



Work experience on algorithm-based platforms: The bright and dark sides of turking

Mehmet A. Orhan^a, Insaf Khelladi^b, Sylvaine Castellano^{a,*}, Sanjay Kumar Singh^c

^a EM Normandie Business School, Metis Lab, France

^b Léonard de Vinci Pôle Universitaire, Research Center, 92 916 Paris La Défense, France

^c National University of Ireland, School of Business, Maynooth, Ireland

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ABSTRACT

The prevalent use of digital labor platforms has transformed the nature of work globally. Such algorithm-based platforms have triggered many technological, legal, ethical, and human resource management challenges. Despite some benefits (i.e., flexibility), the precarious conditions and commodification of jobs are major concerns in these platform-based employment conditions. The remote-work paradigm shift during the COVID-19 pandemic has made the interplay between technology, digitalization, and precarious workers' well-being a critical issue to address. This paper focuses on microtask platforms by examining overall well-being associated with turking as a work experience. Using a sample of 401 Amazon Mechanical Turk workers during the early stage of the COVID-19 pandemic, data were collected on individual conditions affecting the overall quality of workers' lives. The results from two structural equation models demonstrated the direct and mediating effects of task characteristics, excessive working, and financial pressure, mirroring the bright and dark sides of turking. Greater turking task significance and meaningfulness increase personal growth opportunities, ultimately improving workers' perceived quality of life. However, excessive work and greater financial pressure decrease self-acceptance and overall quality of life. This study examines the complicated nature of work experience on algorithm-based platforms by unpacking individual factors that affect workers' well-being.

1. Introduction

Thanks to technological advances, digital labor platforms are major innovations that have transformed work worldwide over the past decade (ILO, 2018), offering opportunities and challenges at the technological, legal, ethical, and human resource management (HRM) levels (Vrontis et al., 2021). Such platforms have contributed to the emergence of crowdworking, which relies on online marketplaces matching employers with individuals (eLancers, employed, unemployed) to perform specific tasks for compensation (Aguinis and Lawal, 2013). These platforms are supported by technological developments, regulatory context, socioeconomic climate, and working conditions (Bergvall-Kåreborn and Howcroft, 2014), offering firms a workforce with global connectivity and rapid scalability and access to a broad range of skills at significantly lower costs (Howcroft and Bergvall-Kåreborn, 2019). These workers are viewed as self-employed, i.e., they lack access to labor and social security law protections (ILO, 2018).

Digital labor platforms entail many categories, but the present study focused on microtask marketplaces, which are crowdwork platforms in which employers (i.e., individuals, small and medium-size enterprises [SMEs], and large companies) search for worldwide flexible workers to perform batches of (very) small human intelligence tasks (HITs) remotely, e.g., answering survey questions, transcribing recordings, and tagging (Aguinis and Lawal, 2013). Microtasking is not consigned to the poorest and least-educated segments of society (Aguinis and Lawal, 2013). Rather, crowdworkers are typically young, well-educated adults from developed and developing countries who generally engage in crowdworking for more than a year, with most being financially dependent on their earnings from crowdwork (ILO, 2018), although monetary gain is not the sole driver of their engagement in crowdwork (Paolacci and Chandler, 2014). Such contemporary work practices simultaneously enhance and diminish crowdworkers' quality of life (Kittur et al., 2013).

Amazon Mechanical Turk (AMT, MTurk) is one of the most well-

* Corresponding author.

E-mail addresses: morhan@em-normandie.fr (M.A. Orhan), insaf.khelladi@devinci.fr (I. Khelladi), scastellano@em-normandie.fr (S. Castellano), Sanjay.Singh@mu.ie (S.K. Singh).

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known microtask platforms (ILO, 2018). Its workers are known as *turkers*, and the work generally is termed *turking*. The turker population's size is hard to estimate. The platform advertises that it has >500,000 individual turkers from 190 countries (Schmidt and Jettinghoff, 2016). Other studies' estimates range from roughly 100,000 to as many as 250,000 or more, with 2000 active at any one time (Difallah et al., 2018; Robinson et al., 2019). This large and diverse pool of workers explains why researchers from different disciplines use MTurk frequently (e.g., for data collection, experiments, data annotation, and survey completion; Paolacci and Chandler, 2014), although data reliability remains questionable (Robinson et al., 2019). People turk not only for money, but also for enjoyment, human capital advancement, and community identification (Kaufmann et al., 2011). Still, little is known about habits related to turking (Ross et al., 2010), particularly considering that turkers are not a homogeneous population sharing the same work experiences (Brawley and Pury, 2016).

Past research mainly has investigated motivational factors that drive turking performance (Deng and Joshi, 2016), work quality (Schmidt and Jettinghoff, 2016), or drivers that engage crowdworkers (Bush and Balven, 2021); however, this literature has neglected life quality and well-being associated with turking as an activity that many individuals practice. Few studies on turking have emphasized individuals' occupational hazards (Silberman et al., 2010), viewed as invisible, ill-recognized computational services (Irani and Silberman, 2013). Other studies have focused on the positive invisibility orientation that turking offers individuals (i.e., freedom from surveillance, control, and intervention in their personal matters; Martin et al., 2014). Further research has revealed workers' perceptions of their turking experiences and how they share them in their professional lives (Kasunic et al., 2019). Finally, extant research has emphasized turking's drawbacks. Microtask workers mostly work remotely, with little social interaction (Deng and Joshi, 2016). Although turking is a part-time job for many turkers (Ross et al., 2010), such workers display psychological and social difficulties (McCredie and Morey, 2019).

Understanding the crowdworking experience is particularly important today due to the changing paradigms amid pandemic conditions. Past research has documented that when economic downturns become more widespread, the level of precariousness in working conditions multiplies, affecting many disadvantaged populations in society (Blustein et al., 2020). Coupled with shrinking job opportunities due to pandemic conditions, as well as growing demand for flexible employment opportunities (Arechar and Rand, 2021; Spurk and Straub, 2020), microtasking platforms pose both challenges and opportunities that remain insufficiently examined.

Our study's objectives include the following. First, we wish to examine the conceptualization of individual factors that affect turkers' well-being. We also aim to understand how the different characteristics of tasks performed on algorithm-based platforms influence one's self-perception. For these reasons, we capture both negative conditions of precarity and positive task characteristics provided by these tasks' flexibility and their influence on overall life quality and satisfaction.

Our research addresses the call to examine turking as part of the growing nonstandard work arrangement phenomenon (Schroeder et al., 2021), as well as to humanize turkers, whether in terms of the microtasking system or the requesters who work and interact with this population. This brings together the Job Characteristics Model (JCM; Hackman and Oldham, 1976) and Heavy Work Investment (HWI; Schaufeli, 2016) to investigate turking experiences (Brawley and Pury, 2016) and turking's effects on turkers' life satisfaction (Stone et al., 2019) and well-being (Bergvall-Kåreborn and Howcroft, 2014), further illuminating the understanding of activities and work practices on digital (technology-based) microtasking platforms (Howcroft and Bergvall-Kåreborn, 2019), as well as their impact on crowdworkers (Deng et al., 2016).

This study's contributions are threefold. First, we enrich the latest HRM literature (i.e., planning and well-being) by unveiling the

antecedents and outcomes of working with and via technological innovation platforms (Pereira et al., 2021). Second, we provide empirical evidence of JCM and HWI concepts' roles and effects in an algorithmically mediated environment as a growing work experience (Makridakis and Han, 2021). Third, we shed light on the psychological determinants of crowdworking (Bush and Balven, 2021) by revealing the dark and bright sides of working shaped by platform-based algorithmic control (Wood et al., 2019).

The article is structured as follows. Section 2 presents the literature review by examining microtask platforms as technological innovations, as well as the bright and dark sides of turking. Section 3 presents the research model and hypotheses development. Section 4 focuses on the empirical part of the study, including the methodology. Sections 5 and 6 present the results, discussion, and implications. Finally, we conclude with the study's limitations and avenues for future research.

2. Literature review

2.1. Microtask platforms as a technological innovation

Microtask platforms are digital-based technological innovations that leverage Internet technology and virtual networks, representing opportunities for organizations to complete tasks using crowd labor (Irani and Silberman, 2013). Such platforms and their workers are accessible through an application programming interface (API), through which programmers develop a complex algorithm that allows them to automate the process of posting tasks, evaluating results, and rewarding workers (ILO, 2018).

MTurk is an online community and a labor market (Antin and Shaw, 2012), but it also is viewed as an online crowdsourcing system (Ross et al., 2010) and is one of the most frequently used eLancing platforms worldwide (Aguinis and Lawal, 2013). Created in 2005 and managed by Amazon, MTurk provides a conduit through which requesters target, recruit, and pay qualified workers (i.e., turkers) to complete designated HITs (Cheung et al., 2017). MTurk is used widely for research and surveys, image labeling, natural language processing, and relevance evaluation (Ross et al., 2010), and has been used extensively in management research (Aguinis et al., 2021).

Turking is defined as a kind of microtasking that is relatively new, viewed as an open-source world form enabled by information and communication technologies (Deng et al., 2016). Such technological innovation allows individuals to work in an algorithmically mediated work environment pressurized by online ratings and reputation systems (Howcroft and Bergvall-Kåreborn, 2019). Turking has changed the relationships between employees and employers (Brawley and Pury, 2016), and even how work is designed, produced, and conceptualized (Kittur et al., 2013). As such, contrary to traditional work characteristics, turking activities are independent of the platform/workplace, i.e., the platform provides the workplace environment, but requesters, who are independent of the platform, design and provide the jobs (Schulte et al., 2020).

Individuals mainly engage in turking for money. They may be paid as little as \$0.01 for quick tasks, and up to a few dollars for more complex ones (Ross et al., 2010). Turking activities are the primary source of income for some turkers, whereas they are supplementary for others (Martin et al., 2014). Individuals also turk for lifestyle integration, independence, and security (Deng and Joshi, 2016), or when they find the HITs fun, interesting, educational, or enjoyable (Martin et al., 2014). Turking also offers task autonomy and skill variety (Kaufmann et al., 2011). Finally, turking offers individuals some invisibility features, e.g., anonymity, as well as the flexibility to work when they want, for whom they want, and on the HITs they want (Martin et al., 2014). Web Appendix A provides the major studies conducted on microtask platforms and their key findings.

Turking is associated with perceptions of empowerment and marginalization (Deng et al., 2016). Such activity is multifaceted, with a

bright side providing advantages, benefits, and satisfaction for individuals (e.g., flexibility, autonomy, task and skill variety, and fulfillment; Chandler and Kapelner, 2013; Deng and Joshi, 2016; Deng et al., 2016). However, turking's anonymity also can have a dark side: It creates a psychological distance between workers and requesters, cultivating feelings of mistrust and dehumanizing work rapport (McInnis et al., 2016). Furthermore, turkers sometimes receive ill-designed tasks with unclear evaluation criteria, leading to unfair, arbitrary, and somewhat malicious rejections from requesters, affecting turkers' quality of life and learning in the process (McInnis et al., 2016). In the next subsection, we investigate turking's bright side (i.e., positive task characteristics) and dark side (i.e., workaholism and financial pressures) in terms of turkers' well-being.

2.2. Turking's bright side

Task significance and work meaningfulness are critical in today's work landscape. Aside from the link between these aspects and well-being and job performance (Allan, 2017), workers increasingly are concerned with how meaningful and beneficial their work is to society (Grant, 2008). The JCM (Hackman and Oldham, 1976) has suggested necessary conditions to motivate individuals and increase their performance at work. One of the five job dimensions is task significance, defined as "the degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organization or in the external environment" (Hackman and Oldham, 1976, p. 257). Job design literature views task significance as objectively related to how the work is designed to increase job performance. Social information processing literature views task significance as a socially constructed subjective judgment in which job performance is increased via social cues that reshape individuals' perceptions of their tasks (Grant, 2008). The notion of a calling refers to "the experience of transcendence or how one makes a difference through service to others and, in doing so, derives meaning and purpose in life" (Fry, 2003, p. 703). Task meaning/calling reflects how workers experience their work lives, comprehend a sense of making a difference, and feel understood and appreciated through their work and within their organizations (Fry et al., 2005). Individuals with great task meaning/calling are attached and loyal to their jobs, believing that the work they perform is meaningful and important (Fry, 2003). Subjective well-being comprises three components, among which *life satisfaction* is defined as "a cognitive judgmental process" (Diener et al., 1985, p. 71) and as "a global assessment of a person's quality of life according to his chosen criteria" (Shin and Johnson, 1978, p. 478).

Personal growth indicates individuals' need for self-actualization and self-realization of their potentialities (Ryff, 1989). Task significance signals to workers that their tasks influence others' well-being (Grant, 2008). Task meaning/calling signals to workers that their tasks make a difference and are personally meaningful to them (Fry, 2003). The search for purpose or meaning in life, self-actualization, and personal growth are the eudaimonic dimensions of well-being, whereas pleasure and life satisfaction are the hedonic dimensions of well-being (Straume and Vittersø, 2015).

2.3. Turking's dark side

HWI refers to the extra amount of time and energy that individuals allocate to their work (Tabak et al., 2021). Past research has distinguished between two types of HWI—namely, workaholism (i.e., a negative/"bad" type) and work engagement (i.e., a positive/"good" type; van Beek et al., 2014). Workaholism refers to "a strong inner compulsion to work excessively hard [...] which includes a behavioral (working excessively) and a cognitive dimension (working compulsively)" (Schaufeli, 2016). Workaholism generally is associated with negative outcomes, e.g., low job performance and satisfaction and lower life satisfaction (Falco et al., 2020). Our research focuses on workaholism's behavioral dimension, in which individuals work for long hours (Tabak

et al., 2021). Individuals who work excessively allocate a significant amount of time (i.e., high frequency) and effort (i.e., energy) for their work (Snir and Harpaz, 2021). More specifically, introverted and neurotic individuals tend to work excessively (Schaufeli, 2016), which negatively affects their job satisfaction (van Beek et al., 2014) and life satisfaction (Clark et al., 2016).

Individuals facing strong or weak financial pressure tend to make different decisions related to work participation or retirement. For instance, people under financial pressure do not view retirement as an affordable option. Such pressure forces individuals to work even under poor employment conditions or strong work-life conflict (Noone et al., 2018). Previous studies have demonstrated a positive relationship between time devoted to work and financial needs, i.e., individuals with strong financial pressures will work more (Snir and Harpaz, 2021). Furthermore, individuals responsible for meeting their own and family members' basic needs must work excessively. Thus, the more individuals need to work, the harder and longer they will work (Snir and Harpaz, 2021). Past research also has demonstrated a strong positive correlation between financial satisfaction and life satisfaction (Diener and Diener, 2009). As such, the less financially pressured individuals feel, the better their quality of life becomes. However, precarious working conditions threaten workers' well-being, as well as successful career growth (Blustein et al., 2020).

Self-acceptance is "the acceptance of one's self and one's past life" (Ryff, 1989, p. 1071). Individuals' self-acceptance involves their nonjudgmental capacity to accept both the good and bad aspects of their past, present, and future lives (Xu et al., 2016). It also involves individuals' capability to maintain a positive attitude and avoid criticizing their deficiencies by accepting them as part of their life experience (Plexico et al., 2019). Extant research has identified a negative relationship between workaholism and self-acceptance (Chamberlin and Zhang, 2009). Individuals tend to work excessively as a way to avoid negative feelings when not working, e.g., shame or guilt, or to address feelings of low self-worth and insecurity (Mudrack, 2006). Such a tendency reflects low self-esteem and a feeling of not being good enough. In such a case, individuals are more likely to work excessively and intensely to address the need to maintain their self-worth (Clark et al., 2016); thus, they are more likely to express low self-acceptance and interpersonal satisfaction (Plexico et al., 2019).

3. Research model and hypotheses development

3.1. Task characteristics' positive effects on turkers' life quality

Task significance and task meaning/calling reflect positive task characteristics. As such, when workers perceive their tasks as highly significant, their work becomes more meaningful (Grant, 2008). Meaningful work refers to "work that is personally significant and worthwhile" (Allan, 2017, p. 174), and it is an important predictor of individual well-being (Allan, 2017). Past studies have investigated task characteristics' effect on the quality of turking activities. Task-related features (i.e., human capital advancement, task autonomy, skill variety, and task identity) were found to be important motivational factors for turkers (Kaufmann et al., 2011). Turking is an activity that is accessible to individuals with diverse cognitive and physical abilities and locations, providing valuable work opportunities (Brawley and Pury, 2016). Workers also derive motivation through enjoyment and microtime structure in their intention to continue microworking (Jiang et al., 2021). Turkers work under total autonomy, choosing when and how long they want to work, with virtually no direct supervision (Howcroft and Bergvall-Kåreborn, 2019); thus, they can select tasks that they find significant and toward which they feel a calling. As such, with greater meaning from the task, individuals become more likely to participate in a turking activity, produce more and better quality output, and require less compensation for their time (Chandler and Kapelner, 2013).

Overall, task significance and meaningfulness increase job performance (Grant, 2008). Such situational factors related to JCM also have been found to exert positive effects on job satisfaction in turking experiences (Brawley and Pury, 2016). Furthermore, extant research has highlighted the positive and reciprocal effects of job satisfaction and life satisfaction (Judge and Watanabe, 1993). Therefore, we proposed the following hypothesis in the turking context:

H1. Positive task characteristics (i.e., task significance and task meaning/calling) positively influence life quality.

Individuals with high levels of personal growth are open to new experiences, have feelings of continued development and a sense of realizing their potential, and view themselves as growing and expanding, observing improvements in themselves and their behaviors (Ryff, 1989). Turking allows individuals to stop working or avoid undesirable HITs while being assured of finding plenty of other HITs (Brawley and Pury, 2016). Turking also provides autonomy, skill variety, task significance, and challenges (Kaufmann et al., 2011) that lead to task meaningfulness (Brawley and Pury, 2016) and satisfaction (Chandler and Kapelner, 2013). Considering that personal growth is reflected by the tendency to be curious and attracted to complexity and learning, individuals' perceptions of task characteristics may influence personal growth (Straume and Vittersø, 2015). Furthermore, favorable task design enhances crowdworkers' emotional bond and satisfaction with this innovative way of working (Durward et al., 2020), ultimately affecting their life satisfaction and quality (Judge and Watanabe, 1993). Therefore, we propose the following hypothesis in the turking context:

H2. Personal growth mediates the relationship between positive task characteristics (i.e., task significance and task meaning/calling) and life quality.

3.2. The negative effects of working excessively and financial pressure on turkers' life quality

Our research focused on workaholism's behavioral dimension, in which individuals work for long hours (Tabak et al., 2021). Individuals who work excessively allocate a significant amount of time (i.e., high frequency) and effort (i.e., energy) to their work (Snir and Harpaz, 2021). More specifically, introverted and neurotic individuals tend to work excessively (Schaufeli, 2016), which negatively affects their job satisfaction (van Beek et al., 2014) and life satisfaction (Clark et al., 2016).

Extant studies have revealed that turking pushes individuals to spend more time looking for lucrative tasks than working, an issue that is intensified by MTurk's reward scheme (i.e., the largest portion of tasks provides modest rewards, i.e., \$1–2 per HIT, while a small portion of tasks provides much higher rewards, \$10–20 per HIT). As such, turkers face stiff competition in trying to seize the best HITs in a short time frame. Furthermore, turking individuals frequently find that they are spending excessive amounts of time on tasks of "ambiguous value," even if turking is not their primary source of income (Lehdonvirta, 2018).

Turking mostly is done remotely, with almost no social interaction (Deng and Joshi, 2016). Furthermore, most turking tasks are menial, monotonous, and tightly bounded (Howcroft and Bergvall-Kåreborn, 2019). Individuals who turk have reported experiencing social isolation, limited social support, and interpersonal coldness and resentment (McCredie and Morey, 2019). Past studies have found that turkers are more neurotic and less extroverted and agreeable than other working populations (McCredie and Morey, 2019). Turkers also have reported low life satisfaction (Stone et al., 2019; Keith et al., 2019) and lower levels of well-being compared with other workers (Keith et al., 2017). Therefore, we propose the following hypothesis in the turking context:

H3. Working excessively negatively influences life quality.

Turking requires individuals to work excessively to reach the average

hourly rate (Irani and Silberman, 2013). Unlike in traditional forms of employment, microtasking through digital platforms is viewed as creating precarious conditions for employees because the work is characterized by the following conditions: Contracts are short-term; the work duration is temporary; the work's nature is insecure; types of tasks are unpredictable and unstable; the pay is too low, with no extra benefits; and the competition is fierce (Webster, 2016). These insecurities place enormous pressure on workers, particularly from a financial perspective, because workers need to dedicate continuously long hours to many different microtasks to earn a living wage. Keith et al. (2019) reported that when workers primarily rely on the income from microtasking, they feel more pressure to work longer hours to earn a living wage, leading to lower life satisfaction. Evidently, these pressures also increase stress levels in workers who utilize microworking platforms. Durward et al. (2020) suggested that higher financial compensation fosters individuals' perceived satisfaction with turking. Nevertheless, numerous individuals still depend financially on their earnings from turking and have called for fairer pay levels (ILO, 2018), a work predicament that hinders their job and life satisfaction (Stone et al., 2019). Therefore, we propose the following hypothesis in the turking context:

H4. Financial pressure negatively influences life quality.

Individuals who turk display lower self-esteem compared with other workers, which may explain the greater social anxiety and depression among these individuals (McCredie and Morey, 2019). On another note, MTurk processes and displays an acceptance rate for each turker, allowing requesters to hire those with higher rates of task acceptance. As such, submitted HITs requiring acceptance scores of 85 or above are not displayed to individuals with lower acceptance scores (Bergvall-Kåreborn and Howcroft, 2014). Furthermore, turking pushes individuals to spend more time searching for and selecting HITs (i.e., unpaid work), and waiting for work, rather than working effectively (ILO, 2018), lowering individuals' self-acceptance and satisfaction with their work. Not only is self-acceptance a key feature of self-actualization, optimal functioning, and maturity (Ryff, 1989), but it also is associated strongly and positively with subjective well-being (Tabak et al., 2021) and interpersonal and life satisfaction (Plexico et al., 2019). Therefore, we propose the following hypothesis in the turking context:

H5. Self-acceptance mediates the relationship between working excessively and life quality.

People who experience financial insecurity and distress also experience diminished well-being. As such, financial insecurity undermines basic psychological wellness needs, e.g., self-esteem, causing anxiety and depression (Weinstein and Stone, 2018). Considering that life satisfaction has been found to be correlated significantly with satisfaction with the self (Diener and Diener, 2009), individuals who feel financial pressure tend to have low self-esteem and self-acceptance, which leads to diminished life satisfaction and quality. Individuals turk for money (Ross et al., 2010), and many face financial precarity (ILO, 2018), pushing them to turk extensively for small amounts and at the expense of their well-being (Keith et al., 2017) and life satisfaction (Stone et al., 2019). Therefore, we propose the following hypothesis in the turking context:

H6. Self-acceptance mediates the relationship between financial pressure and life quality.

Fig. 1 depicts the conceptual models of turking's bright and dark sides.

4. Methodology

4.1. Design and methods

In this study, we collected data using the AMT platform based on a US-based sample. We measured turkers' work habits, the extent of

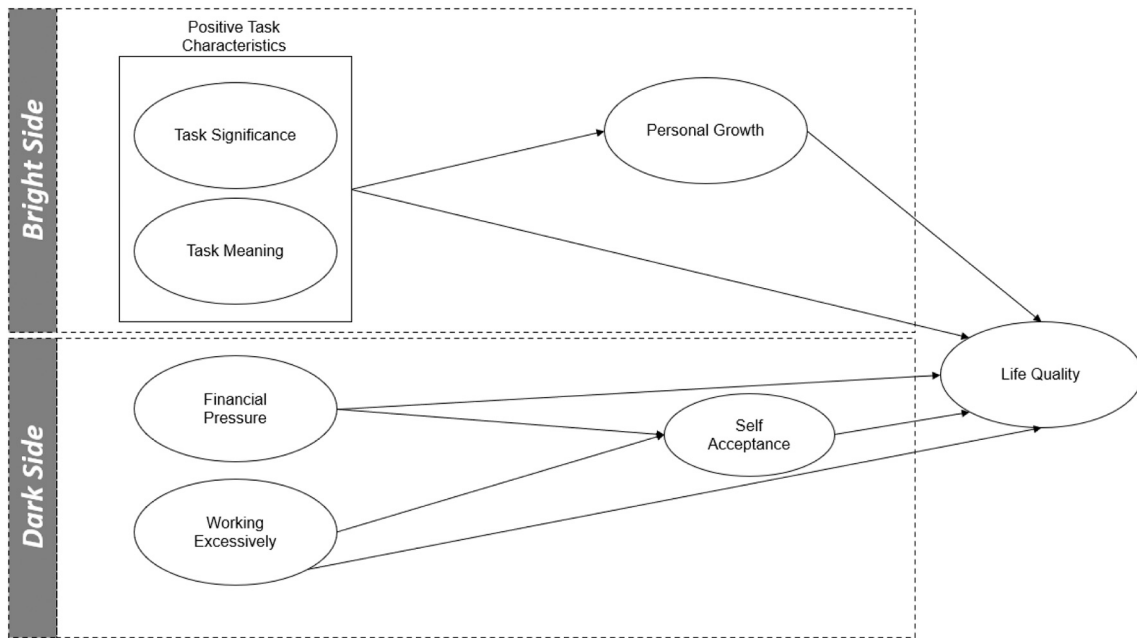


Fig. 1. Integrated conceptual model of the bright and dark sides of turking.

excessive working, task characteristics, financial pressure, personal growth opportunities, self-evaluations, and perceptions of life quality. We also included several control variables, including social class, education level, and whether respondents use AMT as a primary source of income. All measures comprised self-reported items. Demographic questions included age, gender, employment status, and ethnicity. The validation rule for these demographic data was “request response.” We designed the questionnaire using Qualtrics, which estimated the time needed to complete the questionnaire to be 7.1 min. Based on this information, we recruited participants from AMT (mturk.com) by offering US \$0.45 to complete the questionnaire. The number of required respondents was set at 400. This task was visible only to turkers whose approval rates were >90 %.

4.2. Participants

The task was posted online on April 1, 2020, and all responses were collected within 24 h. Altogether, 408 valid responses were recorded, but we identified seven participants who started the questionnaire and did not complete the entire survey; thus, they were not included in the study. The average time taken to complete the task was 5.36 min (*SD* = 5.9 min). Of those responding, 79.3 % were younger than 45, 61.8 % were male, 68.3 % were employed full-time, and 64.1 % had alternative sources of income beyond crowdsourcing activities. Out of the 401 remaining respondents, 71 provided email addresses, indicating their interest in participating in follow-up studies. A summary of demographics can be found in Table 1 below.

4.3. Measurements

4.3.1. Independent variable

Life Quality: We gauged life quality using the Satisfaction With Life Scale (SWLS) by Diener et al. (1985).

4.3.2. Dependent variables

Excessive Working: To assess the extent of excessive working behavior, we utilized the Dutch Work Addiction Scale (DUWAS), developed by Schaufeli et al. (2008). **Positive Task Characteristics:** To measure positive task characteristics, we obtained a combined score of task significance and task meaning. Task significance was measured

Table 1 Demographic summary.

Levels	Counts (N = 401)	% of total
Age (Missing = 0)		
25–34	177	44.1 %
18–24	42	10.5 %
35–44	99	24.7 %
45–54	43	10.7 %
65–74	15	3.7 %
55–64	25	6.2 %
Sex (Missing = 1)		
Female	150	37.5 %
Male	247	61.8 %
LGBTI	1	0.3 %
Other	1	0.3 %
Prefer not to say	1	0.3 %
Education (Missing = 0)		
Less than high school	3	0.7 %
High school graduate	39	9.7 %
Some college	63	15.7 %
2-Year degree	36	9.0 %
4-Year degree	186	46.4 %
Professional/Graduate degree	72	18.0 %
Doctorate	2	0.5 %
Employment status (Missing = 0)		
Employed full time	274	68.3 %
Student	17	4.2 %
Employed part-time	54	13.5 %
Unemployed looking for work	28	7.0 %
Disabled	6	1.5 %
Unemployed not looking for work	14	3.5 %
Retired	8	2.0 %
Race (Missing = 0)		
White	284	71.0 %
Asian	72	18.0 %
Black or American African	32	8.0 %
Native Hawaiian or Pacific Islander	2	0.5 %
Other	9	2.3 %
American Indian or Alaska Native	1	0.3 %
Crowdsourcing as main source of income (Missing = 0)		
Yes	144	35.9 %
No	257	64.1 %

using four items adapted by Grant (2008) from existing measures of task significance (Hackman and Oldham, 1976; Morgeson and Humphrey, 2006). We measured task meaning using the meaning/calling scale used in Fry et al. (2005). **Financial Pressure:** To understand turkers' relationship with money, we measured their evaluation of their financial status. **Personal Growth:** We assessed perceptions about personal growth opportunities while turkers accept take turking tasks. **Self-Acceptance:** Finally, we asked turkers about the extent to which they are proud and satisfied with their lives and achievements.

Web Appendix B details the operationalization and measurement of the constructs.

4.4. Data analysis

The structural equation modeling (SEM) technique was used to test the conceptual models provided in Fig. 1. In this study, we tested two models. The first used the bright side perspective and considered turking's positive task characteristics as the independent variable. The second took the dark side perspective of turking, considering financial pressure and excessive working as the independent variables. In the data analyses, we relied on the open-access, free statistical tool jamovi v.2.2.2. Before testing the conceptual model, we conducted a confirmatory factor analysis (CFA) in SEM and assessed the relevance of latent variables and the items.

The measurement model included 29 items comprising six constructs (i.e., excessive working, financial pressure, self-acceptance, positive task characteristics, personal growth, and life quality). The CFA results demonstrated a reasonably acceptable fit, given that the χ^2 test was significant ($\chi^2 = 943, df = 362, p < 0.001$). The model's fit indices were as follows: CFI, 0.90; TLI, 0.89; SRMR, 0.05; and RMSEA, 0.06, with a 90 % CI of 0.0583–0.0682. These statistics provided confidence that the items used in this study have construct validity. To test the validity statistics further, we calculated composite reliability (CR) and average variance extracted (AVE). Table 2 lists the items for each scale that significantly loaded on their corresponding construct with the factor loadings, as well as CR and AVE scores for each construct. Except for the Excessive Work scale (AVE = 0.33), the AVE values were above 0.5 for all latent variables, indicating that no issues with discriminant validity were present. However, we still viewed the Excessive Work construct as having convergent validity because we obtained a CR score (CR = 0.77) higher than 0.6 (Fornell and Larcker, 1981). Each construct's internal consistency also was acceptable because they met the requirement of exceeding the critical threshold of 0.70.

We present the correlation matrix in Table 3.

5. Results

5.1. Results from structural equation models

The mediation model for Model 1, which tested the hypotheses related to the bright side of turking, demonstrated that all relationships were statistically significant at $p < 0.001$. Our model indicated that personal growth plays a mediating role in the relationship between positive task characteristics and overall life quality. Table 4 shows the indirect, component, direct, and total effects with corresponding z-values. As hypothesized, positive task characteristics (i.e., task significance and task meaning/calling) positively influence life quality, thereby supporting H1. Furthermore, we demonstrated that personal growth mediates the relationship between positive task characteristics and life quality, thereby supporting H2.

However, working on crowdworking platforms also comes with a certain set of limitations. To test the model linked to the dark side of turking, we ran another full mediation model. The Model 2 statistics are provided in Table 5. All relations were found to be significant at $p < 0.01$. As predicted, financial pressure and working excessively exert a significant and negative direct impact on overall life quality, thereby

Table 2
CFA results.

Scale and items	St. Estimate	Z-value	CR	AVE
Excessive work			0.77	0.33
I seem to be in a hurry and racing against the clock.	0.644	12.73		
I overly commit myself by biting off more than I can chew.	0.633	12.43		
I tend to put myself under pressure with self-imposed deadlines when I work.	0.622	12.24		
I feel I am trapped in this work that limits my leisure time.	0.538	10.28		
I feel guilty when I am not working on something.	0.520	9.82		
I find myself doing several things at one time such as eating lunch and doing something else, while working.	0.449	8.40		
It is hard for me to relax when I'm not working.	0.579	11.14		
Financial pressure			0.82	0.61
I can afford what I want to buy. (Reverse)	0.724	15.27		
I am wealthy enough to enjoy my free time. (Reverse)	0.801	17.51		
I am wealthy enough to live without economic hardships. (Reverse)	0.810	17.78		
Self-acceptance			0.85	0.65
I take pride in living the life I have pursued.	0.807	18.53		
I am satisfied with what I have done.	0.804	18.40		
I am proud of the life I have lived.	0.808	18.57		
Positive task characteristics			0.90	0.54
My job activities are personally meaningful to me.	0.710	15.60		
The work I do is very important to me.	0.655	14.02		
The work I do is meaningful to me.	0.718	15.87		
The work I do makes a difference in people's lives.	0.769	17.57		
My job provides opportunities to have positive impact on a regular basis.	0.769	17.66		
My job enhances the welfare of society.	0.764	17.42		
A lot of people can be positively affected by how well my job gets done.	0.723	16.19		
My job provides opportunities to substantially improve the welfare of others.	0.752	17.07		
Personal growth			0.75	0.50
I persevere in my effort to accomplish my goals.	0.716	14.30		
I do my best to develop my potential.	0.678	13.39		
I persevere in my efforts to realize my dream.	0.715	14.28		
Quality of life			0.92	0.70
The conditions of my life are excellent.	0.852	20.97		
I am satisfied with my life.	0.887	22.36		
In most ways my life is ideal.	0.908	23.26		
If I could live my life over, I would change almost nothing.	0.734	16.78		
So far, I have gotten the important things I want in life.	0.799	18.96		

All loadings are significant at $p < 0.001$.

supporting H3 and H4. Moreover, our results indicate that self-acceptance mediates the relationship between life quality and working excessively, as well as the relationship between life quality and financial pressure, thereby supporting H5 and H6. Turkers who feel more financial pressure and work more excessively tend to experience less self-acceptance and reported a diminished quality of life.

5.2. Post-hoc tests

We ran an independent sample t-test to better understand how practices and perceptions differ based on the main source of income. In our sample, 144 respondents indicated that they use MTurk to earn their main source of income. The results in Table 6 demonstrate an interesting

Table 3
Correlation matrix.

Constructs	1	2	3	4	5	6	M	SD
1. Excessive working	0.77*						1.99	0.543
2. Financial pressure	0.135**	0.82					1.94	0.695
3. Self-acceptance	-0.258***	-0.380***	0.85				2.88	0.702
4. Positive task	-0.081	-0.231***	0.347***	0.90			2.35	0.574
5. Personal growth	-0.150**	-0.162**	0.434***	0.425***	0.75		2.59	0.500
6. Life quality	-0.281***	-0.435***	0.701***	0.376***	0.376***	0.92	3.19	1.140

Note. N = 401. Cronbach's Alpha Scores are in diagonals.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

Table 4
Model 1 - SEM results.

Type	Effect	Estimate	SE	95 % CI		β	z
				Lower	Upper		
Indirect	Positive Task Characteristics → Personal Growth → Life Quality	0.223	0.05	0.129	0.317	0.112	4.64*
Component	Positive Task Characteristics → Personal Growth	0.370	0.04	0.293	0.447	0.425	9.40*
Component	Personal Growth → Life Quality	0.603	0.11	0.381	0.824	0.264	5.34*
Direct	Positive Task Characteristics → Life Quality	0.524	0.10	0.331	0.717	0.263	5.33*
Total	Positive Task Characteristics → Life Quality	0.747	0.09	0.566	0.928	0.376	8.11*

* p < 0.001.

Table 5
Model 2 – SEM results.

Type	Effect	Estimate	SE	95 % CI		β	z
				Lower	Upper		
Indirect	Excessive Working → Self-Acceptance → Life Quality	-0.266	0.06	-0.384	-0.149	-0.127	-4.45**
Indirect	Financial Pressure → Self-Acceptance → Life Quality	-0.348	0.05	-0.446	-0.250	-0.212	-6.96**
Component	Excessive Working → Self-Acceptance	-0.272	0.06	-0.387	-0.157	-0.211	-4.64**
Component	Self-Acceptance → Life Quality	0.980	0.06	0.859	1.100	0.602	15.93**
Component	Financial Pressure → Self-Acceptance	-0.355	0.05	-0.445	-0.265	-0.352	-7.74**
Direct	Excessive Working → Life Quality	-0.209	0.07	-0.354	-0.064	-0.100	-2.82*
Direct	Financial Pressure → Life Quality	-0.317	0.06	-0.435	-0.198	-0.193	-5.23**
Total	Excessive Working → Life Quality	-0.475	0.09	-0.657	-0.294	-0.226	-5.15**
Total	Financial Pressure → Life Quality	-0.664	0.07	-0.806	-0.523	-0.405	-9.20**

* p < 0.01.

** p < 0.001.

Table 6
Independent sample t-tests.

Variable	Main source of income		Mean difference	Student's t-test (df)	p-Value
	Yes (n = 144)	No (n = 257)			
	M (SD)	M (SD)			
Excessive working	2.13 (0.51)	1.91 (0.54)	0.221	3.39 (399)	<0.001
Financial pressure	2.01 (0.71)	1.89 (0.68)	0.114	1.58 (399)	0.114
Self-acceptance	2.72 (0.75)	2.97 (0.66)	-0.256	-3.43 (264.18) ^a	<0.001
Positive task characteristics	2.27 (0.52)	2.40 (0.60)	-0.125	-2.19 (330.56) ^a	0.029
Personal growth	2.44 (0.53)	2.68 (0.46)	-0.240	-4.56 (265.65) ^a	<0.001
Life quality	2.91 (1.17)	3.34 (1.10)	-0.427	-3.65 (399)	<0.001

^a Levene's test is significant (p < 0.05), suggesting a violation of the assumption of equal variances.

distinction between turkers who use MTurk as their main source of income and those who do not. We found statistically significant evidence that turkers who try to earn all their income through MTurk experience lower quality of life. By the same token, they feel that they experience less personal growth and find less meaning and significance in tasks that they complete. Furthermore, they report significantly less self-acceptance and more tendencies to work excessively. However, the results indicated no difference in terms of financial pressure.

A summary of the tested hypotheses is provided in Table 7.

Table 7
Summary of hypotheses.

Hypothesis tested	Support
H1: Positive task characteristics positively influence life quality.	Yes
H2: Personal growth mediates the relationship between positive task characteristics and life quality.	Yes
H3: Working excessively negatively influences life quality.	Yes
H4: Financial pressure negatively influences life quality.	Yes
H5: Self-acceptance mediates the relationship between working excessively and life quality.	Yes
H6: Self-acceptance mediates the relationship between financial pressure and life quality.	Yes

6. Discussion and implications

Microtask platforms have been gaining traction, and nonstandard forms of employment have grown more prevalent. This study's purpose was to understand and examine turkers' overall well-being and their experiences with work habits, financial pressure, psychological and task-related evaluations, and overall satisfaction with their lives. We specifically tested two distinct models to assess the bright and dark sides of turking. The results from the two separate models demonstrated the presence of direct and mediating effects of components related to the bright and dark sides of turking—namely task characteristics on one hand and excessive working and financial pressure on the other.

Our first model indicated that when workers perceive tasks as more significant and meaningful, they experience higher personal growth opportunities, which improve their quality-of-life perceptions. The results are also in line with extant research. Workers who dedicate their time to tasks that they find meaningful and significant, as well as evaluate tasks more positively, perceive that they can grow personally (Keith et al., 2019). This also confirms that growth opportunities lead to higher satisfaction with quality of life, which corresponds with Keith et al. (2019).

However, our models suggest that increased financial pressure and excessive work negatively impact life satisfaction, with self-acceptance also mediating these relations. Workers who experience more financial pressure and work more excessively reported declining self-acceptance, which negatively affected their overall quality of life. Considering that a greater time commitment is needed to attain a living wage with turking, working excessively is a factor that is detrimental to overall life quality. Moreover, as the precarious conditions dictate, the fragmented tasks with low pay increase financial pressure. Aside from these factors' direct impact on life quality perceptions, workers are psychologically challenged because the same factors negatively affect their self-acceptance, causing them to perceive overall life quality as even lower (Webster, 2016).

Our study adds to the literature describing both positive and negative aspects of microtasking. Workers face the pressure of working excessively when they have no alternative sources of income. Supporting Tabak et al.'s (2021) findings, we demonstrated that exerting extra effort, energy, and time increases the investment, such that turkers need to work more excessively. This is particularly true when microtasking is their main source of income. These workers also tend to experience lower quality of life and less personal growth. One factor that contributes to the negative trend is that the extrinsic motivational perspective takes over the intrinsic processes such that these workers cannot find tasks meaningful, significantly affecting their sense of satisfaction. Considering that microtasking is an increasingly prevalent factor, the financial aspect also puts additional pressure on workers regardless of their income sources. Our structural equation models provided evidence of these aspects. Considering past research, our paper discusses these opposing mechanisms and opens a new avenue for future research to investigate cognitive, behavioral, and attitudinal processes in turking.

6.1. Theoretical implications

In terms of this study's contributions: First, platforms such as turking have introduced technological innovations that may foster and hinder quality of life. The study's results emphasize the double-edged-sword effects inherent in such platforms, as highlighted in past work. They offer “flexibility, autonomy, task variety, and complexity” on one hand, but also “low pay, social isolation, working unsocial and irregular hours, overwork, sleep deprivation and exhaustion” on the other (Wood et al., 2019). Turkers also experience psychological and social difficulties (McCredie and Morey, 2019) inherent in both the algorithmic platforms and the requesters' role.

Second, while technological advancements are undoubtedly present, and the related platforms will represent a significant part of the future of

work, the underlying psychological mechanisms for turkers still need further investigation, as the present study addresses. This article enriches the well-being literature by analyzing its antecedents further and by uncovering the psychological determinants of crowdworking (Bush and Balven, 2021). It also builds on the concept of task meaning and significance (Grant, 2008; Irani and Silberman, 2013) to unveil their positive psychological dimensions in the turking context (Brawley and Pury, 2016). The research also builds on the HWI literature stream (Tabak et al., 2021). In particular, the findings indicate that such technology can lead to excessive behaviors, e.g., workaholism (Falco et al., 2020; Schaufeli, 2016), as well as generate new types of pressures, including financial pressure (Irani and Silberman, 2013; Snir and Harpaz, 2021; Stone et al., 2019), ultimately lowering life quality.

Finally, this study contributes to algorithmic platforms, particularly turking, which have received little attention from the well-being and life quality fields, even though recent research has documented that workers increasingly rely on such platforms while organizations transition from traditional employment to contractual, temporary (Schroeder et al., 2021), but often precarious working relations (De Stefano, 2015; Spurr and Straub, 2020). Still, they rarely have been included as subjects of study in academia. In particular, in this study, we enrich the microtask platform and crowdworking contexts. While extant research mainly has emphasized business performance dimensions through microtasking (Bush and Balven, 2021; Deng and Joshi, 2016; Schmidt and Jettinghoff, 2016), the present study focuses on the turkers themselves, echoing recent calls for discussion (i.e., Pereira et al., 2021).

6.2. Practical implications

This study's findings carry relevant implications both for the requester and platform at multiple levels, particularly when considering the future of work. Indeed, on the platform side, new practices inherent to the technology can be set to improve task meaningfulness and significance, e.g., limiting task search time (HIT) and not limiting the number of working hours per day, as suggested in previous studies (i.e., Lehdonvirta, 2018). Task significance and task meaningfulness also can be enhanced for the turker if requesters design tasks better. Our results provide evidence that how workers perceive tasks makes a difference in their commitment to and perceptions about growth opportunities that exert a positive effect on their life satisfaction. However, when workers focus solely on the financial aspects of tasks on crowdworking platforms, they increasingly feel the pressure to work excessively. As past research has indicated, when the sole focus becomes financial rewards, the quality of services that turkers offer tends to decline (Keith et al., 2019). This creates a vicious circle, i.e., when quality declines, more time is needed to compensate for the lost effort, then this pressure further reduces performance quality. Consequently, workers find themselves in a position in which growing financial concerns cause more problems as more time spent on platforms does not necessarily yield more income. Alternatively, workers try to find more interesting tasks on competing platforms so that they can learn and grow.

7. Conclusion and limitations

This study's purpose was to examine turking as a technological innovation and its overall influence on turkers' well-being. In particular, both the light and dark sides of turking were examined in terms of life satisfaction. As an example of a technological platform, turking demonstrates that task meaning and significance elicit satisfaction. However, dissatisfaction can be derived from such behaviors, e.g., workaholism, as well as financial pressures that these platforms can exert on turkers, particularly when turking is their main income source.

This paper has some limitations that provide avenues for future research. First, new insights into psychological perspectives on technological innovations require further examination (Pereira et al., 2021; Vrontis et al., 2021). Thus, future studies may build on and compare our

results, drawing data from new theoretical frameworks, e.g., the crowdworking perspective (Ihl et al., 2020). Indeed, investigating the microtasking foundations of multi-platform crowdworking environments (Amiri et al., 2020) may enrich our understanding of the inherent dynamics between these new forms of work and underlying technological innovations. Furthermore, future research may examine how turking and other platforms may inform and advance the understanding of eLancers and how this growing category of online freelancers emerged via technological innovations (Aguinis and Lawal, 2013). In particular, new studies could add to the literature stream that views eLancing as a trend that defines the future of work (Schroeder et al., 2021). Second, from a methodological perspective, this paper might suffer from self-reporting bias. Indeed, considering that the article aimed to analyze both the light and dark sides of turking, the life-quality dimension might be biased, which could threaten the results' validity (Donaldson and Grant-Vallone, 2002). While this study provided turkers with incentives to provide accurate answers, future research could address this potential issue via a mixed methods data-collection approach. Third, while this study focused on turking, microtasking, and crowdworking, these technological innovations rarely have been examined in multiple contexts. New insight could be gained by comparing such innovations' various dimensions and their psychological impact. For instance, new studies could collect data on additional dimensions or different settings, e.g., diverse types of eLancers, and compare their perceptions and attitudes in relation to the technologies as part of the microtasks and other activities that they might perform. Finally, this study was conducted during the COVID-19 pandemic, which required workers to make adjustments that impacted their well-being (Carnevale and Hatak, 2020). Thus, the study could be replicated as a way to offset possible outbreak effects.

CRedit authorship contribution statement

Mehmet A. Orhan: Conceptualization, Formal analysis, Resources, Writing – original draft, Writing – review & editing. **Insaf Khelladi:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Sylvaine Castellano:** Supervision, Project administration, Writing – original draft, Writing – review & editing. **Sanjay Kumar Singh:** Writing – original draft, Writing – review & editing.

Data availability

Data will be made available on request.

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Mehmet A. Orhan is Associate Professor of Management and Organizational Behavior at EM Normandie Business School in France. He obtained his Ph.D. degree in organizational psychology at Tilburg University in the Netherlands. Upon finishing his doctoral studies, he started working at Charles University in Prague. His research interests include behavioral issues linked to remote working, digital communication, and virtuality in organizations.

Insaf Khelladi is an Associate Professor at EMLV Business School - Léonard de Vinci Pôle Universitaire Research Center, 92 916 Paris La Défense, France. She holds a Ph.D. in Management & an MBA from Université Côte d'Azur. Her research interests revolve around the underlying cognitive processes in the online, offline, and human-technology interaction contexts, and their inherent consequences on individual (consumer, individual investor), group (virtual teams, entrepreneurial teams, generational cohort), organizational (corporate e-reputation, Champagne houses) and industry (wine) level. Insaf published in journals such as *TFSC*, *JBR*, *IEEE TEM*, and *International Marketing Review*.

Sylvaine Castellano is the Faculty and Research Dean at EM Normandie Business School, Metis Lab. She holds a Ph.D. in Management from the University of Luxembourg. Her research interests include institutional and competitive processes, virtual and entrepreneurial dynamics; mainly in the wine and the luxury industries. Her publications are related to the concepts of reputation and e-reputation, legitimacy, heritage, and retro-industries. Her work was published in journals such as *Journal of World Business*, *TFSC*, *JBR*, *IEEE*, *Journal of Technology Transfer*, *Management Decision*, *Corporate Reputation Review*. She also wrote and coordinated books in entrepreneurship and online reputation and served as guest editor in several international journals.

Sanjay Kumar Singh, Ph.D. is a faculty member in School of Business, Maynooth University, Maynooth, Ireland. His research interests include international & strategic HRM, innovation management, knowledge management, sustainability and ethics. He has published in *Journal of World Business*, *Journal of Business Research*, *Journal of International Management*, *European Management Review*, *International Journal of Human Resource Management*, *Human Resource Management Review*, *Asia Pacific Journal of Management*, *Personality and Individual Differences*, *Technological Forecasting and Social Change*, *IEEE Transactions on Engineering Management*, and *International Marketing Review*.