustion Disorder Scale |
| MMI | Multimodal Intervention |
| ME/CFS | Myalgic Encephalomyelitis/Chronic Fatigue Syndrome |
| RCT | Randomized Controlled Trial |
| RFT | Relational Frame Theory |

# Introduction

> Many social scientists, myself included, consider meanings and values to be at the center of human life and to represent the essence of stress, emotion, and adaptation. (p. 6, Lazarus, 1999)

> Philosophy of science is largely a matter of describing and choosing the assumptions that enable intellectual and scientific work. The goal of examining assumptions is not so much to justify them as it is to own them and weed out accidental inconsistencies. Phrased another way, the goals of philosophizing are nothing more (or less) than clarity and responsibility. The chief goal is to say "This is what I assume - precisely this." (p. 28, Hayes et al., 2016)

As society evolves, so does the expression of disease. One might assume that life would be getting easier with increased wealth, higher education, and technological advances. However, recent developments in sick leave rates seem to suggest otherwise. Over the last two decades, long-term sick leave due to stress-related ill health has increased in many economically developed countries (American Psychological Association, 2019; Eurofound, 2018; European Commission, 2014; OECD, 2012). When factoring in sickness absence and productivity loss, the total cost of work-related stress has been estimated to be 187 billion US dollars in the Western world (Hassard et al., 2018). Perhaps not surprisingly, stress is a prominent subject within Western contemporary scientific and public discourse (McEwen & Akil, 2020). It is the topic of magazine covers, best-selling books, and shows. Stress permeates our society (O'Connor et al., 2021).

From a clinical perspective, many stress-related disorders, such as depression, anxiety disorders, and post-traumatic stress disorder, have well-established psychological treatments, typically based on various forms of cognitive behavior therapy (CBT; Bhattacharya et al., 2023; Hofmann et al., 2012). However, a portion of today's long-term sick leave rates is attributed to severe symptoms of exhaustion, largely assumed to be the result of persistent stress, often pertaining to work. These symptoms may become so severe and debilitating that they require clinical interventions. In Sweden, this symptomatology is currently classified using the diagnosis of *stress-induced exhaustion disorder* (ED). Stress-related symptoms of exhaustion are often associated with concepts such as burnout and have traditionally not been acknowledged in healthcare settings and psychiatry. However, in the wake of

increasing sick leave rates, concepts such as ED and burnout have garnered increased scientific and clinical attention (Eurofound, 2018; Nadon et al., 2022; Parker & Tavella, 2022; Schaufeli, 2018). Despite heightened awareness and escalating sick leave rates, evidence-based treatments for ED are currently lacking, and there are no established theoretical frameworks for its clinical conceptualization (Lindsäter et al., 2022; van de Leur et al., 2023).

In this thesis, my objective is to present a clinical conceptualization of ED. This clinical model suggests that ED can be understood as a crisis of engagement rather than the result of depleted psychophysiological resources, as is commonly assumed in current recovery-focused treatments. First, historical and present definitions of stress-related symptoms of exhaustion are outlined, along with an overview of existing evidence and clinical practices. Second, the underlying philosophical assumptions of current recovery-focused treatment paradigm of ED are discussed in relation to contemporary theories of stress and contextual behavior science. Third, a contextual behavioral model of ED is presented with an accompanying biopsychosocial treatment designed to be theoretically coherent, practically useful, and compatible with current transactional stress views. In doing so, this thesis seeks to contribute to the ongoing discourse of ED by analyzing current treatment assumptions and proposing a framework that bridges the gap between contemporary theories of stress, basic learning principles, and useful clinical methods.

Complementing this theoretical work are empirical studies of different aspects of multimodal interventions (MMI) for ED with the overarching aim of fostering more theoretically coherent ED treatment that can be made accessible to more patients. Taken together, these studies, along with the theoretical work of this thesis, may be regarded as an incremental step towards aligning ED treatment with the current developments of process-based therapy.

# Stress-Induced Exhaustion Disorder - Concepts and Current Treatment

## History and Definitions of Severe Symptoms of Exhaustion

Throughout history, numerous exhaustion conditions have been described, typically characterized by physical exhaustion, dysphoria, irritability, decreased cognitive functioning, and sleeping difficulties. The models used to describe and understand these conditions have mirrored the distinctive explanatory model of their respective eras.

In ancient Greece, exhaustion was explained using the construct of melancholia, which encompassed a broad range of symptoms considered psychiatric today (Neckel et al., 2017). The physician Galen believed that melancholia had a physiological origin, attributing it to an excess of black bile in the body, which slowed down blood circulation, the individual's cognitive ability, and physical mobility. The black bile could also rise to the brain as black vapor and color the individual's emotions. Galen advocated treating melancholia through bloodletting to clear the sluggish blood (Schaffner, 2016a).

During the Middle Ages, some aspects of melancholia were reformulated into the religiously emphasized condition of acedia. Christian theologians described acedia as a sinful apathy and lack of religious conviction (Daly, 2007). In addition to symptoms of exhaustion, acedia was also characterized by low motivation, hopelessness, and restlessness. The philosopher, priest, and theologian Thomas Aquinas argued that acedia resulted from wavering faith, which led to a vicious circle of passivity and negative feelings towards God and the goodness in the world. Striking some similarities to contemporary treatments of behavioral activation for depression, Aquinas believed that to cure acedia, one should act rationally and responsibly with free will and prioritize good deeds (Daly, 2007).

In 1869, George Miller Beard outlined the diagnosis of neurasthenia - a condition well-recognized by clinicians of the time. It was characterized by persistent exhaustion attributed to the rapid pace and demands of "modern life" (Beard, 1869). As the late 19th century unfolded, neurasthenia became one of

the most prevalent diagnoses across the Western world. Renowned German psychiatrist Emil Kraepelin, famed for his work in classifying mental disorders, dubbed neurasthenia "the disease of our time." He distinguished it from other mental illnesses as an "acquired syndrome" (Kraepelin & Diefendorf, 2018). However, as psychoanalysis gained prominence, emphasizing internal psychological explanations of mental disorders rather than external ones, followed by the world wars, the scientific interest in neurasthenia waned (Taylor, 2001). With the introduction of the non-etiological Diagnostic and Statistical Manual system (DSM) in psychiatry in the second half of the 20th century, neurasthenia appears to have been subsumed within other diagnoses, such as depression (Lipsitt, 2019).

Since its demise, paraphrases of neurasthenia have continued to reappear in the clinical literature continuously throughout the 20th century. During the early 1950s, a term emerged in Germany and Austria that aimed to capture growing stress complaints, known as managerial disease (*managerkrankheit* in German). This condition of exhaustion and overwork was attributed to the socio-economic and cultural circumstances of the time, which was devoted to reconstructing and rebuilding a functional society in the wake of the Second World War (Neckel et al., 2017). In 1957, Swiss psychologist Paul Kielholz described a subtype of depression called exhaustion depression (*erschöpfungsdepression* in German; Kielholz, 1957). Two years later, the French psychiatrist Claude Veil described a similar condition called work-related exhaustion (*épuisement professionnel* in French; Veil, 2012), and both conditions were subject to clinical discussions in 1960s Germany and France. However, these conditions would soon be replaced with burnout, the concept most often associated with work-related stress and exhaustion today.

## Burnout

For the past 40 years, much of scientific and public discourse surrounding stress-related symptoms of exhaustion has revolved around burnout, a concept used in organizational psychology to describe how employees gradually succumb to exhaustion, cynicism, and professional inefficiency due to an adverse relationship between workers and organizational factors (Schaufeli et al., 2009). Although burnout had been described in the novel *A Burnt-Out Case* by Graham Greene in 1960, it was academically conceptualized by Herbert Freudenberger in 1974. In a qualitative paper titled "Staff burn-out," Freudenberger (1974) described the symptoms of voluntary staff working at a free clinic for drug addicts. Their symptoms mainly revolved around exhaustion, headaches, sleeplessness, and irritability and were, according to Freudenberger, the result of excessive unattainable work demands.

Concurrently, the social psychologist Christina Maslach and her colleagues interviewed personnel in varying human services. The interviews aimed to understand how these professionals coped with the emotional arousal resulting from interactions with their clients (Schaufeli et al., 2009). They described feeling emotionally exhausted, having developed negative perceptions about their clients, and because of these experiences, often struggled with a lack of professional efficacy. Many of them referred to this experience as being "burned out" (Schaufeli et al., 2017). As a result, Maslach and colleagues defined burnout as concept of three dimensions: exhaustion, cynicism, and professional inefficiency. These occur due to an incongruence between how individuals perceive and cope with work demands, and the conditions provided by the job context (Maslach et al., 2001).

Initially, burnout referred to workers in human services (i.e., social workers, health care workers, police, and legal services); however, during the 80s and 90s, it became increasingly recognized as a phenomenon applicable to all occupations. Almost half a decade later, the scientific literature on burnout is vast, spanning several thousands of books, chapters, and scientific papers, with studies made in the US, Europe and Africa, the Middle East, Latin America, Asia, and Australia (Schaufeli et al., 2009). Additionally, the concept of burnout has gained wide recognition in many cultures as an accurate and affirming description of a phenomenon typical of contemporary work life (Schaufeli et al., 2009).

According to burnout theory, burnout is a multidimensional process that emphasizes a transactional view. It should not be understood merely as an individual stress response but as an experience that results from an interaction between a worker and a social work context (Maslach et al., 2001). This transactional focus has led burnout research to focus more on variables in the work context, such as workload, social support, and role conflicts, rather than individual factors, such as personality or health factors, such as cardiovascular disease (Maslach, 2003). Consequently, burnout research has mainly revolved around perceived stress and various working conditions rather than the connection between stress and negative health outcomes (Maslach, 2003).

Since the early 2000s, burnout research has increasingly emphasized identifying factors that increase the risk of burnout in the work context. In their model "Six areas of work-life," Maslach and Leiter (1999) present six risk factors for burnout that have been supported in occupational stress research: 1) high work demands, 2) lack of control, 3) effort-reward imbalance 4) deficient social support, 5) lack of fairness, and 6) incongruence between the values of the individual and the values of the organization (Leiter & Maslach, 1999; Maslach, 2003).

Today, much research supports that psychosocial working conditions, such as low job control, low social support, workplace injustice, high demands, and value incongruence, have been identified as risk factors for the exhaustion dimension of burnout (Aronsson et al., 2017). Moreover, several prospective studies have shown a link between burnout and adverse physical, psychological, and occupational consequences (Salvagioni et al., 2017). Consequently, burnout research has produced enough evidence to make it an important focus of scientific inquiry as well as a subject of public and work-environmental debate. However, since its original conceptualization, burnout has struggled with a lack of coherent definitions of what it entails, complicating the translations of burnout research findings into organizational measures and clinical interventions.

## Diagnostic and Conceptual Confusion Surrounding Burnout

Aside from Maslach's characterization of burnout, several other definitions have been proposed. For example, Shirom and Melamed (2006) suggest that it should be conceptualized using the dimensions of physical exhaustion, cognitive weariness, and emotional exhaustion. In fact, eleven conceptual definitions of burnout exist, and 88 unique definitions have been identified in the literature (Guseva Canu et al., 2021).

The lack of a uniform definition has hindered the reliable estimation of the incidence and prevalence of burnout (Bianchi et al., 2015a). The Maslach burnout inventory is most often utilized to measure burnout (Schaufeli et al., 2009). However, this three-dimensional inventory lacks a total score or specific cut-offs and guidelines on how the different dimensions should be weighted. For instance, how should a high score on the exhaustion dimension be weighted to a concurring low score on cynism? As a result, varying cut-offs and interpretations of severity are used throughout the literature, leading to large differences in prevalence estimates (Bianchi et al., 2015b). To illustrate, in a review of burnout in physicians, Rotenstein et al. (2018) found prevalence rates of burnout between 0 and 80.5 %.

In light of this conceptual confusion, the construct of burnout is widely debated. Several authors have advocated for the importance of uniform and coherent definitions of burnout (Guseva Canu et al., 2021; Nadon et al., 2022; Parker & Tavella, 2022). Others have dismissed burnout as "psychobabble" (Roberts, 1986) or accused it of being circular (Heinemann & Heinemann, 2017), as it relies on repeated measurements of symptoms not clearly defined or agreed upon, where these vague measurements are then reiterated to validate its own existence. Another position frequently advocated is that burnout is perhaps better understood as a form of depression (Bianchi & Schonfeld, 2020).

In a series of studies, Bianchi, Schonefeld, and Laurent have repeatedly highlighted that the overlap between depression and burnout is considerable. Given the lack of specificity of burnout and that depression is an established diagnostic construct, they suggest that burnout can be better understood as occupational depression (Bianchi et al., 2015c, 2017, 2019, 2021; Schonfeld & Bianchi, 2016). In a review of 92 studies examining the differences between burnout and depression, they conclude that the distinction between these conditions is fragile and that systematic clinical observation should be given a central place in future research on burnout and depression (Bianchi et al., 2015b). On the other hand, several findings support a distinction. Studies using two-factor analysis based on the Burnout Assessment Tool show that, while in part overlapping, depression and burnout also have distinctive dimensions (Sakakibara et al., 2020; Schaufeli et al., 2020). Furthermore, in a systematic review of studies examining the overlap between depression and burnout and burnout and anxiety, Koutsimani et al. (2019) conclude that there are no definitive results on the overlap between these conditions, indicating they are to be regarded as qualitatively distinct. A recent longitudinal study of 542 Finnish workers over eight years measuring depression and burnout symptoms supported a distinctness between these constructs while simultaneously being reciprocally reinforcing (Tóth-Király et al., 2021).

## Burnout and Psychiatric Nosology

To grasp the various perspectives on burnout, it's helpful to recognize that the discussions concerning burnout are not solely one of construct validity but also mirror differences across diverse research traditions, aims, and methods. Burnout stems from social and organizational psychology and has, therefore, been shaped by a contextual framework focusing on a multidimensional construct intended to capture the interaction between an individual and an organization. It was never intended to be a medical diagnosis (Maslach, 2003). Psychiatry and clinical psychology, on the other hand, have predominantly organized their interventional research based on diagnostic categorical systems such as the International Classification of Mental and Behavioral Disorders 11$^{th}$ revision (ICD-11; World Health Organization, 2019), and the Diagnostic and Statistical Manual, fifth edition (DSM-5; American Psychiatric Association, 2013). These systems are based on a latent disease model (more thoroughly discussed on page 29), which assumes that symptoms expressed result from a uniform underlying cause. Therefore, medical and psychiatric diagnoses typically refrain from continuous measures of severity and strive towards dichotomous categorizations, such as "burnout" or "not burnout," or degrees of severity defined by cut-offs (low, medium, high). As a result, when clinical research and psychiatry aim to capture burnout diagnostically, they typically try to reduce its multidimensionality to the core symptom of exhaustion, a view more compatible with a latent disease model

(Schaufeli et al., 2009). Such a categorical unidimensional orientation is incompatible with the original conceptualization of burnout as a contextual phenomenon, as proposed by burnout theory.

DSM and ICD are descriptive and predominantly focus on clusters of symptoms rather than etiology, making it difficult to incorporate organizational factors in their nosological frameworks of symptom expressions. Concurrently, clinical models tend to focus more on the individual (personality, intelligence, emotions) and their ability to cope with external demands (skills, behavior, motivation) rather than on external events that trigger ill-health, thereby veering further away from the burnout's original conceptualization. As a result, even though burnout is originally a construct referring to a process within a social context, much of interventional research on burnout typically focuses on the individual (Heinemann & Heinemann, 2017; Tetrick & Winslow, 2015). Concerns have been raised that such narrow approaches may risk inadvertently diminishing burnout to an individual matter rather than recognizing it as an expression of dysfunctional organizational factors (Epstein & Privitera, 2017; Mantri et al., 2021; Schaufeli, 2021).

Suffice it to say, even though it is conceptually debated, burnout is today a large part of contemporary public and scientific discussion and plays a big part in conversations on health care, well-being, and hazardous work environmental factors (Schaufeli et al., 2009). As a result, healthcare providers across the globe are now tasked with assessing and treating burnout complaints (Parker & Tavella, 2022). However, the ambiguity of burnout and its incompatibility with the categorical latent disease model prevalent throughout health care presents many challenges. For example, clear diagnoses, aside from organizing research efforts, are typically required to receive health care interventions and take part in benefits from the social security system, such as sick leave compensation. Without a clear diagnosis, access to these benefits is often limited.

In 2021, burnout researchers from 29 countries collaborated to suggest a harmonized definition of burnout: "In a worker, occupational burnout or occupational physical AND emotional exhaustion state is an exhaustion due to prolonged exposure to work-related problems" (p. 95, Guseva Canu et al., 2021). The aim is for this definition to increase the utility and clarity of burnout research in the future and could potentially shed light on differences between burnout and depression (Guseva Canu et al., 2021). However, prominent burnout researchers such as Wilmar Schaufeli have questioned this definition. He argues that by removing the dimensions of cynism and professional inefficiency, the core meaning of burnout as a social interaction between the individual and the environment is lost (Schaufeli, 2021).

In summary, burnout is originally a contextual phenomenon from organizational psychology, not easily captured within the syndromal frameworks currently utilized in health care. As long as there are no universally accepted definitions of burnout and as long as this multidimensional construct has to be fitted within a medical nosologically framework favoring unidimensionality, comparing different constructs such as depression and burnout is hard, and interpreting the results from such comparisons will prove challenging (Neckel et al., 2017). Given the lack of uniform definitions, healthcare providers currently navigate severe symptoms of burnout by attempting to fit them into existing diagnostic systems, resulting in significant geographical and local variations.

## Stress-Related Symptoms of Exhaustion in Clinical Settings Today

Burnout is currently not classified as a medical condition in the ICD-11 but as an occupational phenomenon described by dimensions of exhaustion, cynicism, and reduced professional efficacy in accordance with Maslach's original definition (World Health Organization, 2019). Neither is it recognized by the DSM-5 (American Psychiatric Association, 2013). Despite not being recognized as a medical disorder, in 2019, 14 European countries acknowledged burnout syndrome as an occupational condition, and five countries (Denmark, France, Latvia, Portugal, and Sweden) awarded financial benefits for it (Guseva Canu et al., 2019; Lastovkova et al., 2018). In 2018, the European Union issued a research report on burnout in Europe, concluding that burnout prevalence is prominent in many countries throughout the EU and that policy work is needed to improve measures for prevention and treatment to reduce the risk of adverse health outcomes (Eurofound, 2018).

In practice, how to diagnostically categorize stress-related symptoms of exhaustion requiring healthcare interventions varies across countries. Terms such as work-related depression, adjustment disorder, "other reactions to severe stress," and somatization syndrome are used (van Dam, 2021; Wallensten et al., 2019). In Germany, the term *erschöpfungsdepression* is utilized, and in the Netherlands, work-related neurasthenia is common (Hochstrasser, 2023; van Dam, 2021). Clinical burnout is also sometimes used (Maslach & Leiter, 2016; van Dam, 2021). In a scoping review of clinical psychological treatments for stress-related symptoms of exhaustion, diagnoses were typically not used. When used, a wide array of stress- and depression-related diagnoses were utilized, most often in the F43-category or F32-category within the ICD (van de Leur et al., 2023). Consequently, there is currently no international consensus on how symptoms of stress-related exhaustion should best be diagnosed.

Since 2005, the diagnosis of ED (F48.3A) has been accepted into the Swedish ICD-10 and ICD-11 (Kalliomäki & Brodda Jansen, 2021). ED is defined as a reaction to a prolonged period of identifiable persistent stressors (at least six months, typically work-related) signified by substantial debilitating symptoms of exhaustion coupled with cognitive impairments, but not necessarily symptoms of depression (Grossi et al., 2015). These criteria (presented in Table 1) were developed by a task force of researchers and clinicians commissioned to investigate the underlying cause of an escalation of sick leave rates in the aftermath of the economic recession in the 1990s (Åsberg et al., 2003). According to the task force report, interviews and clinical observations revealed that a significant number of patients on sick leave presented a clinical picture of exhaustion, different from that of depression. Moreover, these patients were atypical to psychiatric patients, with above-average education and no previous history of mental health issues. Notably, the patients attributed their condition to persistent work stress (Åsberg et al., 2003).

**Table 1**

*Diagnostic Criteria for Stress-Induced Exhaustion Disorder Published by the National Board of Health and Welfare in Sweden (Åsberg et al., 2003)*

A. Physical and mental symptoms of exhaustion for at least two weeks. The symptoms have developed in response to one or more identifiable stressors, which have been present for at least six months

B. Markedly reduced mental energy, manifested by reduced initiative, lack of endurance, or increased time needed for recovery after mental efforts

C. At least four of the following symptoms have been present most of the day, nearly every day, during the same 2-week period:

    1. Persistent complaints of impaired memory and concentration
    2. Markedly reduced capacity to tolerate demands or to perform under time pressure
    3. Emotional instability or irritability
    4. Insomnia or hypersomnia
    5. Persistent complaints of physical fatigue and lack of endurance
    6. Physical symptoms such as muscular pain, chest pain, palpitations, gastrointestinal problems, vertigo, or increased sensitivity to sounds

D. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning

| | |
|---|---|
| E. | The symptoms are not due to the direct physiological effects of a substance (e.g., abuse of a drug or medication) or a general medical condition |

*Note*. All criteria with capital letters must be met to set the diagnosis.

Although related, ED is not to be equated with burnout. ED is regarded as the end stage of a severe burnout process that requires clinical attention, equitable to the concept of "clinical burnout" (Grossi et al., 2015). In this sense, everyone who reports burnout does not meet the requirements for ED, but everyone who meets the requirements for ED has probably, at a previous stage, reported high degrees of burnout. Thus, burnout may be considered a risk factor for developing ED, which is conceptualized as a more severe clinical condition.

Since its introduction, the prevalence of long-term sick leave attributed to ED has been steadily increasing in Sweden. ED is now one of Sweden's leading causes of long-term sick leave (Swedish Social Insurance Agency, 2020). Given this development, concerns have been raised about the current diagnostic conceptualization and the potential risk of overdiagnosis (Kalliomäki & Brodda Jansen, 2021; Lindsäter, van de Leur, et al., 2023). This increased incidence of ED could be an expression of increased awareness of this condition, previously categorized as within other diagnostic categories, such as depression. It could also be an expression lacking specificity and overinclusive criteria of the ED diagnoses.

The ED diagnosis has received favorable conditions in the approval of sick leave benefits from the Swedish Social Insurance office, compared to other mental disorders. This might have reinforced the utilization of this diagnosis by doctors aiming to increase the likelihood of having their medical certificate prescribing sick leave approved (Åsberg et al., 2024). In response to such concerns, new criteria have recently been presented that accentuate the gravity of exhaustion symptoms, cognitive impairments, and demand sensitivity required to justify a clinical diagnosis, presented in Table 2 (Åsberg et al., 2024). Whether these new criteria will lead to better construct validity and clinical management remains to be seen.

**Table 2**

*Newly Suggested Diagnostic Criteria for Stress-Induced Exhaustion Disorder (Åsberg et al., 2024)*

A. Symptom onset due to significant and persistent external stress factors in combination with a lack of adequate recovery. These circumstances should have been present for at least six months.

B. A persistent feeling of severe exhaustion with a noticeable lack of mental energy for at least one month.

C. Clinically significant cognitive impairment for at least one month, including significant difficulties in sustaining, shifting, and directing attention. Memory problems are common. The impairment manifests as difficulties in assimilating new information, sorting and processing impressions, solving problems, and planning activities.

D. Marked sensitivity to stress for at least one month. Cognitive function noticeably deteriorates with increased external load.

E. At least three of the following symptoms have been present on most days for at least one month:

    1. Sleep disturbance
    2. Noticeable bodily fatigue or weakness
    3. Sensitivity to stimuli, such as normal levels of noise and light
    4. Physical symptoms, such as pain, chest discomfort, palpitations, nausea, gastrointestinal issues, dizziness

F. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning

G. The symptoms are not caused by substance use or somatic illness and are also not a direct consequence of any medical treatment.

H. The symptoms are not better explained by any other mental disorder or illness, any personality syndrome, any neurocognitive disease (dementia), or any developmental deviation (ADHD, autism, intellectual impairment).

*Note*. All criteria with capital letters must be met to set the diagnosis.

## Is the Diagnosis of Stress-Induced Exhaustion Disorder an Example of Medicalization?

Aside from the skepticism about the construct validity of ED and burnout, some are concerned that cconcepts such as these may inadvertently medicalize "normal" human experiences such as tiredness and fatigue, one way or another always present through life (Heinemann & Heinemann, 2017; Lipsitt, 2019). Perhaps symptoms resulting in work-environmental factors are better addressed using environmental interventions, not clinical interventions

focused on the individual (West & Hauer, 2015). National writings on the matter reflect similar concerns of escalating healthcare and social insurance costs and medicalizing "regular" work stress by accepting ED as a medical diagnosis (Åsberg et al., 2024; Engebretsen, 2018)

While ED is often conceptualized as work-related, in practice, it's clinically hard to separate stressors of work and stressors in private life (marital issues or death of a relative) and from vulnerabilities of the individual (e.g., personality traits and coping strategies that can increase the risk of stress; Nadon et al., 2022). It is evident that these challenges of distinction could risk inflating the diagnostic use of ED in healthcare situations, given that human existence, by definition, involves continuous interaction and coping with stressors and demands.

In a wider context beyond ED, some scholars have argued that the healthcare sciences are continuously expanding their sphere of influence by defining new conditions needing treatment – not seldom mental disorders - that were previously deemed to be within the realms of normal functioning (Clarke et al., 2010; Conrad, 2007; Frances, 2013). These tendencies are probably also reinforced by public discourse and media, where increased stress and mental illness are often described as serious and mounting societal problems (Heinemann & Heinemann, 2017). The diagnosis of ED could, to some extent, be an example of such overmedicalization. Alternatively, the increases in ED could indicate an evolving society, where the expression of disease transforms in relation to the changing demands of modern society and work-life. From this perspective, the scientific and clinical effort to address this condition is not an example of medicalization but reasonable attempts to modernize healthcare models to accommodate these symptom expressions better.

Even though the concept of burnout originally stems from the US and is widely established in organizational research, interestingly, very few clinical studies have been made on severe symptoms of stress-related exhaustion in the US, while most have been made in the EU (van de Leur et al., 2023). Perhaps the lack of clinical treatment studies from the US reflects the absence of clinical diagnoses in the specific healthcare context of the US. It has been suggested that the popularity of "burnout" is the fact that it is a non-medical, socially accepted term that carries less stigma than psychiatric diagnosis (Shirom, 1989). Conversely, the opposite seems to be true in Europe, where conditions of burnout or ED become increasingly popular because they enable access to healthcare services and social insurance, such as treatment and sick leave benefits (Schaufeli et al., 2009).

Medicalization or not, the question of the ED diagnosis seems to boil down to whether severe symptoms of exhaustion that occur in association with

persistent stress (most often work-related) should be considered a focus for clinical healthcare efforts. This question gains relevance as these symptoms appear to be on the rise in modern society, presumably tied to escalating work stress. Sweden has taken a considerable step by formally introducing ED into its public health care system. While this could be seen as setting a precedent, the increasing prevalence of ED could equally serve as a cautionary tale. Regardless, ED patients are now part of clinical everyday life in Sweden, so developing effective clinical interventions is crucial.

## Clinical Treatments of Stress-induced Exhaustion Disorder

Given that ED is still relatively "new" as a formal diagnosis, prevalence estimates are limited. In a cross-sectional study from northern Sweden, 4.2% of 3406 participants reported a physician-based diagnosis of ED (Höglund et al., 2020). In another study, based on patients in primary care, 30 % reported symptoms potentially indicative of ED (Wiegner et al., 2015). A German study of exhaustion symptoms showed that 6 % of the general population reported symptoms of exhaustion with mental impairments (Stöbel-Richter et al., 2013). Several studies from the Swedish working population suggest that between 8 and 21.5 % of workers report ED-related symptoms depending on the measurements used (Asplund et al., 2021; Glise et al., 2010; Persson et al., 2016). In 2020 in Sweden, 14 % of men's and 19 % of women's long-term sick leave rates were due to ED (Swedish Social Insurance Agency, 2020).

Since its introduction in 2005, several research efforts have been made on understanding and treating ED effectively. A recent scoping review summarized 89 research papers published on ED on qualitative studies, biological measures, cognitive functioning, symptom course, and treatment (Lindsäter et al., 2022). Due to small samples, few replications, and limitations in methods, no firm conclusions can be drawn regarding cognitive functioning and biological measures of ED (Lindsäter et al., 2022). While no specific treatment is identified as the gold standard, people with ED participating in treatments based on CBT generally report symptom improvement and improved return-to-work rates (Finnes et al., 2019; Lindegård et al., 2022; Lindsäter et al., 2018; Persson Asplund et al., 2023; Salomonsson et al., 2020; Stenlund et al., 2012). Another concurrent scoping review of the international research literature on clinical treatments of stress-related symptoms of exhaustion concluded that while several psychological treatments based on CBT show promising results, there are currently no established theoretical treatment models (van de Leur et al., 2023).

A multitude of different ED interventions have been studied. Earlier studies describe long treatment periods, sometimes up to a year (Stenlund et al., 2012). Additionally, some of these treatments were nature-based and took

place in a garden environment, based on the notion that restorative environments would effectively facilitate the recovery process of ED (Millet, 2008; Pálsdóttir et al., 2013; Sahlin et al., 2014, 2015). In 2011, clinical recommendations from Sweden advocated using MMI:s as the primary treatment form for ED (SOU, 2011). In an MMI, several interventions are administered simultaneously by a team of professionals working together, initially developed for the rehabilitation of longstanding pain (Kamper et al., 2014). According to the recommendations of 2011, MMI for ED was to include lifestyle changes concerning the balance between activation and recovery, some relaxation techniques, psychotherapy (preferably in a group context), and specific return-to-work interventions, including communication with the patient's workplace. However, the empirical support for MMI in the treatment of ED is, to this date, limited (Lindsäter et al., 2022; Wallensten et al., 2019).

Few studies have focused on standardized MMI containing all the components recommended in 2011. Instead, rather than comparing MMI itself to treatment as usual or wait-list control, studies have explored "MMI additions," such as spinning or cognitive training, in comparison with receiving a "standard"-MMI, with few or negligible results (Lindegård et al., 2022; Malmberg Gavelin et al., 2018). The outcomes of such studies are, in hindsight, perhaps not surprising, given the comprehensive treatment provided within the standard treatment.

These comprehensive multicomponent MMIs are implicitly built upon the assumption that ED is a protracted complex condition and, therefore, necessitates complex and extensive treatment. Simultaneously, they seem to have a wide and unspecific treatment approach, offering a plethora of potentially helpful components, mixing ingredients from various therapeutic and theoretical traditions. The upside of these MMIs is that ED patients participating in them report large improvements in symptoms and return-to-work rates (Glise et al., 2012; Wallensten et al., 2019). The downside is that they offer little clinical flexibility and lack clinical and theoretical specificity, which makes it difficult to discern what components and theories are crucial for treatment success.

Recently, some studies have focused on unimodal and more delimited treatments with promising results. Lindsäter et al. (2018) showed that an Internet-guided CBT for Adjustment Disorder and ED resulted in large significant between-group effect sizes on symptoms of exhaustion ($d$ = 1.09) at post-treatment, compared to a wait-list control. These results were recently replicated in a randomized controlled trial (RCT) where self-referred employees (76.9 % with ED) were randomized to regular CBT, work-focused CBT, and wait-list control (Persson Asplund et al., 2023). Here, significant

between-group effect sizes were found between CBT conditions and wait-list control on symptoms of exhaustion ($d = 0.74$ for each respective group) at the six-month follow-up. Studies such as these suggest that more limited and targeted interventions for ED based on CBT also have the potential to yield positive results.

All the above-described treatment studies share a common focus on recovery. In clinical contexts, ED is frequently assumed to result from a lack of recovery due to an overload of persistent stress (Almén, 2022). As a result, treatments largely focus on fostering recovery behaviors, such as relaxation and yoga (Grensman et al., 2018; Stenlund et al., 2009), breathing exercises (Ristiniemi et al., 2014), encouraging physical workouts (Gerber et al., 2015), and improving sleep (Söderström et al., 2012). Typically, the focus of recovery is combined with additional established CBT components such as applied relaxation, stimulus control for insomnia, cognitive restructuring, the identifying core values from acceptance and commitment therapy (ACT), behavioral activation, and exposure (Persson Asplund et al., 2023; Salomonsson et al., 2020).

In treatment studies on ED focusing on recovery, the theory of recovery processes by Geurts and Sonnentag (2006) is often referred to (Almén, 2022). According to this framework, recovery denotes the activities and experiences facilitating psychophysiological unwinding after effort expenditure (Geurts & Sonnentag, 2006; Sonnentag et al., 2017). It is worth highlighting that the theory of recovery is a general theory on how to wind down from stress during and after work and is not a theory of ED specifically, nor is it explicitly designed to be used in a clinical context.

The focus on recovery in ED treatment and its relation to behavior principles utilized in CBT will be discussed extensively in the next part of this thesis. For now, it can be concluded that in addition to the lack of international nomenclature, knowledge about clinical treatments for ED is limited. Current MMIs are often extensive, unspecific, and challenging to decipher scientifically. While unimodal treatments have started to surface with promising results, these interventions consist of several components and theoretical perspectives, pragmatically combined to harmonize the recovery framework with CBT principles. Currently, no established CBT models pinpoint the central processes initiating and maintaining ED.

## Is Stress-Induced Exhaustion Disorder Better Understood as a Transdiagnostic Symptom of Fatigue?

Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) refers to the symptomatology of persistent disabling fatigue, generally assumed to be the result of some form of organic multisystemic failure with unknown cause (Carruthers et al., 2003). Just as with ED, many criteria exist for ME/CFS, and there is a general lack of evidence for the specificity of ME/CFS (Alme et al., 2023). According to some definitions (for example, the Fukuda criteria), there are many similarities between ED and ME/CFS, as both include severe symptoms of exhaustion coupled with pain, sleep disturbances, and difficulties with memory and concentration (Maroti et al., 2017). However, what is typically highlighted as differences is the presence of post-exertional malaise in ME/CFS and that the prognosis of ME/CFS is generally considered worse compared to ED (Maroti et al., 2017).

Several authors have previously discussed whether burnout, neurasthenia, and ME/CFS could be considered different expressions of the same underlying condition, given their overall shared and somewhat ambiguous symptomatology, albeit with different assumed underlying causes: neurasthenia as the result of overwork and societal changes, burnout as a cause of work-related stress and ME/CFS as the cause of some form immunological dysregulation due to viral infection (Leone et al., 2011; Lipsitt, 2019; Wessely, 1994). In a similar vein, Lindsäter, Svärdman, et al. (2023) have recently suggested that given the limited progress of effectively diagnosing and treating ED, coupled with the absence of shared international nomenclature, the symptoms of ED would perhaps be better understood as transdiagnostic symptoms of fatigue, rather than a diagnosis-specific pathology. Treatment should then focus on transdiagnostic factors - such as motivational factors, sleep disturbances, increasing activity, and self-efficacy – general to all conditions of fatigue rather than on specific processes of ED.

Lindsäter, Svärdman, et al. (2023) used a qualitative content analysis of a survey from 670 participants (573 with self-reported ED and 97 healthcare professionals) as a basis for this claim. Their results showed that beyond symptoms of exhaustion and cognitive symptoms, ED patients report a high degree of comorbid symptoms such as depression, anxiety, and feelings of sickness, similar to the concept of chronic/persistent fatigue. This concept, however, technically refers to persistent fatigue identified in conjunction with chronic somatic conditions such as epilepsy, ME/CFS, multiple sclerosis, neuralgic amyotrophy, ehlers-danlos syndrome, myasthenia gravis, and autoimmune rheumatic disease (Billones et al., 2020; Menting et al., 2018). It does not refer to symptoms of exhaustion/fatigue in relation to psychiatric disorders or as the result of persistent stress.

It is a common fallacy within psychology and psychiatry to assume that similar symptoms across different putative disorders indicate a shared underlying cause or construct (VanderWeele & Batty, 2023). Psychiatric symptoms are reciprocally intertwined, which increases the incidence of additional symptoms over time (Borsboom, 2017). To illustrate, several longitudinal studies show that experiencing symptoms of depression will increase the risk of experiencing anxiety and vice versa (Jacobson & Newman, 2017). Suppose anxiety leads to depression, and depression leads to anxiety. In that case, it is safe to assume that patients who have been struggling with anxiety for a long time will score similarly on self-rated report instruments of depression and anxiety in a cross-sectional assessment compared to patients struggling with depression. Therefore, similarities across different measurements in one-wave data should not be used as evidence to indicate a single underlying latent variable or construct (VanderWeele & Batty, 2023).

To distinguish differences between conditions assumed to be potentially causally related, one must compare these conditions concurrently over time. For example, to evaluate whether ED, burnout, and ME/CFS are all different conceptualizations of persistent fatigue, one would have to study these concepts in the same population prospectively, where all suggested constructs are measured along with factors that could influence burnout, ED, and ME/CFS (Leone et al., 2011). To the best of my knowledge, this has yet to be studied.

Another common symptom shared across different medical conditions is fever. Fever can result from viruses, bacteria, or autoimmune diseases. However, this does not mean we treat these conditions similarly: autoimmune diseases are treated with immunosuppressive drugs, bacteria with penicillin, and viruses with rest and symptom management (if not prevented by vaccination). Likewise, the pathways to mental disorders are plentiful, and different pathways may warrant different clinical responses. A depressive episode as the result of unemployment and poverty should probably be managed differently compared to a depressive episode resulting from genetic vulnerability and social isolation.

As early as the third edition of the DSM, it is stated that:

> A misconception is that all individuals described as having the same mental disorder are alike in all important ways. Although all the individuals described as having the same mental disorder show at least the defining features of the disorder, they may well differ in other important ways that may affect clinical management and outcome (p. 6, American Psychiatric Association, 1980).

If this applies to the diversity within mental disorders, it is reasonable to assume that the same applies to various conditions with overlapping symptoms. The very idea of the ED diagnosis is that its inherent link to persistent stress warrants particular clinical consideration, currently not captured within existing psychiatric and medical categories. Whether this holds and whether the current conceptualization of ED effectively guides clinical intervention remains an open empirical inquiry.

## Challenges to Contemporary Psychiatric Nosology

In a recent scoping review, Lindsäter et al. (2022) highlight that the most basic assumptions of the ED diagnosis, such as the proposed etiology and validity of the criteria, remain unanswered. Concerns about the construct validity of the ED diagnoses should be considered in the broader context of psychiatric nosology. If other psychiatric disorders were well-defined, distinguishable disease entities that effectively guided clinical interventions, then critiquing the lack of specificity of ED would certainly be warranted. However, this does not seem to be the case. Instead, lack of specificity and conceptual ambiguity are commonplace within psychiatric diagnostics.

To elaborate, burnout and ED are often compared and discussed in relation to depression, as if depression is a well-defined and distinct mental disorder (Schonfeld & Bianchi, 2016). However, despite decades of work, many concerns remain as to the validity of depression as a construct and how to measure it effectively (Fried, 2017; Parker, 2005). In fact, evidence based on several different scientific methods suggests that it is not best conceptualized as a unified syndrome (Antonijevic, 2008; Fried et al., 2016; Sullivan et al., 2002).

Compared to many other medical diagnoses based on biological underpinnings and signs, psychiatric diagnoses are mostly based on self-reported symptoms. Therefore, syndromal diagnoses are clinical judgments with no independent forms of measurement or validation, and so what is or is not the disease is, to a large extent, socially negotiated through scientific discussion and clinical practice (Pilgrim, 2007).

Clark et al. (2017) describe four issues in the classification of mental disorders. First, identifying specific etiologies for mental disorders is challenged by the fact that psychopathology results from a web of interacting behavioral, biological, and psychosocial causes. Second, mental disorders are dimensional and vary on a severity continuum, making them hard to specify as “present” or “not present,” as typically pursued within categorical frameworks. Third, mental disorders are multidimensional in the sense that they manifest in behavioral, cognitive, emotional, and physiological

expressions. This multidimensionality makes defining clear diagnostic thresholds and clinical significance challenging in practice, inherently relying on subjective clinical judgment. Lastly, symptoms overlap across many disorders, and individuals diagnosed with one mental disorder have substantially increased odds of meeting the criteria for at least one more, not seldom three or more (Clark et al., 2017).

Within epidemiology, diseases influenced by lifestyle factors, such as diabetes, heart disease, certain forms of cancer, and hypertension, are understood as multicausal phenomena (Kendler, 2019). One could assume that the same would be true for psychiatric disorders, given that they are, by nature, complex multilevel phenomena (Kendler, 2005). However, historically, this has not been the case. When the DSM-III was created, a pragmatic approach was adopted, focusing on atheoretical and descriptive clusters of symptoms (Kendler, 2019). In parallel with statistical approaches of factor analysis, favoring the identification of underlying unimodal constructs, these categories soon became reified as real disease entities (Borsboom, 2017; Kendler, 2019). Consequently, inherent in the diagnostic systems of DSM and ICD is a latent disease model, where the subsequent task for science is to find the specific underlying biology of these assumed homogenous disease entities (Hyman, 2010).

During the past decades, psychiatric research has hoped these diagnostic categories would eventually be validated through the scientific discovery of common etiologies and biological underpinnings (Insel, 2021). Despite technical advancements and an abundance of research, few neuroscientific findings have contributed to the prevention and treatment of mental disorders (Kozak & Cuthbert, 2016). Furthermore, the integration of genetic and neuroscientific findings into the nosological categories of DSM and ICD has been lacking, thereby offering limited contributions to the comprehension of the emergence and maintenance of mental disorders. In an editorial in JAMA Psychiatry, Kraemer (2013) writes:

> Of course, the fly in the ointment is that while DSM has documented test-retest reliability for many of its diagnoses, it has never yet documented validity but has only claimed face/construct validity, both subjective nonevidence-based assessments. There is yet no history of establishing validity for psychiatric diagnoses (p. 139, Kraemer, 2013).

In summary, the linkage between diagnostics and the underlying disease processes has proven unsuccessful; mental disorders lack treatment specificity, and comorbidity is the rule rather than the exception - undermining the idea of separate diagnostic categories (Borgogna et al., 2023; Hayes & Hofmann, 2021). There is today a broad agreement that the current diagnoses

for mental disorders lack clinical utility (Maj, 2018) and that "the reification of DSM-IV entities, to the point that they are considered to be equivalent to diseases, is more likely to obscure than to elucidate research findings," to quote the DSM-5 workgroup themselves (Kupfer et al., 2002).

Hence, while the evidence supporting the validity of the ED diagnosis is currently limited, the same is true for many other mental disorders. However, lack of diagnostic specificity should not be confused with clinical irrelevance. Given the general difficulties surrounding the taxonomy of mental disorders, trying to answer the question, "Is ED a diagnosis in its own right?" offers limited guidance in the development of effective clinical psychological treatments. Instead, novel approaches beyond the focus of syndromal taxonomies will probably be more useful.

## Process-Based Therapy

The latest iterations of the diagnostic systems, the ICD-11 and the DSM-5, have increasingly begun acknowledging multidimensionality and interacting overlapping symptoms across mental disorders (Reed et al., 2019; Regier et al., 2013). However, in light of the challenges and limitations of the current diagnostic paradigm, new scientific and clinical approaches that shift focus away from discrete conditions have begun to emerge. One such approach is process-based therapy.

In the last 40 years or so, much of clinical psychological research on CBT has organized itself around the DSM, where various therapeutic protocols have been developed for specific disorders. The benefits of this focus have been substantial, as it has resulted in the emergence of multiple evidence-based CBT protocols for conditions such as panic disorder, depression, obsessive-compulsive disorder, and social anxiety disorder, to name a few (Hofmann et al., 2012, 2013). Nonetheless, over time, effect sizes reported by RCTs on CBT studies seem to have stagnated (Hayes et al., 2023; Johnsen & Friborg, 2015; Öst, 2008). Response rates typically vary between 50-77 % for mood- and anxiety disorders, meaning available CBT protocols do not help many clients (Hofmann et al., 2012). Moreover, there has been growing concern that the evidence-based protocols intended to aid treatment are rigid and do not mirror the realities of practitioners, nor do they tailor to the needs of the individual (Hofmann & Hayes, 2019).

Advocates of process-based therapy argue that an overly narrow focus on syndromes and protocols has fostered an instrumental approach to psychological treatment, and as a result, clinical theory has suffered (Hayes et al., 2020). Too little clinical research has focused on generating hypotheses based on careful interventions and building theories that can be systematically

tested (Hayes et al., 2021; Kazdin, 2007). Instead, CBT has become a broad term encompassing various theories, models, and interventions. As with current treatments of ED, many evidence-based CBT protocols consist of packages of different methods with diverse and sometimes contradictory underlying theoretical assumptions (Hofmann & Hayes, 2019). However, to better discern why certain interventions work and for whom and be able to compare different treatments with each other, treatments need to be based on coherent theory accompanied by specific therapeutic methods (Hayes et al., 2022).

Therefore, according to process-based therapy, a larger emphasis should be put on the preanalytical philosophical assumptions of science and on treatment models (a) built upon testable theories, (b) targeting specific evidence-based processes of change, and (c) tailored to individual's needs (Hayes et al., 2019; Hayes & Hofmann, 2021). Change processes are defined as the specific variables through which a treatment method influences a targeted dependent variable. These processes should be theory-based, manipulable, dynamic, and multilevel (Hofmann & Hayes, 2019). These theoretical priorities of process-based therapy also call for a shift in clinical research practices with an increased focus on mediational studies, single case design, ecological momentary assessment, and measurements of longitudinal idiosyncratic symptom networks (Hofmann et al., 2020).

Process-based therapy aims to learn "which core biopsychosocial processes should be targeted with a given client who has a given goal in a given situation, and to then identify the component methods most likely to change those processes" (p. 17, Hoffman, 2018). By focusing on specific change processes and methods rather than syndromal protocols, comparisons and cross-fertilization across different theoretical and therapeutic traditions are also more easily facilitated (Hayes et al., 2020). Process-based therapy is still in its infancy – a research agenda aimed at cultivating a new era of clinical research and evidence-based psychological treatment. Only time will tell whether such a theoretical and methodological pivot will be fruitful and provide more effective treatments in the future compared to the current syndromal protocol-focused paradigm.

## Stress-Induced Exhaustion Disorder and Process-Based Therapy

Whether it is defined as clinical burnout, ED, work-related depression, or neurasthenia, severe symptoms of stress-related exhaustion seem to be an increasingly common complaint within Western healthcare systems. Given how established the concepts of stress and burnout have become within our culture, in conjunction with increased reports of perceived work stress, concepts such as ED will likely persist, warranting ongoing scientific and

clinical attention. Much discussion on how ED is best clinically understood pertains to its definition or lack thereof. However, given the limitations of the current diagnostic systems to effectively guide clinical interventions, coupled with the broader developments of process-based therapy within clinical psychology, perhaps ED is clinically more effectively approached through the theorizing of relevant change processes.

Several of the contemporary behavioral approaches within clinical psychology, such as ACT (Hayes et al., 1999), behavioral activation (Jacobson et al., 2001), and functional analytic psychotherapy (Kanter et al., 2010), largely stem from contextual behavior science. Contextual behavior science can be seen as a refinement of radical behaviorism and is a scientific movement that utilizes psychological principles derived from basic research (learning theory) in order to facilitate clinically meaningful behavioral change (Biglan & Hayes, 1996). What distinguishes contextual behavior science from many other clinical research enterprises is that it is based on a set of explicitly defined philosophical principles called functional contextualism, which will be explained in detail later on. In the past four decades, the evolution of ACT and contextual behavior science, focusing on change processes linked to basic scientific principles, has played a crucial part in laying a foundation on which process-based therapy is built (Hayes et al., 2022). Therefore, when approaching ED treatment from a process-based perspective, I have opted to do so from a contextual behavior outlook.

However, to effectively describe a contextual behavioral model of ED based on specific change processes and explain the rationale behind this approach, it's helpful to first examine the preanalytical assumptions forming the basis for current ED treatments. As will be discussed in the next part of this thesis, the lack of progress in treatment models for ED may stem not only from conceptual confusion regarding the concept of ED but also from the underlying assumptions of the current recovery-focused treatments.

# Potential Limitations of Current Recovery-Focused Treatments for Stress-Induced Exhaustion Disorder

Many of the published treatments for ED are primarily based on interventions for burnout and stress, with methods emphasizing stress alleviation, often focusing on reducing/removing external stressors and restoring depleted mental and physical resources through recovery (Almén, 2021; Hobfoll, 1989). If the clinical theory asserts that ED results from exerted resources due to overwhelmingly taxing demands, restoring those lost resources is the logical focus of treatment (Melamed et al., 2006). Correspondingly, if ED results from too frequent and enduring sympathetic activation, focusing on relaxation and breathing exercises that foster parasympathetic activation and sympathetic deactivation seems reasonable. Certainly, the importance of recovery is a common-sense explanatory model with understandable high face validity. Humans are indeed organisms constrained by certain biological prerequisites and limitations. When we are awake for some time, we need to sleep. When our muscles have been exerted, they need to recover. And when we have focused on an intellectual task for too long, our concentration wavers, and we need to take a break.

As previously described, despite several different CBT treatments showing promising results, no treatment stands out as the gold standard, nor are there any widely established theoretical treatment models for ED (Lindsäter et al., 2022; van de Leur et al., 2023). This lack of evidence-based treatments and established models warrants the question of whether a recovery-focused approach fosters effective clinical interventions with high clinical utility specifically for ED. In the following sections, I will discuss several potential limitations of the clinical conceptualization of ED due to lacking recovery and argue why adopting a contextual behavioral approach may be theoretically more coherent and practically more useful. More specifically, I will argue that:

- Treatments based on recovery rely on a reductionist stimulus-response stress model, overlooking the subjective evaluation of external stressors.

- The conceptualization of ED as the result of lacking recovery can be extended to many forms of mental illness and does not define change processes that may contribute to the development and maintenance of ED.

- The concept of recovery originates from biomechanical ontological assumptions and is, therefore, in many ways incompatible with a contextual behavior approach to treatment.

- Reductionist biomechanical models of recovery risk implicitly convey the idea of stress as something potentially harmful. This may inadvertently promote stress phobia and avoidance, thereby increasing the risk of adverse treatment outcomes.

# The Ambiguous Concept of Stress

Defining the concept of stress is crucial in relation to ED, as it is rooted in the assumption that symptoms of exhaustion can ensue as the result of persistent stress. Defining stress is, however, not a simple task, as several definitions of stress are utilized differently throughout various scientific disciplines and contexts (Mcewen, 2005). While theoretically and practically overlapping, stress models can be simplified into two broader categories: physiological and psychological.

## Physiological Definitions of Stress

The first modern scientist to refer to stress and operating within the realms of human functioning was Walter Cannon, who famously defined and introduced the fight-and-flight response, i.e., the adaptive physiological reactions in animals that occur in response to perceived harmful stimuli (Cannon, 1932). Based on previous work from Claude Bernard, Cannon also developed the idea of homeostasis, meaning living organisms functioning and survival rely upon steady internal physical and chemical states (temperature, blood sugars, pH etc.) in need of constant maintenance (McEwen, 2000). Based on the concept of homeostasis and fight-and-flight response, Hans Selye (1936) introduced the theory of the general adaption syndrome. According to Selye, stress was to be defined as a stimulus-response model, where a stressor is considered a stimulus threatening an organism's homeostasis followed by the organism's physiological response aimed to regain homeostasis (Chrousos, 2009). Selye proposed three stages of how the body physiologically reacts and adapts to stressful stimuli: the alarm, adaptation, and exhaustion phase. In the alarm phase, the body reacts with a quick response, the flight and fight

response, to effectively adjust the internal milieu to better evade or accommodate external stressors. If the stressors are not removed, more long-term physiological stress responses will set in, such as the increased secretion of cortisol and glucocorticoids to increase bodily access to glucose, fat, and amino acids, called the adaptation phase. In the third phase, the body can recover if the stressor is overcome by utilizing released glucose, fat, and amino acid for anabolic processes, restoring homeostasis. However, if the stressors are not removed, the organisms' resources will eventually become exhausted, resulting in impaired bodily functions and biological decomposition (Selye, 1950).

Selye heavily emphasized the importance of the hypothalamic-pituitary-adrenocortical axis (HPA axis) and believed that the general adaptation syndrome represented a new approach to human disease that could potentially explain a range of illnesses (McCarty, 2016). However, since its inception, this model has been questioned for being unspecific, excluding neural and endocrine systems important to the stress response, and not accounting for variation in stress responses due to the organism's learning history and individual biological variations (McCarty, 2016).

Since the introduction of the general adaptation syndrome, the scientific knowledge of stress has grown significantly. Today, substantial evidence supports that while acute stress is an adaptive response to increasing demands, persistent stress can increase the risk of adverse health outcomes, including cardiovascular diseases, diabetes, overweight, and psychiatric disorders (O'Connor et al., 2021). Perhaps the most established contemporary theoretical framework accounting for these various physiological mechanisms is the regulatory model of allostatic load, introduced by McEwen and Stellar (1993).

It is beyond the scope of this thesis to describe the biological processes involved in stress physiology in detail. In short, the terms allostasis and allostatic load are a theoretical replacement for Selye's third-stage exhaustion and can be summarized as the biological strain put on the body as it adapts to persistent demands (McEwen & Akil, 2020). Using homeostasis to understand the influence of stressors' impact on the body, as Selye proposed, is associated with two limitations. First, all human activity and external stimuli can technically be considered a threat to homeostasis. Second, homeostasis does not differentiate between the bodily systems essential to life (such as pH, body temperature, glucose levels, and glucose tension) and those that maintain it (Mcewen, 2005). Allostasis "solves" these problems as it refers to a superordinate bodily system that maintains homeostasis through gradual physiological changes in the face of persistent demands, mediated through the regulation of the HPA axis, cortisol dynamics, the autonomic nervous system,

and gene expressions. As external stressors persist, the body can initiate various physiological adjustments, such as hormonal changes, inflammatory responses, metabolic adaptations, and immune system modulations, to facilitate effective adaptation and coping. While such mechanisms are adaptive and crucial to everyday functioning, the burden of allostatic states builds up over time (McEwen, 2017). In this way, allostasis captures the dual nature of stress: How indispensable and adaptive biological processes crucial for survival and adaptation can become detrimental when persistently mismanaged or over-employed.

Allostatic load refers to the cumulative "wear and tear" of allostatic states, such as high blood pressure, diabetes, or being overweight (McEwen & Seeman, 1999). Moreover, behavioral adaptations such as increased hypervigilance, worrying, substance abuse, and different forms of avoidance are also examples of allostatic load (McEwen, 2000). Consequently, the allostatic load framework describes how physical and psychosocial stressors such as harsh climate, food deprivation, infections, pollution, poverty, parental neglect, social exclusion, and adverse life events cumulative impact the body and the brain. To apply this broad systemic approach to the individual experience of stress or a specific context, such as the work environment, one must turn to psychological theories of stress.

## Psychological Definitions of Stress

The three most common psychological frameworks for understanding stress are the appraisal theory, the stress-generation theory, and the job demands-resources model (JD-R model). For in-depth reviews, please see Biggs et al. (2017) for appraisal theory, Rnic et al. (2023) for the stress-generation theory, and Tetrick & Winslow (2015) for the JD-R model. It should be noted that there are sub-theories and refinements within these larger frameworks that are not captured in the following summaries. It should also be noted that more theories of stress exist in the scientific literature, such as the cognitive activation theory of stress (Ursin & Eriksen, 2004) and the social stress theory (Mossakowski, 2014). However, describing these goes beyond the scope of this thesis.

### The Appraisal Theory

Appraisal theory, introduced by Lazarus and Folkman (1984), is one of the most widely accepted broad psychological frameworks for understanding how individuals respond to external demands. According to appraisal theory, "Psychological stress refers to a relationship with the environment that the person appraises as significant for his or her well-being and in which the demands tax or exceed available coping resources*"* (p. 63, Lazarus & Folkman, 1986). In this sense, appraisal theory, like burnout theory, has a

transactional view of stress. It asserts that the interaction between the environment (stressors) and individuals' physiological stress response is mediated through appraisal and coping. In the later iterations of appraisal theory, Lazarus differentiates between primary and secondary appraisal (Lazarus, 1991). Primary appraisal refers to whether a stimulus is relevant to the individual goals and well-being, and secondary appraisal refers to the assessment of how best to cope with the stressor at hand.

Coping encompasses all cognitive and behavioral efforts to master, tolerate, or reduce external and internal demands and conflicts between them (Lazarus & Folkman, 1984). There are several taxonomies on different coping strategies throughout the literature, but the most widely established are problem-focused coping and emotion-focused coping (Smith & Kirby, 2009). Problem-focused coping is behavioral responses explicitly aimed at altering the situation in accordance with one's goals. Emotion-focused coping, instead, refers to altering/managing the internal responses (physiological responses, emotions, cognitions) in relation to the ongoing demands (Smith & Kirby, 2009).

Appraisal theory has contributed to understanding stress as an inherently subjective process, underlining the importance of an individual's needs, goals, resources, and abilities to understand whether external stressors become stressful. Because appraisal theory is a general theory of stress, encompassing all forms of environment-individual interaction, it's typically used in broader interventional research, such as stress-prevention programs in organizational and educational contexts (Amanvermez et al., 2022). However, this theory can be difficult to translate into a clinical setting, working with delimited conditions with idiosyncratic etiologies. Thus, the breadth of appraisal theory has resulted in trade-offs in focus and specificity (Troy et al., 2022). More precise models that describe the processes typical to a certain condition and a particular person are usually sought after in a clinical context. Therefore, even though it is highly relevant to the understanding of stress, appraisal theory is seldom applied as a model in clinical psychological treatment and research.

**The Stress-Generation Theory**

Earlier research on depression largely emanated from a stress-exposure model, similar to Selye's stimulus-response model of stress, where individuals were considered passive recipients of independent environmental stressors, with little influence in the shaping of the events significant to the development of depression (Liu & Alloy, 2010). In 1991, Hammen introduced the stress-generation model, which posits that individuals suffering from depression are active agents in the creation of life stressors that further contribute to depression (Hammen, 1991). While some life events occur outside the individual's control – such as geopolitical developments or the death of a

relative - many are dependent on the individual in the sense that their occurrence includes inputs from the individual based on their unique characteristics. For instance, coping with feelings of shame by isolating oneself can increase the risk of social isolation. Similarly, perfectionism may intensify efforts towards work tasks and increase the risk of interpersonal conflicts.

Since its introduction, the stress-generation model has received increasing empirical support. Much evidence suggests that events dependent on the individual are more strongly predictive of mental disorders compared to independent events (Broeren et al., 2014; Hammen et al., 1985; Kendler et al., 1999). A recent meta-analytic review concluded that there is robust evidence to support that stress generation is a prominent factor in the development and maintenance across psychiatric disorders and symptoms of psychopathology (Rnic et al., 2023). The same review highlighted the potential importance of integrating a transactional stress-generation perspective within clinical treatment models of stress-related disorders, as it more adequately depicts the reciprocal relationship between individuals' responses and their environment (Rnic et al., 2023).

**The Job Demand-Resources Model**

Within organizational psychology, several theoretical frameworks exist for understanding occupational stress. One influential theory of work stress has been the effort-reward-imbalance model, which suggests that high work-related efforts coupled with a low degree of intrinsic rewards, such as recognition or personal development, and extrinsic rewards, such as salary, increases the risk of stress and cardiovascular disease (Siegrist, 1996; Siegrist & Peter, 1994).

Another highly influential theory is the demand-control theory presented by Karasek (1979), which posits that work stress can be understood through the levels of work demands and degree of control. Important implications of this theory are that high demands and a low degree of control increase the risk of negative health outcomes and that organizations may decrease the risk of work stress by increasing workers' perceived control. In 1989, the demand-control theory was expanded by Johnson et al. (1989) to include a dimension of social isolation, labeled the demand–control–support model. They showed that the combination of high demands, low control, and social isolation, called "iso-strain," increased the risk of cardiovascular morbidity and mortality in a large male sample (Johnson et al., 1989).

Research on the demand-control theory has had some difficulties showing a consistent interaction between job demands and perceived control, leading researchers to suggest that more contextual variables should be considered

(Huth & Chung-Yan, 2022). The JD-R model, introduced by Bakker and Demerouti (2007), is an attempt to consolidate the above-described theories with burnout research to broaden the potential variables important in understanding healthy and unhealthy work across many different professions. This model includes both personal demands (e.g., financial strain, relational conflicts) and job demands (e.g., work pace, workload, discrimination) that increase the risk of negative health outcomes (such as burnout) as well as job resources (e.g., support, control, feedback) and personal resources (e.g., personality, coping skills; Tetrick & Winslow, 2015). The JD-R model assumes the interplay between personal and job demands and personal and job resources interact in predicting occupational well-being and adverse health outcomes (Bakker et al., 2014). Over time, the advocates of the JD-R model hope that it will provide a good framework for conducting intervention research at the organizational and individual levels to decrease stress and promote well-being (Bakker et al., 2023).

In part guided by these overarching theoretical frameworks, large meta-analytical evidence shows that individuals exposed to many job stressors report more negative health outcomes than those who are not (Sonnentag, 2018). Variables such as effort-reward imbalance, low job control, and high psychological demands are associated with an increased risk of sick leave due to mental disorders (Duchaine et al., 2020). Moreover, several prospective studies show that high job demands, low job control, low procedural justice, high effort-reward imbalance, low relational justice, role stress, low social support, and bullying in the workplace are associated with a greater risk of developing mental health disorders (Harvey et al., 2017).

In addition to showing that stress in the workplace can have detrimental effects on health and productivity, these theories and empirical findings suggest that some of the most important job stressors are psychosocial in nature - such as effort-reward imbalance, low social support, low relational justice - rather than just pertaining do dimensions of “too much to do,” such as time-pressure and workload (Bakker et al., 2023). In other words, to understand work-related stress, one must consider the individual’s expectations, coping skills, and social support in relation to the demands of the work environment. In this sense, the stress theories of organizational psychology align with the transactional view of stress-generation theory and appraisal theory, as they emphasize the importance of understanding stress as the result of a reciprocal relationship between an individual and their environment.

## Stress is a Transactional Process, not Just a Physiological Response

Ever since the introduction of the general adaptation syndrome, there has been persistent confusion regarding the term "stress" (Koolhaas et al., 2011). In fact, because of this ambiguity, several authors have questioned whether stress is scientifically useful (Kagan, 2016; O'Leary, 1990; Patmore, 2009). Given how many different theoretical accounts of stress currently exist, it's perhaps no surprise the term "stress" is used interchangeably throughout the scientific literature across various disciplines, implicitly meaning different things. Some refer to stressors, others to the stress response, and some to the interaction between the individual and the environment (Epel et al., 2018). Not to mention that "stress" is now a commonly used term in non-scientific and clinical contexts and can carry meaning associated with this everyday use.

Conceptual variations of stress across different disciplines are not necessarily undesirable. However, when several definitions exist, researchers need to be conscious of the specific definitions they use and how they are utilized in their settings. Theoretical inconsistencies can occur if a definition of stress is carried over from one area of research to another due to conceptual confusion rather than based on careful consideration. For example, it seems reasonable to assume that clinical psychological models of stress-related conditions such as ED should reflect contemporary psychological theories of stress. However, as highlighted in the following section, this is not necessarily the case.

A limitation of Selye's original stimulus-response model of stress was its lack of specificity and inherent circular reasoning, whereby stress stimuli were defined based on the presence of stress responses, and conversely, stress responses were defined by referencing the presumed stimulus that triggered them (Lazarus, 1999). Selye's studies predominantly focused on physical and chemical stressors such as cold, heat, lack of oxygen, lack of nutrition, and the ensuing physiological responses. In the 1960s, researchers such as John W. Mason questioned whether these findings were translatable to the human experience of stress. Mason argued that Selye's stimulus-response model underestimated the significance of psychosocial influences. To fully grasp physiological stress responses, one should account for the dimensions of unpredictability and uncontrollability, along with expectations of adverse consequences. These dimensions often pertain to the social context of the organism, arguably even more so for humans than nonhumans (Mason, 1968).

Mason's arguments were much in line with modern developments in physiological stress theories that increasingly emphasize the importance of psychosocial dimensions of stress and the importance of dimensions such as uncertainty, lack of control, and unsafety. For example, Koolhaas et al. (2011)

argue that 'stress' should be restricted to when the environmental demand exceeds the natural regulatory capacity of an individual in situations that include unpredictability and uncontrollability. Similarly, Peters et al. (2017) have proposed that persistent stress will become toxic in contexts characterized by ongoing uncertainty that cannot be resolved by effective coping or habituation, adopting a "Bayesian brain perspective." As an example, human experiments have shown that their beliefs about environmental uncertainty mediate the strength of their acute stress responses (de Berker et al., 2016). Moreover, the dimensions of unpredictability and uncontrollability play a central role in strengthening aversive respondent conditioning in experimental studies, as well as in the development of many anxiety disorders (Mineka & Oehlberg, 2008).

Quite recently, Brosschot et al. (2018) presented a new perspective on stress, named the general unsafety theory of stress. They argue that stress theory historically has focused too much on the physiological responses in relation to direct events, i.e., stressors, but that many detrimental prolonged stress responses seem to occur in chronic situations without actual stressors (Brosschot et al., 2017). For example, many of the predictors of somatic and mental diseases are nonspecific, such as loneliness, post-natal adversity, and prenatal maternal stress (Brosschot et al., 2018). Therefore, they argue that stressors are unnecessary for the stress response to be evoked; A lack of safety information is sufficient. The general unsafety theory of stress is highly compatible with the growing empirical support for the construct of "intolerance of uncertainty," which seems to play a critical transdiagnostic role in the disorders of anxiety and depression (Hong & Cheung, 2015). Consequently, according to modern stress accounts, dimensions of uncertainty, unsafety, and lack of control are crucial to understanding when persistent stress may result in adverse health effects.

A critical implication of these contemporary developments of stress theory is that the mere presence of a neuroendocrine response is insufficient to label it as stress, nor is it indicative of the presence of a stressor (Koolhaas et al., 2011). In addition to understanding the behavioral and physiological responses of the individual, one must also consider the cognitive and perceptual factors along dimensions such as uncontrollability, uncertainty, and unsafety (Brosschot et al., 2018; Koolhaas et al., 2011; Peters et al., 2017). These perspectives on stress are highly compatible with the psychological theories' transactional view of stress, which highlights the importance of a person's appraisal, learning histories, perceived control, and coping strategies *in relation* to external events in understanding the individual stress response (Lazarus & Folkman, 1984). According to appraisal theory, the main source of variation in stress arousal and how it affects human functioning is the subjective evaluation of external events and how the individual copes with

external events. Because individuals vary in their psychological makeup, learning histories, and preferences, different stressors are stressful for different persons (Lazarus & Folkman, 1984). Or, as Lazarus himself puts it: "To separate stimulus and response makes little sense since they are always conjoined" (p. 58, Lazarus, 1999). Consequently, a stimulus-response perspective of stress has difficulties explaining the differences in emotional reactions identified across individuals experiencing the same stressful events (Smith & Kirby, 2009).

Even though most contemporary physiological and psychological theories of stress emphasize a transactional view, stress is still often associated with the response part in medicine and stress research today, mainly focusing on the autonomic nervous system and the short and long-term somatic regulatory consequences of the HPA axis (O'Connor et al., 2021), reminiscent of Selye's original stimulus-response model. As a result, subjective experience and higher-level cortical processing often tend to be overlooked in the study of stress, leading to the assumption that a physiological stress response is equivalent to exposure to stress without explicitly defining the stressor or the specific stress response involved (Armario, 2006).

Similar to how a transactional view is often overlooked in stress research and medicine, there appears to be an affinity for a stimulus-response model of stress in many treatments of burnout and ED as well. These approaches typically center around reducing/removing external stressors and promoting recovery and the alleviation of physiological responses using relaxation techniques and skills training (Maslach et al., 2001; van Dam, 2021; van de Leur et al., 2023). This is not to devalue therapeutic skills training such as breathing exercises, relaxation techniques, and mindfulness; a large body of evidence supports the efficacy of such methods (Keng et al., 2011; Manzoni et al., 2008). However, if the condition is assessed to be specifically associated with persistent stress, such as ED, clinical approaches based on a stimulus-response model of stress risk overemphasize the significance of physiological stress responses while simultaneously overlooking the critical aspect of the subjective experience of external events. A narrow focus like that may exclude clinical methods that could be effectively employed in relation to those subjective experiences. Moreover, from a stress-generation perspective, a stimulus-response model of stress risk implicitly conceptualizes patients as passive recipients of their environment, having little agency in shaping the events in their lives relevant to the development of ED.

ED is assumed to be the result of frequent stress responses in association with ongoing persistent stressors. If this hypothesis holds, contemporary physiological and psychological theories of stress suggest that clinical models of ED should expand their scope beyond a narrow focus on recovery from

persistent physiological stress responses. This expansion should reasonably encompass aspects that encapsulate the subjective experience of stressors and how these experiences pertain to increased risk of uncertainty, unsafety, and lack of control.

## Stress is Not Specific to Stress-Induced Exhaustion Disorder

An affinity for a stimulus-response model of stress within recovery-focused ED treatments is probably not only a result of an ambiguous stress concept. Other potentially contributing factors are the categorization of ED within ICD-11, the specific criteria of the ED diagnoses, and the research divide that exists between stress research and other research areas that constitute the basis for many clinical psychological treatments.

In psychiatric diagnostics, the diagnosis of ED is categorized within "reactions to severe stress and adjustment disorders" in the ICD (Grossi et al., 2015). Here, “stress” refers to the stimuli part, meaning disorders within this category are assumed to be related to aversive external events. Post-traumatic stress disorder is the most typical example of this categorization, as it is assumed that this disorder has occurred in association with a traumatic event. Post-traumatic stress disorder is one of the few psychiatric diagnoses with this type of etiological criterion, meaning specific traumatic events are to be identified to establish this diagnosis.

Due to the confusion regarding the definition of stress, the categorization “reactions to severe stress and adjustment disorders” is easily misinterpreted as if the disorders within this category are associated with heightened or persistent stress responses, more so than other psychiatric diagnoses. However, according to contemporary stress research, such as the theory of allostatic load and the appraisal theory, stress is a general concept that refers to external events and accompanying responses in the organism that increase the risk of diseases in general, both psychiatric and somatic. Conditions such as depression, bipolar disorder, anxiety disorders, and post-traumatic stress disorder are all regarded to be stress-related disorders characterized by impaired functioning of neural circuits that regulate stress reactivity (McEwen & Akil, 2020). Or, as the famous stress researcher Robert M. Sapolsky states: “It is impossible to understand either biology or psychology of major depression without recognizing the critical role played in the disease by stress” (p. 271, Sapolsky, 2004).

Another apparent example of stress as a general risk factor for developing psychopathology is the widely used diatheses-stress model utilized throughout psychiatric research today. According to the diatheses-stress model, multiple risk factors throughout development interact with stressors and protective

factors in developing psychiatric disorders (Kendler & Prescott, 2006). Consequently, while ED can be conceptualized as a disorder triggered by persistent stress, technically, the same holds true for all affective and depressive disorders.

The emphasis on stress alleviation and recovery in the treatment of ED is possibly further reinforced by the criteria for ED, explicitly highlighting that the disorder arises from persistent external identifiable stressors and a lack of recovery (Åsberg et al., 2024). In the original report that introduced the first criteria of ED, it is repeatedly stated that ED results from a lack of recovery (Åsberg et al., 2003). Ten years later, in a report summarizing the effects of a research project called the "DU-project" focusing on ED, it is stated that "It is by now beyond doubt that ED is a reaction to prolonged stress without recovery" (p. 37, Åsberg & Nygren, 2012). This reasoning, however, appears to be circular: If ED is diagnostically defined as the result of persistent stress and lacking recovery, this will, of course, inherently affect how it is approached and understood both clinically and scientifically. However, technically, just because the definition of ED highlights a lack of recovery as a part of its diagnostic criteria does not automatically mean that recovery should be the primary focus of clinical interventions.

In ideal cases, evidence-based treatments are rooted in treatment models based on scientifically well-established psychological principles that utilize methods targeting specific processes of change suggested by a treatment theory (Hayes, Long, et al., 2013). For example, Clark's model of social anxiety disorder postulates that social anxiety is the result of an excessive fear of negative evaluation, a fear maintained by the frequent use of safety behaviors and self-focused attention. Consequently, treatment for social anxiety largely focuses on behavioral experiments challenging catastrophizing regarding social evaluation and efforts to decrease self-focused attention and reduce the frequency of safety behaviors (Wells et al., 1995). If ED indeed results from a lack of recovery, the question remains from a clinical perspective: What potential change processes prevented recovery in the face of persistent demands?

Finally, the research field of "stress" has largely developed parallel to the domains of emotion, cognition, and learning (Lazarus, 1999; Troy et al., 2022). These domains currently constitute much of the theoretical foundation for contemporary evidence-based psychological treatment for mental disorders. The lack of integration between these domains and stress research has likely fueled the tendency for ED treatments to adopt a stimulus-response model of stress focusing on the physiological response. For example, stress and anxiety are usually treated similarly in neuroscience because of their shared neurobiology (Brosschot et al., 2018). While stress is generally

considered an emotional process, how it relates to emotions such as anxiety, fear, or shame, commonly associated with distress, remains unclear throughout the clinical and scientific literature. Given this disparity, it's perhaps clinically appealing to assume that when ED patients say they are "stressed," they describe something qualitatively different from patients reporting high anxiety. However, regardless of what the patients call it, most distressed individuals with an ongoing psychiatric disorder are "stressed out."

In summary, stress is perhaps best conceived as a dynamic process in which environmental demands, filtered through a subjective and cultural context, tax or exceed the adaptive capacity of an individual, resulting in psychological and biological responses – allostatic loads - that may increase the overall risk of somatic and mental illness (Epel et al., 2018; Melamed et al., 2006). It is a broad term, and its conceptual usefulness in a clinical context focused on particular conditions and persons is, therefore, somewhat limited. Treating ED as a generic singular stimulus-response model of stress, mainly focusing on the physiological response, is likely to oversimplify its complexity and provide a narrow avenue for behavioral change. Therefore, it appears reasonable to assume that ED treatment should benefit from moving towards theoretical models that embrace a transactional view of stress and allow for a wider range of potential change processes, along with methods specifically targeting those processes.

So, what are the psychological change processes typically associated with ED? And what principles should serve as the basis for targeting those processes in clinical psychological treatment? To effectively approach these questions, some core differences in underlying philosophical assumptions between treatments focusing on recovery and behaviorally oriented treatments must first be adressed.

# The Conflicting Philosophical Assumptions of Recovery and Contextual Behavior Science

## Philosophical Assumptions in Cognitive Behavior Therapy

Whether scientists and clinical practitioners acknowledge it or not, there is no such thing as an atheoretical science and, subsequently, no such thing as an atheoretical psychological treatment (Moore, 2010). In all forms of clinical interventions, the underlying philosophical assumptions of the clinician, explicit or implicit, will define their understanding of how the world works. This understanding will invariably guide the theories used as a framework for therapy and the methods utilized within sessions and reflect what is communicated to the clients. Consequently, the therapist's comprehension

and conceptualization of how the world works will inevitably be imparted to the client.

With many methods and strategies available, much of contemporary clinical CBT literature and treatment protocols have adopted an eclectic approach to treatment. It is not uncommon in practice for different theories and concepts to be combined to customize treatment to individual needs and therapist preferences, with the risk of incorporating theoretical inconsistencies (Hughes, 2018). Such eclectic approaches are evident in published ED treatments, which include contemporary behavior methods such as valued action from ACT and cognitive components such as methods to address "core beliefs" and challenging negative automatic thoughts from cognitive therapy (Lindsäter et al., 2018; Malmberg Gavelin et al., 2018). These methods potentially create theoretical contradictions since ACT, based on its underlying philosophical assumptions of functional contextualism (explained in detail on page 49), does not emphasize a focus on the literal validity of thought content and the use of mentalist constructs such as "schemas."

Given the recent shift in the CBT field towards a more unified process-based approach (Hofmann & Hayes, 2019), a greater emphasis has been placed on the importance of theoretically coherent treatment models with explicitly articulated philosophical assumptions. This emphasis aims to foster more effective communication and to avoid philosophical discrepancies between different treatments. It is also hoped that this will, over time, improve the precision of treatment and outcomes. Specifically, in one of the articles outlining the process-based therapy research agenda, Hoffman & Hayes (2019) states:

> In addition, there has been an increased recognition within CBT of the importance of philosophical assumptions that give rise to methods of intervention and their investigation. For science to evolve, we need pre-analytic assumptions about the nature of data, truth, and the questions of importance (p. 41, Hofmann & Hayes, 2019).

Given the nosological confusion and the lack of established treatment models for ED, efforts to improve treatment might benefit from developing and applying theoretically coherent process-based models with explicit philosophical assumptions. The endeavor to facilitate such ambition in this thesis is based on a contextual behavioral approach. To elucidate the rationale behind this position and how it relates to the current recovery-focused treatments for ED, several interrelated philosophical perspectives of particular importance in recent decades development of CBT, contextual behavior science, and behavioral medicine must be explored: the biomedical model, the

biopsychosocial model, and the ontological and epistemological assumptions of functional contextualism.

## The Biomedical and Biopsychosocial Models

The biomedical model of illness is a paradigm that has dominated psychiatry, physiology, and medicine since Louis Pasteur's germ theory of disease was introduced in 1861 (Petrini & Arendt-Nielsen, 2020). In short, the biomedical model (sometimes called the medical model or the latent disease model) assumes that illness and symptoms causally arise from an underlying abnormality within the body, i.e., diseases (Wade & Halligan, 2004). Health, then, is, according to the biomedical model, equated with the absence of disease. However, even though this model has historically been associated with great success in improving healthcare outcomes, it also has several limitations. More specifically, it is prone to biological reductionism, as it regards mental phenomena as unrelated to bodily functions. For example, even though symptoms present within health care and psychiatry, such as overweight, fatigue, persistent pain, stress, and depression, are seldom attributable to an underlying pathogen or disease, they are still conceptualized using medical diagnoses, inherently implying an underlying structural cause (Wade & Halligan, 2004). As previously discussed, the clinical utility of this latent disease model within psychiatry has increasingly been questioned as psychiatric disorders are complex multilevel phenomena not easily explained by monocausal disease entities (Hayes et al., 2019; Kendler, 2005).

In response to the biomedical model, George Engel introduced the biopsychosocial model in 1977, asserting that all symptoms and illnesses exist within a psychological and social context. Consequently, when understanding the determinants of disease within health care, biological, psychological, and social dimensions need to be accounted for (Engel, 1977). To comprehend the implications of the biopsychosocial model for the development of psychological theory and treatment within behavioral medicine and modern health care, the field of persistent pain serves as an exemplary illustration.

Historically, persistent pain has been understood through the lens of the biomedical model, adopting a mechanistic notion of pain where there is a one-to-one relation between tissue damage and the experience of pain, an assumption leading to a predominant focus in treatment on medication and surgery (Quartana et al., 2009). However, in 1965, Melzack and Wall introduced the gate control theory, where pain is understood as a complex interaction between emotional, sensory, cognitive, and cultural factors (Melzack & Wall, 1965). The gate control theory, coupled with the biopsychosocial model, has led to greater recognition of psychological and social factors within research and treatment of chronic pain. Today, the biopsychosocial model is

predominantly accepted as the most comprehensive perspective for guiding interdisciplinary treatment of persistent pain (Gatchel et al., 2007). These developments have led to an increasing understanding of how psychological factors such as depression, catastrophizing, and fear avoidance contribute to developing and maintaining persistent pain disorders (Gatchel, 2004). As a consequence, numerous evidence-based treatments for pain have been developed, predominantly rooted in learning principles and employing methods such as exposure procedures that encourage patients to approach previously avoided aversive stimuli (such as pain-related movements and situations that may exacerbate pain), with notable improvements in overall function and well-being (Eccleston et al., 2013).

The biopsychosocial perspective is today utilized throughout modern health care, usually described within the discipline of behavioral medicine, where psychological treatments based on behavioral principles are effectively utilized in the treatment of type-2 diabetes (Sakamoto et al., 2022), irratable bowel syndrome (Axelsson et al., 2023), tinnitus (Westin et al., 2011), atrial fibrillation (Särnholm et al., 2023) and ME/CFS (Kuut et al., 2023) to name a few. In summary, adopting a biopsychosocial perspective has provided fertile ground for substantial advancements in psychological theory, treatment, and health outcomes across a spectrum of somatic conditions previously conceptualized mainly using the biomedical latent disease model. This is perhaps further encouraged by recent developments in CBT, such as ACT, with its core focus on behavioral principles fostering acceptance and committed action towards enhanced functioning, which are highly compatible with the biopsychosocial model (McCracken, 2021).

## Mechanism and Contextualism

Contextual behavior science adheres to a specific set of underlying philosophical assumptions known as functional contextualism (Vilardaga et al., 2009), which aids research and clinical practice within these therapeutic approaches. From a contextual point of view, all events (for example, human behavior) must be described and understood from the particular physical, social, and temporal context in which the event occurred. Events cannot be understood by deconstruction into separate “parts” and are more than the “sum” of its parts. Consequently, while relations of elements in the world can be described, these descriptions are not assumed to correlate to some form of a priori independent organization of the “real” world (Hayes et al., 2012). This ontological perspective can be contrasted to a “mechanistic worldview,” the most prominent outlook within psychology and the natural sciences today.

From a mechanistic worldview, there is a physical external reality independent of the perception, which can, much like a machine, be understood through

deterministic causal principles involving separable parts and relations (Hayes et al., 2012). The biomedical model adopts a mechanistic outlook as it ascribes to the natural laws of physics, meaning what happens in the human body (and the natural world) is best understood through biological processes and the mechanical properties of physical objects. Much of contemporary psychology and psychiatry also adheres to a mechanistic worldview when it tries to understand human behavior through mentalistic constructs such as intelligence, personalities, or "core assumptions." Or, for example, how neurotransmitters and the communications of neurons between different areas of the brain translate into human behavior and cognition. The idea that behavioral processes can be described through the expenditure of energetic resources, as is described by the theory of recovery often referred to in ED treatment (Sonnentag, 2018), is also an example of a mechanistic outlook.

The etymology of exhaustion is implicitly mechanical, alluding to the act of using up a limited supply. The English term is derived from the Latin *exhaurire*, which in turn is composed of the prefix "ex-" (out) and "haurire" (to draw; Schaffner, 2016b). Similar mechanical notions are evident in the concept of stress. When Walter Cannon first defined stress, he borrowed the term from physics; the analogy is that humans - just like construction beams, have varying durability characteristics and can resist different amounts of pressures and loads (Hobfoll, 1989). However, as external demands persist, resilience is reduced, and durability gradually stagnates. Eventually, the beam becomes exhausted.

Consequently, the framework of stress and recovery, to a certain extent, carries an inherent biomedical and mechanical orientation. From such an outlook, stress symptoms tend to be regarded as the result of a physiological resource-demand imbalance rather than a consequence of interacting physiological, behavioral, cognitive, emotional, and social elements. More specifically, stating that ED is the result of too much stress and lacking recovery holds two mutually dependent underlying biomechanical assumptions: a) That exhaustion is mainly to be understood as the result of excessive external loads, and b) that the brain and body are best understood as a biological system with limited resources and energy.

Biomechanical assumptions are also evident throughout the field of burnout. As with "exhaustion," the term burnout alludes to energy depletion. One widely accepted definition of burnout (consisting of the dimensions of physical fatigue, emotional exhaustion, and cognitive weariness) by Shirom & Melamed (2006) is based upon the conservation of resources theory, which, just like the theory of recovery, assumes that chronic stress is the result of chronic depletion of an individual's energic resources (Hobfoll, 1989). Schaufeli and Enzmann (1998) resemble the burnout process with "a broken

car battery that cannot be recharged and loses its power bit by bit." Perhaps not surprisingly, it is common in writings about burnout to encounter phrases like "Since individuals with burnout have limited energy resources…" (p. 689, Demerouti et al., 2021). Similarly, one item in the Shirom-Melamed Burnout Questionnaire, frequently utilized within clinical ED research, explicitly reads, "My batteries are dead" (Sundström et al., 2022), clearly invoking an implicit understanding of the human body in the form of a biological machine.

These biomechanistic notions mirror explanations common in treatments of neurasthenia in the late 1800s. Neurasthenia was typically framed as a result of overwork, of struggling beyond the limits of what is physiologically tolerable (Dercum, 1917). George Miller Beard, the "father" of neurasthenia, paraphrasing the technical developments of his time, likened humans to batteries exhausted by unusual efforts (Neckel et al., 2017). As a result, the treatment of neurasthenia focused heavily on promoting rest and healthy lifestyle changes. Sufferers of neurasthenia were urged to treat their "nerve center balance" like a bank account and should, therefore, just as in any sound business endeavor, be careful not to overdraft (Wessely, 1994). Similar accounts are common in the treatment of ME/CFS, where ME/CFS patients have historically been encouraged to rest and to "keep within their energy envelope" (Wessely, 1994).

It appears that the same bio-reductionist mechanistic treatment rationales endorsing a form of bodily economics advocated for neurasthenia more than 100 years ago are, to some extent, utilized in ED treatment today, where a large emphasis is put on fostering recovery. This is perhaps not unexpected, given that the concepts of stress, burnout, and recovery are inherently biomechanical. While they may seem compatible with CBT strategies that often involve sleep, relaxation, and mindfulness techniques, introducing such mechanistic notions in treatment may risk introducing philosophical inconsistencies in treatments based on a biopsychosocial and contextual behavior approach. Although this kind of reasoning may perhaps be interpreted as philosophical navel-gazing, the ensuing sections will discuss how such philosophical inconsistencies carry both theoretical and practical implications.

## Learning Theory and Recovery

Another fundamental idea within contextual behavior science is to apply scientific principles derived from basic research, such as experimental designs within laboratory settings. Applying learning principles within a clinical context is usually called functional analysis (Hayes, Long, et al., 2013). The principles of learning theory stand among the best established in all of psychology and help orient clinicians toward contextual events that can be

changed (Dixon & Rehfeldt, 2018). Today, these learning principles include respondent and operant conditioning, modeling, and the recent theoretical developments toward understanding human language and cognition from a behavioral approach called relational frame theory (RFT; Dymond & Roche, 2013).

In short, in the context of facilitating behavioral change, all forms of human behavior can be comprehended from a learning perspective in terms of respondent and operant principles. Respondent condition refers to the process in which the function of an unconditioned stimulus is transferred to another previously co-occurring neutral stimulus (conditioned stimulus) such that the conditioned stimulus also evokes the response triggered by the unconditioned stimulus. In other words, the neutral stimulus gains the ability to produce a response similar to the one caused by the paired unconditioned stimulus (Catania, 2013). In operant conditioning, behaviors increase or decrease in relation to the resulting consequences. The behavior increases if the consequence constitutes something positive for the organism (positive reinforcement) or removes/decreases the presence of an aversive stimulus (negative reinforcement). Conversely, if the ensuing consequences entail increasing or adding something aversive to the organism (positive punishment) or the removal/reduction of something positive (negative punishment), the behavior decreases (Catania, 2013). In modeling, an organism can learn respondent and operant contingencies by simply observing and imitating the actions of others (Bouton, 2007).

Historically, behaviorism has been criticized for a narrow stimulus-responsive view of human functioning, unwilling to recognize how the "black box" of the mind mediates the connection between external input and behavioral output (Baum, 2011). Over time, this approach has not been scientifically or practically fruitful. As a result, RFT has been developed and can be considered a theory of cognition stemming from basic scientific behavioral principles (Hayes et al., 2023). As noted by several scholars, RFT is compatible with modern views of cognitive psychology, effectively bridging the gap between behavioral and cognitive theories (De Houwer et al., 2018; Hayes & Hofmann, 2023).

According to RFT, human learning is profoundly influenced by the presence of language, which allows us to manipulate stimulus functions using symbols. Unlike other organisms, which rely on direct experience or observation of respondent and operant learning contingencies, humans possess the unique ability to engage in *arbitrarily applicable relational responding*, which means we can establish relationships between stimuli and transform their functions in diverse and flexible ways, ultimately shaping our understanding of the world and influencing our actions (Blackledge, 2003). This ability contributes

to our capacity for problem-solving, abstract reasoning, and communication. However, it also provides us infinite access to distress and fear, ultimately increasing the risk of mental illness. Thus, according to RFT, the human ability to transform stimulus function is the key to both our success as a species and to understanding the abundant diversity of human suffering.

To my knowledge, there have been no explicit attempts to consolidate ED treatments specifically with behavior principles. A cognitive model of burnout has been suggested (Tyrrell, 2010). Additionally, there have been attempts to conceptualize ED due to lacking recovery within a general CBT framework. Almén (2021) presents a cognitive behavioral model for how ED, or clinical burnout as defined in his account, maintains itself through disturbed recovery processes, assumed to be related to contextual factors and cognitive and overt behaviors. Recovery behaviors are defined as:

> Any type of activity that involves psychophysiological deactivation of responses activated during stress/effort, leading to an increase in resources that were reduced due to the stress/effort. An assumption is that recovery behaviors can be learned via respondent and operant processes (p. 3, Almén, 2022).

From a strict behavioral account of human functioning, asserting that recovery behaviors should be learned through respondent and operant conditioning is unnecessary. These principles inherently apply to all forms of behavior, irrespective of whether they are classified as recovery behaviors. If understanding recovery requires learning principles, why would not these principles alone be sufficient? There is no theoretical contradiction in examining the impact of biological deficits on behavioral contingencies; this is commonly done by establishing operations. For instance, extensive literature explores how antecedent events other than discriminative stimuli, such as the deprivation of food, water, or sleep, can influence operant behavior (Iwata et al., 2000). Additionally, the principles of establishing operations are frequently utilized within the clinical literature (Cooper et al., 2013). From a contextual behavioral approach, using concepts such as recovery to facilitate the restoration of depleted resources significantly deviates from the fundamental premise of contextual behavior science that a relatively adequate set of behavioral principles derived from basic experimental research already exists to analyze clients' difficulties, their history, and context.

## Truth Criteria and the Purpose of Science

The different ontological assumptions (i.e., What is the nature of what is?) within the mechanistic and contextualistic worldviews are highly intertwined with epistemology (i.e., What is truth?). In mechanistic schools of thought, the truth criteria can generally be described from a positivist perspective where

the theoretical constructs and models are validated through their predictive qualities, meaning how well the theoretical models and constructs correspond with "reality" (Hughes, 2018).

Several scientific enterprises that adhere to a contextual worldview, such as postmodernism and social constructivism, typically conclude that there can be no such thing as objective truth, as all knowledge, by definition, is subjective. Contextual behavior science, however, adopts a pragmatic truth criterion, stating "what is true is what works" (Vilardaga et al., 2009) - hence the word "functional" preceding contextualism in functional contextualism. This perspective assumes that a researcher and clinician gain the foundation to determine successful outcomes by defining what one is working toward. Therefore, to effectively discern what works, a prerequisite for all scientific endeavors is to have a clear a priori statement of the scientist's or practitioner's goal or intent (Hayes, Levin, et al., 2013).

The specific goal of contextual behavior science is "to predict-and-influence, with precision, scope, and depth, whole organisms interacting in and with a context considered historically and situationally" (p. 4, Hayes et al., 2012). What is scientifically considered to be true is if the results produced contribute to the overarching goal of prediction and influence (Hayes et al., 2012). These goals require researchers and clinicians to identify and specify manipulable events, as any model is considered inadequate if it cannot achieve the objective of influence. This is why behavioral therapists so heavily emphasize the importance of models focusing on manipulable variables in the environment, i.e., contextual variables, rather than on mechanistic mentalist constructs, as variables in the environment are the only "things" that can be directly manipulated through therapeutic interventions (Ferster, 1973; Hayes & Brownstein, 1986).

For example, if humans were equated with industrial components, we could, in theory, based on mechanistic principles, understand the experience of exhaustion because of persistent stress. This would require that all external stressors be measured, and the characteristics of the individual (intelligence, personality, sociocultural context, learning history, skills, and so on) could be accounted for in relation to those stressors. In reality, this is far from feasible. Clinical psychologists cannot map and measure the alleged stressors; they must rely on the client's verbal reports. Furthermore, even if all predisposing characteristics of the client could be measured, the knowledge about such constructs and their interactions is imprecise and vague at best.

Consequently, while mechanistic models founded on assumptions of external loads and internal energy fluctuations stemming from various psychological constructs proposed by recovery theories are theoretically conceivable, they

may not be suitably adapted to the clinicians' goals, according to a contextual behavioral approach. Furthermore, the assumptions of recovery behaviors resulting in increased resources previously reduced due to stress and efforts give rise to further questions typical to abstract mentalistic constructs: What is precisely meant by "resources" or "energy"? How are these constructs to be understood, measured, and manipulated? Most importantly, how do these concepts of depleted resources add to the utility of predicting and influencing behavior?

A practical example might help illuminate these theoretical considerations further. A treatment based on functional analysis and exposure will encourage clients to engage in potentially challenging yet meaningful life activities, such as visiting a grocery store, playing with their kids, having lunch with a friend, or going to the gym. Much like the idea of homeostasis, where everything technically can be perceived as a threat to homeostasis, if treatment aims to reduce stressful experiences and increase recovery, then all meaningful, positively reinforced behaviors are, by definition, potentially stressful. Therefore, from a contextual behavioral approach, ideas about limited energetic resources become impractical since all human activities, by definition, can be viewed as demands or resource taxing. Moreover, it may be challenging to encourage a client to approach a stress-inducing situation in an exposure procedure if a considerable focus of the treatment concurrently revolves around the importance of increasing recovery and monitoring one's limited energetic resources.

This line of reasoning does in no way imply that the existence or potential usefulness of mechanistic constructs utilized throughout natural science and psychology is denied within contextual behavior science or that such concepts have no place in other forms of scientific enterprises. Nor does it imply that activities often described as recovery behaviors, such as relaxation, sleep, and exercise, are irrelevant in ED treatment. It is simply to highlight that the idea that behavior is to be understood through the depletion of energetic resources in the clinical treatment of ED does not seem useful when it is practically operationalized and, therefore, does not align with the truth criteria of functional contextualism: To practically aid the goals of predicting and influencing behavior with precision, scope, and depth.

# The Potential Adverse Effects of Biomechanistic Notions of Recovery in the Treatment of Stress-Induced Exhaustion Disorder

## Exhaustion as a Learned Response

While the current evidence and research on the clinical treatment of ED are still limited, there is research on conditions with similar symptomatology that does indicate that an excessive focus on recovery could potentially have inadvertent countertherapeutic effects. Lenaert, Boddez, et al. (2018) have presented a cognitive-behavioral framework, titled 'ALT+F' model, that conceptualizes persistent fatigue from an associative learning perspective, applicable to unexplained persistent fatigue prominent in conditions such as ME/CFS, multiple sclerosis, cardiovascular diseases, and neurologic and immunological disorders (Lenaert, Boddez, et al., 2018). In general, there is limited evidence of direct associations between fatigue complaints and the pathophysiology of these conditions, suggesting that both psychosocial variables and biological factors might need to be considered in understanding and treating fatigue in these conditions (Lenaert, Boddez, et al., 2018).

There is ample evidence showing that respondent conditioning plays a prominent role in the development of several bodily symptoms, such as nausea and vomiting (Stockhorst et al., 2006), dyspnea (De Peuter et al., 2005), gastrointestinal symptoms (Stockhorst, 2007) and musculoskeletal pain (Vlaeyen & Linton, 2012). By such accounts, the ALT+F model proposes that the experience of fatigue is subject to respondent and operant conditioning. Therefore, these experiences can become more prominent and persistent through anticipatory fear and avoidance behaviors, with several empirical findings supporting this notion. For example, fatigue sensations can be associated with acoustic stimuli (the sound of a metronome) through respondent conditioning in healthy individuals (Ishii et al., 2013). Furthermore, in an experimental design, Lenaert, Jansen, et al. (2018) showed that self-rated fatigue could be increased by operant reinforcement using subtle social rewards during a working memory task, compared to a control group receiving neutral feedback.

Beyond experimental findings, robust evidence supports an association between catastrophizing and fatigue symptoms in individuals with cancer, multiple sclerosis, ME/CFS, and fibromyalgia (Lukkahatai & Saligan, 2013). Furthermore, one systematic review has shown the presence of attentional biases toward fatigue symptoms in patients suffering from ME/CFS (Hughes et al., 2016). Such attentional biases may influence the processing of somatic information, potentially increasing the frequency and intensity of fatigue experiences over time. Mediational studies in clinical trials have also

corroborated the potential importance of catastrophizing, high focus on fatigue symptoms, and avoidance behaviors in understanding persistent fatigue. In two different RCTs for ME/CFS, treatment gains were mediated through a decrease in symptom focus (Moss-Morris et al., 2005; Wiborg et al., 2011). Furthermore, a recent mediational analysis of four RCTs on CBT for fatigue across different medical conditions (ME/CFS; multiple sclerosis, diabetes mellitus, and Q fever fatigue syndrome) showed that reduction in fear avoidance, catastrophizing, and avoidance/resting behaviors mediated the positive effect of CBT on fatigue across all diagnostic groups (de Gier et al., 2023).

A consequence of the ALT+F model and the research findings presented above is that individuals experiencing persistent fatigue would generally benefit from clinical interventions based on functional analysis and exposure procedures. These clinical approaches are likely to effectively address the patient's idiosyncratic learning history and behaviors while also promoting a positive approach toward functional improvement by reducing the role of catastrophic thinking and fear avoidance (Lenaert, Boddezet al., 2018).

While the ALT-F model is a cognitive model, as it leans heavily into constructs such as catastrophizing – thereby not directly compatible with a contextual behavioral approach – it does provide helpful direction as it conceptualizes persistent fatigue from a biopsychosocial outlook, underlining the importance of operant and respondent principles in the understanding of symptom of exhaustion/fatigue. Not to equate ED with ME/CFS or other medical conditions associated with fatigue. However, if respondent and operant learning processes contribute to the experience of fatigue, it is likely that this is also the case in ED as learning principles are general and not disorder-specific.

## Why Recovery-Focused Treatment May Risk Promoting Stress-Phobia

Since the introduction of the stress concept by Selye, science has continually struggled with its dual nature (Koolhaas et al., 2011). Later in his career, Selye coined the terms "distress" and "eustress," aiming to differentiate between "bad" and "good" stress (Selye, 1976). While these terms were scientifically unprecise, the ideas of "positive" and "negative" stress are still prominent in popular psychology. This is an inherent challenge with the concept of stress: The HPA axis and the long-term dynamics of cortisol and glucocorticoids involved in the detrimental effects of persistent stress are also crucial for effective adaptation and building resilience (Spencer-Segal & Akil, 2019). Even though many prominent stress researchers regularly underline the

importance of understanding both dimensions (Dallman, 2007; de Kloet et al., 2005; Lupien et al., 2009), the damaging effects of persistent stress have typically received much more attention than the potential positive benefits of building resilience (McEwen, 2019).

A large body of descriptive literature shows that cultural processes affect psychiatric illness (Kendler, 2005, 2019). Therefore, when working with conditions assumed to be stress-related, clinicians need to be aware of the dual nature of stress and the clinical models should preferably account for this duality. Suppose that physiological stress responses are conceptualized as something clients must notice and limit or avoid based on a biomechanistic outlook on stress. In that case, there is an apparent risk that the client will start interpreting previously harmless stress reactions as potentially dangerous, akin to the processes outlined in Clark's model of panic (Clark, 1986).

In the context of stress research, several studies support that one's mindset about stress affects the stress response. For example, a positive outlook on stress as associated with learning and growth, rather than an increased risk of debilitating consequences, is associated with approach behaviors and lower cortisol levels during acute stress (Crum et al., 2013). Furthermore, experimental data indicate that participants who have received an instruction video emphasizing the enhancing properties of stress while performing a mock job interview (8-minute speech followed by 5 minutes of questioning) experience higher positive affect and are more attentive towards positive stimuli, compared to participants who performed the same task, albeit foregone with a negative instruction underlining the debilitating properties of stress (Crum et al., 2017). In studying stress mindsets, one study following a large cohort of adolescents showed that those who believed in the potential benefits of stress were less prone to feeling stressed in the wake of adverse life events (Park et al., 2018). Consequently, there is empirical support for the notion that when stress experiences or stressful events are conceptualized as potentially dangerous and harmful, the risk of experiencing them as harmful increases (Schroder, 2021). From a transactional perspective of stress, findings such as these are not surprising, given that this perspective assumes that the main source of variation in stress arousal and how it affects human functioning lies in the subjective evaluation of external events and the individual's efficacy in coping with them.

The acute phase of ED can be shocking (Jingrot & Rosberg, 2008), and the extensive temporary disability that ensues sets the stage for ample new learning possibilities. If, in this context, healthcare professionals emphatically underline the potential dangers of long-term stress and the importance of reducing stressful experiences and increasing focus on recovery, this could hypothetically increase the risk of reinforcing fear avoidance behaviors and

increase symptom focus. Therefore, strategies such as "listening to your body" or "learning to identify early stress signals" could have inadvertent effects. Such strategies can potentially risk increasing hypervigilance, increasing the risk of fear-related conditioned responses. For example, evidence supports that healthy subjects focusing attention internally while doing a fatiguing isometric task report increased exertion and perform worse than when performing the same task with an external locus of attention (Lohse & Sherwood, 2011). Therefore, using mechanistic concepts such as recovery may inadvertently reinforce avoidance behaviors and increase the risk of aversive conditioning with stress stimuli and symptoms of exhaustion. This aversive learning might be further substantiated by biomechanical claims of limited bodily energetic resources, suggesting the best way to deal with symptoms of stress and exhaustion involves adopting strategies of bodily economics.

Advocates of recovery do emphasize that it is not only seen as a focus on withdrawal but is to be considered an approach behavior (Almén, 2022). However, framing recovery as an approach behavior may also be challenging as this term, much like stress, has established meanings outside of clinical psychology in various scientific disciplines and domains. For instance, the sociocultural meaning of recovery, primarily based on medicine, is innately associated with the ideas of resting and freedom from demand or pressure. Consequently, employing unspecific constructs like recovery carries the risk of easily adhering to the subjective interpretations of clients or practitioners, significantly reducing the clinical precision of the concept. Such vague terms introduce a great deal of variation in how interventions are administered to clients, not because the methods and models are precisely tailored to the client's particular needs and contexts but as unintentional consequences of imprecise clinical principles. Therefore, if the goal is to design clinical interventions based on basic scientific principles with high clinical utility, then using generic biomechanical concepts such as recovery is probably not helpful.

## Summary

Much of ED treatment focuses on recovery, based on the assumption that ED results from persistent stress in combination with a lack of recovery. Such treatment approaches are not surprising, given the large emphasis on ED being a stress-related disorder in conjunction with writings on the diagnoses of ED and burnout research endorsing such a rationale. Although the concept of recovery carries high face validity, it inherits biomechanical assumptions of energetic depletion that can be traced back to the original conceptualizations of a stimulus-response stress model, generic to all forms of illness. However, such biomechanistic assumptions do not align with contemporary theories of

stress that emphasize a transactional view, highlighting the dimension of uncertainty, lack of control, and unsafety. Nor are they philosophically, theoretically, and practically compatible with a contextual behavioral treatment approach.

A narrow focus on recovery risks veering away from manipulable contextual variables and neglects the critical aspect of subjective evaluation of external events in the clinical conceptualization of a client's suffering. Additionally, as recovery has well-established meanings outside of clinical psychology, there will always be a risk of introducing a great deal of variability in clinical implementation due to the subjective interpretations of clients and therapists. Lastly, heavily promoting the importance of recovery could lead to disadvantageous clinical outcomes, as this approach might reinforce avoidance behaviors, inadvertently promoting withdrawal from important activities in life.

A challenge with the psychological treatment of ED is to build a clinical model that acknowledges the existence of external stressors while simultaneously practically operationalizing the idiosyncratic context of these perceived stressors. If ED results from an overload of external persistent stressors in combination with a lack of recovery according to a biomechanical perspective, the ensuing questions from a process-based contextual behavioral approach would be: What behavioral processes, targetable by clinical methods, contribute to an individual's recurrent stress responses to persistent external demands, leading to symptoms of exhaustion over time?

# Towards a Contextual Behavioral Perspective of Stress-Induced Exhaustion Disorder

Creating new constructs to accommodate specific model requirements is tempting when developing treatment models. As a result, clinical interventional science has many theoretically overlapping constructs, making it hard to compare different models and discern which concepts are most important (Hayes et al., 2022). ACT is built on an integrated process model of *psychological flexibility*, which can broadly be defined as "The ability to persist or change behavior in a way that includes conscious and open contact with internal experiences, together with an appreciation of what each situation entails with respect to one's values and goals" (McCracken & Morley, 2014). The psychological flexibility model has been extensively researched and shown to mediate therapeutic improvement in 37 independent studies across various disorders and health problems (Hayes et al., 2022). Therefore, it is reasonable to turn to the psychological flexibility model when designing a behavioral treatment model for ED rather than creating new constructs to increase compatibility within a broader process-based approach.

Psychological flexibility is, in turn, suggested to be composed of six underlying interrelated processes of behavior change: acceptance; defusion; flexible attention to the now; a perspective-taking sense of self, or self-as-context; values; and committed action, which together are summed up into three pillars of adaptive behavior characterized as "open, aware, and engaged" (Hayes, Levin, et al., 2013). Newer accounts of the psychological flexibility model also include six opposed processes, argued to be at the core of most human suffering, namely experiential avoidance, cognitive fusion, lack of contact with the present moment, self as content, lack of contact with values, and inaction (Hayes, Levin, et al., 2013).

Values and committed action are often considered at the heart of the psychological flexibility model. These processes constitute the motivational foundation for the rest of the model, providing globally desired life directions that establish intrinsic reinforcers (Hayes et al., 2022). Because values are pivotal to the treatment model of ED presented below, I will briefly touch upon the theoretical underpinnings of this change process.

## The Theoretical Basis of Values

Fundamentally, human life revolves around the pursuit of meaningful endeavors. Therefore, aversive events or persistent stress need to be understood in the context of such pursuits. The importance of working with values has historically been advocated in various psychotherapies outside of ACT, such as logotherapy, humanistic therapy, psychoanalysis, and dialectical behavioral therapy (Cameron et al., 2014; Frankl, 1984; Holmes, 1996; Rogers, 1995).

What is distinctive to ACT is the conceptualization of values as a specific behavioral change process that can be monitored and manipulated throughout treatment. One of the most common definitions of values in ACT is that of Wilson & DuFrene (2009), who state values are "Freely chosen, verbally constructed consequences of ongoing, dynamic, evolving patterns of activity, which establish predominant reinforcers for that activity that are intrinsic in engagement in the valued behavioral pattern itself" (p. 64, Wilson & DuFrene, 2009).

A few terms from RFT need to be explained to understand the theoretical underpinnings of the purpose of values and committed action, as the principles of RFT fundamentally extend how operant and respondent principles apply to human behavior. Put simply, because of language, following verbally constructed rules can become operantly conditioned, which, in RFT, is described as rule-governed behavior (Harte et al., 2020). Using language, humans produce verbal rules that guide our behavior: laws, "self-truths," cultural norms, or defining specific criteria of goal achievement, to name a few examples. Much of human suffering arises from rigidly adhering to verbal rules when the function of those does not serve one's values. For instance, following the rule "This assignment needs to come out perfect; otherwise, my colleagues will think I am a fraud" will increase the risk of overwork, steering the individual away from what truly matters privately and professionally. Following a rule due to historically reinforced consistency between the action specified by the rule and the performed action is called *pliance* (Villatte et al., 2019). Another example is the rule "The customer is always right," which will make employees cater to the customer's needs. While perhaps beneficial for the customer (and the customer's ego), following this rule could lead to a variation of potentially frustrating and stressful situations for the employee. Throughout childhood, pliance is needed in many instances, such as following the recommendations of adults regarding what you should and should not do. However, it is typically associated with rigidity and contextual insensitivity in adult life, as behaviors comply with the rules rather than the actual consequences of behaviors in specific contexts.

Following rules as a result of reinforcement history of contacting the consequences specified by the rules is instead defined as *tracking*, much like following the instructions of a map (Villatte et al., 2019). For example, "You should strive to make the customer happy" is a more flexible rule, enabling employees to approach dissatisfied customers from various angles, regardless of who is wrong. Behaviors governed by tracking are therefore considered more flexible and advantageous than those governed by pliance. The last symbolic process of rule-governed behavior in RFT is *augmenting*, meaning distant behavioral consequences are brought into the present, enabling humans to direct their behaviors towards appetitive consequences not explicitly occurring in the current contextual contingencies (Villatte et al., 2019). In a situation involving an overbearing and complaining customer, an employee can access distant consequences such as "I want to treat humans with respect and dignity" or "This job paves the way for my kids" to reciprocate the customer more constructively and calming, instead of directly responding to the aversive contingencies at hand. Such an approach is probably less likely to provoke a stressful and aggressive response in both the customer and the employee.

Consequently, from an RFT perspective, human behavior tends to become rule-governed and rigid, as it is governed by verbal rules rather than the direct operant and respondent contingencies of the present. Clients with a lack of value clarity will risk having behavior mainly characterized by pliance of socially instilled rules (avoidance of criticism or the achievement of social approval) and avoidance tracking, meaning their behavior repertoire is mainly dominated by trying to escape and control potentially aversive experiences (such as stress, anxiety shame, and guilt). Therefore, the overarching goal in ACT when working with values is shaping behavior toward being governed by actual experiences and less by rigid rules, thereby increasing response flexibility. More specifically, this is achieved mainly by augmenting. By defining valued actions, in other words, "This is important and valuable to me, and this is how I would like to behave," the client induces a new set of verbal rules, thereby building symbolic bridges between actions and distant potentially appetitive consequences and steering them away from behaviors characterized by pliance and avoidance tracking (Hayes et al., 2016).

From a contextual behavioral approach, the interpretation and behavioral responses, as described within appraisal theory by the terms appraisal and coping, in relation to persistent potentially aversive and stressful external events visited upon an individual, can be understood in light of the idiosyncratic verbal contingencies of that particular person; what is perceived as stressful, is invariably dependent on what that individual deems essential and meaningful in one's life. That is why I suggest that values likely constitute a critical behavioral process in the clinical treatment of ED.

# A Contextual Behavioral Model of Stress-Induced Exhaustion Disorder

If a person becomes exhausted in association with a persistently high degree of identifiable ongoing demands, those demands have inevitably been endured for a long time. However, a high level of external demands does not inevitably lead to exhaustion, just as experiencing traumatic events does not always result in post-traumatic stress disorder; individual responses vary (Breslau, 2001). So, how come some persons become exhausted while others do not?

As extensively discussed, the most common clinical answer to this question is presently "recovery insufficiency." Here, ED is conceptualized as a condition of a psychophysiological resource deficiency. This perspective is based on a biomechanical stimulus-response model, emphasizing alleviating physiological responses and restoring depleted psychological and physiological resources. Humans are indeed biological organisms with certain physiological prerequisites whose bodies must recover after regular exertion and strain. Just like other animals, humans have certain physiological needs. However, unlike other animals, we are meaning-seeking language users, which inherently change how we react, learn, relate, and act in our world.

If anything is to be learned from contemporary physiological and psychological theories of stress, it is that the presence of an external stressor or a physiological stress response alone is not enough to label it as stress. Stress is a transactional process. It is an interaction between the environment and the individual and includes experiences of uncontrollability, uncertainty, and unsafety. These experiences, in turn, are influenced by social, cognitive, emotional, and behavioral processes by virtue of the individual's learning history. In other words, stress is highly contextual.

Rather than concentrating on the specific form of the individual variables that perpetuates a persistent stress response, such as the type of cognitive appraisal (as suggested by appraisal theory) or the depletion of energetic resources (as highlighted in the theory of recovery), clinical models of ED might benefit from adopting a more functional view on stress. What are the behavioral functions of stress, and how do they influence the individual's experiences and life? Because enduring a significant amount of persistent stressors does not inevitably lead to disruptions in one's life or the manifestation of symptoms of exhaustion.

What is called for, then, is a more comprehensive analysis of the change processes of ED and the contexts that determine them. If the biomechanical ontological assumptions of the stimulus-response model of stress are replaced with those of the biopsychosocial model and contextual functionalism, new

explanatory models and avenues of treatment are made available. From a clinical perspective, rather than asking how many stressors are present, how much stress is being felt, and how much psychophysiological resources have been depleted, it may be more clinically beneficial to examine how persistent perceived stress influences behavior, leading to an increased risk of ED, and suggest change processes driving these effects.

Therefore, in line with Lazarus (1999), I suggest that persistent stress is best understood as an inherently transactional process in the treatment of ED. The meaning constructed by an individual about what is happening is critical in determining both the occurrence and intensity of persistent physiological stress responses (Lazarus, 1999). As a result, symptoms of exhaustion in relation to persistent demands should be understood within the context of the individual's personal values, goals, and situational intentions. Given that most goals and situational intentions are often extensions of what an individual finds meaningful in life, a person's values - or a lack of connection to them - serve as a useful clinical proxy for comprehending the potential impact of persistent external demands on the individual. Furthermore, having a clear sense of purpose will increase one's sense of control and safety and decrease unpredictability, as ongoing external events can be interpreted within one's values and goals. This perspective aligns well with contemporary models of stress as well as a contextual behavior approach since values and committed action are core processes within the psychological flexibility model.

From a contextual behavioral perspective, if exhaustion ensues as the result of persistent demands, those demands will likely have been value-incongruent. Alternatively, the individual lacks contact with values, and other verbal contingencies, such as social expectations and norms, have governed behavior. Furthermore, as these persistent demands remain unaddressed and are merely endured, the behavioral repertoire is functionally likely characterized by avoidance tracking rather than approach tracking. This means that behavior repertoire is mainly characterized by rule-governed overactivity trying to avoid and control aversive experiences. ED, then, from a contextual behavioral approach, can potentially be understood as a result of a lack of contact with values in the face of persistent demands that are endured due to negatively reinforced avoidance and control. In non-behavioral terms, ED results from persistently enduring high demands in combination with a low degree of perceived meaningfulness, primarily using coping strategies of emotional avoidance.

A contextual behavioral model of ED is presented in Figure 1. The yellow-colored part of the model represents the input of the model, while the green color represents the suggested change processes. Blue represents symptoms or "outcomes" resulting from the negative interactions of the change

processes. In this way, the model aims to underline explicitly, in accordance with a process approach, what variables are conceptualized as independent variables outside the scope of treatment, target variables (independent variables), and dependent variables (symptoms/outcomes). Furthermore, while based on the psychological flexibility model, its descriptions of the change processes are meant to make it applicable and useful to psychological treatment and process-based approaches outside of contextual behavior science.

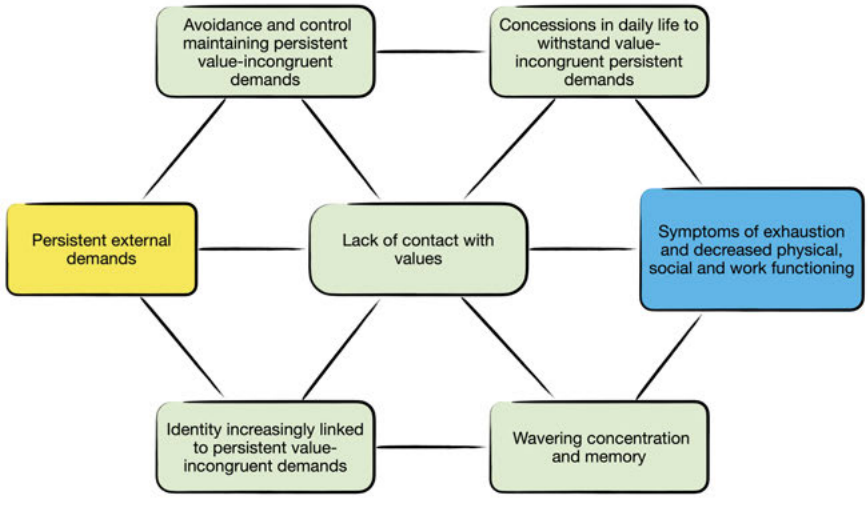


**Figure 1**

*A Contextual Behavioral Model of Stress-Induced Exhaustion Disorder*

*Note*. Yellow indicates independent variables outside the scope of treatment, green indicates change processes targetable by clinical methods, and blue indicates dependent variables (symptoms/outcomes).

The model can be summarized as follows: ED cannot merely be understood as an overload of persistent demands but rather the presence of persistent demands that do not align with the idiosyncratic values of the individual. These persistent demands are endured because of a lack of contact with values and a behavioral repertoire dominated by overactivity fueled by avoidance and control. This includes rigidly complying with various social norms and avoiding potentially aversive experiences (i.e., negatively reinforced rule-governed behaviors). These avoidant and control strategies will often result in successive concessions of important everyday activities in daily life to endure the value-incongruent demands, which subsequently increases the risk of negative outcomes such as symptoms of long-term stress, exhaustion, and a decline in physical, social, and work functioning. As these negative outcomes

accumulate, the individual's life becomes more restricted, and their sense of self becomes increasingly linked with maintaining these persistent demands. Increasing symptoms of stress and diminished functioning also negatively affect memory and concentration, further exacerbating the other behavioral processes and negative outcomes described in the model.

In essence, according to this model, ED results from a combination of external persistent demands, a lack of contact with values, and a behavioral pattern of overactivity, predominantly characterized by avoidance and control and compliance with social norms. As a result, individuals endure the persistent value-incongruent demands, even though they are idiosyncratically aversive, with escalating symptoms of stress, negative consequences on their sense of self, and wavering concentration and memory, escalating the risk of developing ED over time. Put simply, ED results from avoidant persistence in the face of too many shoulds and musts - a form of enduring lack of engagement akin to an existential crisis.

It should be noted that while the model (Figure 1) emphasizes the importance of values, the relative importance of the idiosyncratic processes of individuals may vary extensively and appear in personally unique ways. Some individuals may struggle primarily with values, while others will describe more issues of avoidance and control. Additionally, there are likely individuals with ED who struggle with processes not delineated within this model. This model does not claim to be universal nor encompass all possible change processes in ED. It is a practical model that aims to be clinically useful by suggesting change processes potentially targetable by common methods in behavioral treatments while simultaneously being compatible with contemporary stress models outlined outside of clinical psychology and contextual behavior science.

It should also be noted that this is a conceptual model. The two-dimensional lines (Figure 1) will confer an implicit notion that these relations are best understood through a causal linear explanatory model. In reality, these pathways are probably more complex, more like networks. However, attempting such a depiction would defeat the pedagogical purpose of this clinical model. I will now present a more thorough run-through of the model, using a step-by-step description of the different components of the model along with some clinical implications.

## Persistent External Demands

The psychological flexibility model does not include independent and dependent variables, such as triggering events or outcomes. However, in an ED model, including external demands or stressors outside the individual is pivotal. If this environmental component is removed, then stress would

exclusively be an internal process, indistinguishable from other symptoms and processes. That would render the very notion of stress as something that occurs between the environment and organism meaningless.

External demands, or stressors, encompass a lot of varying stimuli: work assignments, sickness or death of a relative, relational conflicts, financial strain, or major life changes like moving or changing jobs. Additionally, parenting, particularly for a child with special needs, presents its own form of unique stressors. Stressors may also be more pervasive and less defined, such as being poor, loneliness, being part of a minority, and living in a socially vulnerable area. Furthermore, external demands also take the form of societal and cultural norms (such as gender norms), and the expectations we put on ourselves, often stemming from our upbringing and learning history; these expectations are internalized and reinforced through verbal rules and contingencies.

In the context of ED, stressors will often originate from the work environment: low job control, low social support, workplace injustice, and high workload, as outlined in the JD-R model. As previously described, the existence of these negative factors at work is associated with increased risks of self-reported symptoms of exhaustion (Aronsson et al., 2017; Asplund et al., 2023; Fagerlind Ståhl et al., 2018; Salvagioni et al., 2017). Several studies also indicate that repeated reorganizations and cutbacks are, over time, associated with increased sick leave rates and symptoms of exhaustion (Bryngelson et al., 2011; Hallesten, 2005; Verhaeghe et al., 2003). Qualitative interviews with patients with ED also show that poor working conditions are common themes in their own understanding of the development of their problems (Eriksson et al., 2008; Hasselberg et al., 2014)

While dimensions of uncertainty, unsafety, and lack of control are fundamental from a scientific and conceptual standpoint, from a clinical standpoint, virtually anything can be a stressor. If stress is a transactional process, all stressors must ultimately be evaluated in conjunction with the client's learning history and behavior repertoire to be practically useful. External demands cannot by themselves result in exhaustion (or other forms of mental health, for that matter) since living, by definition, is dealing with persistent demands. One can experience a great deal of stress without necessarily believing it will interfere with one's life or develop symptoms of exhaustion. Therefore, a wider analysis of the change processes of the client and the contexts that determine them is needed when clinically working with ED.

## Lack of Contact with Values

What is perceived as stressful is inevitably tied to what an individual considers important and meaningful in their life. If an individual pushes themselves to the brink of exhaustion, it can be inferred, from a behavioral standpoint, that the contingencies that guided their persistence were negative reinforcement since they apparently were aversive and stressful. If they had been positively reinforced and appetitive, they would reasonably not have resulted in such long-term persistent physiological stress responses. That is not to say that the demands, or verbal contingencies, at some point were not appetitive; however, over time, due to changes in the client's life (i.e., context), such as increasing marital difficulties, a sick child or parent, organizational changes due to new priorities or cutbacks, the persistent demands have become increasingly aversive. Yet, for some reason, the individual continued to push through.

Lack of contact with values can stem from many reasons. One reason may be a lack of value clarity, meaning one cannot contact and specify potentially appetitive consequences for oneself. Alternatively, one's perceived values are based on pliance and avoidant tracking rather than free choice. For instance, rule-governed behaviors directed at avoiding social criticism or achieving the approval of others, as reflected in thoughts like "My parents taught me that I should do X," or "To be a good person, I should do this and that" or, "For others to like me, I cannot show any signs of weakness." Such behaviors based on social compliance and avoidance are seldom helpful since they are not linked to positive consequences for the individual (Hayes, Levin, et al., 2013).

Another reason for lacking contact with values is the potential mismatch between the individual values and the values and rules prevalent in their social context. In work contexts, verbal rules will be intimately linked with the organization's rules and culture, the profession's values (for example, the Hippocratic oath of doctors), and the legal regulations governing work procedures. Additionally, functional contingencies will always be in place to organize work and increase productivity. Sometimes, the rules and working conditions of the organization will clash with the values and principles individuals believe they should adhere to, whether through personal conviction or legal obligation. This conflict is sometimes referred to as ethical stress (O'Donnell et al., 2008; Ulrich et al., 2007), and in burnout theory's six areas of work life, this is highlighted by the factor "incongruence between the values of the individual and the values of the organization" (Leiter & Maslach, 1999).

Value incongruence has been highlighted as one of the potentially most important dimensions to acknowledge in burnout research (Maslach et al., 2001). From a contextual behavioral point of view, ethical stress and

conflicting values are examples of a lack of contact with values. Acting in accordance with value-incongruent demands put forth by the organization will likely increase the risk of long-term stress, as the behaviors are guided by averse avoidant properties rather than positive reinforcement.

Numerous studies point to the importance of value congruence as a predictor of well-being in health care practitioners (Prentice et al., 2023; Veage et al., 2014). Moreover, several qualitative studies of patients with ED describe the process as a form of crossroads, where previous ways of life are re-evaluated, and new values and directions in life are identified (Alsén et al., 2020; Arman et al., 2011; Ellbin et al., 2021; Engebretsen & Bjorbækmo, 2020; Hörberg et al., 2020; Jingrot & Rosberg, 2008). In a review, van Dam (2021) highlights that patients returning from ED describe a form of post-traumatic growth with positive changes in self-perception, interpersonal relationships, and philosophy of life (van Dam, 2021). This implies that, prior to ED, these individuals were not acting in alignment with their values. Early writings in burnout research have also suggested that the root cause of burnout is an ongoing struggle to invest our lives with meaning and that individuals with burnout do not believe what they do is useful and important (Freudenberger & Richelson, 1980; Pines, 1993). In his thesis "Diagnosing Burnout: An Anthropological Study of a Social Concept in Sweden," Thorbjörn Friberg suggests that the term burnout and diagnoses of ED in Sweden are plausible ways to describe Swede's extensional distress in rapid changes within workplaces and in society as a whole (Friberg, 2006). These findings suggest that a critical part of the ED treatments is to help clients increase contact with values and meaning by introducing new verbal rules and guiding them away from behaviors characterized by pliance and avoidance.

## Avoidance and Control Maintaining Persistent Value-Incongruent Demands

In the current treatment literature of ED, different concepts alluding to inflexibility, avoidance, and an excessive need for control are described as contributing to the clinical picture: Overcommitment, type-A personality, perfectionism, and obsessive-compulsive personality disorder (Almén, 2021; Gulin et al., 2021). In the burnout literature, the same concepts are described as predictors of burnout, along with dutifulness, workaholism, and performance-based self-esteem (Blom, 2012; Hill & Curran, 2016a; Maslach et al., 2001; Parker & Tavella, 2022). Collectively, these traits point towards tendencies of prioritizing achieving goals and meeting external and internal expectations at the expense of one's well-being. Such behavioral patterns will, if rigidly applied, risk exacerbating perceived stress over time. For instance, if an individual is highly perfectionistic, their work tasks will increase in scope

and complexity, and the efforts needed to meet those standards will grow. Such intensified efforts can elevate the risk of perceived stress and feelings of lacking control. According to the stress-generation theory, this perceived stress can, in turn, lead to new standards and increased effort to maintain control, leading to a self-perpetuating cycle of increasing demands and intensified stress.

In the case of perfectionism, the patterns described above are typically associated with perfectionistic concerns, which refer to the fear of making errors and worrying about being negatively evaluated by others and have been frequently linked to an increased risk of psychopathology (Limburg et al., 2017; Stoeber & Damian, 2014). From a functional view, instead of focusing on the form of such patterns using mentalistic constructs (such as personality), such behaviors need to be analyzed in the context that occasions them.

According to a functional view of behavior, there are no inherently adaptive or maladaptive behaviors. Rather, their appropriateness must be evaluated in the context in which they occur. This emphasis on context has also been highlighted in appraisal theory, where the importance of "fit" between the specific features of demands/stressors and the type of coping deployed (Cheng et al., 2014; Park et al., 2004). For example, studies of appraisal and coping have shown that problem-focused coping in relation to stressors with a low degree of controllability reports higher symptoms of stress compared to using problem-focused coping in response to controllable stressors (Cheng, 2001; Forsythe & Compas, 1987; Park et al., 2001). Additionally, emotionally avoidant and controlling coping strategies are more likely to be applied rigidly, independent of the current context (Folkman et al., 1986). Finally, functional equivalents of avoidance and control are prominent as maintenance processes in many mental health disorders as well as somatic conditions such as chronic pain (Hann & McCracken, 2014; Hayes et al., 2011).

In relation to ED, what will determine whether behaviors are characterized by avoidance and control is whether they are contextually linked to valued appetitive outcomes or the potential aversive consequences of not meeting the expectancies of value-incongruent demands. Examples of behaviors in ED that risk having properties of avoidance or pliance may include exercising efforts of control, double checking, working long hours of overtime, setting unrealistic high standards in work and life with little regard for the actual prerequisites for accomplishing those tasks, enforcing principles at work not compatible with actual work context, seldom asking for help, continuously optimizing tasks throughout everyday life, inability to delegate tasks in both private and work spheres, high levels of self-critique and blame, avoiding breaks, neglecting periods of self-reflection, procrastination, and maintaining a facade that everything is fine when it isn't. These behaviors serve to fulfill

perceived expectations of work, society, others, and oneself, often accompanied by emotions of anxiety, shame, and guilt. The prevalence of these patterns of rigid overactivity in ED is also probably one additional reason why stimulus-response theories of recovery conclude that ED results from an overall lack of recovery experiences, as they typically leave little room for relaxation and rest.

In the psychological flexibility model, these processes are mainly captured by the facet of "experiential avoidance," which refers to trying to avoid and control one's internal states, such as bodily sensations, emotions, and thoughts (Hayes et al., 2016). The alternative to experiential avoidance is acceptance, which is defined as:

> The adoption of an intentionally open, receptive, and flexible posture with respect to moment-to-moment experience. Acceptance is not passive tolerance or resignation but an intentional behavior that alters the function of inner experiences from events to be avoided to a focus of interest, curiosity, and observation as part of living a valued life. Ironically, acceptance is one of the biggest functional changes possible, and often will ultimately change the form of emotional events themselves (p. 6, Hayes, Levin, et al., 2013).

Studies investigating acceptance procedures, both in isolation and in combination with other ACT components, demonstrate enhanced persistence and a greater willingness to engage in distressing tasks in conjunction with lower reported degrees of distress compared to coping strategies of emotional control and distraction (Brown et al., 2002; Gutiérrez et al., 2004; Levitt et al., 2004; McMullen et al., 2008). It is worth noting that experimental studies on fear and anxiety conditions show that perceived predictability and control are equivalent to actual predictability and control regarding the strength of conditioning (Mineka & Oehlberg, 2008). In other words, perceived control is functionally equivalent to actual control of external stressors. These findings suggest that strategies aimed at perspective-taking and increasing willingness and openness to internal experiences can be equally effective as changing the stressors themselves. For example, brief values exercises have been shown to reduce both psychological and physiological stress responses during distressing tasks (Creswell et al., 2005). Consequently, using methods of defusion and acceptance, exposure procedures, and value clarification, one can encourage ED clients to challenge the contingencies of value-incongruent demands and promote more flexible behaviors towards positively reinforced consequences.

Several scholars have argued that Western culture promotes the pursuit of positive emotions and the removal/reduction of negative emotions over a life in accordance with one's values or a sense of deeper meaning (Hayes et al., 2016; Ryan et al., 2008). These cultural tendencies could risk reinforcing

coping strategies of avoidance and control in relation to experiences of stress. A biomechanical stimulus-response model of stress communicating that stressful experiences lead to the exertion of resources and energy in need of restoration might equally reinforce an agenda of control and avoidance. However, the things in life that can cause the most stress – personal relationships, work and private commitments, striving for something beyond ourselves, involvement in community or societal matters – are often the things that people care about most deeply. Acting in accordance with the moment-to-moment reinforcement consequences of one's values, for example, writing a thesis on the treatment of ED, will often be painful and associated with a great deal of stress. In this sense, acting in accordance with values can potentially increase willingness to open up to stressful experiences, thereby increasing perceived control and transforming the stimulus functions of these experiences and stressors. Consequently, by aligning the actual demands of life and the expectations of society, others, and self with one's own values, what could initially be perceived as stressful aversive demands can transform into positive reinforced action.

## Concessions in Daily Life to Withstand Persistent Value-Incongruent Demands

Inaction, the opposing side of the facet of committed action, is intimately intertwined with a lack of contact with values and avoidance and control. Committed action is the "doing" part of the pillar of engagement. A behavior repertoire dominated by avoidance and control to uphold value-incongruent demands coupled with emotions of fear, guilt, anxiety, and shame will typically steer away from what one deems meaningful in life. For individuals struggling with ED, positively reinforcing and purposeful activities will successively become less and less prioritized over time, leading to a progressively narrower life space. For example, studies on predictors of sick leave due to stress-related disorders have shown that interference between home and work is associated with a higher risk of sick leave (Danielsson et al., 2024; Svedberg et al., 2018).

The reciprocal process of the reduction of positively reinforcing activities and increased distress is somewhat like that of depression. However, the difference between ED and depression, I would argue, lies in dissimilar topographical patterns: While depression is typically associated with heightened isolation and passivity, ED is marked by avoidance, persistence, and overactivity. Rather than doing nothing, one does too much because of too many verbal rules of "shoulds" and "musts." As with depression, fewer positive reinforcing activities, such as spending time with friends and recreational activities, can exacerbate the onset of long-term stress symptoms: irritability, insomnia,

emotional lability, and somatic symptoms such as headaches and stomach problems. These symptoms will contribute to decreased work, social, and work functioning, which in turn will compel individuals at risk of ED to exert more effort on prioritizing the upholding of demands incongruent with their values. As a result, life becomes gradually more centered around upholding value-incongruent demands, veering further away from what's important in life.

In behavior activation for depression, patients typically fill out a mood diary together with planning potentially positively reinforcing activities despite not feeling motivated (Martell et al., 2010). Phrases such as "fake it until you make it" are not uncommon in CBT literature on depression. However, in the ED, patients generally do not engage in meaningful and positive reinforcing activities due to a lack of motivation; rather, their behavior is governed by excessive shoulds and musts. In this sense, doing things despite not feeling like it is typically a surplus in ED, rather than a deficit. Therefore, treatment should preferably encourage the tracking of appetitive spontaneous reinforcement – doing things simply because I feel like it, things that are playful - rather than because they help towards some value-incongruent demands.

Likewise, aside from aiding individuals with ED in increasing contact with core values, they will probably benefit from challenging unhelpful rule-governed behaviors. This can be done with exposure procedures such as supporting them in asking for help, appearing vulnerable, lowering effort in non-valued tasks, making conscious mistakes, and so on - thereby challenging rule-governed behavior typically associated with the thought content of being inadequate, not meeting expectations, being a failure, and so on. Consequently, the implications of the current analysis are that ED treatment should focus more on challenging negatively reinforced persistence and avoidance associated with value-incongruent social expectations rather than doing things despite not feeling like it.

## Identity Increasingly Linked to Persistent Value-Incongruent Demands

Language enables humans to construct rules and stories that guide behavior. This ability can also lead us astray, as we easily get stuck in the contents of our rules, which in turn may limit our capacity to discriminate and track relevant operant contingencies effectively. In this sense, adherence to verbal rules can result in behavioral rigidity (Hayes et al., 2016). Examples of such potentially rigid rules include societal and cultural norms, influences from our

upbringing, workplace protocols, expectations from friends and family, and personal self-imposed standards.

According to RFT, verbal rules can transform functions across stimuli without direct contact (Hayes & Berens, 2004). For example, consider a scenario in which an aversive experience has been associated with an event through respondent conditioning, such as emotions of shame in relation to failing a work task. Later, when asked to perform a similar task, or even just thinking about a similar task, may trigger feelings of shame. This association can widen into a larger network of stimuli dependent on the individual's context and learning history. Feelings of shame may be linked to verbal stimuli of "worthless," which may be evoked as soon as the task is undertaken. The word worthless may, in turn, evoke other memories and experiences of failure and similar words, such as "weak" or "stupid," and become linked to societal norms such as "a good citizen is a working citizen" or "you are the forge of your own luck." Over time, relational frames of the self can become involved, leading to thought content such as "I am worthless" or "I can't do my job. Therefore, I am bad person." In this way, through arbitrary applicable relational framing, acting in accordance with these verbal rules might increasingly link an individual's sense of self to verbal self-imposed demands.

Over time, repeatedly reinforced rules can construct a narrative, in ACT described as the conceptual self, and include beliefs like "If I can't do my job correctly, then I'm worthless," "I must never fail," "The job always comes first," "If I make mistakes others will not like me," or self-limiting thoughts like "I should not trouble others with my needs." Such beliefs may also become interwoven with other societal norms, such as "I should find fulfillment in my job," "I should strive to become the best version of myself," "I should be loving and accepting of who I am," or "I should be grateful because there are others in the world faring far worse than me."

These often contradictory verbal relations – descriptions and evaluations of who I am, what I am like, what I should and should not do, and how these aspects relate to descriptions and evaluations of others - formed and reinforced through relational framing, can gradually affect an individual's behavior repertoire, thereby increasing rigidity and making them less open and aware of the contingencies of the current context (Hayes & Berens, 2004). Parallels between the conceptual self and "role conflicts" described with burnout research can be made here: Individuals with burnout often struggle with their roles within organizations and between private and work life (Leiter & Maslach, 1999) – conflicts that can effectively impede contact with values.

In the psychological flexibility model, being unable to differentiate oneself from the rules and restrictions of one's conceptual self and being entangled in

the content of thoughts and the stories are framed by the negative processes of self-as-content and fusion (Godbee & Kangas, 2020). In the context of ED, the actual demands and stressors of the environment will, from a transactional view of stress, be intimately intertwined with the verbal contingencies of the individual. As individuals continuously act in accordance with value-incongruent demands imposed by the actual environment or by themselves - and as their life space gets narrower due to avoidance and control – their identity may become increasingly linked to the upholding of persistent demands, as avoidance in accordance with these verbal contingencies will be negatively reinforced. In this sense, fusion with the conceptual self may, over time, strengthen the functional influence of the persistent value-incongruent demands over behavior.

In a comprehensive study mapping the symptoms and experiences of 573 ED patients, one subcategory emerged as "perception of self and mindset" (Lindsäter, Svärdman, et al., 2023). More specifically, many of the participants in this study described struggling with feelings of being misunderstood, conflicts with identity, having a hard time accepting the symptoms, and reduced functional ability. Another qualitative study of interviews with ED patients has described the process of ED as losing a sense of home in oneself and the world (Jingrot & Rosberg, 2008). These findings highlight the existential struggles with self and identity that many ED patients seem to face. Considering questions of self and identity is, therefore, probably helpful in treatment. Based on a contextual behavioral framework, it seems reasonable to endorse a more flexible attitude to the contents of socially prescribed verbal rules and to help patients come into contact with a self-as-context based on the I/here/now on conscious experience rather than rooted in attachment to a conceptualized self.

Likewise, it's also important that the previous value-incongruent "self-truths" that have governed behavior before the onset of ED are not replaced with new rigid rules of what living with ED will entail. For example, the term "burnout" suggests that some form of biomechanical irreversible energy depletion has occurred. Studies on biogenetic reductionist explanations show that psychiatric diseases can decrease hope for recovery and negatively affect beliefs about how much of the current symptoms are related to behaviors that can be changed (Haslam & Kvaale, 2015; Schroder, 2021). Furthermore, in studies of unspecific fatigue, expectations about fatigue being a chronic symptom have been shown to be a negative predictor of symptom progression (Nijrolder et al., 2009). In light of these insights, a recovery-focused biomechanical treatment focusing on the physiological stress response could potentially risk instilling new rigid rules such as "Stress is dangerous and needs to be carefully regulated," "I need to be careful not to deplete my energy," "Conserving my resources should be my number one priority."

Ideally, ED treatment should try to foster flexibility and help ED patients navigate their lives without imposing new rigid rules, as they are – according to this model - part of the problem in the first place.

## Wavering Memory and Concentration

Attention processes, such as hypervigilance and attentional bias, have a long history of being included in cognitive-behavioral conceptualizations of anxiety disorders, mood disorders, and persistent pain (Cisler & Koster, 2010; De Houwer & Koster, 2023; McCracken, 2007; Mennen et al., 2019). In the diagnostic conceptualizations of ED, difficulties with concentration and memory are cardinal symptoms (Åsberg et al., 2024). Sufferers of burnout and patients with ED often describe cognitive impairments in relation to attention, executive functioning, and memory as assumed to be the result of high job pressure and cognitive demands (Deligkaris et al., 2014; Gavelin et al., 2015). In a 3-hour cognitive test situation, ED patients report increased mental fatigue earlier and difficulties recovering focus during breaks, compared to healthy controls (Gavelin et al., 2023). Moreover, clinical populations of ED show small cognitive impairments in some cognitive tests compared to healthy controls (Franke Föyen et al., 2023; Gavelin et al., 2022).

When we are subjected to acute stress, our attention shifts from intentionally oriented towards being more stimulus-driven, making it harder to concentrate (Sänger et al., 2014). Indeed, employees who experience higher levels of job strain report more mistakes and difficulties concentrating (Linden et al., 2005). Given the substantial body of evidence of the negative effects of chronic stress on cognitive performance in general (Lupien et al., 2009; McEwen, 2017; O'Connor et al., 2021), it is reasonable to hypothesize that difficulties with attention and memory may contribute to the development and maintenance of ED.

In the model of psychological flexibility, difficulties with attention are mainly captured by the negative facet of "lack of contact with the present moment" (Hayes, Levin, et al., 2013) in the current model named "wavering memory and concentration." The inability to effectively direct one's attention intentionally may hinder the individual's ability to effectively discriminate among the moment-to-moment operant contingencies. Long-term symptoms of stress include heightened anxiety, irritability, and insomnia. Insomnia, in turn, is associated with cognitive impairments such as difficulties with memory and concentration. Impaired attentional capacity, in turn, can lead to decreased performance in daily tasks at work and in personal life, further exacerbating perceived stress, resulting in a cycle of stress, symptoms, wavering concentration and memory, more stress, and so on. Therefore, it is probably helpful to include methods such as mindfulness in the treatment of

ED - not with the primary intent of fostering relaxation and restoring lost psychophysiological resources but as a method of facilitating the effective tracking of positively reinforced value-based contingencies.

## Implications for Treatment

This contextual behavior model of ED suggests how the processes of psychological flexibility manifest specifically in relation to ED while also aligning transactional views prevalent in stress research. The model's clinical implications, compared to the current recovery-based paradigm, could be significant. Instead of understanding ED as the result of a stress overload and resource depletion, ED is conceptualized as an enduring crisis of engagement.

Knowing what to do and when to do it in the face of persistent external and perceived demands – whether it concerns prioritizing task completion, acceptance, taking breaks, seeking social support, or attending to one's physical health – is dependent on the capacity to identify and act in accordance with what one deems meaningful in life. As a result, the main focus of psychological treatment for ED, according to this model, should be on contact with values and committed action rather than recovery behaviors.

Using various behavioral methods, such as value clarification, exposure, functional analysis, shaping, goal setting, contingency management, mindfulness, and defusion and acceptance exercises, a therapist can promote approach behaviors toward positive reinforcement that have the potential to transform the stimulus functions of persistent demands, thereby diminishing their perceived aversiveness over time. Simultaneously, these methods enable endorsing behaviors toward more idiosyncratic appetitive demands.

Translated into non-behavioral terminology: By using therapeutic strategies based on functional analysis, such as value clarification, exposure, mindfulness, and defusion techniques, the therapist can aid the client in defining what is meaningful and important in life and encourage behaviors towards that, rather than being driven by avoidance and control. Such therapeutic procedures can, over time, result in new experiences that alter the client's perception of demands, thereby making them less stressful. Concurrently, these strategies can assist the client in gaining perspective on the desirability of the external demands in relation to their own intrinsic values and sense of self. In turn, this can potentially help clients orient towards more fulfilling and desirable pursuits in life rather than being governed by societal norms and social expectations.

# A Biopsychosocial Treatment Based on a Contextual Behavioral Model

In this section, I will give a short presentation of a clinical treatment developed in conjunction with the contextual behavioral model of ED. In this treatment, the pedagogical term *psychosocial needs* is introduced. To understand the basis of this term, a few things must first be addressed concerning terminology within evidence-based clinical interventions.

An inherent challenge in all evidence-based clinical psychology is that practical models are often not precise, while precise models are seldom practical. Clinical treatment requires flexible models that are efficiently utilized, broadly applicable, and can facilitate quick and effective treatment choices for particular clients in specific contexts. However, these models must also adhere to established scientific principles, which require terms and models to be technically precise and coherent (Hayes, Long, et al., 2013). To illustrate: It is not particularly useful - nor desirable - for a clinical psychologist to communicate to a client using words such as "negative reinforcement" and "arbitrarily applicable relational responding." Different levels of knowledge must be harmonized when designing clinical psychological treatments: 1) practical knowledge from clinical settings, 2) clinical research, and 3) basic science. The language used on each level does not have to be uniform - that would be equivalent to asking a 16-year-old to grasp the engineering and mechanics behind a car before learning how to drive. Just as the words used by an engineer to describe the mechanics of a car, the formal instructions for driving, and the terms used by a driver instructor can vary, so can the terms used across different levels of clinical psychology and research (Hayes, Levin, et al., 2013).

In contextual behavior science, these challenges of nomenclature have been solved by sorting terms into different categories based on the level of analysis: philosophical concepts, basic technical terms, middle-level theoretical terms, and clinical terms (Barnes-Holmes et al., 2015). RFT and principles of respondent and operation conditioning are examples of basic technical terms, while psychological flexibility is a middle-level theoretical term (Harte & Barnes-Holmes, 2022). The terms used in psychological flexibility, such as acceptance or self-as-context, are not necessarily conveyed to clients - they

are the “formal instructions for driving” to help applied researchers and clinicians communicate around relevant clinical change processes. Consequently, the language used in therapy does not have to mirror the clinical change processes directly if different words are deemed more helpful in facilitating behavioral change. For example, middle-level phrases such as “acceptance” or “values” appear in non-scientific and clinical contexts and can, as a result, carry other meanings for clients, potentially obfuscating therapeutic communication.

In the contextual behavioral model of ED presented in this thesis, a large emphasis is placed on contact with values. While the importance of this change process is frequently highlighted in the ACT literature, some concerns have been raised regarding how value clarity is to be reliably implemented in clinical practice (McLoughlin & Roche, 2023). If the clinical procedures of a certain method are imprecise, there is inevitably a risk of introducing a great deal of unintentional clinical variability.

It has been suggested that one way of clarifying values is to link them to basic needs independent of language, such as safety, social connection, exploration, and mastery (Villatte et al., 2019). Historically, there has been great skepticism within behaviorally oriented researchers towards the use of concepts such as “needs” or “drives” (Deci & Ryan, 2000). This skepticism has veined with the emergence of contextual behavior science and RFT and the separation of terms used across different levels of analysis.

In recent developments within process-based therapy, Hayes et al. (2022) suggest that it’s important to acknowledge how different change processes relate to the satisfaction of particular psychological needs or “yearnings” (Hayes et al., 2022). Building on this idea, they draw upon the framework of self-determination theory, which suggests three fundamental psychological needs in understanding human motivation: autonomy, competence, and relatedness (Ryan & Deci, 2000). Extensive evidence supports that actions towards these ends promote well-being and increased functioning (Donald et al., 2020; Ng et al., 2012; Tang et al., 2020; Vasconcellos et al., 2020). Several items in the newly developed Process-Based Assessment Tool are intended to be used to evaluate change processes in psychological interventions irrespective of theoretical origin and are based on psychological needs suggested by self-determination theory (Ciarrochi et al., 2022). Consequently, in the context of contextual behavior science and process-based therapy, linking clients’ actions to certain needs seems to be a potentially viable approach to clinically promote contact with values in treatment.

## A Biopsychosocial Treatment of Stress-Induced Exhaustion Disorder

In developing a practical treatment for ED, the term psychosocial needs has been introduced as a clinical pedagogical term. The purpose of this term is to ensure availability for clients and reliability of administration amongst clinicians and as a way to put value clarification and committed action at the center of treatment, in contrast to the current stimulus-response paradigm of emphasizing physiological needs and recovery. With a focus on psychosocial needs, while in no way disregarding physiological needs, the treatment is described as a "biopsychosocial treatment" for ED.

In this biopsychosocial treatment of ED, it is asserted that humans are indeed biological organisms with certain physiological prerequisites whose bodies must recover after regular exertion and strain. With regard to such biological needs, humans regularly need to sleep, eat, relax, engage in activities associated with sexual reproduction, and do things that are playful and creative. These biological needs are typically accommodated by activities often described as recovery behaviors.

Unlike other animals, we are meaning-seeking language users, which inherently change how we act and relate to our world. Humans need meaning and purpose. The strive for meaning and purpose is captured by psychosocial needs: community, love, worthiness, autonomy, mastery, and contributing to something beyond ourselves. These biopsychosocial needs are inspired by the self-determination theory (autonomy, competence, and relatedness) and the six core dimensions of psychological well-being (self-acceptance, purpose in life, environmental mastery, positive relationships, personal growth, and autonomy) defined by Ryff (1989).

ED is not described as a lack of recovery but impoverished psychosocial needs in the face of value-incongruent demands that are endured due to negatively reinforced persistence avoidance and control. While this treatment shares similarities with ACT, it is perhaps more accurately described as a value-based exposure therapy.

Psychosocial needs are described as temporary and fleeting, in the same way that biological needs are. Even though you ate dinner, you will wake up the next day hungry. Even though you showed love and care for your partner one day, you cannot foster a loving relationship without doing so constantly, day after day, moment to moment. This way, psychosocial needs are infinite and must be satisfied indefinitely throughout life.

Coming into contact with a psychosocial need is also described as a subjective experience, not necessarily dependent on external context. In the same way, one can objectively sleep a whole night without feeling rested, being among well-intentioned colleagues may not necessarily evoke a sense of community. Therefore, instead of focusing too much on the external conditions – how exactly to plan for perfect circumstances to satisfy a psychosocial need – clients are encouraged to track the fleeting experiences of love and togetherness and not get stuck in the intellectual ramifications of exactly what that entails.

Finally, the biopsychosocial treatment of ED describes that being willing to come in contact with psychosocial needs necessitates a willingness to confront stress and pain. Inspired by the writings of Hägglund (2019), the treatment underlines that things are meaningful because they are fragile and something important is at stake. For example, the importance of a child to a parent is underscored by the parent's acute awareness of the child's vulnerability and the profound devastation the parent would face if the child was harmed. Similarly, it is precisely because a teacher can fail their student in providing a good education that the role of a teacher gains meaning. All things important in life can come to naught.

Describing psychosocial needs in this way is a method of value clarification while simultaneously fostering acceptance, as accommodation of psychosocial needs will unvaryingly be tied with experiences of stress and pain. Instead of focusing mainly on satisfying their biological needs or value-incongruent demands, clients are encouraged to prioritize doing things that increase their chances of accommodating psychosocial needs – behaviors that may result in a sense of worthiness, community, love, autonomy, mastery, and so on. It should be noted that these needs are merely clinical pedagogical terms aimed at facilitating the tracking of positive reinforcement. Not to be confused with some inner form of actual mentalistic notion of depleted inner resources.

In this treatment, defining actions to accommodate psychosocial needs (value clarification) is supplemented by functional analysis, stimulus control and exposure methods aimed to facilitate committed action and are suggested to be based on the following themes: prioritizing things that are spontaneous and playful, challenging need for constantly optimizing to maintain value-incongruent demands (walking slow, doing one thing at a time), challenging rule-governed behaviors in relation to sleep, challenging rule-governed patterns regarding training (constantly exerting oneself or avoiding an increased heart rate) challenging perfectionistic negatively reinforced behaviors, asking for help, showing oneself vulnerable, and acknowledging but not acting on intrusive worrying thoughts.

A 10-module Internet treatment has been developed to facilitate the above-described behavioral targets. The specific contents of the modules are currently as follows:

- Module 1 – Treatment rational, encouraging contact with playful activities and spontaneity.

- Module 2 – Principles of functional analysis and exposure exercises aimed at challenging inner stressful demands of constant optimization (for example, multitasking, rushing when not needed, and constantly managing time to increase effectivity).

- Module 3 – Stimulus control regarding sleep and challenging rule-governed behaviors of sleep and training.

- Module 4 – Defining behaviors towards psychosocial needs (i.e., value clarification).

- Module 5 – Principles of exposure and committed action.

- Module 6 – Committed action and how to approach obstacles of worry with exposure.

- Module 7 – Committed action and how to challenge perfectionistic behaviors, approaching obstacles of fear, shame, and guilt.

- Module 8 – Committed action and how to ask for help and show vulnerability, approaching obstacles of fear, shame, and guilt.

- Module 9 – How to manage accommodating different, sometimes contradictory biopsychosocial needs and the demands of life.

- Module 10 – Summary and maintenance plan.

In summary, based on the contextual behavioral model of ED presented in this thesis, a biopsychosocial treatment of ED has been developed. The core aim of this treatment is to assist ED clients in effectively tracking positively reinforced value-based contingencies, thereby reshaping the functional context of perceived and actual stressful demands in life. The treatment aims to be theoretically coherent and based on basic scientific principles. It defines specific change processes and establishes methods for targeting these processes. While this treatment is currently a disorder-specific protocol, it represents an incremental first step towards aligning treatment for ED with a

process-based approach to treatment, as presently reflected in the wider field of clinical psychology.

# Empirical Work

## Overarching Aim

The foundation for the empirical work presented in this thesis began almost ten years ago. Despite lacking evidence for MMI for ED, the Health Care Service of Stockholm initiated a specialized healthcare initiative called "The health care choice for treatment of long-standing pain with or without comorbidity and stress-induced exhaustion disorder" in 2014. Given the limited knowledge about ED and its treatment, we set out to investigate the effects of this treatment at two specialized clinics. Our overarching aim was to gain an increased understanding of current treatment practices to foster more focused and theoretically coherent treatment that can be made accessible to more patients. More specifically, we wanted to describe the contents and effects of current recommended treatment practices, namely MMI for ED (Study I). We also wanted to examine predictors of improvement, including sub-groups in MMI for ED (Study II), and explore psychological mediators during treatment (Study III). Consequently, studies I-III are based on the same large open clinical trial ($N$ = 915) conducted at two specialist clinics for ED over three years.

In parallel to Studies I-III, the contextual behavioral model of ED was developed along with the biopsychosocial treatment presented within this thesis. This treatment was subsequently implemented into the standard practice of the two specialist clinics to improve the focus and quality of their clinical procedures. During the COVID-19 pandemic, an increased focus on digital treatment led to the development of a digital MMI, where the biopsychosocial treatment for ED was delivered via an online CBT platform. Study IV is a pilot study that aims to evaluate the feasibility of the biopsychosocial treatment for ED delivered within this shorter digital MMI.

# Study I

## Aim

Even though MMI is recommended for ED, the current body of research speaks little about whether it is effective or not and how an MMI should be structured to facilitate symptom improvement and return-to-work. Therefore, Study I aimed to describe the contents of a standardized 24-week MMI for ED and investigate whether ED patients participating in such a treatment report improved symptoms and increased return-to-work rates. Given that MMI for ED was implemented in regular care despite lacking evidence, a second aim was to evaluate the adverse effects of MMI for ED.

## Method

### Design

Study I was an open clinical trial with a 12-month follow-up, based on a sub-sample from an extensive data collection from a 24-week MMI for ED at two specialist health care centers (PBM Sweden AB) in Stockholm, Sweden. The clinics received referrals from general practitioners, primary health care centers, and occupational health services from all over Stockholm. This study was registered on Clinicaltrials.gov (Identifier: NCT03360136), approved by the Regional Ethical Review Board in Stockholm, Sweden (Approval Nr. 2016/1834- 31/2) and followed the ethical principles of the Declaration of Helsinki.

### Participants and Recruitment Procedure

After being referred, the patients went through a multi-professional team assessment performed by a licensed physician (45 minutes), a licensed psychologist (60 minutes), and a licensed physiotherapist (45 minutes), after which a 30-minute summarized assessment was returned to the patient by the team.

Inclusion criteria for the study were as follows: a) referred for ED, fulfilled the criteria for ED; b) scored > 4.5 on the Shirom-Melamed Burnout Questionnaire (a cut-off determined by the Health Care Services Stockholm County for being accepted to the health care initiative described under the heading “Overarching aim”); c) 18-65 years of age; d) the patient was considered to be suitable for group treatment and logistically able to participate in treatment.

Exclusion criteria were: a) abuse of alcohol or drugs; b) participating in any other form of MMI; c) severe depression, moderate/high risk of suicide,

psychosis, or untreated post-traumatic stress disorder. Since this was an open clinical study, no specific medication restrictions were endorsed.

A total of 662 patients underwent a multi-professional assessment between September 2017 and April 2018. Of the 463 patients included in treatment, 70 declined research participation. Before treatment started, three of the patients who had initially agreed to participate terminated their treatment and were excluded. A total of 390 patients were included in the study. Eleven of these dropped out during the treatment. Consequently, 379 patients completed the 24-week MMI.

**Treatment**

The treatment was administered by a multi-professional team comprising a licensed M.D., a licensed psychologist, a licensed physiotherapist, and a rehabilitation coordinator (occupational therapist, licensed nurse, or licensed psychologist). The MMI was based on CBT and included individual sessions along with several group treatments: a CBT group, an applied relaxation group, and a physical activity group. Additionally, individual sessions were given by each respective professional to ensure personalized treatment. Rehabilitation meetings, together with the rehabilitation coordinator and relevant stakeholders, such as the employer, the Swedish Employment Agency, and the Swedish Social Insurance Agency, were also utilized to facilitate return-to-work.

The published paper extensively describes the MMI's contents and scope. In short, the interventions focused on increasing recovery and included a wide range of established CBT components, such as applied relaxation, mindfulness, valued action, behavioral activation, exposure, and assertiveness training, together with the promotion of physical exercise.

**Measurements**

Baseline characteristics and measures of psychological variables were collected during the assessment phase, at the start of rehabilitation, mid-treatment, post-treatment, and 12-month follow-up. All questionnaires were administered digitally through a secure online login, a reliable way of collecting psychological self-report measures (Hedman et al., 2010). To decrease the risk of instrumentation bias, the order of all self-rating questionnaires was randomized at each instance of administration.

The primary outcome was symptoms of exhaustion, measured with the Karolinska Exhaustion Disorder Scale (KEDS; Besèr et al., 2014), and working time and sick leave compensation, measured using self-rated questions - “How much are you working right now?” and “How much compensation are you receiving from the Swedish Insurance Agency?”.

Secondary outcomes were burnout symptoms, symptoms of anxiety and depression, insomnia, and quality of life, measured by the Shirom-Melamed Burnout Questionnaire (Melamed et al., 1992), Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983), Insomnia Severity Index (Bastien et al., 2001) and EuroQol five-dimension scale (The EuroQol Group, 1990) respectively. The Negative Effects Questionnaire (Rozental et al., 2019) was used to measure adverse treatment events.

**Analysis**

Statistical analysis was performed using IBM SPSS Statistic version 25 (IBM Corp, 2017). All repeated symptom outcome measures were analyzed using mixed-effects models, with time as a fixed effect and random intercepts. Model fit was evaluated using – 2 restricted log-likelihood. Data were analyzed using an intention-to-treat procedure. Missing data were handled using maximum likelihood estimation. We calculated within-group effect sizes over time using Cohen's *d*, where 0.2 - 0.5 was considered small, 0.5 - 0.8 moderate, and $\geq$ 0.8 large (Cohen, 1988). The guidelines by Jacobson and Truax (1991) were utilized to evaluate clinically significant change. The specific criteria for clinically significant change are presented in the published paper.

## Results and Discussion

There were significant and large improvements in all measures. Patients showed reduced symptoms of exhaustion, burnout, insomnia, as well as anxiety and depression following treatment, with large within-group effect sizes at 12-month follow-up ($d$ = 0.91 – 1.76). Patients also reported a significant increase in quality of life. Improvements in symptoms of KEDS are presented in Figure 2. At the 12-month follow-up, 37 % ($n$ = 143) of the patients achieved clinically significant change on KEDS and 57 % ($n$ = 223) measured by the Shirom-Melamed Burnout Questionnaire. Beyond these improvements, patients with some form of occupation (employed or studying; $n$ = 365) had returned to work with an average rate of 50 %, and in the sample as a whole ($N$ = 390), sick leave compensation was reduced by 49 % at 12-month follow-up. Some patients ($n$ = 97) reported adverse effects of treatment, mainly concerning an increase in symptoms of stress.

In summary, ED patients participating in a standardized CBT-based MMI reported large symptom alleviation, increased working time, and reduced sick leave compensation, suggesting that they did seem to benefit from treatment. There were some negative effects, but no more so than other psychological treatments. While these results are encouraging, considering the comprehensiveness and lack of specificity of the current MMI, which can limit

access to treatment, more focused and accessible interventions should preferably be investigated.

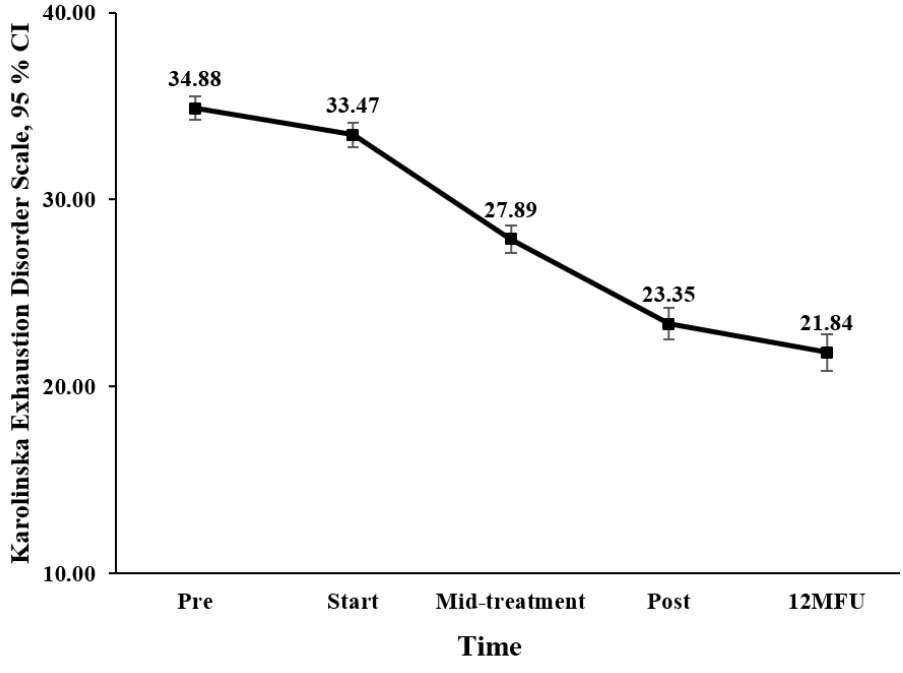


**Figure 2**

*Changes in Mean Scores on Karolinska Exhaustion Disorder Scale in Patients With Stress-Induced Exhaustion Disorder (N = 390) Participating in a 24-Week Multimodal Intervention*

*Note*. Pre: Before treatment; Start: Treatment start; Mid-treatment: 12 weeks into treatment; Post: After treatment; 12MFU: 12-month follow-up

# Study II

## Aim

Given the current knowledge gaps about the ED population and treatment in general, we wanted to empirically approach questions on how to improve focus and individualize treatment. Two ways to address these questions include analyses of individual predictors of improvement during treatment and analyses of empirical sub-groups of treatment participants who differ in treatment response. Therefore, the aim of Study II was twofold: 1) To explore whether a wide range of demographic variables, clinical characteristics, and treatment-related variables at baseline individually predicted changes in symptoms of exhaustion in participants receiving an MMI for ED; 2) To explore the existence of sub-groups across the variables from the first aim and to understand whether these sub-groups predicted symptom improvement over time.

## Method

### Design, Procedure, Participants, and Treatment

The design, procedure, and treatment were identical to Study I. Study II concerns the entire data collection of the open clinical trial, thereby including the population of Study I. Between September 2017 and March 2019, 1643 patients underwent a multi-professional assessment. Of the 1083 patients included in the 24-week treatment, 17 dropped out before treatment started and were excluded from the data collection. Another 151 declined participation. As a result, 915 patients were included in the study.

### Measurements

Exhaustion symptoms were measured using KEDS (Besèr et al., 2014). In psychological treatment research, predictors of outcome can be divided into three general classes to differentiate among them practically: Demographics, clinical characteristics, and treatment-related variables.

The following demographic variables were collected: age, gender, marital status, education, and socioeconomic status. Furthermore, patients were asked if they had a child living at home with a neuropsychiatric or developmental disorder.

Clinical characteristics were as follows: the duration of symptoms before seeking help, previous sick leave due to ED, psychiatric comorbidity, persistent pain, antidepressant medication, and concurrent symptom burden of depression and anxiety measured by the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983).

Finally, treatment-related variables were insomnia (Insomnia Severity Index; Bastien et al., 2001), physical activity, pathological worry (the Penn State Worry Questionnaire ultra-brief; Berle et al., 2011), perfectionism (the Clinical Perfectionism Questionnaire; Parks et al., 2021) and treatment credibility (the Credibility/Expectancy Questionnaire; Devilly & Borkovec, 2000)

**Analysis**

All statistical analyses were performed in Jamovi 2.3.16.0 (*The Jamovi Project [Computer Software]*, 2021). The statistical procedure is described briefly, and a more comprehensive description is available in the published paper. First, crude linear mixed-effects models were built separately for each predictor variable, using all five repeated measurements of KEDS (pre-, start, mid, post, and 12-month follow-up) with time as a categorical variable and each predictor as fixed effects and random intercepts for each subject. Interactions between the predictor and each time point were included in all models to let the growth curves vary over time depending on the predictor variable.

In the second step, separate models were built for each predictor, adjusting for demographic variables (including previous significant interactions). In a third step, one large model was built for the treatment-related variables, adjusting for all demographic variables and clinical characteristics (including previous significant interactions with time) to evaluate the relative contribution of each predictor in relation to one another.

Latent class analysis was used to identify sub-groups. We first estimated a two-class model and then added classes until the best model fit was achieved. Finally, using the final solution of sub-groups from the latent class analysis as a predictor, change over time was explored in a linear mixed-effects model using all five repeated measurements of KEDS with time and sub-groups as fixed effects and random intercepts for each subject. Again, an interaction between sub-groups and time was included to model growth curves over time.

## Results and Discussion

Age was the only demographic predictor that showed a significant interaction with time on KEDS, $F(4, 3454) = 6.52$, $p < .01$. Of the clinical characteristics, "previously on sick leave due to ED" ($F$ (4, 3451) = 4.24, $p < .01$), anxiety ($F$ (4, 3447) = 5.84, $p < .01$) and depression ($F$ (4, 3448) = 7.08, $p < .01$) showed significant interactions with time on KEDS. Out of the treatment-related variables insomnia ($F$ (4, 3454) = 5.77, $p < .01$), perfectionism ($F$ (4, 3438) = 8.92, $p < .01$), physical activity ($F$ (16, 3441) = 2.03, $p < .01$) and treatment

credibility ($F$ (4, 3448) = 8.59, $p$ < .01) showed significant interactions with time on KEDS.

Results from the latent class analysis supported the existence of sub-groups of ED patients at baseline before starting treatment. Differences across the three sub-groups mainly concerned education, socioeconomic status, insomnia, depression, perfectionism, marital status, anxiety, and worry, with differences in education, marital status, socioeconomic status, anxiety, and worry being most pronounced. Based on differences in scores, the sub-groups were named "partner high neuroticism" ($n$ = 253, 28 %), "single lower income" ($n$ = 252, 28 %), and "partner low neuroticism" ($n$ = 407, 44 %). The mixed effects model using the three-class solution as a predictor showed a significant interaction between the subgroups and time on KEDS ($F$ (8, 3438) = 3.28, $p$ < .001). Over time, the improvement in the "single lower income" group stagnated, indicating a less beneficial trajectory than the other two sub-groups.

The trajectories of anxiety, depression, insomnia, and physical exercise, while significant, were hard to interpret in any clinically meaningful way. The results showing that being older, having previously been on sick leave due to ED, and the subgroup "single lower income" was associated with less improvement is potentially scientifically interesting. However, their clinical utility appears limited because their effects are minor and cannot be targeted in treatment. The findings of perfectionism and treatment credibility do, on the other hand, have the potential to inform treatment practices of ED. Perfectionism, as a predictor for symptom improvement in the current study, suggests that perfectionism may be important to address in the treatment of ED. Moreover, efforts to ensure ED patients understand and believe in the treatment rationale should be encouraged, as high perceived treatment credibility seems to be associated with larger improvements in ED symptoms during treatment.

# Study III

## Aim

The understanding of the underlying psychological processes of development and maintenance of ED is limited. Conventionally, studying change processes during psychological treatment is typically done by investigating mediators. Therefore, the aim of Study III was to explore different mediators commonly suggested to be important within ED treatment, namely sleep concerns, pathological worry, perfectionistic concerns, and psychological flexibility.

## Method

### Design, Procedure, Participants, and Treatment

The design, procedure, population, and treatment were identical to those of Studies I and II. However, two participants were unavailable for the variables analyzed in the current study and were therefore excluded from the analysis, resulting in a final sample of 913.

### Measurements

In the current study, only measurements from treatment start, mid-treatment, and post-treatment were utilized, as the focus was change during treatment. KEDS was used as a primary outcome measure of exhaustion symptoms (Besèr et al., 2014). The suggested mediators explored were sleep concerns, pathological worry, perfectionistic concerns, and psychological flexibility. Sleep concerns were assessed using a shorter 3-item version of the Insomnia Severity Index (Bastien et al., 2001), focusing only on the psychological dimensions of insomnia. Pathological worry was measured using the Penn State Worry Questionnaire Ultra-Brief (Berle et al., 2011), and perfectionistic concerns using the subscale "perfectionistic concerns" from the Swedish Clinical Perfectionism Questionnaire (Parks et al., 2021). Finally, psychological flexibility was assessed using the Swedish Acceptance and Action Questionnaire (Lundgren & Parling, 2017).

### Statistics

All analyses were done in R version 4.1.3 (R Core Team, 2022). The statistical procedure is described briefly since a more comprehensive description is outlined in the published paper.

Meditation was explored using two criteria: 1) There had to be an established effect of time in treatment on mediators, which in turn was associated with levels of exhaustion symptoms, and 2) within-individual change in the suggested mediators preceded the subsequent change in exhaustion symptoms.

To establish criterion one, we utilized the mediation procedure by Baron & Kenny (1986) and Preacher and Hayes (2008) in a four-step process in which different linear mixed-effects models were built for each suggested mediator to estimate a-, b-, c, c´- and ab-paths between mediators, "time in treatment" (independent variable) and exhaustion symptoms (dependent variable). Following the separate models for each mediator, a multiple mediator model was created to account for covariance between the four mediators (Preacher & Hayes, 2008).

Random intercept cross-lagged panel models were utilized to explore criterion two (Hamaker et al., 2015; Mulder & Hamaker, 2021). In a random intercept crossed-lagged panel model, the variance is broken down into 1) stable differences between persons (trait-like stability), represented by random intercept, and 2) within-unit fluctuation around the individual means. Auto-regressive paths represent state-like stability over time at the within-person level. The cross-lagged paths between variables over time show whether a deviation from an individual's expected score (as determined by their random intercept) at one measurement point predicts a deviation from the expected score at the next measurement (Mulder & Hamaker, 2021). This way, random intercept cross-lagged panel models enable the investigation of whether variables of interest (mediators and exhaustion symptoms) predict each other over time and which variable is the dominant causal factor.

## Results and Discussion

The criterion one analysis showed significant associations between the mediators and symptoms of exhaustion when controlling for the time in treatment. The ab-products for all four mediators were significant in all single mediator models, with a proportion of mediated change of 30 % for sleep concerns, 24 % for pathological worry, 20 % for perfectionistic concerns, and 18 % for psychological flexibility, respectively. In the multiple mediator analysis, the proportion of mediated change was 48 % in total, with sleep concerns accounting for 23 %, pathological worry at 11 %, perfectionistic concerns at 6 %, and psychological flexibility at 8 %.

The second analysis using random intercept cross-lagged panel models (criterion two) failed to demonstrate that changes in the suggested mediators occurred prior to changes in exhaustion symptoms. As a result, this aspect of mediation between the suggested mediators and exhaustion symptoms could not be established. Instead, changes in symptoms of exhaustion appeared to precede changes in the suggested mediators.

While this study's findings are limited, they do establish a link between exhaustion symptoms and sleep concerns, pathological worry, perfectionistic

concerns, and psychological flexibility. These links highlight the need for a deeper understanding of the underlying psychological processes of the development and maintenance of ED. Such understanding is probably more easily achieved by researching ED treatment based on a theory of specific change processes and employing high-granularity measurements to capture these processes.

# Study IV

## Aim

While several CBT-based treatments and multimodal interventions show promise, there are currently no evidence-based treatments for ED, nor are there any established theoretical models to guide clinical interventions. This uncontrolled pilot study aimed to examine the feasibility, acceptance, and utility of a novel biopsychosocial treatment for ED based on a contextual behavioral approach.

## Method

### Design, Procedure, Participants and Treatment

Study IV was an uncontrolled pilot trial of 12-week biopsychosocial treatment for ED delivered within an MMI administered online. The recruitment procedure was identical to that of Study I-III, except that patients could be referred to either digital or in-person treatment. Patients referred to the digital unit had two assessments done via video call, and a third assessment was performed in person at the clinic. For patients referred to the unit for in-person treatment, all assessments were made in person.

Inclusion criteria were similar to those of Study I-III, except that Study IV required that participants were on sick leave due to ED, and that they had not been on sick leave for more than one year. Of the 66 patients included in the digital MMI from February 2023 to July 2023, 20 did not fulfill the inclusion criteria, and 19 declined to participate in the study (but received the treatment), resulting in 27 patients initially included in the study. At the start of treatment, one participant reported she had independently discontinued her stable antidepressant medication, which she had been on for 20 years. As a result, she was removed from the study, leaving 26 participants in the final sample.

### Treatment

The biopsychosocial treatment utilized is described in detail on page 83
. In addition to this online treatment, the contents of this digital MMI were as follows: seven sessions of a digital physiotherapy group (30 minutes), four digital team meetings (15 minutes), three or four individual digital sessions with the psychologist (30 minutes), one or two digital medical consultations (first 30 minutes, the second 15 minutes), one or two individual digital physiotherapy sessions (30 minutes), one digital rehabilitation meeting with relevant parties (45 minutes). In addition, all participants were free to participate in weekly open digital lectures (45 minutes) on various subjects relating to stress and exhaustion.

**Measurements**

Baseline characteristics and psychological variables were collected during the assessment phase, pre-treatment, weekly during treatment, post-treatment, and three-month follow-up. The clinic at which this study was conducted was closed for three weeks during the summer. As a result, the data collection was paused for three weeks during this period, which affected 14 of the participants. While their treatment was still technically 12 weeks, their entire treatment phase was 15 weeks.

The primary outcome was exhaustion symptoms, measured by KEDS (Besèr et al., 2014). Secondary outcomes were anxiety and depressive symptoms, measured by the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983), disability measured by The World Health Organization Disability Assessment Schedule (2.0) 12-item scale (Andrews et al., 2009), and clinical severity measured by Clinical Global Impressions Scale (Busner & Targum, 2007). World Health Organization Disability Assessment Schedule 12-item scale and Clinical Global Impressions Scale were administered by an independent therapist using a 15-minute telephone interview. Additionally, Psy-Flex (Gloster et al., 2021) was administered on a weekly basis to measure psychological flexibility as a process variable during treatment. To assess acceptability, the Client Satisfaction Questionnaire 8 (Larsen et al., 1979) and the Credibility/Expectancy Questionnaire were used (Devilly & Borkovec, 2000). The Negative Effects Questionnaire (Rozental et al., 2019) was utilized to measure the adverse effects of treatment.

**Measurements**

All analyses were done in R version 4.1.3 (R Core Team, 2022). All self-rated outcome measures at pre-treatment, post-treatment, and three-month follow-up were analyzed using mixed-effects models, using the same procedure outlined in Study I. Mediation of weekly measurements of psychological flexibility and KEDS was evaluated using the same procedure outlined in the criterion one analysis in Study III.

## Results and Discussion

All participants completed their treatment, resulting in a 100% completion rate. In the online platform, 85% of the modules were successfully finished. There was a significant improvement over time in symptoms of exhaustion, $F(2, 49.19) = 32.65$, $p < .001$, $\eta^2 = .57$, with a large within-group effect size at post-treatment ($d = 1.10$), which was maintained at three-month follow-up. There were also significant improvements over time in symptoms of anxiety, $F(2, 49.21) = 22.63$, $p < .001$, $\eta^2 = .49$, and depression $F(2, 49.37) = 10.69$, $p < .001$, $\eta^2 = .30$. The within-group effect sized were also large for anxiety ($d$

= 0.97) and depression ($d$ = 0.75), and these results were also maintained at three-months follow-up. The independent clinician ratings also showed positive results. Functional disability decreased from 22.15 pre-treatment to 12.45 post-treatment. Clinical severity decreased from 4.54 pre-treatment to 3.15 post-treatment. Additionally, the indirect relation between time in treatment on exhaustion symptoms through change in psychological flexibility was significant (ab-path = - 0.13; 95 % CI: -0.28, -0.03), indicating mediation. Weekly average measurements of exhaustion symptoms and psychological flexibility are presented in Figure 3.

The current study provides preliminary support for the feasibility, acceptability, and utility of this novel biopsychosocial treatment for ED, delivered in a 12-week digital MMI. Furthermore, it adds some initial support for the underlying contextual behavioral model based on this practical treatment. These results are promising, as they suggest that ED can be treated more effectively with fewer clinical resources than more extensive MMIs, given that a more focused and theoretically stringent approach is utilized.

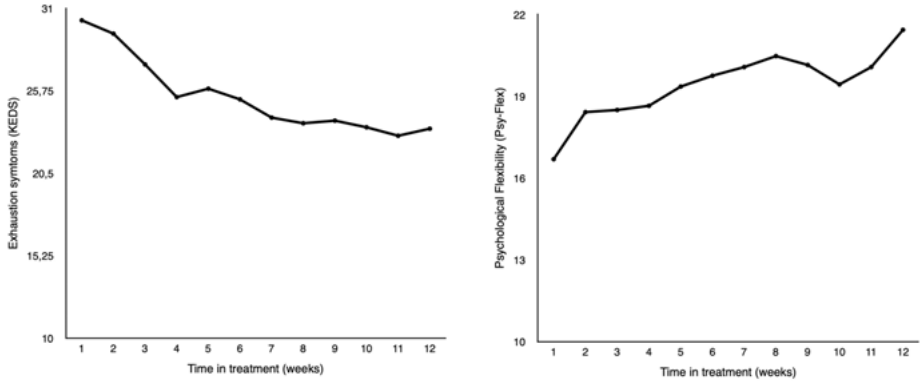


**Figure 3**

*Weekly Observed Means of Symptoms of Exhaustion and Psychological Flexibility Throughout Treatment*

*Note*. KEDS: Karolinska Exhaustion Disorder Scale

# General Discussion

Aside from the theoretical work on a contextual behavioral model of ED, this thesis aimed to gain an increased understanding of the current treatment practices of ED to foster more focused and theoretically coherent treatments that can be made accessible to more patients. Four studies were conducted in a clinical setting using different methodological approaches to approach this aim. Study I was an open clinical trial of a standardized MMI for ED. Study II explored the sub-groups and predictors of improvement during MMI in an extended cohort of Study I, while Study III explored psychological mediators of symptom improvement in the same cohort. Finally, Study IV was a pilot study evaluating the feasibility and acceptability of a newly developed biopsychosocial treatment for ED based on the contextual behavioral model presented within this thesis.

## Treatment for Stress-Induced Exhaustion Disorder

Study I showed that ED patients participating in a standardized CBT-based MMI reported large symptom alleviation, increased work time, and reduced sick leave compensation, suggesting that they did seem to benefit from treatment. Additionally, while there were a few negative effects, they were no more prevalent than in other psychological treatments. While no causal conclusions can be drawn due to the absence of a control group, these findings indicate that some elements within this multi-component MMI help facilitate symptom improvement and return-to-work. Since the MMI included different simultaneously administered components, identifying specific elements responsible for the observed effects would not have been possible even with a more refined scientific method such as an RCT.

Ideally, when studying clinical methods, treatment developers should be clear about what is being created and evaluated (Hayes, Long, et al., 2013): What are the change processes targeted? What methods are utilized? What scientifically established principles are those methods based on? In ED treatment, clinical research practice seems to have been somewhat more practical; multielement packages have been evaluated based on varying established CBT methods that work for other psychiatric disorders without

explicitly suggesting and targeting suggested change processes (Lindegård et al., 2022; Malmberg Gavelin et al., 2018; Stenlund et al., 2012). When few or no differences have been found between packages, and all show positive results, it has been hard to draw conclusions regarding what elements of treatment are important for treatment success (Lindsäter et al., 2022).

Study IV constitutes an incremental step towards approaching ED treatment from a more theoretically coherent contextual behavioral approach presented within this thesis. The results from Study IV indicate that this biopsychosocial treatment of ED, delivered via the Internet, resulted in significant improvements over time, which remained at three months follow-up. These symptom improvements were comparable with the results of Study I, which is encouraging given that the MMI administered in Study I was twice as long (six months compared to three) and consisted of considerably more clinical treatment time (forty-one hours compared to ten). While the treatment in Study IV was also administered within the context of MMI, these results show that going forward with larger, more methodologically comprehensive trials of this biopsychosocial treatment for ED is warranted.

Although concerns regarding a biomechanical focus of recovery in ED treatment have been discussed in this thesis, the contextual behavioral model of ED does not in any way exclude the contribution of biological factors in ED. The pathways of various forms of psychological suffering are complex, encompassing numerous multilevel reciprocal biopsychosocial processes (Hofmann & Curtiss, 2018). While symptoms of stress or exhaustion are ultimately expressed in the body and the brain, this does not necessarily imply that the neurobiological level is the most efficient level to observe and target them in clinical psychological treatment (Kendler, 2005). Multiple mutually informative perspectives are needed to approach psychological suffering, such as ED, depending on the level and purpose of the analyses. Therefore, a biomechanical outlook, conceptualizing ED as a result of persistent stress and lacking recovery, may be a fruitful point of departure for medical research to identify neurophysiological correlates and biomarkers for ED, which could advance pharmaceutical treatments. Similarly, physiotherapeutic interventions such as physical exercise and relaxation techniques can probably contribute to ameliorating stress and exhaustion symptoms. However, that is not to say that a biomechanical outlook is a useful point of departure when designing clinical psychological treatments for ED.

Similarly, while the perspective of recovery may be incompatible with a contextual behavioral approach to ED, it does not mean it is irrelevant within psychology in general. Advocating the importance of recovery can promote general health behaviors such as sleep and training in epidemiological research and primary care contexts. Furthermore, it can serve as a basis for

designing organizational stress prevention programs. Concepts such as stress and recovery may also be useful in the context of work environmental law, where they can underscore the importance of sound working conditions such as regular breaks, limitations to overtime, etc.

The NIH Science of Behavior Change Program asserts that "interventions to change health behaviors ought to be guided by a hypothesis about why the behavior exists and how best to change it" (Nielsen et al., 2018). Consistent with this agenda, the contextual behavioral model of ED and associated biopsychosocial treatment aims to be philosophically transparent, theoretically stringent, and practically useful. Simply put, the model aims to articulate its underlying assumptions and demonstrate how these assumptions inform the subsequent clinical methods.

## Sub-Groups, Predictors, and Mediators in the Treatment of Stress-Induced Exhaustion Disorder

While several predictors of change were identified in Study II, perfectionism and treatment credibility stood out as potentially clinically relevant. On a group level, patients scoring high on perfectionism before treatment reported higher degrees of exhaustion symptoms and improved more during treatment. Two possible interpretations of this trend are that 1) perfectionism may be a risk factor in developing ED, and 2) ED patients with a high degree of perfectionism benefit more from treatment. Previous research has highlighted that ED patients often struggle with high self-imposed demands (Gulin et al., 2021), and perfectionism seems to be associated with the development of burnout (Hill & Curran, 2016b). In relation to the contextual behavioral model presented within this thesis, perfectionism can be seen as an indicator of tendencies of rule-governed avoidance and control in relation to value-incongruent demands.

The finding that higher treatment credibility was associated with larger improvements adds to the evidence that patients who believe in treatment report more considerable treatment gains (Constantino et al., 2019; Salomonsson et al., 2019; Smeets et al., 2008; Wampold, 2015). This result underlines the importance of assessing treatment credibility during ED treatment to identify cases where patients do not believe or understand the treatment rationale. Moreover, it underscores the importance of a clear and focused treatment rationale. A multi-package MMI lacking an underlying theoretical model, as presented in Study I, is, of course, built on the intention of offering a broad pallet of methods addressing the various personally unique challenges of ED. However, such broadness and lack of specificity may

inadvertently risk obfuscating the parts of treatment deemed most important by clinicians. Therefore, treatment based on a clear theoretical model with specific methods is not only desirable from a scientific and theoretical perspective but also from a pedagogical standpoint.

Study III explored potential mediators during MMI for ED, albeit with limited results due to the inability to change mediators prior to the change in symptoms of exhaustion. Possible explanations for the lack of mediated effects are plentiful. The time frames addressed might have been too long, there may have been individual differences in how the potential mediators operated, or the relations between outcomes and potential mediators were more complex, such as bidirectional and nonlinear (Hofmann et al., 2020), which the current design probably failed to capture adequately. Additionally, it could very well be the case that the suggested mediator's studies were not appropriate for ED or that the measures used were not appropriate for capturing said change processes. When planning for the data collection of Study I-III, knowledge about ED change processes was limited and was therefore adapted from existing research, associated areas of CBT, and clinical experience.

Study III used the Swedish Acceptance and Action Questionnaire to measure psychological flexibility, which is based on the Acceptance and Action Questionnaire (version 2). While the Acceptance and Action Questionnaire (version 2) has been widely employed to measure psychological flexibility, it has recently been criticized for low discriminant validity against measures of emotional distress and not adequately capturing the different facets of psychological flexibility (McAndrews et al., 2019; Ong et al., 2020). To better capture psychological flexibility, the newly developed Psy-Flex was instead used in Study IV. The results show that psychological flexibility was associated with improvements in symptoms of exhaustion, warranting further research into the model of psychological flexibility model in relation to ED.

In summary, given the relatively limited knowledge about ED treatment, Studies II and III took on a bottom-up explorative approach in the hopes that these results would provide new insights into positional sub-groups, predictors, and mediators. While the results do point to some potentially relevant predictors and change processes in ED treatment, the relatively limited results within this extensive dataset underscore the necessity for complementary top-down conceptual work in gaining a better understanding of change processes in clinical psychological interventions (Kazdin, 2007).

# The Contextual Behavioral Model of Stress-Induced Exhaustion Disorder in a Wider Societal Context

This thesis has concentrated on discussing how stress-related symptoms of exhaustion may be effectively addressed in a clinical context. However, given that phenomena such as ED may be regarded as an expression of this era, it seems appropriate to briefly widen the discussion to a broader societal context.

We live in a period described by many as highly stressful, marked by the evolution of the Internet, social media, smartphones, AI, high information loads, globalization, and 24/7 society. Many attribute the observed rise in sickness absences due to mental illness in Western society to increasing psychosocial stress (Henderson et al., 2005). Some highlight organizational cutbacks, a harsher labor market, and increased job demands as significant contributors (Cooper, 2010; Stefansson, 2006). Others attribute it to social media consumption and evolving social patterns (Wolgast et al., 2023).

Contemporary German sociologist Hartmut Rosa argues that modern life is characterized by an increased sense of "acceleration," which inhibits individuals from finding a sense of purpose in life (Rosa, 2013). Rosa argues that as technology, communication, and transports move increasingly faster, people will find it harder to experience resonance, meaning a present meaningful connection to our world (Rosa, 2019). According to Rosa (2019), a perpetuated loss of resonance increases the risk of burnout over time.

Other sociologists and philosophers have highlighted individualism as a basis for understanding the rising prevalence of burnout and depression in modern society. For example, Sennet (1998) has argued that with the emergence of flexible capitalism, more traditional homogenous social institutions have been replaced with flexible, heterogenous ones, resulting in social fragmentation and an increased focus on the individual. In a similar vein, Christopher Lasch and Svend Brinkmann believe that modern society is becoming more and more narcissistic, increasingly emphasizing the importance of self-actualization and the maximization of positive feelings (Brinkmann, 2015; Lasch, 1978). Contemporary philosopher Byung-Chul Han has argued that while the 20th-century norms were characterized by prohibitions and laws, contemporary norms concern self-realization and being one own "project," which results in a compulsive need for achievement and optimization and an inability to manage negative experiences (Han, 2017).

Interestingly, research on perfectionism, which can be assumed to be psychologically correlated to increased competitive individualism, indicates that perfectionism is increasing. A large study of 41,641 American, Canadian, and British college students measured over 27 years indicates that recent

generations of young people perceive that others are more demanding of them, are more demanding of others, and are more demanding of themselves (Curran & Hill, 2019). These numbers can be considered worrisome, as perfectionistic concerns - pressure to meet the extreme expectations of demanding people or society as a whole – are associated with a wide range of adverse health outcomes, including increased risk of burnout and general psychopathology (Flett et al., 2022).

While we live in times perceived as stressful, it's easy to disregard that earlier societies probably considered themselves equally stressed (Jackson, 2014). Importantly, previous generations have struggled with more "actual" stressors, as the incidence of poverty, violence, and disease has generally decreased over time (Pinker, 2011). In his thesis, Jones (2021) introduces the theory of the "neurotic treadmill," which suggests a reciprocal relationship between individuals' personal definitions and expectations of trauma. As adverse events become rarer, definitions of stress and trauma widen. Wider personal definitions, in turn, increase the likelihood of acute stress reactions to adverse events. The biomechanical notions of stress reactions as something potentially harmful may perhaps be considered an example of such a contemporary widened definition of stress.

Those skeptical about burnout and diagnoses such as ED would probably argue that these constructs are ill-advised attempts to medically explain diffuse symptoms of exhaustion and weariness of living, always present throughout human existence but labeled as stress-related in an era preoccupied with stress. As time moves on and new explanatory models prevail, these concepts of burnout and ED will be added to our historic psychiatric records of era-specific diffuse functional disorders, together with managerial disease and neurasthenia (Lipsitt, 2019; Wessely, 1994). In line with such reasoning, it is somewhat noteworthy that most conceptualizations of exhaustion of the last three centuries have defined it as a "modern" phenomenon attributed to particularly stressful times, often along with treatment recommendations of lifestyle changes such as resting, dietary restrictions, and exercise (Schaffner, 2016b).

Similarly, when discussing "these stressful" times, it is equally important to remember that the idea that difficulties of engagement can arise in response to the evolving demands of modern society is also not new. At the beginning of the 20th century, seminal scholars of sociology, such as Karl Marx, Emil Durkheim, and Max Weber, wrote about how the modern industrialized society risked alienating individuals from society and work, with adverse effects on morale, motivation, identity, and social commitment (Lazarus, 1999). For example, in the book *Protestant Ethics and the Spirit of Capitalism* from 1905, Weber analyzes the protestant work ethics of the industrialized

West with its emphasis on hard work and economic growth - values deemed irrational and shameful in other cultures and historical periods (Weber, 1930). In his later works, Weber explored how the bureaucratization and rationalization of modern society may lead to a neglect of the existential fundaments of human living, which he calls "the disenchantment of the world" (Gane, 2002). Consequently, it appears that humans have been struggling with modernity for quite some time.

Of course, while technological advances and societal progress can contribute to reducing certain adverse events, new avenues of stress might arise as society evolves. For example, societal developments such as increased individualism, social media use, and rationalization can result in increased uncertainty, unpredictability, and unsafety, along with fewer opportunities to fulfill needs of meaning, autonomy, and relatedness. Such developments could reasonably contribute to an increased prevalence of symptoms such as exhaustion, depression, and anxiety.

Rather than understanding ED as a "disease" grounded in a latent disease model or as a psychophysiological resource imbalance due to the relentless demands of our time, it is perhaps better understood as a transhistorical, ubiquitous human experience of struggling with the demands of life (Schaffner, 2016b) while simultaneously trying to infuse our lives with meaning. Maybe this task is becoming increasingly more difficult in these modern times compared to previous modern times, resulting in an increased incidence of severe symptoms of exhaustion. Nevertheless, as proposed in this thesis, these difficulties may be effectively addressed by the change processes of values and committed actions and other facets of the psychological flexibility model within the clinical context of ED.

# Methodological Considerations

## Samples, Validity, and Generalizability

The study's generalizability and external validity are strengthened by several factors, including a large sample size (915 in the total sample of Study II-III, 390 in the sub-sample of Study I), a rigorous assessment procedure involving three professionals, and inclusive criteria for comorbidity. Furthermore, data collection took place in two natural clinical settings, further enhancing the study's ecological and external validity. Consequently, albeit restricted to one geographical area (Stockholm), given the sample size, the population of Study I-III is estimated to be representative of ED patients in general.

In Study IV, patients from all around Sweden were included. Here, inclusion criteria requiring patients to be on sick leave pre-treatment was added to ensure a clinical severity comparable to that of patients in a typical MMI. Given these inclusion criteria, the geographical heterogeneity, and the demographical mirroring of the samples in Study I-III, we estimate that the population of Study IV is representative enough of ED patients to warrant further clinical trials.

The absence of a control group is a significant limitation in all studies, as it precludes the ability to infer causality between treatment and symptom improvement, predictors, and mediators. The changes across measures described could result from spontaneous recovery or other confounding variables. For example, improvements in exhaustion, anxiety, and depression could be an expression of regression to the mean, meaning extreme values tend to move towards the average when sampled repeatedly over time. Although open clinical trials and cohort studies are not as conclusive as controlled studies, they can still yield valuable insights by allowing for the examination of real-world interventions (Kazdin, 2007; Maric et al., 2012). These types of designs may stimulate new ideas and hypotheses for future, more refined research designs, which has been the case in the current research project.

## Measurements and Statistics

There is currently no international agreement on how symptoms of ED are to be measured (Lindsäter, Svärdman, et al., 2023). Study I-IV utilized KEDS as an outcome measure, explicitly constructed for measuring symptoms of the previous criteria of the ED diagnoses. In a recent study, based in part on the population of Study II and III, we showed that a one-factor confirmatory analytic model exhibited a poor fit with modest reliability (Lindsäter, van de Leur, et al., 2023). While this finding does not disqualify the symptom improvements identified across Study I-IV, it does pose questions about the usefulness of KEDS as symptom measuring for ED going forward. Given these limitations of KEDS, the new criteria for the ED diagnoses (Table 2), and the fact that ED is unique to Sweden, future clinical research efforts would probably benefit from utilizing more general measures of exhaustion and fatigue. That would enable comparisons across different populations and facilitate international comparisons and collaborations. Moreover, diagnostically nonspecific outcome measures would also be more aligned with the aims of process-based therapy.

Study I-III employed mixed effects models, which handled missing data using maximum likelihood estimation, assuming all covariates related to missingness were included in the model. This enables the use of all available

data, as previous measurement points can be used to estimate parameters if participants fail to provide follow-up points, leading to a more robust prediction when utilizing an intention-to-treat procedure (Hesser, 2015). Additionally, Study I-III had high power and low attrition, which, combined with the use of mixed-effects models, decreased the risk of bias due to missing data. Additionally, questionnaires were randomized at each instance of administration to reduce the risk of instrumentation bias. In Study IV, weekly measurements were employed to increase power. Given the low degree of attrition, no dropouts during treatment in combination with mixed effects models, the risk of bias due to missing data was also considered low in Study IV.

In Study II, latent class analysis was employed to explore whether combining the variables predicted symptom improvement. An overall limitation of methods such as latent class analysis is that they are data-driven, and as a result, the models produced depend on particular data sets (Weller et al., 2020). Firstly, this means that the sub-group structure identified in Study II, where the sub-group "single lower income" showed a less beneficial trajectory, needs to be replicated. Secondly, an exploratory approach was utilized based on the limited knowledge about the ED population, and the need for studying potential sub-groups of ED patients participating in the treatment had been frequently highlighted (Glise et al., 2020; Gulin et al., 2021; Norström et al., 2022). Given this large sample's limited findings, future research into sub-groups will probably benefit from being more theory-driven.

Study III employed random intercept cross-lagged panel models in addition to random-mixed effects models to establish the time-precedence of change in mediators before change in symptoms of exhaustion. As sophisticated as random intercept cross-lagged panel models are, they do have limitations. For example, while these models effectively distinguish between-person and within-person variation and attempt to account for time-invariant confounding, they do not address the potential impact of time-varying confounders (Mund et al., 2021). Additionally, recently, concerns have been raised that random intercept cross-lagged panel models, in which between and within-level variances are separated within the models, are based on assumptions of stationary processes that have reached equilibrium (Andersen, 2022). Such assumptions between change processes and symptoms can be hard to make in clinical treatment research. Yet another limitation of cross-lagged panel models, in general, is that they are sensitive to the time interval chosen between observations (Kuiper & Ryan, 2018). In Study III, measurements with three-month intervals (pre-treatment, mid-treatment, and post-treatment) were chosen out of convenience, as is often the case in psychological interventional research. However, as previously noted, the relationship between change processes and exhaustion symptoms is likely

dynamic, reciprocal, and multifaceted, necessitating measurements with higher granularity.

Despite the limitations of random intercept cross-lagged panel models, using it was deemed to increase the methodological quality of Study III, compared to using only mixed effects models. The lack of results in Study III underscores the importance of utilizing more specific measures of change processes and symptom measures for ED on a more regular basis, perhaps on a daily or hourly basis. This would enable a more comprehensive understanding of the temporal dynamics and potential causal pathways between change processes and symptoms of exhaustion over time.

## Future Directions

The overarching aim of this thesis may appear paradoxical. It tries to bring ED treatment closer to process-based therapy by introducing a theoretical model of a specific condition with an accompanying treatment –precisely what process-based therapy is trying to move away from. Therefore, the model and treatment presented in this thesis and evaluated in Study IV should only be considered a first step; many more must follow.

One logical progression would naturally be to evaluate an unimodal version of the biopsychosocial treatment for ED in a larger RCT, comparing both TAU and active control, predominantly emphasizing recovery. Another way to increase knowledge about the specific methods of importance in the treatment of ED would be to contrast methods of valued action, exposure, or relaxation techniques utilized exclusively. To bring the ED treatment closer to process-based therapy, nomothetic approaches should be complemented by more idiographic designs, focusing on how idiosyncratic networks of change processes and exhaustion symptoms transpire for particular people in specific contexts (Hayes et al., 2022). This could be accomplished by studying networks of symptoms and change processes at both a group and individual level. Another idiographic approach is single-case designs, which could be utilized to carefully map how symptoms and change processes unravel in ED on a daily, perhaps hourly, basis.

The primary focus of this thesis revolves around symptoms of exhaustion *due to persistent stress,* but as previously described, symptoms of exhaustion can stem from various assumed etiologies, including cancer, diabetes, post-COVID, multiple sclerosis, and ME/CFS. As previously highlighted, there is limited evidence of direct associations between fatigue complaints and the pathophysiology of these conditions, and psychological variables, such as fear avoidance, have been identified as mediators in CBT in several of these groups

(de Gier et al., 2023; Lenaert, Boddez, et al., 2018). To better understand the psychological change processes at play in different conditions of fatigue, such as ED, ME/CFS, and post-COVID, it would be beneficial to compare these conditions concurrently over time with varying potentially influential psychological change processes. As suggested by the contextual behavioral model of ED, such change processes should include the different facets of psychological flexibility, especially contact with values. Research efforts like that would also benefit from moving away from disorder-specific outcome measures, such as KEDS, to more general symptom measures of fatigue/exhaustion to increase comparability across different research domains.

Finally, the contextual behavioral model of ED does make several predictions that can be tested empirically. If psychological flexibility, specifically the facet of contact with values, is important in the development of ED, then a low degree of psychological flexibility with lacking engagement should be a risk factor for developing ED. Similarly, in the treatment of ED, psychological flexibility should mediate the change of exhaustion symptoms more so than process measures of relaxation and recovery.

## Concluding Remarks

This thesis studies a large cohort of ED patients participating in a standardized 24-week CBT-based MMI. Results show that ED patients participating in MMI report large symptom improvements and return-to-work rates. Moreover, the negative effects reported were negligible and comparable to other forms of psychological treatment. High degrees of perfectionism and treatment credibility were identified as predictors of improvement, indicating the importance of addressing perfectionistic behaviors and treatment credibility during ED treatment. While the mediators concerns about sleep, psychological flexibility, clinical perfectionism, and pathological worry were explored, mediation could not be established. The relatively sparse findings of Study II and III speak to the importance of conceptual work aiding empirical investigations and employing measurements with high granularity to further the understanding of change processes during ED treatment.

This thesis has also conceptually explored the potential limitations of a biomechanical stimulus-response perspective on ED and the potential theoretical and practical benefits of acknowledging a biopsychosocial transactional view. Moreover, I have suggested a contextual behavioral model where ED is understood as a crisis of engagement coupled with avoidance and control rather than the result of depleted psychophysiological resources. A novel biopsychosocial treatment for ED based on this model was tested in a

pilot trial to evaluate its utility, feasibility, and acceptance. While this treatment was delivered within a 12-week digital MMI, with positive results comparable to those of Study I, Study IV constitutes a first step toward a more focused and theoretically coherent treatment approach that can be made accessible to more ED patients.

All theoretical models navigate costs of complexity and domain specificity with benefits of utility and generalizability. As a result, all models need to be evaluated by their stated objectives (Schoemaker, 1982). The model presented within this thesis, along with its accompanying treatment, is designed with the pragmatic objective of clinical utility while simultaneously being theoretically coherent and compatible with the recent developments of process-based therapy. Whether it fulfills this objective remains an empirical question. Hopefully, trying to understand what change processes generate and maintain ED can, over time, yield better and more useful psychological treatments and, consequently, better outcomes for individuals with ED. Such clinical advancements would be highly relevant in an era marked by escalating perceived stress and exhaustion.

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