

Work Design in the Contemporary Era

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Summary

Work design refers to the roles, responsibilities, and work tasks that comprise an individual's job and how they are structured and organized. Good work design is created by jobs high in characteristics such as autonomy, social support, and feedback, and moderate in job demands such as workload, role ambiguity, and role conflict. Established research shows good work design is associated with work outcomes such as job satisfaction, organizational commitment, work safety, and job performance. Poor work design is characterized by roles that are low in job resources and/or overly high in job demands, and has been linked to poor health and well-being, absenteeism, and poor performance. Work design in the 20th century was characterized by traditional theories focusing on work motivation, well-being, and performance. Motivational and stress theories of work design were later integrated, and work characteristics were expanded to include a whole variety of task, knowledge, social, and work-context characteristics as well as demands, better reflecting contemporary jobs. In the early 21st century, relational theories flourished, focusing on the social and prosocial aspects of work. The role of work design on learning and cognition was also recognized, with benefits for creativity and performance.

Work design is affected by many factors, including individual traits, organizational factors, national factors, and global factors. Managers may impact employees' work design "top-down" by changing policies and procedures, while individuals may change their own work design "bottom-up" through "job crafting".

In the contemporary era, technology and societal factors play an important role in how work is changing. Information and communication technology has enabled remote working and

collaboration across time and space, with positive implications for efficiency and flexibility, but potentially also increasing close monitoring and isolation. Automation has led to daily interaction with technologies like robots, algorithms, and artificial intelligence, which can influence autonomy, job complexity, social interaction, and job demands in different ways, ultimately impacting how motivating jobs are.

Given the rapidly changing nature of work, it is critical that managers and organizations adopt a human-centered approach to designing work, with managers sensitive to the positive and negative implications of contemporary work on employees' work design, well-being, and performance. Further research is needed to understand the multitude of multilevel factors influencing work design, how work can be redesigned to optimize technology and worker motivation, and the shorter- and longer-term processes linking work design to under-researched outcomes like identity, cognition, and learning. Overall, the aim is to create high-quality contemporary work in which all individuals can thrive.

Keywords

work design, work characteristics, job resources, job demands, work redesign, automation, technology, algorithms

Introduction

Work design refers to the roles, responsibilities, and work tasks that comprise an individual's job, or the jobs in a team, and how they are structured and organized (Parker, 2014). Good work design yields jobs that are high in positive work characteristics, or job resources, that help workers achieve their goals, such as autonomy, social support, and feedback, and moderate in job demands, such as workload, role ambiguity, and role conflict. An established body of research has linked good work design with a myriad of work outcomes, such as job

satisfaction, organizational commitment, work safety, and job performance (see [Humphrey et al., 2007](#)). Poor work design produces roles that are low in job resources and/or overly high in job demands, and it is linked to poor health and well-being, absenteeism, and poor performance.

Despite extensive research linking good work design to positive individual and organizational outcomes, it is often overlooked by research in related disciplines (e.g., human resources management, leadership), and it is also frequently neglected by managers and practitioners whose actions influence the design of work ([Parker et al., 2019](#)). The aim of this article is to promote a better understanding of the role of work design in shaping work of the future and to integrate the topic into wider perspectives. This aim is increasingly important in a world where workplaces are changing and the nature of work is rapidly shifting in response to technology developments, globalization, and economic and global crises (e.g., the COVID-19 pandemic, increased remote working).

To understand the direction that future work is taking, it is necessary to reflect on the past. Therefore, first, traditional work-design theories are reviewed, before expanded theories and antecedents of work design are discussed. [Table 1](#) provides a summary of the theories and their key propositions, evidence, and criticisms. Second, work-design changes in response to technological developments, such as information-communication technology (ICT), automation, algorithms, and artificial intelligence (AI), are discussed. How technology is changing in response to work design is also considered, as well as how work design can promote adaptation to changing and dynamic work ecosystems. In so doing, future work trends that are likely to emerge over the next few decades are highlighted, such as increased remote working and interaction with novel technologies, and the potential for AI to take over decision-making.

<insert Table 1 here>

Traditional Work Design Theories

The landscape of work-design research has been extensive, with various perspectives that have emerged from different research disciplines over the years (Parker et al., 2017). In this section, the development of early work-design theories is charted, focusing especially on motivational and stress theories of work design at the individual level. Team-level work design, which has emerged alongside individual-level theories, is also discussed.

Motivational Theories of Work Design

Scientific management (Taylor, 1911) was one of the first approaches to designing work, with an emphasis on efficiency, standardization, specialization, and simplification of work. Jobs were broken down into simplified elements to reduce training time and to improve efficiency. Managers were responsible for all the thinking and decision-making (e.g., planning work, providing tools), while ensuring compliance from their workers. This resulted in specialized, yet boring and mundane, work. Negative effects included employee absenteeism, turnover, job dissatisfaction, and decreased productivity (Braverman, 1974; Fraser, 1947). Researchers turned to the design of motivational jobs to counter these negative effects, with Herzberg and colleagues (1959) proposing one of the earliest motivational theories of work design. Their two-factor model proposed that motivator factors (e.g., level of recognition) led to job satisfaction by fostering intrinsic motivation and self-actualization (the realization of one's full potential), while the absence of hygiene factors (e.g., pay and promotion) decreased extrinsic motivation and caused job dissatisfaction. Empirical support for Herzberg's theory has not been forthcoming (Hinton, 1968; Hulin & Smith, 1967) and the model lost popularity due to its oversimplified nature and lack of consideration of individual differences, such as an employee's age (House & Wigdor, 1967).

A drive to make jobs more stimulating and motivational led to work-redesign methods, such as job rotation (the rotation of employees from one job to another job), job enlargement (the expansion of the content of jobs to include more task variety), and job enrichment, that included giving workers more responsibility and opportunities for reward, recognition, learning, and development (Paul & Robertson, 1970). Job enrichment differs from job redesign in its focus on providing more responsibility to the employees and bringing greater task variety. It focuses on job characteristics that meet higher-order needs that are essential for motivating employees in their jobs and lead to higher job satisfaction.

The Job Characteristics Model (JCM; Hackman & Oldham, 1976) consolidated the idea of enriched and motivational jobs. The JCM identifies five job characteristics important for work motivation: task variety, the degree to which a job includes a variety of activities and different skills; job autonomy, the degree to which a job provides discretion over everyday work decisions; job feedback, the degree to which the job itself provides clear information about the job performance; task significance, the degree to which a job has a significant impact on others' lives or work; and task identity, the degree to which a job requires completion of a whole job, from beginning to end. It is proposed that these characteristics promote three critical psychological states: experienced meaningfulness in work, knowledge about the results of one's effort, and a sense of responsibility for outcomes. These states, in turn, are theorized to lead to an increase in intrinsic motivation, job satisfaction, performance, and reduced absenteeism. Positive relationships between the work characteristics and theorized outcomes have been largely supported (Fried & Ferris, 1987; Humphrey et al., 2007). An extension to the JCM that holds that work characteristics are more beneficial for individuals who are high on growth need strength (GNS, meaning a preference for learning and growth at work) has received little or mixed support (see meta-analysis by Roberts & Glick, 1981).

Although the JCM has been widely studied, it has been criticized for its focus on a narrow range of characteristics, mediators, and outcomes (Andrei & Parker, 2018), as well as its sole focus on the individual level, which fails to consider team-level characteristics (e.g., task interdependence; Langfred, 2005) or organizational and structural factors (e.g., centralization, physical environment, use of technology for virtual work; Morgeson et al., 2013). Morgeson and Humphrey (2006) expanded the model to include 21 job characteristics, grouped into four categories: social characteristics (e.g., social support, interdependence), knowledge characteristics (e.g., problem-solving demands, information-processing), and contextual characteristics (e.g., work context, ergonomics), in addition to task characteristics (e.g., task variety, task identity). Humphrey et al. (2007) found meta-analytic support for the positive relationships between these characteristics and a range of outcomes, including work motivation, job satisfaction, and performance, as well as negative relationships with anxiety, stress and burnout. Despite the wide range of characteristics included in Morgeson and Humphrey's (2006) model, its omission of job demands, such as workload and time pressure, is notable.

Stress-Oriented Theories of Work Design

At the same time as the emergence of motivational theories of work design, the Job Demand–Control Model (JDCM; Karasek, 1979) developed out of stress research that began during the 1940s when scholars focused on the impact of work on the physical and mental health of employees. The JDCM proposes that job demands (those aspects of work that require physical, emotional, and psychological effort, such as time pressure and role conflict) cause stress and strain, and high job control (i.e., job autonomy) leads to better well-being. The model also proposes that high job control can help mitigate, or buffer, the negative effects of demands that cause strain, because individuals can use their autonomy to manage the

demands. Thus, “high-strain” jobs involve high demands and low control, whereas “active” jobs have high demands but also high control. Empirical support for the buffering effect has proven inconsistent, however (Wall et al., 1996), and the model has been criticized for its focus on a single work characteristic (autonomy or job decision latitude) and primarily only two job demands (time pressure or role conflict; Parker, 2014).

In later work, Karasek and Theorell (1990) added social support (emotional or instrumental help from a senior or supervisor at work) to the JDCM as they acknowledged the socially embedded nature of work and theorized that social support from colleagues would also buffer the effects of job demands. Empirical research has continued to provide greater evidence for the direct effects of demands, job control, and social support on stress than for the buffering hypothesis (Häusser et al., 2010; Kain & Jex, 2010; Sargent & Terry, 2000; Van der Doef & Maes, 1999). Like the JCM, the JDCM has been criticized for not taking into account individual worker characteristics, such as proactive personality, which may make it easier for individuals with high autonomy to use their autonomy to cope with high demands (Kain & Jex, 2010).

Integrating Motivational and Stress Theories of Work Design

The job demands–resources (JD-R) model (Bakker & Demerouti, 2007, 2008) integrated work motivation and stress research perspectives. In contrast to previous models, the JD-R model proposes that a wide range of demands and resources can affect the well-being of employees. The central tenet is that a range of job resources (i.e., work characteristics), such as job feedback, job autonomy, task variety, and social support, predict work engagement, well-being, and performance by enhancing intrinsic motivation, learning, and growth. Job demands, such as workload, role ambiguity, and interpersonal conflict, predict ill health and strain, because the individual must invest physical and psychological effort to manage them,

which can deplete physical, emotional, and cognitive resources and energy. Unlike previous models, the JD-R model also proposes that personal resources, which are positive self-evaluations that can promote resiliency (Hobfoll, 1989), such as self-efficacy, optimism, and resilience, promote goal-striving and achievement, leading to work motivation, well-being, and performance, among other outcomes (Judge et al., 2004).

Like the JDCM, the JD-R model also proposes that job resources can reduce the negative impact of job demands by allowing employees to cope and to manage the demands. Further, the JD-R model proposes that when job demands are high, job resources are particularly motivating and positively boost well-being (Bakker & Demerouti, 2008; Tadić et al., 2015). The general relationships between resources and demands and well-being have been well supported (Halbesleben, 2010; Nahrgang et al., 2011; Van den Broeck et al., 2013). However, the buffer effect has again proven elusive, with researchers finding greater support for the additive effects of job demands and resources on strain, rather than interactive effects (Gonzalez-Mulé et al., 2020).

Scholars have criticized the JD-R model for its inclusion of many demands, resources, and outcomes of all kinds, and its lack of specificity, as it assumes all resources and all demands have the same respective effects on outcomes, failing to define how different job and personal characteristics lead to particular outcomes (Schaufeli & Taris, 2014). It is also unclear how to define a characteristic as a demand or a resource. Some scholars differentiate between “challenge” and “hindrance” demands (see Cavanaugh et al., 2000; Crawford et al., 2010). Challenge demands are those that create opportunities for performance and a sense of accomplishment (e.g., workload), and hindrance demands are those that are likely to interfere with, or thwart, performance and personal goals (e.g., role conflict). However, scholars have reported mixed evidence supporting the theorized differential effects of challenge and hindrance demands on performance and other outcomes, such as organizational citizenship

behaviors, counterproductive work behaviors, job satisfaction, and retention (Mazzola & Disselhorst, 2019). Similarly, Dawson et al. (2016) only found support for the buffering effect of high control and social support in the relationship between hindrance demands and strain, but not challenge demands and strain. This could be because individuals tend to invest resources to meet challenge demands when control and social support are high, but when control and support are low, individuals tend to preserve resources and thus don't invest them in meeting demands (Dawson et al., 2016).

Motivating Teams: Autonomous Work Groups and Team

Empowerment

All the models discussed so far consider work design at the individual level. A parallel stream of work has also traditionally considered work design at the team or group level. This “sociotechnical” approach focuses on designing work that is intrinsically motivating for teams and groups as well as geared toward fulfilling task and organizational goals. This is achieved through structural empowerment, which is a work-design practice or set of practices that involve the delegation of authority and responsibility to employees (Mathieu et al., 2006). Structural empowerment led to the formation of autonomous work groups (AWGs; Cummings, 1978), also known as autonomous work teams, which are groups of interdependent employees that share collective autonomy over daily aspects of work (Kiggundu, 1983). Research shows that the positive effects of AWGs on job attitudes like job satisfaction and organizational commitment are stronger than the effects on performance (Cordery et al., 1991; Wall et al., 1986). Indeed, the overall evidence for the effects of AWGs on performance is inconclusive, with some research demonstrating positive effects (see Pasmore & King, 1978), and other research demonstrating mixed effects (for a review, see Knight & Parker, 2019). Negative outcomes of AWGs include absenteeism and turnover

(Cordery et al., 1991; Wall et al., 1986), groupthink and conformity (Manz & Sims, 1982), coercive interpersonal control (Barker, 1993), and difficulties in intergroup coordination (Ingvaldsen & Rolfsen, 2012). For example, high levels of group autonomy can be used to coerce individuals into following group norms, influencing group decision-making and overall effectiveness (Manz & Sims, 1982), and causing stress (Barker, 1993). Scholars have also argued that workers in self-managed teams are more susceptible to burnout due to managing multiple relationships, whereas in traditional teams, supervisor relationships are emphasized (Novelli et al., 1989). The majority of these studies have been conducted using case-study methods, making comparisons with more traditional, hierarchically organized work difficult.

Around the 1990s, AWG research began to focus on psychological empowerment. In contrast to structural empowerment, which focuses on objective work characteristics, psychological empowerment is a positive motivational state that focuses on individuals' subjective perceptions of the control and responsibility they have over how their work is conducted and their work outcomes (Mathieu et al., 2006). Psychologically empowered AWGs collectively and positively evaluate their work tasks within the organizational context. According to Kirkman and Rosen (1999), empowerment is experienced by team members on four dimensions: potency, the collective team belief that it can be effective; meaningfulness, the extent to which members of the team are intrinsically motivated by their tasks; autonomy, the degree to which members feel that they have the freedom to make their own team decisions; and impact, the extent to which members believe that their tasks make significant contributions to the organization. Empowered teams have been found to be more productive, leading to positive work outcomes, such as job satisfaction, organizational and team commitment (Kirkman & Rosen, 1999; Maynard et al., 2012), and proactivity (Erkutlu & Chafra, 2012).

Summary

The traditional work-design theories discussed in this section focus on intrinsic motivation and strain as the two key pathways driving relationships between work characteristics and demands on the one hand, and job attitudes, well-being, and performance on the other. All the models have been criticized, for being too limited in scope (e.g., JCM, JDCM), for being too broad, with limited development of differential relationships between different resources and demands, and for their outcomes (e.g., JD-R). Furthermore, work design for teams has largely remained a separate stream, with little attempt made to integrate it into individual-level models. The next section covers expanded work-design models.

Expanded Work-Design Theories

Nontraditional work-design theories have emerged that build on previous work-design models and research. These include relational work design, the theory of purposeful behavior, and learning and development perspectives. These theories highlight the need to move beyond task-based work characteristics and to include other aspects of jobs and work design. Each of these perspectives is considered in turn.

Relational Theories of Work Design

Relational work design refers to aspects of work that offer an opportunity for employees to interact with others, including colleagues, and the customers, clients, or patients who benefit from one's work (Grant & Parker, 2009).

The idea that individuals are socially embedded at work is not new. For example, work-design models such as the Job-Demand-Control-Support (JD-CS; Karasek & Theorell, 1990) and JD-R (Bakker & Demerouti, 2007) consider social support from colleagues and

supervisors as important for improving well-being and work outcomes. AWG research (see [Trist & Bamforth, 1951](#)) also highlighted the importance of social interaction among team members. Even role theory ([Kahn et al., 1964](#)) considered the social aspects of work in terms of two particular role demands that emerge through worker–manager interactions—role conflict, when behaviors expected of a given role are inconsistent with one another, and role ambiguity, the lack of necessary information about one’s work role. Research suggests that these role characteristics are important for shaping work characteristics like autonomy, feedback from others, and task and skill variety ([Jackson & Schuler, 1985](#)), as well as well-being, job satisfaction, and organizational commitment ([Fisher & Gitelson, 1983](#)). These examples show that social characteristics have a long history, yet they are fairly limited in the types of characteristics discussed.

An expansion to work-design theory in the form of “relational work design” was introduced by [Grant \(2007\)](#). Relational theories focus on the full range of interpersonal interactions and relationships embedded in, and influenced by, the jobs, roles, and tasks that employees perform ([Freeney & Fellenz, 2013](#); [Grant & Parker, 2009](#)). This broader approach considers both positive and negative, as well as expanded, social characteristics, and thus it builds on and integrates knowledge from previous work-design models and theories.

There are two main types of relational characteristics ([Grant, 2007](#)). First, social characteristics broadly refer to characteristics that have typically been studied in previous work-design models, such as social support. In keeping with these models, social characteristics are predicted to increase intrinsic motivation by generating a sense of belonging to a work group, team, or department ([van den Broeck et al., 2013](#)) and by buffering against the impact of job demands ([Bakker & Demerouti, 2007](#)).

Second, prosocial characteristics are attributes that generate prosocial motivation, or the desire to make a positive difference to the lives of others, that is, the beneficiaries’ of one’s

work (Grant, 2007). These include job impact, or the opportunities workers have to make a positive difference to beneficiaries (akin to the task significance espoused by the JCM; Hackman & Oldham, 1976), and beneficiary contact, the degree to which the job provides opportunities to meet, communicate with, and interact with beneficiaries (Grant, 2008). Grant (2007) proposed that jobs that include these two prosocial characteristics tend to produce two psychological states: perceived impact on beneficiaries (the degree to which employees experience their actions as positively affecting other people) and affective commitment to beneficiaries (the degree of employees' emotional attachments to these people). These two psychological states have together been associated with a higher level of prosocial motivation (Castanheira et al., 2016; Grant, 2008; Van der Voet & Steijn, 2019), which in turn has been linked to an increase in helping behaviors, task commitment, effort, and persistence (Grant, 2008), organizational commitment (Shao et al., 2017), organizational citizenship behaviors (Grant & Mayer, 2009; Rioux & Penner, 2001), and feelings of value, competence, longevity, and improved health (Grant, 2008). In a series of studies on firefighters and fundraising callers, Grant (2008) found that the opportunity for impact and contact with beneficiaries provided participants with greater awareness of the impact of their actions and work on others, leading to positive outcomes.

To date, little is known about the antecedents of, and influences on, the social context of work design (Grant & Parker, 2009). In addition, researchers have somewhat overlooked the role of individual and situational differences in workplace relationships. For example, employees may appreciate receiving social support in some situations while in others it may harm their self-esteem and threaten their competence (Grant & Parker, 2009). Research has also demonstrated that merely having contact with beneficiaries may not always be associated with positive effects. For example, it could also make employees aware of their negative impact on beneficiaries (e.g., physicians meeting patients they might have caused harm to;

Grant, 2008). Based on the social undermining literature, scholars have also found that it is possible to receive support while being undermined (having one's work, relationships, or reputation hindered by others) at work. Duffy et al. (2002) found that if employees are undermined by one source (e.g., a coworker or a supervisor), finding support from another source could act as a buffer against negative outcomes. However, undermining and support from the same person could exacerbate negative outcomes, because emotional energy would be required to manage such inconsistent and unpredictable behavior. A higher level of burnout may also be a consequence of extensive interaction with clients outside the organization due to the investment in energy required to self-regulate one's emotions and maintain appropriate behavior. This is especially true in the context of service jobs, where employees might have to display more acceptable emotions during interactions (Grant & Parker, 2009).

The Theory of Purposeful Work Behavior

Another theory that has incorporated relational work-design aspects with traditional work characteristics is the theory of purposeful work behavior (Barrick et al., 2013). This theory explores the effects of personality, task, and social characteristics on employee motivation and behavioral work outcomes, such as job satisfaction, citizenship behaviors (e.g., going out of one's way to help others), and counterproductive work behaviors. In contrast to other work-design theories, the underlying assumption of this theory is that the Big Five personality traits (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience), are equally as important as work characteristics for understanding what motivates an individual at work. The theory postulates that personality traits are differentially associated with the attainment of four fundamental higher-order goals at work: communion, meaningful relationships with others; status, the ability to exert authority and

influence over others; achievement, a sense of competence and mastery of one's work; and autonomy, control over one's life and personal growth (Barrick et al., 2013). Task and social work characteristics interact with these personal goals, leading to experienced meaningfulness in work, that is, the sense that one's work is significant. This is particularly likely to occur when the motivational forces emerging from task and social characteristics match those from purposeful goal strivings. Experienced meaningfulness is motivational and positively influences work outcomes. By illuminating how employee personality traits interrelate with work characteristics, the theory posits that relevant work characteristics can be redesigned to enhance their motivational impact (Li et al., 2014b). While the theory is often overlooked by researchers and empirical evidence is lacking, it is one of the few attempts to formally integrate individual differences into theories of work design and motivation.

Learning and Development-Oriented Theories of Work Design

The learning and development perspective postulates that jobs with certain characteristics, such as job complexity, autonomy, relational work design, job feedback, and high job demands, can promote cognition and learning, as well as other forms of development, among employees (Parker, 2014; Parker et al., 2021).

Cognition refers to a range of mental processes, or cognitive functions, associated with knowledge acquisition, memory, and manipulating and retrieving information. Cognitive functioning is important for employees to perform well and to engage with new and digital technologies throughout life (Parker et al., 2021). In their review, Parker et al. (2021) found that job characteristics can affect the cognitive functioning of workers in the short to medium term in multiple ways, such as by influencing their knowledge acquisition, and in the long

term through multiple pathways, such as by affecting the extent to which individuals use their cognitive abilities (a “use it or lose it” process).

More specifically, in the short term, jobs provide individuals with opportunities to use their cognitive abilities, such as when a product developer must problem-solve to overcome design issues, or a doctor must use his or her knowledge to diagnose a patient. Such job complexity (Kohn & Schooler, 1982) can be important for learning because, although initially complex tasks might require more effort, with practice the actions can become more automatic and thus can be regulated more automatically, which frees cognitive resources and allows individuals to learn additional new skills (Parker, 2014). Job designs also influence the opportunity to acquire knowledge and can motivate deeper learning, such as when individuals work in complex, challenging roles that require them to learn to solve problems. On the other hand, excessively demanding jobs that cause strain can inhibit learning and cognition. Taris and Feij (2004), for example, found that jobs high in autonomy and low in demands are optimal for learning, while excess strain arising from demands reduced learning.

In the long term, work that is high in job autonomy, complexity, and skill variety can result in higher levels of accumulated knowledge, allowing individuals to perform better. Moreover, there is reasonably strong evidence that the continued use of mental abilities at work as a result of work design (e.g., job autonomy and having complex jobs) helps preserve cognitive functioning over time, enabling workers can continue to perform effectively as they age (Parker et al., 2021). Some evidence also suggests that, over the long term, personality development can occur as a result of work design. For example, Li et al. (2014a) found that jobs with greater demands and higher levels of control predicted the development of a proactive personality (the propensity to produce meaningful and positive work changes) in employees. In other words, repeated exposure to control increased workers’ propensity to actively shape and manipulate their environment, such as by scanning for opportunities,

showing initiative, and taking action. This sort of research builds on studies that link, in the shorter term, job autonomy with outcomes like creativity (see [Coelho & Augusto, 2010](#)) and proactivity (see [Parker et al., 2006](#)), and suggest the long-term effects of such processes.

One further way in which work design can affect people's development is by influencing identity and moral processes ([Parker, 2014](#)). For example, there is some evidence that jobs designed with greater autonomy promote more perspective-taking (that is, the ability to understand things from others' points of view), whereas some job designs can make employees think more narrowly, inhibiting their ability to understand the "bigger picture" or how their actions affect others ([Parker & Axtell, 2001](#)). As a consequence of such processes, autonomy and group interaction are potentially important for moral development. For example, [Verdorfer and Weber \(2016\)](#) found that employees from democratic firms (characterized by collective decision-making and greater interaction between members) scored higher on moral development than employees from conventional firms. This was because they developed a greater understanding of social problems, which in turn facilitated moral development. According to [Parker \(2014\)](#), teams that are cross-functional provide employees with access to information from various sources, enhancing their perspective-taking and motivating them to become involved in moral issues, while reducing feelings of isolation. Challenging and enriched jobs that provide opportunities for growth, development, and different experiences are also argued to influence identity development, because they provide employees with greater flexibility to adopt multiple identities ([Parker, 2014](#)). For example, in self-managed teams, members have the freedom to rotate supervisory roles, thus giving the opportunity for all members to experience the identity of leader at some point in time. More research is needed on such processes.

Summary

The expanded work-design perspectives discussed in this section emerged in response to the need to move beyond task characteristics and to understand work design from wider contexts. These particularly include efforts to understand the relational architectures of jobs, and how work design can foster employee learning and development, morality, and identity formation. Although much is yet to be explored, these perspectives have directed attention beyond the initial focus of work-design theories on promoting intrinsic motivation, toward other mechanisms, such as prosocial motivation and cognitive development.

So far, work design has been considered in the form of work characteristics and demands as causal factors in relationships with mechanisms and outcomes. But what causes work design? Why do some people in similar jobs experience different levels of work characteristics and demands? In the next section, some of the broad multilevel factors that influence employees' work design are highlighted.

Antecedents of Work Design and Work Redesign

In the early 21st century, scholars focused greater attention on the factors that cause, or influence, the work design of employees (Parker et al., 2017). This is important because it helps researchers, practitioners, managers, and organizations understand how to create better work. The process of work redesign also helps with understanding the antecedents of work design, because it aims to change work design to stimulate employee motivation and engagement, with optimal effects on well-being and performance. Key multilevel influences on work design are first discussed, followed by a brief discussion of key types of work redesign.

Multilevel Influences on Work Design

Work design is influenced by both individual and contextual factors, with the latter involving local department and team factors, as well as organizational, national, and global factors (Parker et al., 2017). These are briefly discussed in turn.

Individual Factors

Individual characteristics, such as personality and previous work experiences, will affect job perceptions. In line with appraisal theory (Lazarus & Folkman, 1984), individuals' perceptions of work characteristics will affect the positive outcomes individuals expect (e.g., job satisfaction, meaningful work), and thus directly affect which roles and types of work design they seek and remain in. For example, if an individual appraises their job as overwhelming due to too many demands and constant time pressure to meet deadlines, that person might try to avoid the demands and to reduce the number of tasks they have to accomplish ("avoidance job crafting," see Zhang & Parker, 2019). A different person in the same job may view the same demands as challenging and exciting and find the time pressure to be motivational. This person would actively engage with the demands and would seek to increase them ("approach crafting"). Second, individual characteristics like personality also directly influence the type of work design people choose, but also indirectly affect whether and how individuals craft their own jobs. For example, someone high on introversion might choose a job that requires interaction with a limited number of others (e.g., an administrator), whereas someone who is highly proactive may craft their job to create opportunities for entrepreneurial or creative behaviors.

Contextual Factors

Within organizations, teams and departments influence the work design of employees. These small units of work organization are shaped by group leadership styles, task interdependencies between group members, group autonomy, and group composition. For

example, in a traditional, manager-led team, the manager might allocate work tasks to team members, whereas in an autonomous, self-managing team, allocation of tasks is decided by team members, increasing individual job autonomy. Team crafting may also occur in autonomous teams, such as collectively deciding on new projects to progress and collaborations to pursue. Scant research has linked team autonomy to individual work characteristics, although it is possible that team autonomy can constrain individual autonomy and crafting, as team members are required to operate within boundaries collectively imposed by the team. This may mean a specific opportunity must be forgone by the individual (e.g., training) unless the team decides it is relevant for that individual to pursue it.

More broadly within organizations, organizational design aspects, such as strategy, types of human resources (HR) practices and policies, and technology choices, directly influence individuals' work design, such as when cost-minimizing strategies reduce job autonomy and skill variety (e.g., on a production line where an individual repeats the same task for an entire shift), or flexible working policies increase autonomy. Research shows that work design is often not aligned with organizational strategy and HR practices, often due to managers who lack the autonomy, skills, or knowledge to design work that aligns with strategy. For example, [Parker et al. \(2019\)](#) showed that managers tend to design roles according to what tasks need doing, rather than what might be motivating for the individual, resulting in simplified jobs with little task variety (e.g., an administrator whose sole task is to scan patient notes onto a computer). Other organizational-level factors include the type and extent of technology adoption, which sometimes promotes the recruitment of highly skilled workers and motivates managers to retain these workers by offering attractive benefits like training and development, and good working conditions (e.g., spacious offices, flexible work policies, meaning individuals can choose to at least some extent when and where they work; see [Goos et al., 2009](#)). At other times, technology adoption (e.g., automation) can cause impaired job

quality, such as via the creation of highly passive vigilance jobs in which the main task of the worker is to observe and monitor machines (Grote & Parker, 2020).

At an occupational level, different occupations (e.g., medical professionals, accountants, air pilots) have varying rules and regulations, which influence the formal distribution of tasks as well as the surrounding aspects of work design, such as training. For example, medical professionals have strong demarcations among specialties, as well as between the roles of nurses and doctors, which significantly influence the tasks that members of these groups engage in. Members of different occupational groups also hold diverse values, with some occupations promoting competition and achievement (e.g., sales), and others promoting altruism (e.g., healthcare; Morgeson et al., 2010), which likely shape both formal and informal work-design processes. In regard to occupational influences, Dierdorff and Morgeson (2013) found that occupation explained 16% of the variance in work characteristics.

At a global level, international trade laws, supply chains, and health and safety standards influence the formal decisions of organizations about, for example, the degree of investment in training and new technology and the extent to which there is a focus on improving work conditions (e.g., reducing noise, hours of work), which in turn can shape the level of job demands for workers (see Idris et al., 2011). Nationally, research has found that countries with strong economies and low unemployment tend to be characterized by higher job autonomy and cognitive demands and lower workload (Eurofound, 2015). National culture may also influence the work designs people design and/or choose, with those in cultures that tolerate high power differentials between individuals preferring centralized power, in which individuals have lower job autonomy and skill variety. In contrast, cultures that prefer structure and formal rules may prefer, and may be more likely to create, clearly defined and formalized roles with high role clarity.

Formal and Informal Decision-Making Processes

In addition to individual and contextual factors, [Parker et al. \(2017\)](#) proposed that within organizations, an individual's work design is created by both formal decision-making processes and informal processes. Formal processes, also known as "top-down" processes, involve senior management decisions that affect whole teams or organizations, such as the implementation of flexible working policies. Formal processes also involve decisions that local managers apply to their teams and employees, such as work allocations and the assignment of responsibilities. Informal processes, also known as "bottom-up" processes, refer to the more emergent and idiosyncratic ways in which a person's job is changed, such as the work-design changes arising when employees negotiate with their manager involvement in a project that particularly interests them, or they negotiate working hours to accommodate home duties (also known as idiosyncratic deals, or i-deals; [Hornung, 2010](#)). Individuals may also informally shape their own work designs by seeking specific training and development opportunities, asking colleagues for support, requesting feedback from a manager, or taking on different duties within the team in accordance with their skills and interests. These informal work-design changes are termed "job crafting," which refers to self-initiated, proactive behaviors individuals engage in to adapt work to meet their own needs, desires, and goals ([Tims et al., 2013](#), [Wrzesniewski & Dutton, 2001](#)).

Work-Redesign Interventions

When formal or informal processes are systematically and intentionally changed to alter the work design of employees, and these changes are tracked, they are referred to as "work-redesign interventions." Research suggests work-redesign interventions are effective for increasing work motivation, well-being, and performance (for reviews, see [Daniels et al.,](#)

2017; Goodman et al., 1988, Knight & Parker, 2019; Semmer, 2003). Researchers and practitioners are therefore keen to understand how work design can be effectively changed to improve the quality of work, well-being, and performance. In the following paragraphs, formal, top-down, and informal, bottom up, work redesigns are briefly discussed, and key are reviews highlighted.

First, formal, top-down, manager-led work-redesign strategies include implementing flexible working policies, which increase employees' autonomy over where and when they work (see Narayanan & Nath, 1982), devolving decision-making autonomy to workers by creating autonomous teams (see Cordery et al., 1991), or enriching and enlarging jobs to increase variety and complexity (see Campion & McClelland, 1993). In their systematic review, Knight and Parker (2019) found that 39 out of 55 top-down work-redesign interventions reported a positive effect on performance, with relational, participative, and job enrichment and enlargement interventions offering the most promise. Key mechanisms, such as changes in work motivation, having the autonomy to respond quickly to arising work problems, and learning "on the job" were identified, alongside boundary conditions, such as aligning interventions with organizational systems, how well interventions were implemented, and person factors like conscientiousness and prosocial values. For a full discussion of the impact of such interventions on performance, see Knight and Parker (2019). For a discussion of the impact of top-down interventions on well-being, see Daniels et al. (2017).

Second, informal, bottom-up, individual-led work-redesign strategies include job crafting. Job-crafting interventions aim to train employees to increase their job and social resources and to reduce hindering demands. Oprea et al. (2019) found in their meta-analysis of 14 studies that job-crafting interventions are successful for increasing job-crafting behaviors, and especially for increasing challenging job resources and reducing demands.

Positive effects were observed on work engagement and performance, demonstrating the utility of such bottom-up interventions for increasing work motivation, well-being, and performance. For further discussion of job crafting and interventions, see [Oprea et al. \(2019\)](#), [Rudolph et al. \(2017\)](#), and Tims and [Knight \(2019\)](#).

Summary

In sum, there are many factors at the contextual and individual levels that influence work design, either through manager-led, top-down, formal decision-making processes, or through bottom-up, informal processes such as i-deals and job crafting. Work-redesign strategies also take the form of formal, top-down processes, or informal, bottom-up processes. Little research exists that links the processes affecting work design between the different levels, with the majority of research conducted at the individual or team levels. This reflects the difficulty in conducting research across organizations and internationally, which requires large numbers of participating organizations and/or countries in order to achieve adequate statistical power for cross-comparisons.

The Changing Nature of Work Design

Work design is influenced by global and national forces, including societal norms and technology. Technology and society are changing, however, so it is important to consider how these dynamic changes affect work design. Indeed, the world of work is constantly and often radically changing, especially due to innovation in technology, dubbed the “fourth industrial revolution” ([Schwab, 2017](#)). Technology includes developments in virtual communication platforms, such as Microsoft Teams and Zoom, the ability of machines and algorithms to capture and use big data (vast amounts of data collected digitally) in order to

learn and to make decisions, such as in the diagnosis of rare diseases, and the automation of transport, such as cars and trains and other such processes. Advantages of “digitalization” include businesses’ being able to offer cheaper goods and services (DeLong & Froomkin, 2000), increasing the amount that can be produced and distributed, and workers no longer having to be geolocated together (Boudreau et al., 2015), potentially increasing efficiency. Disadvantages include the risk that technology will replace both unskilled, repetitive work and higher skilled, complex work, including decision-making, and thus replace human workers altogether. For example, Frey and Osborne (2017) predicted that automation would replace 47% of jobs in the United States. Others have disputed this claim (see Arntz et al., 2016) and yet others suggest that it is more realistic that parts of jobs, such as specific tasks, will become automated, rather than whole jobs being eradicated (Brynjolfsson et al., 2018). This latter view is becoming more dominant (Parker & Grote, 2020), leading work-design researchers to query how technological innovation is changing the nature of work design and the impact that this has on workers’ well-being and performance. The vast array of technological advances has been referred to as STARA (smart technology, AI, robotics, and algorithms; Brougham & Haar, 2018), and it is clear that STARA technologies are shaping work.

In addition to technology, societal and global factors also have a major influence on how work design is changing. For example, during the global COVID-19 pandemic, government health and safety mandates forced many people to work remotely in order to reduce the spread of coronavirus (World Health Organization, 2020). The sudden transition to large-scale remote working rapidly accelerated the evolution of ICT to support this way of working. This is likely to promote the continued practice and acceptance of remote working by employees and organizations around the world and suggests that remote working is likely

to persist to a greater or lesser extent permanently. Therefore, not only is technology shaping work, but also work is shaping technology.

In this section, two key themes are predicted to be of growing importance over the decade to come, and they capture the essence of the dance between technological and societal change and work design: the first is ICT and remote work, which includes smart technology and global mobility, and the second is automation, a broad term to capture all forms of technological development besides ICT, including AI, robotics, and algorithms. The literature uses a multitude of different terms to describe different types of technological developments, but with no consensus. The themes used here are intended to be general and inclusive, and while they are not entirely mutually exclusive, they are used as a guide to organize the discussion. Examples are provided to illustrate key positive and negative effects of technological developments on work design, focusing especially on job autonomy, job demands, and relational aspects of work.

ICT and Remote Working

ICT is technology that can “gather, store, or send information” (Day et al., 2012, p. 473), such as mobile phones, email, and virtual communication platforms (e.g., Skype, Zoom, Microsoft Teams), and it includes smart technology. ICT is designed to enable workers to be productive, but it has three key implications for work design (for a review, see Wang et al., 2020) in terms of job autonomy, job demands, and relational characteristics.

ICT and Job Autonomy

First, ICT can positively affect job autonomy by enabling individuals to carry out work almost anywhere at any time, increasing control over the work schedule as well as who workers connect with, when they choose to connect, and where connections are based in time

and space (e.g., a different country and/or time zone). However, ICT also enables managers to monitor their employees, which can decrease autonomy by forcing individuals to work between certain times and thus can lead to stress (Carayon, 1993). During the height of the COVID-19 pandemic, Parker et al. (2020) found that those who felt closely monitored by their manager felt less trusted and were more likely to suffer anxiety and poorer performance than their counterparts who did not report such intense monitoring. Close monitoring was also associated with higher work–home conflict, likely because these people did not feel they had the autonomy to organize their work and day to meet both home and work needs. Individuals who prefer to integrate work and home roles perceived they had higher job autonomy than those who preferred to keep the two roles separate (see Piszczek, 2017).

ICT and Job Demands

Second, ICT can positively affect job demands by making some tasks easier and decreasing the repetitiveness of tasks, for example, by allowing individuals to connect quickly with a large number of people through a single email. However, ICT can also increase job demands, because it can increase how responsive individuals feel they need to be to emails and messages related to work, which can lead to working longer hours, decreased work–home life balance, and difficulty detaching from work (Van Zoonen & Rice, 2017). This is a particular concern in a global context where people collaborate across continents and time zones. In a study of 413 global workers, Nurma and Hinds (2020) found that “global connectivity demands” pressured some workers to organize virtual meetings at odd hours and to generally remain constantly available to work with colleagues located elsewhere in the world, a situation that interfered with home–work boundaries (Nurmi & Hinds, 2020). ICT can also increase the amount of information that individuals need to process, increasing the learning

requirements of jobs and depleting cognitive resources. ICT can also create new hassles in the form of technology malfunctions, creating stress (Wang et al., 2020).

ICT and Relational Characteristics

Third, ICT can positively affect relational work characteristics. For example, it can improve instrumental relationships because it allows individuals who are not necessarily located geographically close to each other to connect to achieve specific work goals at any time and anywhere (see Monzani et al., 2014). This reduces the cost of acquiring information because individuals no longer need to physically travel to meet each other. It also increases individuals' social support networks, as advice can be sought from far and wide (Robertson et al., 2020). ICT can also negatively affect relational work characteristics, for example, by making it difficult to develop quality supportive relationships because social cues can be hard to read when individuals are not face-to-face in a room in real time, and there is decreased opportunity for informal chats (Walther, 2011). This means individuals tend to prioritize work tasks when communicating using ICT, rather than developing social relationships (see Zornoza et al., 2002). In addition, Nurmi and Hinds (2020) found that among remote global workers, the frequency of communication via ICT, as well as on-site visits to colleagues, was associated with improved interpersonal relationships, increased job satisfaction, decreased home–work conflict, and decreased turnover. However, connecting with colleagues after hours was not related to higher quality colleague relationships and was generally viewed as an intrusion into personal life, making it difficult to attend to both home and work demands. Taken together, these findings suggest that when working remotely either by choice or by necessity, such as when colleagues are geographically dispersed or during the COVID-19 pandemic, individuals may be at increased risk of failing to develop or maintain close social relationships. If remote working is to become more persistent and long-term, managers and

individuals would be wise to consider how workers can retain high-quality relational aspects of work.

Automation

Automation refers to the array of new and developing technologies that have enabled work processes to become, at least to some extent, “automatic” or carried out by machines and robots. The economic benefits of automation are uncontested, with technology used to complete tasks more efficiently than humans can (e.g., on a production line), to provide services ubiquitously and cheaply (e.g., digital goods), to gather big data to inform decision-making (e.g., customer preferences for particular products), and to support the diagnosis and treatment of human ill health and disease (Kellogg et al., 2020; Parker & Grote, 2020).

Algorithms are at the core of many of these technological advances and refer to computer programs derived from statistical models that enable decisions to be made according to a set of predetermined rules (Duggan et al., 2019). AI, also termed “machine learning” and “algorithmic technology” (Kellogg et al., 2020), takes this idea further and refers to the ability of computer-programmed algorithms to “learn” how to respond in different situations (Wang & Siau, 2019). These algorithms use big data based on millions of employees and learn by trial and error, for example, in the prediction of employee performance.

Algorithms, AI, Job Autonomy, and Job Demands

When algorithms and AI are programmed into machines and robots, the boundary between different types of technology becomes blurred, and humans must learn to interact with all of the different forms simultaneously and efficiently. A meta-analysis found that successful human–robot interaction occurred when the robot had higher autonomy in its actions, enabling it to adapt in response to information, reducing cognitive effort on the part of the

human employed to operate the robot (Otting et al., 2020). However, increasing the autonomy of robots has both positive and negative effects on work design. Positive effects include the reduced need for workers to process complex data, decreasing cognitive demands and enabling machines to carry out complex work (Parker & Grote, 2020). As an example, medical diagnoses are increasingly being made using machines, such as when radiological imaging technology is used to capture digital images of specific areas of the human body, facilitating diagnoses. Machines can even help carry out surgery (see Agbalé et al., 2016). When the speed and accuracy of diagnoses are increased, it can free practitioners' time and cognitive resources so that they can focus on other aspects of patient care and treatment. Negative effects of automation on work design include making jobs duller and more mundane if automated tasks are not replaced by other complex, stimulating, and varied tasks. For example, strain, boredom, and fatigue may occur when trains are automated and train drivers are no longer required to use their skills to drive trains but must monitor them for long periods to ensure they are working correctly and safely (Cham et al., 2021). Further, when individuals lose the skills, abilities, and knowledge to understand how automatic processes and systems work, they are unable to override or fix them if needed. This further decreases autonomy and task significance if individuals sense that they are no longer able to make a difference to others (Parker & Grote, 2020). Furthermore, learning and development are impeded, which can impair the ability of workers to do their job well in the immediate term, and over time can impair the preservation of cognitive abilities, and thus performance, in the long run (Parker et al., 2021).

Algorithmic Management

New and developing technology can also be used to manage or control workers, with potentially negative effects (for a review, see Parent-Rochelleau & Parker, 2021). For

example, algorithmic management includes the practice of using algorithms to make decisions about labor, without input from workers (Duggan et al., 2019). A classic example of this is in the “gig” economy, where jobs may be allocated to workers (e.g., rideshare drivers, delivery workers) according to algorithms that use data from individual customer service ratings, response speeds, and geographical location (see Lee et al., 2015). This increases efficiency and reduces managers’ workloads, freeing managers’ time and cognitive energy for other tasks (Kellog et al., 2019). Employees may experience reduced job autonomy, however, because they are not able to choose which jobs are allocated to them, or in which order to complete them (see Leclercq-Vandelannoitte, 2017).

More widely, AI algorithms can be used to monitor individuals in a variety of industries by collecting all sorts of information, such as worker movements, physical health, social media use, and browser histories (see Angrave et al., 2016). Tomczak et al. (2018) report that nearly 80% of organizations use such technology to monitor employee performance; however, this can encourage individuals to focus attention on particular tasks that are monitored, rather than those that are not, reducing autonomy and task variety, and potentially making jobs less meaningful (Tomczak et al., 2018). Algorithmic management has generally been associated with negative well-being outcomes, such as reduced positive affect (Lee, 2018), lower job satisfaction (Keith et al., 2019), and lower work engagement (Bucher et al., 2019). However, if employers are transparent about how such algorithmic technology is being used, are careful to restrict it to work-related behaviors, and use it to promote learning and development, as opposed to using it as a form of control and punishment (Tomczak et al., 2018), such technology can be advantageous. For example, workers can more quickly receive feedback on their own performance and alter their behavior accordingly, thus learning more quickly than if they had to wait for verbal feedback.

The Dark Side of AI

More broadly, AI that is initially designed by humans and honed through interaction with humans can evolve, creating further generations of AI without the need for human interaction or programming (Van Rijmenam & Logue, 2021). For example, AI has learned to play computer games and to beat both human players and itself successfully, as well as to develop second generations of games with no input from human developers (Silver & Hassasbis, 2017). Such AI is essentially autonomous and can potentially give rise to “intelligent” AI that no longer resembles what was originally created (Armstrong et al., 2012). Advantages include the potential to outperform humans and to solve complex problems that organizations and managers have found insoluble, without being hindered by staff absences or management pressure. Disadvantages include the lack of control humans have over autonomous AI. Furthermore, this means AI could potentially develop intelligent, self-learning algorithms that are no longer bound by human morals, values, and safety concerns and do not behave in accordance with original human intentions. Van Rijmenam and Logue (2021) identified three ways this can happen. First, AI may initially be trained by biased people on biased data and thus fail to retain objectivity. Inequalities could emerge such that, for example, recruitment decisions, performance rewards, and work allocations are biased in the favor of either men or women, young or old workers, or workers with particular educations, nationalities, or even facial features. Second, AI allows mass surveillance and collection of large-scale, big data, and individuals may not always be aware of cameras, sensors, and digital footprints. This raises privacy and moral questions about whether and how such data should be collected, stored, and used, and by whom. Third, AI may have an impact on the order of the social world by developing alone, without interacting and connecting with humans. This means it could potentially behave differently than humans. It remains to be seen what this might look like, and whether and how this is useful in a world where technology has typically been

designed and developed in response to human interaction, needs, and desires (Orlikowski, 2009).

Automation and Relational Characteristics

Taken together, the evidence suggests that automation, including AI, can have a considerable impact on autonomy and job demands. In addition, automation may also affect the relational aspects of work. To return to the medical diagnosis example, it is clear that medical diagnoses require machines, machine operators, administration staff to manage patient bookings, and doctors to interpret and convey results to patients. Coordination of these different workers is essential, and yet they may be geographically dispersed within or between hospitals. This creates greater interdependence not only between workers, but also between workers and machines. While interdependence between workers may positively increase how connected an individual feels to their colleagues, improving work relationships and social support, it may also create social and role demands as individuals must negotiate role boundaries and conflict (Grant & Parker, 2009). Further, increased interdependence can facilitate perspective-taking and learning, as individuals interact with a wider range of people more often and learn about others' job roles and how they promote organizational goals. Automation also facilitates increased interdependence when individuals are geographically dispersed; however, when interactions are remote and via online platforms, for example, it may be more difficult for individuals to understand the meanings of interactions due to fewer social cues and the reduced ability to convey empathy (Parker & Grote, 2020). Nevertheless, the negative effects of automation can be mitigated by careful management during the introduction phase. For example, Kellogg et al. (2020) described how the engagement of managers with marketing employees who were being newly evaluated by algorithms served to reduce employee stress and to facilitate learning. In summary, automation can either

improve or worsen relational aspects of jobs, depending on how well managed the introduction and communication of such new technologies is with employees, and the purpose of the new technologies.

Summary

In sum, technological and societal advances are having considerable impact on work design, particularly job autonomy, job demands, and relational aspects of jobs. Such changes can support positive effects on work design, such as by improving efficiency due to enabling workers to manage work and home demands and to connect globally from virtually anywhere. Automation also reduces the need for humans to process complex data, freeing up time and cognitive resources for workers to spend on other work activities, promoting work motivation and engagement. However, technological and societal advances may also negatively affect work design, particularly in terms of worker control, job complexity and stimulation, and the quality of social interactions. Implications include reduced job meaning and purpose, fewer opportunities for learning and development, reduced cognitive ability in the longer term, and changes in societal norms and expectations. To counter these negative effects, [Wang et al. \(2020\)](#) recommended that managers and organizations adopt a human-centered approach when designing work involving technology, ensuring that workers are trained in the systems they need to use and that managers are aware of how technology may affect workers either positively or negatively. The rapid development of new technologies means it is time-critical that managers and organizations consider the implications of these new technologies for employees when designing work, in order to promote optimal outcomes for individuals, organizations, and society as a whole.

Future Research Directions

The changing nature of work, society, and technology has implications for work design beyond what is already known from previous research. To achieve optimal outcomes for workers and organizations, therefore, it is critical that researchers continue to explore contemporary work design within this broader context. Future research directions to help achieve this aim are outlined.

Understanding the Multilevel Factors Influencing Multilevel Work Design

Increasingly, research is needed that focuses on work design within an organizational and global system, and thus considers multilevel factors that influence work design. [Parker et al. \(2017\)](#) promoted this line of enquiry by integrating previous research into a multilevel model of work design (described in the section “Antecedents of Work Design and Work Redesign”). Nevertheless, there is a continued tendency for researchers to be siloed within research disciplines, and therefore to overlook the impact of wider factors, such as technology, organizational policy and procedures, government regulations, and global crises, on work design. Furthermore, little is known about how these factors influence work design at different levels, such as the team, group, or department level. Current models of work design focus on individuals. Yet organizations consist of teams, units, and departments in which individuals form collective groups. The work-design perceptions of individuals may vary from the shared perceptions of groups or teams, so it is important to understand the links between the different “levels,” as well as the factors that influence them, and outcomes.

Exploring How Work Can Be Redesigned to Optimize Both Technology and Worker Motivation

In the section “Work-Redesign Interventions,” strategies to promote worker motivation, well-being, and performance are briefly described. The strategies include top-down, manager-led strategies (see [Daniels et al., 2017](#); [Knight & Parker., 2019](#)), and bottom-up, individual-led strategies (see [Oprea et al., 2019](#)). This previous research, however, does not typically focus on the redesign of work involving new and emerging technologies, such as AI or automated machines. Nor does it consider how remote work can be redesigned to optimize worker–technology interaction in ways that assist with creating work that is motivational and socially connected to others. Can “old” work-redesign strategies be adapted to contemporary work environments, or are “new” redesign methods needed? While some strategies may be more adaptable than others, such as job crafting, in which individuals can make small changes to their jobs, others are not. As organizations increasingly adopt remote and geographically dispersed work practices, for example, how might managers redesign teams to promote effective collaboration, knowledge sharing, and team cohesion across time zones? Is the increasing practice of “hybrid” work, where individuals sometimes work remotely and sometimes work in the workplace, ideal, and if so, in what proportions? Research is needed to develop and test potential interventions that apply to these contemporary work environments.

Expanding Knowledge of the Short- and Long-Term Processes

Linking Work Design with Outcomes, Such as Morality, Identity, Cognition, and Learning

Research has highlighted how contemporary factors like new technologies and remote working may affect work design and outcomes, such as learning, development, well-being, and performance (see [Wang et al., 2020](#)). More broadly, however, how might contemporary work affect underresearched outcomes, such as morality, identity, and personality? For

example, AI can lead to moral decisions that are not controlled by humans and may not be in the best interests of humans (Van Rijmenam & Logue, 2021). How can we guard against this, and are there situations in which it might be beneficial? Further, how might new technologies or remote working, for example, change work and facilitate different types of cognition and learning (e.g., exploratory learning, complex thinking)? Understanding more about the impact of contemporary work could inform how schools and higher education institutions prepare young individuals for the workforce, or the opportunities available to current workers for training and development.

Modeling Dynamic Processes Over Time

Understanding the dynamic relationships between wider influences on work design and outcomes in the shorter and longer term will require more advanced techniques that can model theoretical processes over time. This could involve adopting computational modeling techniques, which are common in other fields (such as cognitive psychology) but less common in organizational psychology (see Ballard et al., 2021; Weinhardt & Vancouver, 2012). Such models are able to explore the rate of change of different factors over time and to compare alternative models involving different types of relationships beyond the linear and quadratic relationships typically considered. Such methods may help with the development of theories about processes underlying relationships between work design and wider factors influencing work design and outcomes in the shorter and longer term.

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Table 1. Summary of Key Work-Design Models and Theories

Work-Design Model/Theory	Key Propositions	Key Work Characteristics/ Job Resources	Key Job Demands	Summary of Evidence
Motivational Theories				
Scientific management	Simplification and standardization of jobs to	n/a	n/a	n/a

improve efficiency and productivity
Decision-making controlled only by managers

Herzberg's motivators and hygiene factors theory

Motivator factors (e.g., level of recognition) lead to job satisfaction, while the absence of hygiene factors (e.g., pay and promotion) causes job dissatisfaction.

Recognition
Opportunities for personal growth and achievement
Interpersonal relations

n/a

Reviews and meta-analyses have largely revealed little support for this theory

Job Characteristics Model (JCM)

Five work characteristics are intrinsically motivational and predict job satisfaction and performance
Three psychological states mediate between work characteristics and outcomes: experienced meaningfulness, knowledge about results, and sense of responsibility
Growth need strength (GNS) moderates relationships between work characteristics and outcomes

Task variety
Job autonomy
Job feedback
Task significance
Task identity

n/a

Reviews and meta-analyses largely support the theorized relationships between work characteristics and outcomes
The moderating effect of GNS has received little support

Morgeson & Humphrey's expanded work design model	Expanded the JCM to include 21 job characteristics as predictors of job satisfaction and performance	Social characteristics Knowledge characteristics Contextual characteristics Task characteristics	n/a	Meta-analyses have supported the positive relationships between expanded work design characteristics and outcomes like work motivation and job satisfaction, and negative relationships with anxiety, stress, etc.
Stress theories				
The Job Demands-Control Model (JDCM)	Four job profiles are proposed: i) "Active jobs" comprise high job control (autonomy) and job demands; autonomy buffers the negative effect of high demands	Job control	Time pressure Role conflict	Empirical support for the buffer effect of job demands and control on strain has been inconsistent

on stress (buffer

hypothesis)

ii) "Passive jobs" comprise

low job demands and

control, leading to

dissatisfaction and

boredom

iii) "High strain" jobs

reflect high demands

and low control, and

lead to psychological

and physical strain

(strain hypothesis)

iv) "Low strain" jobs

reflect low demands and

high control (i.e., job

autonomy)

The Demand-
Control-Support
Model (JDSCM)

Social support was added to
the JDCM as it was
theorized to have a
buffering effect on job
demands

Eight job profiles are
predicted that resemble the
4 JDCM profiles,

Job control
Social
support

Time
pressure
Role
conflict

Research has
found greater
support for the
direct effects of
demands, job
control, and
social support on
stress than

subdivided to account for
high or low social support

support for the
buffering effect

Integrating Motivational and Stress Theories

The Job Demands- Resources model (JD-R)	A wide range of demands and resources can impact the well-being of employees Job resources enhance intrinsic motivation and work engagement, while job demands predict burnout, strain, and ill health Job resources can reduce the negative impact of job demands by allowing employees to cope and manage their demands When job demands are high, job resources are particularly motivating and positively boost well-being Personal resources can also promote goal striving and	A large range of work characteris- tics (e.g., job feedback, job autonomy, task variety, and social support)	Work- load Role ambi- guity Interper- sonal conflict	Research has supported the general relationships between resources and demands and well-being Greater support has been found for the additive effects of job demands and resources on strain than support for interactive effects
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achievement, leading to
outcomes like work
motivation and work
engagement

Team Motivational Theories

Autonomous work groups & team empowerment	AWGs are characterized by employees in teams or groups who have greater control over work and high interdependence, with a range of skills among members Self-empowered teams are characterized by potency, meaningfulness, autonomy, and impact Considers work design at the team/group level	Teamwork involving interdepen- dence and collective autonomy	n/a	Research shows positive impacts of AWGs on job attitudes, such as job satisfaction and organizational commitment The impact of AWGs on performance is inconsistent The majority of studies used a case-study design, making
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generalizations

difficult

Expanded Work-Design Theories

Role theory	Considers the social aspects of work in terms of two particular role demands that emerge through worker–manager interactions: role conflict and role ambiguity	n/a	Role conflict	Role ambiguity	Research has found that role characteristics are important for shaping work characteristics like autonomy, feedback from others, and task and skill variety, as well as well-being, job satisfaction, and organizational commitment
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Theory of purposeful work behavior	Five personality traits (extraversion, agreeableness, conscientiousness, emotional stability, & openness to experience) are	Task characteristics (e.g., task identity, skill variety)	n/a	n/a
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associated with higher order Social
 goals (communion, status, characteris-
 achievement, & autonomy tics (e.g.,
 striving) that are social
 motivational support)
 Work task and social
 characteristics are also
 motivational and interact
 with personal goal strivings,
 leading to experienced work
 meaningfulness
 Experienced work
 meaningfulness further
 increases motivation and
 the attainment of work
 outcomes

Relational work
 design theories

Two sets of relational Social n/a
 characteristics: social characteris-
 characteristics and prosocial tics (e.g.,
 characteristics social
 Prosocial characteristics support,
 include two components: social
 task significance (job interaction)
 impact) and beneficiary Prosocial
 contact characteris-

Research
 suggests a
 positive impact
 of prosocial
 motivation on
 outcomes like
 helping
 behaviors, task
 commitment,

Social characteristics are intrinsically motivating and lead to engagement and job satisfaction, while prosocial characteristics are prosocially motivating and lead to an increased sense of meaning and purpose in one's job

tics (e.g., task significance, beneficiary contact)

effort, persistence, organizational commitment, etc.

Learning &
development

Jobs with certain characteristics can promote the cognition, learning, and development of employees
Work design can promote moral, cognitive, and personality development of employees

Job complexity
Autonomy
Relational work design
Job feedback
High job demands

n/a

Emerging research has supported the role of job characteristics for the moral, cognitive, and identity development of employees
