HR Analytics and the data collection process: The role of attributions and perceived legitimacy in explaining employees' fear of datafication

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Abstract:

Purpose: This paper analyses employee's perception of data collection processes for Human Resource Analytics (HRA). More specifically, we study the effect that information sharing practices have on employee's attributions (i.e. benevolent vs malevolent) through the perceived legitimacy of data collection and monitoring processes. Moreover, we investigate whether employee's emotional reaction (i.e. fear of datafication) depends on their perceived legitimacy and attributions.

Design/methodology/approach: The research is based on a sample of 259 employees operating for an Italian consulting firm that developed and implemented HRA processes in the last 3 years. The hypothesized model has been tested using Structural Equation Modelling on Stata 14.

Findings: This paper demonstrates the mediating role of perceived legitimacy in the relationship between information sharing practices and employees' benevolent and malevolent attributions about data collection and monitoring processes for HRA practices. Results also reveal that perceived legitimacy predicts employee's fear of datafication, with benevolent attributions that partially mediate this relationship.

Practical implications: This research indicates that employees perceive, try to make sense, and emotionally react to HRA processes. Moreover, we reveal the crucial role of information sharing practices and perceived legitimacy in determining employees' attributions and emotional reaction to data collection and monitoring processes.

Originality/value: Combining HR attributions, HR system strength, information processing and signalling theories, this work explores employee's perception, attributive processes, and emotional reaction to data collection processes for HRA practices.

Keywords: HR Analytics; HR Attributions; Datafication; Perceived legitimacy; High involvement work practices; Workplace Surveillance.

Paper Type: Research paper.

1. Introduction

The increased availability of digital technologies enhanced data collection and analysis in several organizational domains (Marler and Boudreau, 2017), increasing scientific and managerial interests in Human Resource Analytics (HRA) (Margherita, 2021). Scholars define HRA as an organizational capability (Minbaeva, 2017; Falletta and Combs, 2021; Samson and Bhanugopan, 2022) that enable the use of statistical techniques to support HR management decisions (van den Heuvel and Bondarouk, 2017; Larsson and Edwards, 2022). HRA need to be integrated with existing HR and organisational processes (Minbaeva, 2018; Larsson and Edwards, 2021), creating a coherent system of practices (Boon et al., 2019) that can improve organizational performance (Aral *et al.,* 2012; Levenson and Fink, 2017) and employees' experience (Tursunbayeva *et al.*, 2018).

Despite the promising outcomes, individual perceptions of HRA may differ from managerial motives and intentions (Bowen and Ostroff, 2004; Boon *et al.,* 2019). In this regard, recent research (e.g. Chatterjee *et al.*, 2021; Tursunbayeva *et al.,* 2021) argued that the implementation of HRA processes arises practical and ethical issues related to data collection and organizational surveillance. More specifically, literature (e.g. Sewell and Barker, 2006; Ball, 2010; Ramasundaram et al., 2022) showed that employee's data collection and monitoring processes can be interpreted according to two competing formations, depending on the purpose attributed to HRA practices. The coercive formation conceives surveillance practices as a malevolent form of organisational domination, focused on controlling individual behaviour in favour of organizational goals (Sewell and Barker, 2006). The care formation considers these processes as a benign way of organizing managerial routines, improving their efficiency, effectiveness, and universal fairness (Sewell and Barker, 2006). Furthermore, researchers explained that these cognitive and interpretative processes are strong predictors of employees' attitudinal and behavioural reactions (Montag-Smit and Smit, 2020; Katou *et al.,* 2020). In light of these debates, it is important to understand individual's interpretation of HRA practices (Gal *et al.,* 2020; Giermindl *et al.,* 2021), especially considering monitoring and data collection processes (Ball, 2010; Khan and Tang, 2016).

In this regard, academics provided theoretical and practical guidance for the development of transparent, fair, and ethical HRA practices (e.g., Green, 2017; Giermindl *et al.,* 2021). Nevertheless, data collection and monitoring processes for HRA are often one-sided, with employees that are unaware of its execution and objectives (Gal *et al.,* 2020). Additionally, due to imbalance of power in the contractual relationship, employees are often forced to provide their personal data and information to their organizations, raising ethical, privacy, and legitimacy concerns (e.g. Gal *et al.,* 2020; Chatterjee *et al.*, 2021; Tursunbayeva *et al.,* 2021). More specifically, datafication of personnel has been indicated by scientific literature (Ball, 2010; Newman *et al.,* 2020; Gal *et al.,* 2020) as one of the main issues that employees may perceive when their organizations implement HRA. Datafication refers to the process of transforming specific phenomena into data streams so that they can be tabulated and analysed, enabling the application of analytics techniques (Mayer-Schonberger and Cukier, 2013; Couldry and Yu, 2018). Personnel datafication, thus, reflect a psychological phenomenon affecting employees experiencing data collection and monitoring processes (Todolí-Signes, 2021), shaping their perceptions of workplace surveillance and analytics practices (Bertolotti et al., 2020). Individuals participating in data collection processes, indeed, may ultimately believe that employee datafication leads to a reduction in their qualitative characteristics and complexities, reducing in turn perceived trustworthiness, transparency, and fairness in organizational decisions (Newman *et al.,* 2020).

Despite individuals' interpretation of HRA has started to be recognised in academic literature, the issue of how employees perceive, attribute meaning, and react to HRA still received limited attention (Ball, 2010; Khan and Tang, 2016; Newman *et al.,* 2020). On the other hand, an important line of research in the HR management field has focused on employees' perceptions, demonstrating that employees form different attributions regarding management's motives for implementing specific HR practices (Nishii *et al.,* 2008).

More specifically, studies in this field suggest that employees form benevolent or malevolent attributions according to the intention they attribute to the managerial decisions to implement an organizational practice (Montag-Smit and Smit, 2020). Furthermore, academics demonstrated that different attributions predict relevant individual- and organizational-level outcomes (e.g. Nishii *et al.,* 2008; Van De Voorde and Beijer, 2015), emphasising again the need to further understand employees' response to HRA practices (Khan and Tang, 2016; Gal *et al.,* 2020; Newmann *et al.,* 2020; Giermindl *et al.,* 2021).

Based on this theorizing, this study has two objectives. First, we analyse how employees form different attributions – both malevolent and benevolent – on the data collection and monitoring processes implemented for developing HRA practices. In this regard, we considered the role of information and personal beliefs, identified by previous research (Heider, 1957; Kelley and Michela, 1980) as important antecedents of individuals' attributions. Second, we investigate employees' emotional reactions to HRA processes, analysing the effect of personal beliefs and attributions on their fear of being datafied.

Overall, this paper provides three main contributions. First, we expand existing knowledge on HRA by demonstrating that information sharing practices and legitimacy concerns are related to employee's benevolent and malevolent attributions on data collection and monitoring process. Second, we highlight the fundamental role of employee's perceived legitimacy, both as a mediator of the relationship between information sharing practices and attributions and as antecedent of employees' fear of being datafied. Finally, we demonstrate that benevolent attributions mediate the relationship between legitimacy concerns and the fear of datafication. These results suggest that the information context in which data collection processes are embedded as well as their perceived legitimacy influence employees' attributions, and thus, their emotional reaction to HRA. In the long term, attributions and emotions can have important consequences on employees' outcomes (Nishi et al., 2008), affecting HRA development and organizational performance (Hewett et al., 2019).

2. Theoretical background and hypotheses

Recent research (Tursunbayeva *et al.,* 2018; Gal *et al.,* 2020; Chatterjee *et al.*, 2021; Tursunbayeva et al., 2021; Todolí-Signes, 2021) increasingly discussed the ethical and privacy implications of HRA, focusing on possible risks and concerns for employees (Giermindl et al., 2021). Although most of these studies are reviews or conceptual papers, they emphasised the importance of considering employees in the theoretical and managerial discussion on HRA (Gal *et al.,* 2020; Giermindl *et al.,* 2021). In this regard, Khan and Tang (2016) investigated how individuals perceive and attribute meaning to analytics practices, testing their effect over employees' affective organisational commitment. Newmann *et al.* (2020), then, focused on employees' evaluations of analytics- and algorithmic-based decisions, demonstrating that individuals perceive these decisional process as reductionistic and less accurate. Besides these contributions, to the best of our knowledge, research has no further provided empirical evidence on employee perceptions, interpretations, and attributions on HRA.

Drawing inspiration from prior research on HRA (i.e. Khan and Tang, 2016; Newman *et al.,* 2020) and employee attribution (i.e. Hewett *et al.,* 2019; Montag-Smit and Smit, 2020), thus, we developed our theoretical model integrating Human Resource Systems Strength (HRSS) (e.g. Bowen and Ostroff, 2004), signalling (e.g. Ehrnroorth and Bjorkman, 2012), information processing (Fiske and Taylor, 1991), and HR attributions theories (e.g. Nishii *et al.,* 2008; Sanders *et al.,* 2021).

More specifically, HRSS research explains that, in order to build an effective system of HR practices, firms need to operate on two system dimensions: *content* and *process* (Bowen and Ostroff, 2004; Boon *et al.,* 2019). The *content* dimension refers to the set of specific organisational practices implemented to achieve specific objectives. In this regard, it is crucial for organizations to create a coherent and consistent system of practices (Katou *et al.,* 2014) aligned with their strategic goals and values (Boselie *et al.,* 2005). Furthermore,

researchers stressed that the same organisational practices could lead to "broadly varying" employee perceptions and interpretations (Katou *et al.,* 2014), resulting in different behaviours and reactions (Takeuchi *et al.,* 2009). This heterogeneity in individual cognitive processes brings a further challenge to organisations (Nishii *et al.,* 2008), which need to create the appropriate conditions for a clear and shared understanding of the system's content (Bowen and Ostroff, 2004). The *process* dimension, thus, refers to the way policies and practices are communicated to employees (Li *et al.,* 2011) or to the features of the system that send signals to employees, enabling them to interpret the reality and understand the desired responses (Bowen and Ostroff, 2004; Katou *et al.,* 2014).

Rooted into these premises, signalling theory defines organizations as a complex communication system that sends implicit and explicit signals to their employees (Guest *et al.,* 2020), affecting their perceptions, attributions, and behaviours (Guest *et al.,* 2020). More specifically, literature demonstrated that HR practices are signalling functions that send continuous and distinctive messages to employees (Bowen and Ostroff, 2004; Rehmani *et al.,* 2012), who use them to understand organisational intentions and attribute meaning to their work situation (Nishii et al., 2008). These signals can be explicit and clear but also be unintentional and subjected to different individual interpretation (Rousseau, 1995). In this regard, information processing theory details how employees perceive, interpret, and attribute meanings to organisational practices and processes, describing three main stages (Sanders *et al.,* 2021). First, individuals receive signals from the organization and decide which ones to pay attention to. Second, they categorize information according to their prior experiences and beliefs. Third, they interpret information and signals forming attributions.

Finally, HR attribution theory (e.g. Nishii et al., 2008) explains the cognitive processes that led individuals to form different attributions to understand the motives behind organizational practices and processes (Hewett et al., 2019). These cognitive and attributive processes are performed to satisfy individual basic need of interpreting the reality, attaching meanings to events (Heider, 1958). Research classified employee's attributions along several dimensions (Nishi *et al.,* 2008; Montag-Smit and Smit, 2020), depending on whether the intentions behind the implementation of organizational practices are considered internal (e.g. managerial choices) or related to external causes (e.g. external requirements). Focusing on internal attributions, we leverage the classification adopted by Montag-Smit and Smit (2020), which distinguish employee's attributions in benevolent and malevolent. Individuals form benevolent attributions when they believe that the practice is implemented with benign intentions (e.g. increase their wellbeing). On the other hand, malevolent attributions are formed when the practice is considered to be implemented for instrumental and managerial goals (e.g. cost savings, control, or exploitation).

Scholars increasingly applied attribution theory to further understand how employees attribute meaning to organisational practices, analysing attributions' antecedents and outcomes. In this regard, prior studies on attributional antecedents (Heider, 1957; Kelley and Michela, 1980) explained that individuals form attributions depending on the information available to them, their personal beliefs, and their motivations. Furthermore, literature examined the effects of different HR attributions on individual-level outcomes, including turnover intention (Tandung, 2016) and organizational citizenship behaviour (Korsgaard *et al.,* 2002). Additionally, according to cognitive-emotional process (Lazarus, 1991) and affective events theory (Weiss and Cropazano, 1996), individual's emotions emerge as a consequence of individuals cognitive evaluation of given situations or events. In this regard, recent research has demonstrated the relevant role of attributions in explaining the relationship between individuals' perception, beliefs, and emotions (e.g. Tzafrir and Hareli, 2009).

Rooted on these premises, in the following sections we will define the theoretical model depicted in Figure 1. More specifically, we consider information (i.e. information sharing practices) as antecedent to employee's attributions about HRA data collection processes, which is mediated by their personal beliefs (i.e. legitimacy concerns). Then, we investigate the emotional reaction to the data collection and monitoring processes, analysing the effect of beliefs (i.e. legitimacy concerns) over the fear of being datafied and the mediating effect of attributions.
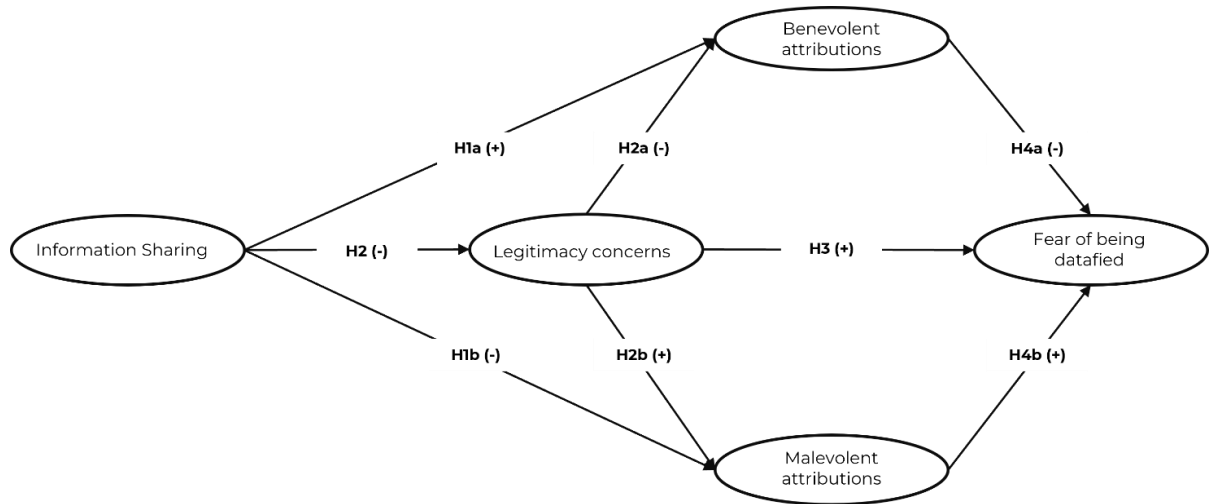

Figure 1. Hypothesised model.

2.1. *Information sharing practices as an antecedent of benevolent and malevolent attributions*

Information sharing practices is one of the practices constituting High-Involvement Work Systems. Information sharing refers to the extent to which a company distributes information to its employees regarding its processes, policies, work-related goals, and future plans (Pfeffer, 2005). Previous research agrees that information sharing practices enable employees to further understand organizational decisions, reducing their feelings of uncertainty and engaging them in appropriate behaviours when pursuit desired business goals (Ogbonnaya and Valizate, 2014). In order to function and make accurate attributions about work situations, indeed, employees need adequate and unambiguous information about the organisation and its practices (Bowen and Ostroff, 2004; Boon *et al.,* 2019).

In the context of HRA, firms often fail in setting up direct communication strategies to inform their employees about the implementation of analytics processes, including information about the data that will be collected and how they will be used (Gal *et al.,* 2020; Tursunbayeva *et al.,* 2021). Thus, how do employees attribute meanings to data collection processes in absence of direct communication on HRA? In these organisational settings, employees have limited (or do not have) direct information about the stimulus (i.e. data collection process) and, thus, use available information as a signal of the general organisational tendency to be transparent and fair with respect to its processes, plans, and goals (Ehrnroorth and Bjorkman, 2012; Katou *et al.,* 2014). Thus, information sharing practices become particularly relevant for employee's understanding and interpretation of managerial decisions (Ogbonnaya and Valizate, 2014).

Considering the HRA process of collecting employees' data, thus, we expect that, when individuals perceive that their organization share information about its practices, goals, and plans, this provides a signal to the employees that the organization has positive and genuine intentions, which in turn lead to benevolent attributions for HRA data collection processes. On the contrary, when employees perceive little (or none) information to be shared by their organization, the signal is that the organization might have instrumental goals, resulting in malevolent attributions. Thus, we hypothesize as follow:

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Hypothesis 1a. Information sharing practices are positively related to benevolent attributions on HRA data collection processes.

Hypothesis 1b. Information sharing practices are negatively related to malevolent attributions on HRA data collection processes.

2.2. *Perceived legitimacy and attributions*

The datafication of personal information touches on most areas of life (Mayer-Schonberger and Cukier, 2013) permeating also organizational boundaries. As more firms realize the potential in collecting and processing employee's data, privacy concerns are growing among workers (Bradley *et al.,* 2006; Ball, 2010). More specifically, information privacy embodies a perceived legitimacy component, which reflects one's belief in the extent that their organization's personal information gathering practices have violated one's expectations of legitimate conduct (Alges *et al.,* 2006; Bradley *et al.,* 2006).

Individual beliefs can be defined as "mental representations of the nature and workings of the self, of their relationships, and of their world" (Dweck, 2008), which in turn provide individuals with a framework for experience and action. Kelly and Michela' (1980) explained how, in developing attributions, people engage in an information-seeking process, looking for information to make sense of their environment. Moreover, they revealed that personal beliefs not only predict the attributions but are also affected by the use of relevant information.

Thus, we hypothesize that employees will use the information they receive from their organization to form beliefs about data collection processes and that these beliefs mediate the relationship between information sharing practices and attributions. More specifically, we assume that the quantity and quality of information received by employees from their organization will contribute to the shaping of their beliefs about the data collection process being legitimate or illegitimate, which in turn determines employees' attributions. Accordingly, we hypothesize as follows:

Hypothesis 2a: Legitimacy concerns mediate the positive relationship between information sharing practices and benevolent attributions on HRA data collection processes.

Hypothesis 2b: Legitimacy concerns mediate the negative relationship between information sharing and malevolent attributions on HRA data collection processes.

2.3. *Perceived legitimacy, employee's attributions, and fear of datafication*

Data-driven technologies are increasingly gathering and processing data across organizations and their HR departments (Ball, 2010; Schafheitle *et al.,* 2020). In this regard, datafication models not only allows sophisticated information analyses, but also poses the risk of reducing the complexity of those information to pure quantitative data (Jens-Erik Mai, 2016; Newman *et al.,* 2020). Given the new possibilities provided by digitalization to collect, analyse, and interpret a huge variety of personal data, thus, we claim that not only employees' perceptions but also their emotional reactions are at stake.

According to cognitive emotion theory (Lazarus, 1991), beliefs are one of the major antecedents and determinants of emotions (Frijda *et al.,* 2000). More specifically, emotions are the result of how individuals believe the world should be, how events are believed to come about, and which implications events are believed to have (Frijda, 1986; Lazarus, 1991). Following this traditional cognition-emotion schema (Lazarus, 1991), we theorize that employees' beliefs of whether data collection and monitoring processes are legitimate or not are further associated with employees' emotional reactions, including fear, anger and happiness. In this regard, affective events theory provide support that fear, as one of the basic emotions, is a powerful predictor of individuals' behaviours (Weiss and Cropazano, 1996).

Thus, aligning with prior studies that explore the cognition-emotion relation, we focus on fear as employee emotional reactions to data collection and monitoring processes. More specifically, we hypothesize that, when employees believe that the organization is collecting personal data for illegitimate or instrumental purposes, they will respond with negative emotions - i.e. fear of being datafied. We theorize that this specific emotional state occurs when employees feel afraid that behaviours and human characteristics can be objectified by their organization, and, thus reduced to quantitative data (Bertolotti *et al.,* 2020; Newman *et al.,* 2020). Therefore, a further hypothesis is the following:

> Hypothesis 3: Legitimacy concerns about HRA data collection processes are positively associated with employee's fear of datafication.

Additionally, according to the cognition-emotion schema, cognitive processes often start with the perception of a stimulus or event, continue with the processing of specific information according to personal beliefs and with the causal attribution of that stimulus or event, and end with the individual emotional reaction (Frijda, 1986).

Thus, according to attribution and cognitive theories, we further hypothesize that employees' attributions on data collection process mediate the relationship between legitimacy concerns and the fear of being datafied. In this regard, we theorise that individuals' beliefs of whether data collection processes are legitimate or illegitimate (I.e. legitimacy concerns) influence individuals' attributions with respect to the motives behind data collection (i.e. benevolent and malevolent attributions), which in turn determines their fear of being datafied. More specifically, we expect that when employees believe that the organization cares about its employees and is collecting data to support them/increase their wellbeing, this benevolent attribution will mitigate the impact of legitimacy concerns on their fear of being datafied. On the contrary, when employees believe that the organization is collecting data to exploit or control them, this malevolent attribution will foster the impact of illegitimacy beliefs on their fear of being datafied. Thus, our last set of hypotheses are the following:

> Hypothesis 4a: Benevolent attributions on HR Analytics data collection process mediate the positive relationship between legitimacy concerns and employee's fear of datafication.

> Hypothesis 4b: Malevolent attributions on HR Analytics data collection process mediate the positive relationship between legitimacy concerns and employee's fear of datafication.

3. Method

Sample and Procedure

Data have been collected administering a questionnaire in August 2022 in an Italian company with around 500 employees (i.e. referred to as *Artemis* for privacy reasons), which provide a wide range of digital services in different industries. *Artemis* has been selected for two main reasons. First, in the last 3 years the company collected employee's data, opinions, and information through different channels to implement HRA practices on employee's wellbeing and set up corrective initiatives. Considering that *Artemis* has been founded in 2018, it is an interesting case of HRA adoption over time. Second, similar to other organizations (Gal et al., 2020; Giermindl *et al.,* 2021), the firm has not explicitly declared its use of HRA to personnel, providing employees with limited direct information on data collection and monitoring processes. The choice of *Artemis* ensures that the effect of information sharing practices and legitimacy concerns on employee's attributions and emotions about data collection processes for HRA is not affected by other communication variables.

The questionnaire has been administered to employees through an online platform and with the support of *Artemis* HR department, explaining the main research objectives and ensuring them on the anonymity of the gathered data. The questionnaire has been preliminary tested with 5 employees in order to ensure questions comprehensibility. The final questionnaire has been articulated in three sections. The first included

demographic variables. The second included questions on the individual perception of organizational practices and processes implemented in *Artemis*. In the last section, we collected employee's attributions and emotional reaction to the HRA data collection process. The questionnaire collected 259 complete answers out of 484 employees, obtaining a response rate (53,5%) that ensures representativeness of the entire population. Table I represents the descriptive statistics of our final sample.

Measures

Information sharing practices exist when individuals perceive that their organization share with them information about its practices, goals and plans. The construct has been measured using the 5-item scale created by Riordan et al. (2005) and based on previous research (e.g., Vandenberg *et al.,* 1999). The construct had a good Cronbach α value (0.87). A sample item is "*Company practices and procedures are clearly communicated to employees*".

Legitimacy concerns of information practices reflect the individual's belief that the organizational processes of collecting and handling employee's personal data, information, and/or opinions violated her expectations of legitimate conduct (Alge *et al.,* 2006). The construct has been measured using a 5-item scale created by Eddy *et al.* (1999) and used in several works (e.g., Alge *et al.,* 2006; Khan and Tang, 2016), obtaining a good Cronbach α (0.85). A sample item is "*The way that my organization monitors its employees makes me feel uneasy*".

Benevolent and malevolent attributions represent positive and negative individual's explanations of the reasons behind the implementation of specific organizational practices and procedures (Nishi *et al.,* 2008). Since there is not a specific and tested scale for employee's attributions about HRA data collection process, the construct has been developed using the procedure proposed by Montag-Smith and Smith (2020). The method is based on the administration of an open-ended questionnaire to a group of over 50 employees. The group is different from the sample used to test the hypothesized model in order to not influence respondents when answering the construct items. Thus, the questionnaire has been sent to 150 employees from different organizations operating in Italy, collecting 77 responses. Following Montag-Smit and Smit (2020) recommendations, the questionnaire has been divided in two main sections. In the first one, we proposed a first questions to respondents: Q1. *"What comes to mind when you hear the organizational process of collecting employee's data, information, and opinions?"*. Then, in the second one, we asked them: *Q2. "Why do organizations collect employee's data, information, and opinions?"*. Results for Q1 suggested that people spontaneously make attributions about the reasons why organizations collect employee's personal data – i.e., the 35% of respondents made attributions. For Q2, responses have been coded by two of the authors independently. In this phase, we identified eight main themes in the responses, mainly corresponding to attributions categories already identified by previous research (e.g. Nishi *et al.,* 2008; Hewett *et al.,* 2019). Accordingly, we built two different measures, one for benevolent and one for malevolent attributions. More specifically, five items have been used to evaluate benevolent attributions, all derived from previous validated scales (Nishi *et al.,* 2008; Hewett *et al.,* 2019). Then, four items have been used for malevolent attributions, three derived from previous validated scales (Nishi *et al.,* 2008; Hewett *et al.,* 2019) and one adapted to evaluate attributions related to the organization's control over employees (i.e. "*My organization collects employee's personal data, information, and opinions to control employees*"). According to previous attributive dimensions (Hewett *et al.,* 2019), the selected items assess the commitment dimension for benevolent attributions, and the cost saving, employee's exploitation, and employee's control dimensions for malevolent attributions. A sample item for benevolent attributions is "*My organization collect employee's personal data, information, and opinions to promote the wellbeing of employees*", while a sample item for malevolent attributions is "*My organization collect employee's personal data, information, and opinions to reduce operational costs*". Both scales, validated through exploratory and confirmatory factor analysis, obtained great Cronbach α values, equal to 0.91 and 0.88.

Fear of datafication is an emotional state of employees that occurs when they are exposed to the datafication process, which has been defined as the process of transforming life-processes into data (Couldry and Yu, 2018). In academic literature there are no validated scales for evaluating emotional states related to the datafication phenomena. Thus, we created an ad-hoc construct using again the procedures proposed by Montag-Smit and Smit (2020). More specifically, we included a third and fourth section with other two open-ended questions in the same questionnaire administered for benevolent and malevolent attributions. In the third section, we firstly provided respondents with a definition of datafication. Then, we proposed them the first open-ended question: Q1. *"What comes to mind when you hear the word datafication?"*. In the fourth section, then, we asked them: Q2. "*What are your main concerns if you think at the datafication of employees?"*. For Q1, 42% of responses were negative thoughts and/or feelings, confirming possible individual concerns related to personnel datafication. For Q2, two of the authors independently red and analysed all responses, coding them in different categories through an iterative process. Responses have been organized in four categories. A4-item scale has been developed in order to evaluate employee's fear of being datafied. In this phase, open-ended responses have been used to define and refine the items. Annex I and Annex II report coding examples and the final scale in English. The final construct presented a great Cronbach α value (0.92), confirming a good scale reliability and solidity.

All items were adapted and translated in Italian and were rated on a 7-point Likert, from "Totally disagree" (1) to "Totally agree" (7). First, we translated the items of the scales from English to Italian. Second, we asked a bilingual translator to back-translate the items to English in order check the correspondence with the original formulation. Finally, we pilot-tested the translated items on five experts. Each participant was asked to rate the clarity of the instructions and the items of the scale. A minimum inter-rater agreement among the sample was greater than 80% (Sousa & Rojjanasrirat, 2011).

For what regards *control variables*, in line with prior research on HR attributions and HR Analytics (Van de Voorde et al., 2015; Khan and Tang, 2016; Sanders et al., 2021), we included in the model six socio-demographic control variables – i.e., age, gender, educational level, seniority, role (employee or manager), and job tenure.

Statistical analysis

Stata 14 was used for all the five phases of our data analysis. First, we performed factor analysis to evaluate our measurement models. Factor analysis has been defined as a collection of methods used to examine the relationship between a number of underlying measured indicators and a certain number of latent constructs (Brown, 2006). More specifically, we conducted an Exploratory Factor Analysis (EFA) to identify the underlying constructs. This first analysis was particularly useful to ensure that the items constituting the fear of datafication construct composed a latent variable. In this phase we also used the Harman single-factor method to test the possible common method bias. Second, we performed a Confirmatory Factor Analysis (CFA) to test the distinctiveness of the construct. Third, descriptive statistics have been performed to provide a general overview of the variables included in the model. Fourth, we used structural equation modelling technique to test the hypotheses and the relationships between latent variable (Muthén and Muthén, 1998-2015). More specifically, in order not to exclude a priori possible promising results, we decided to adopt the procedure proposed by Zhao et al., (2010) to analyse our mediating effects. We used the Comparative Fix Index (CFI), the Tucker-Lewis index (TLI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA) to test model's fit.

4. Results

Exploratory and Confirmatory Factor Analysis

EFA and CFA have been performed to validate and confirm the appropriateness of the scales used in this research. First, we performed an EFA to verify that the number of constructs assumed at the theoretical level

is also supported by available data. All factor loadings values are above the minimum (0.7), while uniqueness values are all below the suggested value of 0.6 (Raykov and Marcoulides, 2000). Second, we performed the CFA considering five models with various numbers of factors. The fit indexes of the models are presented in Table II and confirm that the five-factor is the best model for the measurement part. The factor loadings of all items were significant at $p < 0.01$.

Common method variance

Items have been designed to be specific, concise and simple to comprehend with the support of the company's HR department, removing ambiguities from the questionnaire. However, self-reported measures may lead to common-method bias (Podsakoff et al., 2012). Thus, the measurement items for all variables were subjected to an EFA using the Harman single-factor test method. The maximum unrotated factor variance interpretation rate was 35% (less than 50%), indicating that the common method bias of the sample data was not a problem in our study (Podsakoff et al., 2003).

Descriptive statistics

Means, Standard Deviations (SDs) and the correlations between constructs are presented in Table III.

Path analysis

The structural model of the relationship between constructs is represented in Figure 2. First, we studied the directs effects of the information sharing practices on benevolent and malevolent attributions through the direct structural model that evaluated the relationships without considering the mediating role of legitimacy concerns. The results demonstrated that information sharing practices have a positive and significant effect on benevolent attributions ($\beta = 0.201$, $p < 0.01$), and a positive but non-significant effect on malevolent attributions ($\beta = 0.071$, $p > 0.05$). Thus, results confirm hypothesis 1a but not hypothesis 1b.

Then, our investigation revealed that information sharing practices significantly predict legitimacy concerns ($\beta = -0.366$, $p < 0.001$), which in turns significantly influence benevolent ($\beta = -0.471$, $p < 0.001$) and malevolent attributions ($\beta = 0.343$, $p < 0.001$). This indicates how employee's legitimacy concerns mediate the relationship between information sharing practices and attributions, according to the procedure explained by Zhao *et al.,* (2010). More specifically, for benevolent attributions the results show a partial mediating effect of legitimacy concerns, explaining the 48% of the total effect. For malevolent attributions, results demonstrate that there is a significant indirect effect between information sharing practices, employee's legitimacy concerns, and malevolent attributions, fulfilling the requirement to demonstrate mediation (Zhao *et al.,* 2010). These findings reveal an indirect-only mediation effect (Zhao *et al.,* 2010) of legitimacy concerns on the relationship between information practices and malevolent attributions. The application of the Sobel test (see Annex III) confirmed both the partial ($z = 4.172$, $p < 0.001$) and the indirect-only ($z = -3.60$, $p < 0.001$) mediation effects described above. Thus, hypothesis 2a and 2b are confirmed.

Third, fear of datafication is affected by legitimacy concerns ($\beta = 0.419$, $p < 0.001$) and benevolent attributions ($\beta = -0.186$, $p < 0.01$). On the other hand, malevolent attributions have a non-significant effect ($\beta = 0.014$, $p > 0.05$) over employee's fear of datafication. The direct effect of perceived legitimacy concerns on employee's fear of datafication has been studied through the direct structural model that evaluated the relationships without considering the mediating role of benevolent and malevolent attributions. Thus, our results demonstrated that employee's legitimacy concerns are positively and significantly related to the fear of datafication ($\beta = 0.431$, $p < 0.001$), supporting hypothesis 3.

Fourth, results shows that benevolent attributions partially mediate the direct relationship between employee's legitimacy concerns and the fear of datafication, explaining the 17% of the direct effect. This confirms hypothesis 4a. On the other hand, as explained before, malevolent attributions have a non-significant and positive effect over employee's fear of datafication ($\beta = 0.014$, $p > 0.05$). The application of

the Sobel test (Annex III) confirmed the partial mediation effect of benevolent attributions (z = 2.363, p < 0.05) and demonstrated that malevolent attributions do not mediate the relationship between perceived legitimacy of information practices and the fear of datafication (z = 0.221, p > 0.05). Thus, hypothesis 4b is not supported. Our results revealed a significant effect of seniority on benevolent attributions (β = 0.021, p = 0.042) and of role on malevolent attributions (β = -0.55, p = 0.001).

The proposed model (Figure 2) obtained good fit indices (χ2(342) = 637.464, CFI = 0.932, TLI=0.922, SRMR = 0.078, RMSEA = 0.058), indicating a good fit to the data. The model obtained better fitness than the direct model without the mediating effect of legitimacy concerns of information practices (χ2(343) = 667.747, CFI = 0.925, TLI=0.915, SRMR = 0.112, RMSEA = 0.060) and then the direct model without the mediating effect of attributions (χ2(344) = 710.801, CFI = 0.916, TLI=0.904, SRMR = 0.115 and RMSEA = 0.064).
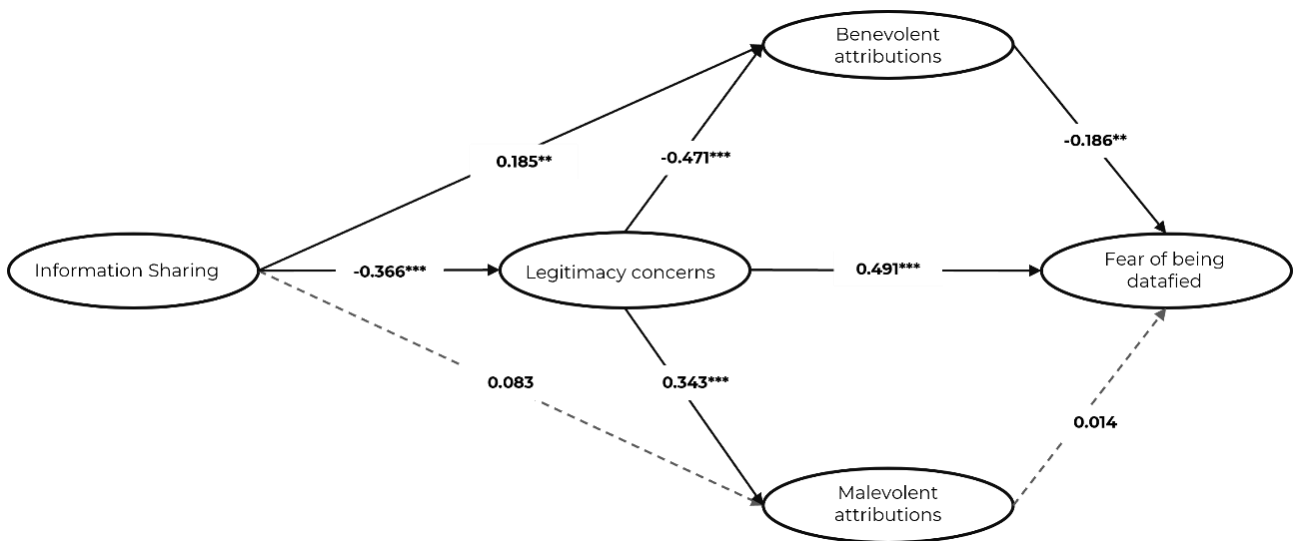

Figure 2. SEM results of the hypothesized model – i.e., n=259.
Notes: The figure shows the standardized coefficients and the significant levels – i.e., *p<0.05; **p<0.01; p***<0.001

5. Discussion

The theoretical and practical contributions and the limitations of this papers, together with directions for future research, are further discussed in the following chapters.

5.1. Theoretical contributions

This paper combines HRA (e.g. Khan and Tang, 2016), HRSS (e.g. Bowen and Ostroff, 2004), information processing (e.g. Fiske and Taylor, 1991), signalling (e.g. Ehrnroorth and Bjorkman, 2012), and HR attribution theories (e.g. Nishii *et al.,* 2008) in order to investigate employee's cognitive process and emotional reaction to data collection and monitoring processes, enriching existing empirical evidence on employee's interpretation of HRA (e.g. Khan and Tang, 2016; Newman *et al.,* 2020). Our findings produce four main theoretical contributions.

First, we show that employees subjected to data collection and monitoring processes for HRA form different attributions (i.e. benevolent and malevolent), assigning both instrumental and care intentions to the same organisational practices. Although the declared goal of *Artemis* was to implement HRA practices to enhance personnel wellbeing and performance, employees attributed to data collection and monitoring processes also exploitation, cost reduction, and control meanings. Thus, our results confirm that individual attributions may differ from original managerial intentions (Bowen and Ostroff, 2004; Boon *et al.,* 2019), arising in

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employees' negative attributions and emotional state (Khan and Tang, 2016). In this regard, we emphasise the need to further investigate the information and communication processes embedded in the development of HRA, focusing on employees' perceptions, concerns (e.g. privacy, fairness, nudging), and reactions. Indeed, prior research demonstrated that individual attributions and emotions influence the effective development of organisational practices (Coleman, 1990; Minbaeva *et al.*, 2012), determining individual behaviours and possible resistances (Ball, 2010; Khan and Tang, 2016).

Second, we show that employees develop attributions on data collection and monitoring processes despite the absence of a clear and explicit organisational communication on the functioning, objectives, and purposes of HRA processes. In this regard, our results confirm the idea that the exposure to analytics processes is enough to generate negative attributions and emotions in employees, regardless of the managerial intentions behind HRA practices (Khan and Tang, 2016; Boon *et al.,* 2019). This is particularly interesting considering that, nowadays, most organizations are struggling in finding ways to communicate HRA to their personnel (Tursunbayeva *et al.,* 2021), with data collection and monitoring processes that are often one-sided, obfuscated, and only partially visible to employees (Gal *et al.,* 2020). In this regard, our research indicates that attributions and emotions arise in employees from a conscious and unconscious processing of available information and personal beliefs. More specifically, we reveal that employees' benevolent and malevolent attributions depend on the presence of information sharing practices and the perceived legitimacy of data collection processes.

For what regards information, we demonstrate that information sharing practices – existing when employees perceive that their organization is sharing with them information about its processes, goals, and future plans (Riordan *et al.,* 2005) – influence employee's benevolent and malevolent attributions on data collection and monitoring processes, aligning with previous research on HRA (e.g. Khan and Tang, 2016) and HR attributions (e.g. Van De Voorde and Beijer, 2015; Sanders *et al.,* 2021). This can be explained by the fact that employees use the signals and the information received from their organisation (Fiske and Taylor, 1991; Connelly et al., 2011; Bower and Ostroff, 2004) to generate their own interpretation of the managerial intentions behind organisational processes (Guest *et al.,* 2020). Prior research (e.g. Guest *et al.,* 2020; Sanders *et al.,* 2021) demonstrated indeed that information and consistent signals regarding organisational plans and objectives are fundamental for employees to participate, understand, and feel involved in the firm, aligning personal beliefs and attributions with organisational intentions (Bowen and Ostroff, 2004; Boon *et al.,* 2019).

For what regards individual beliefs, our findings demonstrate that the effect of information sharing practices on attributions is partially and completely mediated by the perceived legitimacy of data collection processes (i.e. beliefs), respectively for benevolent and malevolent attributions. This may be due to the fact that employees who do not have enough information and understanding regarding the firm and its strategic objectives fail to decipher the purpose of organisational processes (Gal *et al.,* 2020), and, thus, the legitimacy behind data collection and monitoring (Khan and Tang, 2016; Tursunbayevae et al., 2021). In this regard, prior research (Tursunbayeva et al., 2018; Hamilton and Sodeman, 2019) explained that when employees do not understand the motives behind the collection of personnel data, they perceive it as illegitimate and invasive of their privacy. In turn, legitimacy and privacy concerns negatively influence employees' attributional, and emotional processes (Gal *et al.,* 2021), resulting in negative individual and organisational outcomes (Hewett et al., 2019). Information sharing practices, thus, are fundamental to signal to personnel the organisational general objectives of data collection and monitoring processes, reducing employees' legitimacy concerns (Gal *et al.,* 2020), and preventing employees from perceiving analytics as instrumental practices (Sewell and Barker, 2006). In this regard, our results demonstrate that legitimacy concerns are a consistent mediator for benevolent attributions, but also that there are probably omitted mediators explaining the significant direct effect (Zhao et al., 2010). Thus, other relevant mediators need to be included in future research.

Third, our research demonstrates that individual beliefs and attributions significantly influence employees' emotional reactions to data collection processes, enriching prior research on workplace surveillance (e.g. Ball, 2010) and datafication phenomena (e.g. Newman *et al.,* 2020). These results align with academic literature reporting that individual emotions are the result of their cognitive processes of evaluations of significant events (Weiss and Cropazano, 1996; Lazarus, 1991). Those processes are based on available information, personal belief, and the meanings individuals assign to events (Weiner, 1985). More specifically, our model demonstrates that employees' legitimacy concerns have a fundamental effect on their emotional reactions to data collection processes and, in particular, on their fear of being datafied. The individual belief that personnel data are collected for illegitimate purposes, thus, has a huge influence on employees' fear of being objectified, reduced to quantitative information, and neglected in their human characteristics (Newman et al., 2020). Prior research stated indeed that the erosion of workplace privacy, through surveillance and monitoring processes, undermines the psychological, cognitive, and emotional processes of employees (Khan and Tang, 2016; Gal et al., 2020; Todolì-Signes, 2021), who fear the excessive personnel "datafication and quantification" (Falletta and Combs, 2020). Negative emotions and attributions, in turn, can affect employees' wellbeing, including stress, anxiety, and burnout (Todolì-Signes, 2021).

Finally, our findings show that benevolent attributions partially mediate the relationship between employee's legitimacy concerns and the individual fear of being datafied, suggesting a buffer effect of the former on the latter. In the context of HRA, this indicates that employees perceiving legitimacy in the organizational request for data attribute positive motivations to the data collection process. These results can be explained by the fact that employees- and care-oriented practices must necessarily consider qualitative and human-related factors (e.g. employees' wellbeing), reducing the possibilities of being reduced to numbers. Despite these results, it is important noticing that benevolent attributions explain only a small portion of the relationship between employee's perceived legitimacy and fear of datafication, and thus, other possible mediators can be included in future models.

On the other hand, the role of malevolent attributions in our findings is less clear. Despite the fact that the "reductionism" phenomenon has often been associated with unfair and simplistic use of data by the organization (Newman et al., 2020), our results indicate a non-significant relationship between malevolent attributions and the fear of datafication. This could be explained by previous studies on emotions (e.g. Izard, 1993) arguing that individual emotional reaction to an event could also depends on non-cognitive processes. These results leave room for research to further analyse the effect of negative attributions (and coercive purposes) on personnel emotional reaction. Although perceptions, beliefs, and attributions have been recognised as logical antecedents of emotions, indeed, the existence of different degrees of cognitive involvement generates different emotional experiences (Roseman, 1984; Weiner, 1985). The fear of being datafied, thus, could also depend on other individual (e.g. attitude towards data and analytics, political orientation, etc.) or contextual variables (e.g. trust in the organization, trust in the supervisor, etc.), which could be analysed in future studies.

5.2. Practical implications

This research provides significant contributions to managers interested in HRA. First, we remember practitioners to consider employees' cognition during HRA implementation and development. Our results prove that HRA data collection and monitoring processes could be perceived both as coercive and caring practices, depending on the meaning attributed by employees. Thus, firms interested in HRA must pay attention to how data collection processes will be received and perceived by employees, aligning organizational and individual interests in order to avoid negative reactions and counterproductive behaviours.

In this regard, we demonstrate that information sharing practices is an effective lever for introducing HRA processes in organizational settings. This is important since firms that struggle in defining an effective

communication plan to inform employees about HRA (such as *Artemis*) often decide not to clearly explain the motives and purposes behind data collection and analytics processes. However, our research demonstrates that employees still develop attributions and emotions despite the absence of organizational communication, combining available information and personal beliefs in their cognitive processes. More specifically, employees receiving limited information from the organization will believe that data collection processes are illegitimate and will attribute malevolent and coercive meanings. Thus, we suggest that hiding or not communicating analytics processes is not an effective choice for successful HRA implementation. On the contrary, we recommend setting up effective information sharing practices and communication campaigns to send consistent signals to employees regarding the implementation of HRA, explaining the real goals and objectives behind analytics processes.

In addition, our findings show that the data collection process can arouse an emotional reaction in employees. These emotions, if negative, could damage individual work experience and, in the long term, employees' and organizational outcomes. Cognitive and emotional processes are influenced by the information and the perceptions that employees receive and develop over time, considering both HRA processes, firm processes, and other contextual factors (e.g. organizational culture, leadership, etc.). Thus, practitioners need to be aware of the consequences of analytics processes, preventing the possible negative effects on the psychological, cognitive, and emotional states of employees. More specifically, firms interested in HRA should pay attention to both the operative and the emotional dimension of their communication campaigns, ensuring employees about the functioning of analytics processes, their purposes, their ethical implications, and their consequences for individuals.

5.3. Limitations and future research

This paper is not without limitations. First, the measures used in this research are self-reported. In this regard, we performed the Harman single-factor and guaranteed respondents' anonymity to avoid respectively common method bias and social desirability bias. Despite these precautions, self-reported measures retain a degree of error with respect to real phenomena (Podsakoff et al., 2003). Second, this paper adopts a cross-sectional research design therefore causality among the variables included in the model cannot be explored. We thus call for more studies employing a longitudinal design or adopting repeated measures to empirically test causality. Additionally, qualitative research might provide insights on the dynamics occurring during HRA processes implementation. Third, our data have been collected on a single organization. Despite this choice limits the generalizability of our results, focusing on a single organization enable to control for contextual variables. Additionally, *Artemis* is constituted by separated business units that operate in an autonomous way. Future research, however, could conduct a more comprehensive analysis by considering different organisational contexts and including contextual variables in the model (e.g. trust in management, perceive organizational support, organizational culture).

Finally, this paper opens the door to future research on relevant themes for both academics and practitioners. First, further studies could investigate the interaction occurring between HRA and other organisational processes by deepening HRSS theories (Boon *et al.,* 2019). Second, academics could investigate employees' perceptions of other HRA (e.g. change management), analytics (e.g. algorithmic recruitment), and surveillance processes (e.g. real-time monitoring). Third, in light of our findings, it becomes important to deepen the communication of HRA practices, explaining how organizations and their managers can best communicate analytics processes to employees. More specifically, it would be interesting to study individual perceptions and attributions in organisations where HRA has been communicated to employees, analysing which factors determine the success or the failure of communication campaigns. Fourth, future studies could analyse the effects of the fear of datafication on different employees and organizational outcomes (e.g. turnover intention). Lastly, future research could study how individual perceptions, attributions, and behaviours affect HRA emergence, development, and implementation.

6. Conclusions

Responding to the recent call for more empirical research on employee perceptions and attributions (Khan and Tang, 2016; Gal *et al.,* 2020; Newmann *et al.,* 2020; Giermindl *et al.,* 2021), this research provides a cross-sectional study based on SEM technique on 259 workers operating for Artemis, an Italian digital organisation implementing HRA practices over the last 3 years. The research found that employee perceive data collection processes for HRA both as a coercive and caring organisational practice, depending on the information available to employees and the perceived legitimacy of these processes. Furthermore, the legitimacy perceived by employees and their attributions determine their fear of being datafied, treated as a number, and threatened in respect of their human complexities. In this regard, our theoretical and practical contributions bring employee cognitive, attributive, and emotional processes back to the centre of the academic and managerial discussion on the implementation of HRA practices and processes. Future research, however, is still needed to solve the remaining doubts about the relationship between employees and the development of HRA.

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