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SEEING HUMANS AS A DISEASE:
ANTECEDENTS AND CONSEQUENCES OF
OTHER-BIOLOGIZATION

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Abstract

Despite several authors (e.g., Douglas, 1966; Savage, 2007; Sontag, 2002) theoretically examined biologization (i.e., a form of dehumanization that involves the perception of others as infected and contagious) empirical research on this field is still lacking. Starting from different theorizations, the present dissertation sought to provide the first experimental evidence of this phenomenon and expand the knowledge on its possible antecedents and consequences in two different contexts, namely, in the intergroup and work domain.

In the first set of studies (see Chapter 2), we aimed to verify whether feelings of physical disgust, centred on protecting the body from harmful substances, might play a crucial role in biologization towards the other, especially when the target was an outgroup member. Furthermore, we aimed to verify whether attitudes of social distance might be considered a reliable consequence of biological dehumanization. In addition, by employing the *Semantic Misattribution Procedure* (SMP; Imhoff, Schmidt, Bernhardt, Dierksmeier, & Banse, 2011), we aimed to analyse whether biological dehumanization involved an automatic association of an outgroup member with the concepts of disease and contagion. Overall, results showed that feelings of physical disgust (vs. moral disgust) led to other-biologization. In addition, we found that this dehumanizing process had consequences in terms of attitudes of social distance. Moreover, our findings revealed that biological dehumanization involved an unaware cognitive process in which the outgroup was automatically linked to the concepts of disease and contagion.

Considering that biologization has been especially examined from a theoretical point of view within intergroup relations, in the second set of studies

(see Chapter 3), we analysed this process in a different and daily context, that is, in the work domain. In particular, by integrating the literature on "dirty jobs" (e.g., Ashforth & Kreiner, 1999; Hughes, 1951, 1958) with that of dehumanization (e.g., Volpato & Andrighetto, 2015), we investigated whether different types of stigmatized workers would be associated with distinct metaphorical dehumanizing representations. Furthermore, of particular relevance to the present research project, we focused on the relationship between physically tainted workers and biologization. As assumed, results showed that different types of occupational taint were associated with different dehumanizing images of workers. Crucially, we consistently found that degrading work environment perceptions led to increased feelings of disgust towards workers and, in turn, to an increased association of these workers with biological metaphors. Importantly, this pattern did not emerge for the other forms of dehumanization (i.e., objectification and animalization, the consideration of a certain group of people as more similar to objects and animals rather than to human beings), confirming that the relationship between the work environment and feelings of disgust is a peculiar process that triggered only the biological kind of dehumanizing perception.

Riassunto

Sebbene diversi autori (ad esempio, Douglas, 1966; Savage, 2007; Sontag, 2002) abbiano teoricamente approfondito il concetto di biologizzazione (cioè, la percezione degli altri attraverso metafore che richiamano la sfera della malattia e del contagio), la ricerca empirica su questo argomento risulta ancora carente. Partendo dalla letteratura teorica riguardante tale costrutto, con il presente progetto ci si è posti l'obiettivo di fornirne una prima evidenza sperimentale e di espandere la conoscenza relativa ai suoi antecedenti e alle sue conseguenze in due differenti contesti: nelle relazioni intergruppi e in ambito lavorativo.

Nel primo set di studi (si veda il Capitolo 2), abbiamo voluto verificare se il disgusto fisico, relativo alla protezione del corpo da sostanze nocive, avesse un ruolo cruciale nella biologizzazione dell'altro, soprattutto nel caso di un membro dell'outgroup. In aggiunta, abbiamo voluto verificare se le intenzioni comportamentali di distanza sociale potessero essere considerate una conseguenza di tale fenomeno. Attraverso l'applicazione della *Semantic Misattribution Procedure* (SMP; Imhoff, Schmidt, Bernhardt, Dierksmeier, & Banse, 2011), abbiamo inoltre indagato se la biologizzazione potesse manifestarsi attraverso l'associazione implicita di un membro dell'outgroup con i concetti di malattia e contagio. I risultati hanno mostrato che i sentimenti di disgusto fisico (vs. disgusto morale) portano a maggiori percezioni biologizzanti dell'altro e che la biologizzazione ha conseguenze in termini di intenzioni legate alla distanza sociale. Dai risultati è, inoltre, emerso come tale processo si manifesti anche tramite l'associazione automatica e inconsapevole del target di riferimento con i concetti di malattia e contagio.

Considerando che la biologizzazione è stata studiata soprattutto da un punto di vista teorico all'interno delle relazioni intergruppi, nel secondo set di studi (si veda il Capitolo 3), abbiamo analizzato questo fenomeno in un differente contesto, cioè in ambito lavorativo. Nello specifico, integrando la letteratura relativa ai "lavori sporchi" (ad esempio, Ashforth & Kreiner, 1999; Hughes, 1951, 1958) con quella relativa alla biologizzazione e alla deumanizzazione (ad esempio, Volpato & Andrighetto, 2015), abbiamo verificato se diverse tipologie di lavoratori stigmatizzati potessero essere associate a differenti rappresentazioni deumanizzanti. Inoltre, di particolare rilevanza per il presente progetto di ricerca, si è deciso di focalizzare l'attenzione sulla relazione tra i lavoratori fisicamente stigmatizzati e le percezioni di tipo biologistico. Come ipotizzato, i risultati hanno mostrato che differenti tipologie di stigmatizzazione lavorativa sono associate a diverse forme di deumanizzazione. Relativamente alla biologizzazione, dai risultati è emerso che percezioni più degradanti dell'ambiente di lavoro aumentano i sentimenti di disgusto nei confronti dei lavoratori che in quegli ambienti svolgono la propria attività e, a loro volta, tali sentimenti portano a una maggiore associazione dei lavoratori di riferimento con metafore biologiche. Degno di nota è che i risultati da noi osservati non sono emersi per le altre forme di deumanizzazione (cioè, oggettivazione e animalizzazione, rispettivamente la percezione degli altri come più simili a oggetti e ad animali piuttosto che a esseri umani), confermando che la relazione tra ambiente lavorativo e disgusto è uno specifico meccanismo che attiva solo questa particolare forma di rappresentazione deumanizzante.

Introduction

Hirsch and Smith (1988) stated that the use of terms like vermin, pests, and viruses by those with political authority is a clear sign that the society is moving in a genocidal direction. Similarly, Savage (2007) argued that metaphors defining enemies as cancers or viruses exacerbate the perceptions of threat towards outgroup members and provide group members with a justification for collective violence. More recently, Steuter and Wills (2010) revealed that Western mass media often included biological metaphors to describe terrorism and terrorist enemies. Despite the theoretical relevance of these investigations, no previous research has empirically assessed the biological perceptions related to metaphors concerning disease and contagion. For this reason, the present research project aimed to deeply examine the phenomenon of biologization in two different fields: in the intergroup and work domain. In particular, starting from theoretical analyses on biological dehumanization, we sought to provide the first experimental evidence of this phenomenon and expand the knowledge on the possible antecedents and consequences of other-biologization in terms of feelings of physical disgust and attitudes of social distance.

A brief overview of dehumanization will be exposed in Chapter 1 with a specific focus on the process of biologization and historical research, that is, the mainstream line of investigation on this process. In addition, I will present biological dehumanization in combination with the literature on feelings of disgust. I will conclude the first chapter with the research questions. In the following sections, I will present a series of laboratory and online studies through which we aimed to demonstrate that physical disgust represents an important source of biologization towards outgroup members and that attitudes of social

distance may be considered a possible consequence of this phenomenon in the intergroup domain. Then, by employing the *Semantic Misattribution Procedure* (SMP; Imhoff et al., 2011), we aimed to analyse if biological dehumanization involves an automatic association of a human being with the concepts of disease and contagion. Finally, biologization will be presented in the work domain. Theoretical literature on dehumanization and occupational taint (e.g., Davis, 1982; Goffman, 1963; Haslam, 2006; Henson, 1996; Kelman, 1976) suggest indeed that both dehumanization and tasks labelled as "dirty work" involve denying a person identity. Thus, we aimed to demonstrate that different types of stigmatized workers may be associated with distinct metaphorical dehumanizing representations and, of particular relevance to the present research project, that degrading work environments may increase feelings of disgust towards physically tainted workers, which, in turn, may lead to a view of the workers as contagious individuals.

Therefore, the general goal of the present research project is to empirically investigate biologization in the intergroup and work domain. In particular, through the set of studies reported in this dissertation, we aim to shed some light on the most empirically unexplored form of dehumanization and expand its analysis in non-extreme contexts.

1

Dehumanization and biologization

1. Dehumanization: A brief overview

Dehumanization refers to the idea that people are denied their proper humanness and can assume different forms, such as objectification, animalization, and biologization, namely, the consideration of a certain group of people as more similar to objects, animals or viruses rather than to human beings (Haslam & Loughnan, 2014; Volpato & Andrighetto, 2015). Dehumanization is a radical form of outgroup derogation intrinsically linked with conflicts and mainly serves for justifying groups violence and legitimizing the group's status quo.

Allport (1954) was among the first social psychologists to address dehumanization. In Allport's view, this process concerns those individuals or groups perceived as outside the boundaries defined by ethical and moral values. The moral exclusion of individuals or groups by the boundaries of the moral community rationalizes and justifies the perpetration of evil towards them (Volpato & Andrighetto, 2015). This theoretical framework led to the first empirical studies about the combined effect of dehumanization and the sense of personal responsibility. For example, in Bandura, Underwood, and Fromson (1975), a supervisory team was given the power to punish a group of problem solvers with an electric shock for deficient performances. The punishment was administered to the performing targets characterized in either humanistic,

animalistic, or neutral terms. Results showed that dehumanized individuals were treated more punitively than those who had been invested with human qualities. Inspired by these findings, Kelman (1976) conceptualized dehumanization as a perception of victims that weakens the victimizer's restraints on violent behaviours. This dehumanizing perception consists of denial of victims' identity and community, namely, their distinct individuality and their belonging to a network of caring interpersonal relations. Bandura (1999) and Opotow (1990) similarly suggested that dehumanization lifts prohibitions against violence by stripping targets of moral consideration extended to others. Moving beyond the early emphasis on overt dehumanization, research has used innovative approaches to demonstrate a variety of subtle ways in which we can deprive others of full humanity (Kteily & Bruneau, 2017). For example, Leyens and colleagues (2000) showed that individuals are more likely to ascribe to their own group (vs. other groups) complex positive and negative emotions considered "human-specific", while showing no intergroup bias when attributing more basic emotions shared with animals. Therefore, investigations on dehumanization have explored dehumanizing perceptions along a spectrum from blatant to subtle. More blatant forms tend to draw a direct metaphorical link between a person or a group and a non-human entity, whereas subtler forms of dehumanization ascribe fewer human attributes to a target (Haslam & Loughnan, 2014).

Although modern empirical work on blatant dehumanization remains limited, recent research has begun highlighting its importance across cultural contexts and towards a wide range of targets. Recently, Kteily, Bruneau, Waytz, and Cotterill (2015) developed a measure tapping blatant dehumanization, which provides people with popular "Ascent of Humans" diagram depicting evolutionary progress and asks them to rate where they think each group belongs on the scale, from ape-like human ancestors (0) to advance modern humans (100). Furthermore, Kteily and colleagues (2015) found that ratings on the ascent-dehumanization

scale correlate robustly with the degree to which people judge targets to be characterized by dehumanizing traits, such as *primitive*, *savage*, and *barbaric*. In this respect, other blatant instances of dehumanization are cases where people directly associate individuals with non-humans in language. Blatant phenomena are revealed by studies that used self-report dehumanization scales to assess perceptions about different targets. For example, regarding objectification in the work domain, in Andrighetto, Baldissarri, and Volpato (2017), participants were asked to rate the extent to which a certain type of low-status worker called to mind words like *instrument* and *machine*. Accordingly, in different research projects (e.g., Castano & Giner-Sorolla, 2006; Jackson & Gaertner, 2010), perceptions about deviants, enemies, and ethnic groups were measured by using items that reflected explicit perceptions of people as non-human entities (e.g., *Native Americans were basically wild creatures before the arrival of the White man*; Castano & Giner-Sorolla, 2006). One study among students and soldiers in Sweden found that those with dominant personalities were more likely to blatantly dehumanize terrorists by endorsing statements like *terrorists do not deserve to be treated like humans* (Lindén, Björklund, & Bäckström, 2016). Another study showed that highly politically identified Italians blatantly dehumanized their political opponents (e.g., *Some left-wingers deserve to treated as animals*) (Pacilli, Roccato, Pagliaro, & Russo, 2015).

As reported above, dehumanization can also be observed more subtly, for example in the implicit associations that people hold about different targets. Many studies have used different implicit tasks (e.g., *Go/no-Go Association Task*, GNAT; *Implicit Association Test*, IAT; *Semantic Misattribution Procedure*, SMP) to demonstrate these automatic perceptions (Haslam & Loughnan, 2014). Of particular relevance to the present research project, Imhoff (2010) adapted the *Affect Misattribution Procedure* (AMP; for a detailed description see Chapter 2, paragraph 4.1.) – introduced by Payne, Cheng, Govorun, and Stewart (2005) – to

establish a new indirect measure of dehumanization. Instead of judging the pleasantness of Chinese ideographs, participants were instructed to guess whether the ideograph had a meaning related to the human sphere (e.g., house, hand) or related to the animal kingdom (e.g., nest, paw). The ideographs were preceded by pictures of Germans or gypsies. Results showed evidence that ideographs were like to be rated as having a meaning related to animals after pictures of gypsies compared to Germans. Furthermore, researchers' entities (Bain, Park, Kwok, & Haslam, 2009; Rudman & Mescher, 2012) have examined associations between social groups and non-human or associations between groups and human attributes (Martinez, Rodriguez-Bailón, & Moya, 2012). These studies showed that participants unintentionally revealed a lack of automatic association between persons and the distinctive characteristics of persons. For instance, through the *Implicit Association Test* (IAT; Greenwald, Nosek, & Banaji, 2003), Baldissarri, Valtorta, Andrighetto, and Volpato (2017) found that compared to an artisan, a factory worker, who performed repetitive, fragmented, and other-directed activities, was automatically associated with the object-related words (e.g., *object, tool, machine*) than the person-related words (e.g., *person, subject, individual*). Moreover, nonconscious forms of dehumanization have been demonstrated using neuroscience and priming methods. Neuroimaging studies (Harris & Fiske, 2006) revealed a lack of activation of social cognition networks in the brain when groups that are usually considered cold and incompetent were presented. Subliminal presentation of black faces facilitates identification of ape images (Goff, Eberhardt, Williams, & Jackson, 2008), and subliminal presentation of monkey versus human faces facilitates identification of outgroup versus ingroup names (Boccato, Capozza, Falvo, & Durante, 2008). Because they do not rely on an explicit expression of lack of humanness, these methods provide another scientific pathway to subtle dehumanization (Haslam & Loughnan, 2014).

In recognition of this spectrum, in the present research project, we investigated dehumanization by using both blatant and subtle measures. In particular, considering that previous investigations have especially assessed the perceptions related to metaphors concerning objects (i.e., objectification) and animals (i.e., animalization), we decided to empirically examine the most unexplored form of dehumanization, that is biologization, by using dehumanization-related explicit scales and the implicit technique of the *Semantic Misattribution Procedure* (SMP; Imhoff et al., 2011).

2. Biologization: Historical research

Biologization is a form of dehumanization that involves the perception of others as infected and contagious (Savage, 2007). This dehumanizing process employs metaphors linked to disease, purity, and protection of cleanliness (Douglas, 1966; Volpato & Andrighetto, 2015). In recent decades, biologization has drawn the attention of several theorists (e.g., Hirsch & Smith, 1988; Savage, 2007; Sontag, 2002), who have focused on historical research and have revealed that biological rhetoric and metaphorical language have been widely used in the political domain and in relation to genocidal episodes. In particular, according to Hirsch and Smith (1988), the use of terms like vermin, pests, and viruses by those with political authority is a clear sign that the society is moving in a genocidal direction. In other words, such terms prepare the victim for destruction by dehumanizing members of the group and providing a warrant for genocide. Modern totalitarian movements have been particularly inclined to use disease imagery: the Nazis declared that someone of mixed "racial" origin was like a syphilitic. European Jewry was repeatedly analogized to syphilis, to a cancer that must be excised, and Hitler's *Mein Kampf* also included the conceptualization of Jews as parasites and harmful bacilli (Capozza & Volpato, 2004; Musolff, 2007). Disease metaphors were a staple of Bolshevik polemics, and Trotsky used them with

the greatest profusion. Stalinism was called a cholera, a syphilis, and a cancer. Using only fatal diseases for imagery in politics gives the metaphor a much more pointed character: to liken a political event or situation to an illness is to impute guilt, to prescribe punishment (Sontag, 2002). Coherently, Savage (2007) argued that metaphors defining enemies as cancers or viruses exacerbate the perceptions of threat towards outgroup members and provide group members with a justification for collective violence. According to the author, language which names people as a disease not only justifies their destruction, but the perpetrator may even feel self-righteous. In other words, metaphorical language renders murder non-murderous (Hirsch & Smith, 1988). In this respect, metaphors which name victim people as cancers, tumours, viruses, and bacilli construct them as a threat and refer to the standard solution to that threat: their destruction. These metaphors consistently conceptualize outgroups as engaged in threating behaviour, but devoid of thought or emotional desire. They simply destroy and therefore must be destroyed (Tipler & Ruscher, 2014).

In a more recent and different context, Steuter and Wills (2010) analysed the dehumanizing metaphors used by Western mass media to describe terrorism and terrorist enemies and revealed that they often included biological metaphors such as cancers, metastases or viruses: for instance, the military is instructed to "root out the global terrorist cancer" by eliminating all Muslims (McChesney, 2002, page 16). In this sense, as described by Levine (1995), the central feature of the organism metaphor is that the social community is viewed as analogous to a physical body. Just as the integrity of our own bodies may be threatened by contaminating external elements, so too is the social body vulnerable to corruption by invading sub-groups. Therefore, the community transfers the metaphors associated with the disfavoured group to the disease. According to Brandt (1987), the illness is thought to be caused not only by individuals' transgressions, but also by an attitude of permissiveness in society at large. For example, popular opinion

held venereal disease to be rooted in the tolerance of the immigrant element in the society (Mendicino, 1987). More recently, in line with these considerations, O'Brien (2003) argued that linguistic metaphors related to disease are most often used to describe the negative impact of the marginalized group on society: an example is the depiction of immigrants as indigestible food causing digestive pains.

These theoretical investigations consistently show the pervasiveness of biologization within the political and historical realm. However, biologization may encompass a broader range of human interactions and domains. An example is that of *Dalits* in Hindu tradition. As reported by Nussbaum (2010), the "untouchables", or *Dalits*, are people who perform physically unclean work in an occupation that puts them in contact with soiled objects. *Dalits* cremate the dead, clean latrines, remove dead animals from the roads or sweep streets. In line with the Hindu caste system, *Dalits* must be isolated from the community because they can make people of the upper castes impure simply by looking at them and they are conceptualized as infected and contagious. Interestingly, for these reasons, that of *Dalits* is also the most impactful example of how feelings of disgust are culturally used to subordinate and socially exclude people from communities (Nussbaum, 2010). In this respect, likening outgroups to viruses and bacilli may identify them as contaminants and be associated with specific emotions and behaviours.

2.1. BIOLOGIZATION AND DISGUST

Cottrell and Neuberg (2005) have demonstrated that social groups seen to pose contamination threats are associated with feelings of disgust. Disgust is widely regarded as an innate and highly unmodifiable emotion that deeply shapes how people react towards others (Rozin, Haidt, & McCauley, 2008; Russel & Giner-Sorolla, 2013). Accordingly, a large amount of social psychological literature (see, e.g., Buckels & Trapnell, 2013; Hodson & Costello, 2007) has shown that disgust is a relevant emotion in the intergroup domain that shapes, for instance, negative

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perceptions and attitudes towards outgroup members, immigrants or deviant individuals (Faulkner, Schaller, Park, & Duncan, 2004; Hodson & Costello, 2007; Navarrete & Fessler, 2006). Harris and Fiske (2006, 2007) found that members of certain disgust-eliciting outgroups fail to be processed as fully human. Through an fMRI investigation, the authors found that only extreme outgroups, groups that are low in both warmth and competence (e.g., the homeless) activated insula and amygdala, a pattern consistent with disgust. In line with these investigations, Buckels and Trapnell (2013), by examining the influence of disgust on outgroup dehumanization through a modified version of the *Implicit Association Test* (IAT; Greenwald et al., 2003) and a minimal-groups paradigm, found that all participants demonstrated a dehumanizing bias whereby outgroup members were more strongly associated with animals than were ingroup members. Crucially, feelings of disgust significantly potentiated this dangerous cognitive bias. Furthermore, the authors found that this effect was distinct from sadness, which showed little influence on dehumanization. Disgust thus appears to have the unique capacity to foster social-cognitive dehumanization of outgroup members.

It is noteworthy that some studies revealed an association among feelings of disgust, perceptions of contagion and negative attitudes towards outgroup members (Laakasuo, Köbis, Palomäki, & Jokela, 2017; Navarrete & Fessler, 2006). For example, Faulkner et al. (2004), by manipulating the salience of contagious disease, found that participants under high disease-salience conditions expressed less positive attitudes towards foreign immigrants (but not familiar) and were more likely to endorse policies that would favour the immigration of familiar rather than foreign people. In other words, this study revealed an influence of aroused feelings of vulnerability to disease on xenophobic attitudes. According to these results, Navarrete and Fessler (2006) found that both temporal and chronic disease salience were related to negativity towards foreigners. Their findings also showed that participants' disgust sensitivity scores reliably predicted their preference for

an ingroup target over a foreign one. In line with these considerations, Neuberg and colleagues (Neuberg & Cottrell, 2002; Neuberg, Kenrick, & Schaller, 2011) speculated that disgust motivates contaminant-minimizing behaviours, including the desire to avoid and/or eliminate the contaminant (see also Dutta & Rao, 2015). The concept of disgust is entwined with that of contamination, but they are arguably discrete. On the one hand, disgust may be primarily characterized by its "qualia" (e.g., revulsion and nausea) and then by its action tendency (e.g., avoidance). On the other hand, contamination is a process (not an emotion) and is better characterized by acts such the physically removing of the contaminant (Oaten, Stevenson, & Case, 2009). In this sense, according to Rachman (2004), contamination is an intense feeling of having been infected as a result of contact with a person/place/object that is perceived to be infectious or soiled. Importantly, the feeling of contamination is accompanied by negative emotions such as disgust (Rachman, 2004). Of particular relevance to the present research, Tipler and Ruscher (2014) argued that disgust is strongly linked to disease and non-human metaphors concerning illness, purity, and protection of cleanliness. In line with these considerations, Curtis and Biran (2001) described an association between routes of infectious diseases and disgust elicitors: faeces, urine, vomit, blood, and spoiled food are all strongly associated with disgust and are also the source of "over 20 known bacterial, viral and protozoan pathogens" (Curtis & Biran, 2001, page 23). In this respect, disgust is associated with categories of people who were more likely to carry pathogens, which pose a more acute threat to fitness (Case, Repacholi, & Stevenson, 2006; Curtis, Aunger, & Rabie, 2004) or who are stereotypically linked with specific types of infectious disease (Cottrell & Neuberg, 2005).

But why does disgust play such an important role in determining the avoidance, rejection or even biological dehumanization of others? According to Nussbaum (2010), disgust is commonly felt towards a wide range of primary objects, such as faeces, blood, corpses or decaying meat. This primary disgust can

be then projected onto an individual or an entire group that is culturally perceived as contaminated by these disgusting primary objects. Summing up this idea, Rozin, Millman, and Nemeroff (1986) defined the principles of projective disgust as "laws of sympathetic magic": if object A is disgusting and B looks like A or comes into contact with A, B is also disgusting. More generally, disgust forms part of what can be considered the psychological immune system, a motivational system involving behaviours aimed at protecting the body from infections that also influence social interactions (Murray & Schaller, 2016; Schaller & Duncan, 2007; Schnall, 2016). In this respect, through an experimental study, Curtis et al. (2004) showed that people were much more disgusted by stimuli that could lead to the transmission of infectious disease, compared to stimuli involving no such danger. Thus, disgust may communicate a potentially dangerous social situation and therefore makes health concerns salient.

3.   THE RESEARCH QUESTION AND THE PRESENT PROJECT

The present set of studies is particularly relevant as they, for the first time, attempt to empirically relate biological dehumanization. Further, they shed some light on the antecedents and consequences of this phenomenon in two different contexts, namely, in the intergroup and work domain.

Starting from the mentioned theoretical and empirical analyses that pointed out how disgust is associated with categories of people who are more likely to carry pathogens, we focused on feelings of disgust, assuming that this emotion could lead to biologization. In other words, we sought to demonstrate that feelings of physical disgust, centred on protecting the body from harmful substances, represent an important source of biologization towards the other, especially when the target is as an outgroup member or is presented as a worker engaged in a physically stigmatized occupation. Moreover, in the present project, we focused on

the effect of biological dehumanization on specific attitudes related to social distance.

Considering that no previous research has empirically assessed biologization, throughout this investigation, to examine biological dehumanization, we created an ad-hoc measure that explicitly rates the degree of the perception of the other as virus-like. This scale was built on the basis of the theoretical literature on dirtiness and dehumanization (e.g., Douglas, 1966; Savage, 2007; Speltini & Passini, 2014; Steuter & Wills, 2010; Tipler & Ruscher, 2014). Furthermore, we used an implicit technique, the *Semantic Misattribution Procedure* (SMP; Imhoff et al., 2011), in which participants had to guess whether Chinese ideographs had a meaning related to well-being or to disease after different categories of prime (see Chapter 2, Study 2).

In distinct laboratory and online studies, we aimed to verify whether feelings of physical disgust led to see outgroup members as more similar to viruses than human beings. Moreover, we wanted to test whether the SMP could produce the main effect of greater frequency of guessing "disease" after words related to contagion (objective semantic effect) and after black people pictures (i.e., the outgroup) than white people pictures (biologization) (see Chapter 2). Furthermore, integrating the literature on dehumanization (e.g., Volpato & Andrighetto, 2015) with that of "dirty jobs" (e.g., Ashforth & Kreiner, 1999; Hughes, 1951), we aimed to demonstrate that different tainted occupations may not only lead to stigmatization but also elicit a dehumanizing image of workers (see Chapter 3, Study 1 and Study 2). Finally, starting from the results emerged in our studies and the mentioned Nussbaum's (2010) statements about *Dalits* and disgust, we aimed to empirically verify the presence of the relationship between feelings of disgust and biological dehumanization in the work domain. In particular, we analysed whether performing a physically stigmatized occupation characterized by dirty

work environments increased feelings of disgust and biologization towards the workers. We wanted to verify whether focusing on the work environment could increase the participants' feelings of disgust, which in turn led to a view of the workers as contagious individuals (see Chapter 3, Study 3 and Study 4).

In each chapter, the theoretical assumptions underlining our hypotheses and the specific methods that we employed to verify them were exposed together with the underlying and general goal of demonstrating that dehumanization and biologization of the other (an outgroup member or a physically stigmatized worker) can be linked to feelings of disgust and, in the intergroup domain, can have detrimental consequences in terms of attitudes of social distance.

2

Dehumanization and biologization in intergroup relations

Feelings of disgust and dehumanizing perceptions

1. Introduction

As reported in Chapter 1, a basic role for disgust in outgroup perceptions is supported by research suggesting that this emotion may be uniquely equipped to enable dehumanized social cognition; in particular, as reported by Buckels and Trapnell (2013), disgust may block perceptions of target humanity. Harris and Fiske (2006, 2007) found that members of certain disgust-eliciting outgroups fail to be processed as fully human. Furthermore, Hodson and Costello (2007) reported positive correlations between interpersonal disgust sensitivity and a tendency to dehumanize immigrants.

Of relevance to the present investigation and to the association of disgust with dehumanizing perceptions, Rozin, Haidt, and McCauley (1999) defined disgust by distinguishing between physical and moral disgust. According to Tybur, Lieberman, and Griskevicius (2009), some authors (e.g., Miller, 2004) found that disgust applies to objects and actions beyond the scope of food, and more generally serves to protect the self. In particular, Rozin et al. (1999) described disgust as "the body and soul emotion" and developed a theory to trace a trajectory from food-related disgust, centred on protecting the body from harmful substances, to

ideational disgust, serving to protect the soul from harmful influences. In line with this conceptualization, a related framing of disgust conceives it as the emotion that protects both the bodily self and the social self (e.g., Fessler & Haley, 2006; Miller, 2004). Rozin et al. (2008) suggested a cultural evolution of disgust: what originated as "physical or core disgust" − a rejection response to bad taste and dirt − has evolved into a much more abstract emotion defined as "moral disgust", which functions to protect the soul and the social order. In this respect, some researchers (e.g., Inbar, Pizarro, & Bloom, 2012; Schnall, Haidt, Clore, & Jordan, 2008) have reasoned that moral disgust represents an extension of an adaptive reflex: just as feelings of disgust encourage withdrawal from substances and objects that are dangerous to the body, they similarly encourage withdrawal from humans whose behaviour signals danger to the group.

Importantly for the present studies, although moral disgust may be related to contamination-based disgust, it is different from the most primitive forms of this emotion that are connected to the ingestion of certain substances (Rozin, Lowery, & Ebert, 1994). In particular, the "bad taste" of moral disgust may serve as an abstract metaphor rather than reflecting a concrete origin in oral distaste (Chapman, Kim, Susskind, & Anderson, 2009). Accordingly, Russel and Giner-Sorolla (2013) stated that moral disgust arises from moral considerations and informs moral judgements. Furthermore, Vartanian (2010) examined the role of disgust in evaluations of some social groups and observed that drug addicts, smokers, obese people, and politicians are the social targets generating the most disgust. In line with these results, through a functional magnetic resonance imaging (fMRI) investigation, Harris and Fiske (2006) found that groups that are usually considered cold and incompetent, such as drug addicts, especially activate insula and amygdala, a pattern consistent with disgust. Drawing from this evidence, the present studies aimed to show that different experiences in terms of physical and moral disgust may affect different judgments about others.

In Study 1 we aimed to empirically demonstrate the relevance of the conceptualization of disgust as "the body and soul emotion" by showing that disgust may represent a consistent component of intergroup dynamics, impacting on perceptions of humanity and on aggressive intentions in relation to ingroup and outgroup members. In particular, for both dehumanizing perceptions and aggressive tendencies, we supposed that the effect of physical and moral disgust would be stronger towards an outgroup member than towards an ingroup member. Supporting this assumption, a set of studies (e.g., Buckels & Trapnell, 2013; Taylor, 2007) demonstrated that disgust may play a crucial role in generating aversion towards the outgroup. In addition, our hypothesis was backed up by Tajfel's social identity theory (Tajfel, 1981; Tajfel & Turner, 1979), according to which, since people generally need to evaluate themselves favourably and group membership is a fundamental part of self-concept, people will tend to evaluate their own group more positively than other groups.

Regarding dehumanizing perceptions and aggressive intentions, the aim of this study was two-fold. Our first goal was to provide evidence of the connection between disgust and dehumanizing perceptions. Of particular relevance to the present research project, consistent with the idea that dirt, infection, and contagion are the core concepts of biological dehumanization (Savage, 2007; Volpato & Andrighetto, 2015) and that physical disgust is a rejection response to bad taste and dirt (Rozin et al., 2008), we supposed that physical disgust would especially increase the view of the outgroup member as a contagious being. Moreover, considering that perceiving others as lacking morality is an important antecedent of animalization (Haslam, 2006; Kteily & Bruneau, 2017) and that moral disgust can be elicited by immorality, injustice, and violations of social rules (Curtis & Biran, 2001), we hypothesized that moral disgust would especially lead to an increased association of the outgroup target with animalistic metaphors. Additionally, our second goal was to investigate whether different disgust experiences would shape the

participants' aggressive behavioural tendencies. Considering that physical disgust may motivate the avoidance of potentially-contagious people and that disgust is one of the evolutionary mechanisms that help to keep our distance from contagion (Nesse & Williams, 1995), we assumed that physical disgust would especially increase the unwillingness to engage in contact with the outgroup member. On the other hand, Simpson, Carter, Anthony, and Overton (2006) found that moral disgust elicitors, unlike physical disgust elicitors, shared a great deal of variance with feelings of anger and aggression. Accordingly, we hypothesized that this form of disgust would especially increase active harm tendencies and, in particular, the intention to insult the outgroup target.

Based on Study 1, in Study 2 we aimed to extend our findings in two directions. The first direction concerns the nature of biologization in intergroup relations. Primarily, we aimed to analyse if biological dehumanization involves an automatic association of a human being with the concepts of disease and contagion. We decided to compute this association at an implicit level in order to provide evidence that biologization involves an unaware cognitive process in which the outgroup is automatically linked to the concept of disease. Moreover, the implicit measure allowed us to avoid participants' desirability concerns (e.g., Crowne & Marlowe, 1964; Nederhof, 1985). Furthermore, in line with Study 1 and the conceptualization of physical disgust as the emotion centred on protecting the body from harmful substances (Rozin et al., 2008), in Study 2 we hypothesized that physical disgust (vs. moral disgust) would be considered a reliable antecedent of biological dehumanization.

The second direction concerns the consequences of biologization. In particular, considering that all rapid epidemics and diseases give rise to roughly similar practices of avoidance and exclusion (Sontag, 2002), we assumed that biological dehumanization may motivate the unwillingness to engage in contact with the target of this kind of dehumanizing perception. In other words, we

supposed that feelings of physical disgust and attitudes aimed to avoid individuals would be considered, respectively, a reliable antecedent and a consequence of biologization.

2. OVERVIEW OF THE STUDIES

Our hypotheses were tested across two studies. By manipulating group membership and disgust experiences, the purpose of Study 1 was to explore the impact of different disgust experiences in terms of physical and moral disgust on dehumanizing perceptions and aggressive tendencies in the intergroup domain. Accordingly, by focusing on the association between physical disgust and biologization, Study 2 was designed to extend findings of Study 1 by employing an implicit technique (SMP, *Semantic Misattribution Procedure*; Imhoff et al., 2011) to measure this kind of dehumanizing perception and by verifying whether the social distance may be considered a reliable consequence of biological dehumanization.

3. STUDY 1[1]

The present study was designed to explore the impact of physical and moral disgust on perceptions of humanity and aggressive intentions towards ingroup and outgroup members. Depending on the experimental condition, group membership and disgust experiences were manipulated. Consistent with our hypotheses, we expected that the salience of physical disgust (vs. moral disgust vs. non-disgusting condition) would increase participants' dehumanizing perceptions in terms of biologization and passive harm tendencies towards the outgroup member than towards the ingroup member. Additionally, in the moral disgust condition (vs. physical disgust vs. non-disgusting condition), participants would show more

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[1] This paragraph is based on Valtorta, R. R., & Volpato. C. (2018). "The body and soul emotion" – The role of disgust in intergroup relations. *TPM, Testing, Psychometrics, Methodology in Applied Psychology, 25*, 239-252. doi: 10.4473/TPM25.2.5.

animalization and active harm tendencies towards the outgroup than towards the ingroup.

3.1. Method

Our hypotheses were tested by manipulating group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition). Group membership was manipulated by using Tajfel's (Tajfel, Billig, Bundy, & Flament, 1971) minimal group paradigm. In the traditional minimal group study, by randomly dividing participants into two groups on the basis of trivial criteria (e.g., preference for paintings or the toss of a coin), the authors noticed that, even in the most minimal group conditions, responses favouring the ingroup occurred. In line with this procedure, as we will discuss below, we informed participants that their group membership was determined by their preference for certain paintings. According to our assumptions, in order to verify whether dehumanizing perceptions and aggressive tendencies towards ingroup and outgroup members varied depending on disgust experiences, participants were randomly assigned to read one of three vignettes describing a situation eliciting physical disgust, moral disgust, or no emotion (for a similar procedure, see Schnall, Benton, & Harvey, 2008).

3.1.1. Participants and experimental design

Two hundred and four (131 females) volunteers participated in the study. Participants' age ranged from 16 to 64 years (M = 28.68, SD = 7.58). A 2 (group membership: ingroup vs. outgroup) $\times$ 3 (disgust: physical disgust vs. moral disgust vs. non-disgusting condition) design was used, with both group membership and disgust as between-subjects variables. Participants were randomly allocated to the experimental conditions.

3.1.2. PROCEDURE AND MATERIALS

Participants took part in an online study that involved "sharing events" among people. Participants were informed that they would make decisions about paintings, be assigned to one of two groups on the basis of these decisions, and, lastly, read a memory written by another participant. This "other participant" was fictitious, and the written memory was a scenario eliciting physical disgust, moral disgust, or no emotion (non-disgusting condition). The participants were asked to rate their dehumanizing perceptions and behavioural intentions about the (fake) author of the memory who, depending on the experimental condition, was described as a member of the ingroup or as a member of the outgroup.

Group membership manipulation. According to Tajfel's (Tajfel et al., 1971) minimal group paradigm, participants were shown three pairs of paintings on the computer screen (see Figure 1); their task was to state the one they preferred in each pair. Before starting, it was explained that their group membership was determined by their preference for de Chirico's or Sironi's paintings (after completing the task, all participants were informed that they were members of the de Chirico group).

Figure 1. Representative paintings used in Study 1 (de Chirico's painting on the left, *La torre rossa*, and Sironi's painting on the right, *Composizione architettonica urbana*).

Disgust manipulation. To manipulate disgust, participants were randomly assigned to read one of three vignettes written by a (fake) participant and describing a situation eliciting physical disgust, moral disgust, or no emotion (non-

disgusting condition). Participants first read the following: "A few days ago, a couple of friends and I saw a homeless person begging for money. We decided to get close to the homeless person". The subsequent sentence varied depending on the experimental condition. For the physical disgust condition, participants read: "Because of the repugnant smell, I felt sick and vomited next to the homeless person". For the moral disgust condition, participants read the following: "I stole the money that pedestrians had donated to the homeless person, and I ran away". Finally, for the non-disgusting condition, participants read the following: "I donated 50 cents to the homeless person, and I continued my walk". After reading the vignette, all the participants completed a questionnaire using the scales described below. Finally, participants were asked for their demographic information, thanked, and fully debriefed.

Dehumanizing perceptions. Dehumanizing perceptions of the target were measured by employing words that recalled the two forms of dehumanization considered (i.e., biologization and animalization). More specifically, respondents were asked to rate the extent to which (1 = *not at all*; 7 = *extremely*) the target was associated with these words. The perceptions of the target as virus-like (biologization) and animal-like (animalization) were measured using, respectively, 4 virus-related words (*virus, contamination, filth,* and *contagion,* $\alpha = .88$) and 4 animal-related words (*animal, savage, primitive,* and *beast,* $\alpha = .95$) borrowed from previous works and the literature on dirtiness and dehumanization (e.g., Douglas, 1966; Savage, 2007; Speltini & Passini, 2014; Steuter & Wills, 2010; Tipler & Ruscher, 2014).

Aggressive behavioural intentions. The participants' aggressive behavioural intentions towards the target were measured using two items of passive harm intentions and active harm intentions (Cuddy, Fiske, & Glick, 2007). In particular, participants were asked to rate the extent to which they would be inclined to

distance (passive harm) and to insult (active harm) the target (1 = *not at all*; 7 = *extremely*).

Manipulation check. After completing the scales, participants were asked to indicate to which group they and the (fake) author of the vignette belonged. Participants selected one of two responses: (a) "de Chirico group" or (b) "Sironi group". Furthermore, participants were asked to rate, on a 7-point scale (1 = *not at all*; 7 = *extremely*), the extent to which they perceived physical (*nausea, revulsion, r =* .98, *p* < .001) and moral (*contempt, scorn, r =* .94, *p* < .001) disgust towards the event described in the vignette.

3.2.   RESULTS AND DISCUSSION

PRELIMINARY ANALYSIS

Thirteen participants were excluded from the study because they failed the group manipulation check by failing to report to which group the target belonged.

Two one-way between-subjects (disgust: physical disgust vs. moral disgust vs. non-disgusting condition) ANOVAs were conducted to analyse the effect of disgust manipulation through the vignettes on participants' feelings of physical and moral disgust.

Physical disgust. The analysis showed a main effect of disgust manipulation, $F(2,188) = 93.73$, $p < .001$, $\eta_p^2 = .50$, indicating that participants perceived more physical disgust in the physical disgust condition ($M = 5.31$, $SD = 2.27$) rather than in the moral disgust condition ($M = 2.26$, $SD = 1.94$), $p < .001$, and in the non-disgusting condition ($M = 1.15$, $SD = .53$), $p < .001$. Further, participants' mean score in the moral disgust and non-disgusting conditions differed significantly ($p = .002$).

Moral disgust. The analysis showed a main effect of disgust manipulation, $F(2,188) = 202.02$, $p < .001$, $\eta_p^2 = .68$. Participants perceived more moral disgust in the moral disgust condition ($M = 6.43$, $SD = .95$) rather than in the physical disgust

condition (M = 2.68, SD = 2.19), p < .001, and in the non-disgusting condition (M = 1.31; SD = .91), p < .001. Participants' mean score in the physical disgust and non-disgusting conditions differed significantly (p < .001).

These results confirm that the disgust manipulation through the vignettes was successful.

Main analysis

To analyse the effects of group membership and disgust experiences on our dependent variables (i.e., dehumanizing perceptions and aggressive behavioural intentions), we utilized two multivariate analyses of variance (MANOVA).

Dehumanizing perceptions. A MANOVA was conducted to analyse the effect of group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition) on participants' dehumanizing perceptions of the target. We used group membership and disgust experiences as independent variables and biologization and animalization scores as dependent variables.

The multivariate test revealed a main effect of group membership, λ = .86, $F(1,185)$ = 15.33, p < .001, η_p^2 = .14, a main effect of disgust, λ = .43, $F(2,185)$ = 48.89, p < .001, η_p^2 = .35, and an interaction Group membership × Disgust, λ = .70, $F(2,185)$ = 18.22, p < .001, η_p^2 = .16. The univariate tests showed a significant effect of group membership and disgust on dehumanizing perceptions.

Analyses showed a main effect of group membership: $F(1,185)$ = 6.77, p = .01, η_p^2 = .03, for biologization; $F(1,185)$ = 29.80, p < .001, η_p^2 = .14, for animalization. Participants perceived the target more as a contagious being when he/she was described as an outgroup member (M = 2.06, SD = .11) rather than an ingroup member (M = 1.63, SD = .12), p = .01. By the same token, participants perceived the target more as an animal when he/she was described as an outgroup

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member ($M = 2.68$, $SD = .13$) rather than an ingroup member ($M = 1.68$, $SD = .13$), p < .001.

The main effect of disgust was also significant: $F(2,185) = 20.77$, $p < .001$, $\eta_p^2 = .18$, for biologization; $F(2,185) = 77.31$, $p < .001$, $\eta_p^2 = .45$, for animalization. Participants perceived the target more as a contagious being in the physical disgust condition ($M = 2.55$, $SD = .15$) than in the moral disgust condition ($M = 1.76$, $SD = .14$), $p < .001$, and in the non-disgusting condition ($M = 1.22$, $SD = .15$), $p < .001$. Participants' mean scores in the moral disgust and non-disgusting conditions differed significantly ($p = .009$). Further, participants perceived the target more as an animal in the moral disgust condition ($M = 3.76$, $SD = .16$) than in the physical disgust condition ($M = 1.67$, $SD = .16$), $p < .001$, and in the non-disgusting condition ($M = 1.11$, $SD = 0.16$), $p < .001$. Participants' mean score in the physical disgust and non-disgusting conditions differed significantly ($p = .01$).

Finally, we observed that the Group membership × Disgust interaction was significant: $F(2,185) = 14.87$, $p < .001$, $\eta_p^2 = .14$, for biologization; $F(2,185) = 15.51$, p < .001, $\eta_p^2 = .14$, for animalization (see Figure 2 for biologization and Figure 3 for animalization).
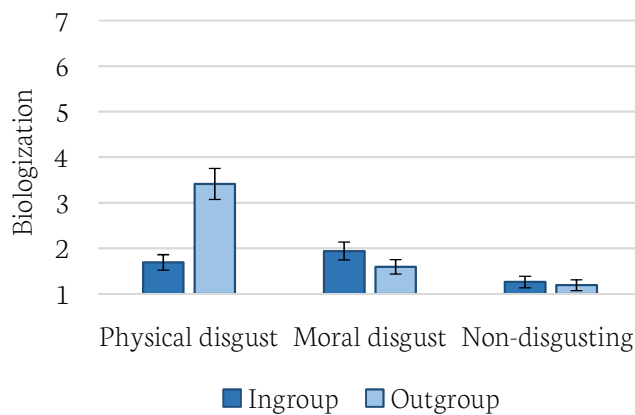

Figure 2. Study 1: Biologization as a function of group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition).
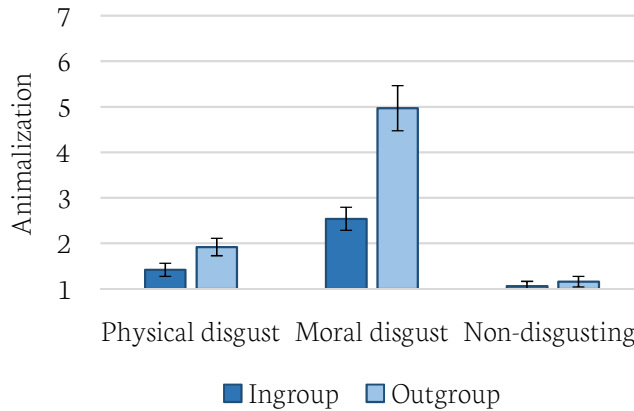
Figure 3. Study 1: Animalization as a function of group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition).

Analysis of simple effects showed that, when the target was an ingroup member, the effect of disgust on biologization was not significant, $F_{(2,185)} = 2.92$, $p = .06$, whereas the effect of disgust on animalization was significant, $F_{(2,185)} = 12.31$, $p < .001$, $\eta_p^2 = .12$. As reported in Table 1, when the target was an ingroup member, in the moral disgust condition, participants perceived the target more as an animal than in the physical disgust ($p = .001$) and in the non-disgusting conditions ($p < .001$). Participants' mean scores in the physical and non-disgusting conditions did not differ ($p = .30$). When the target was an outgroup member, the effect of disgust on both biologization and animalization was significant: $F_{(2,185)} = 38.17$, $p < .001$, $\eta_p^2 = .29$, for biologization; $F_{(2,185)} = 78.42$, $p < .001$, $\eta_p^2 = .46$, for animalization. In line with our assumptions, when the target was an outgroup member, in the physical disgust condition, participants perceived the other more as a contagious being than in the moral disgust and in the non-disgusting conditions (all ps $< .001$). Participants' mean score in the moral disgust and non-disgusting conditions did not differ ($p = .18$). Moreover, participants in the moral disgust condition perceived the target more as an animal than in the physical disgust and in the non-disgusting conditions (all ps $< .001$). Participants' mean score

in the physical disgust and non-disgusting conditions differed significantly ($p =$ .01).

The analysis of simple effects showed that, according to our hypotheses, in the physical disgust condition, the effect of group membership on biologization was significant, $F(1,185) = 34.66$, $p < .001$, $\eta_p^2 = .16$, while it was not significant on animalization, $F(1,185) = 2.40$, $p = .12$. As reported in Table 1, in the physical disgust condition participants showed more biologization towards the outgroup member than towards the ingroup member. In line with our assumptions, in the moral disgust condition, the effect of group membership on biologization was not significant, $F(1,185) = 1.46$, $p = .23$, whereas the effect of group membership on animalization was significant, $F(1,185) = 59.91$, $p < .001$, $\eta_p^2 = .24$: participants showed more animalization towards the outgroup than towards the ingroup. Finally, in the non-disgusting condition, the effect of group membership was not significant either on biologization, $F < 1$, or on animalization, $F < 1$.

Table 1. Study 1: Means (and standard deviations) for biologization and animalization as a function of group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition).

	Biologization		Animalization	
	Ingroup	Outgroup	Ingroup	Outgroup
Physical disgust	1.69$_a$	3.41$_b$	1.42$_a$	1.92$_a$
	(0.23)	(0.18)	(0.25)	(0.20)
Moral disgust	1.94$_a$	1.59$_a$	2.54$_b$	4.97$_c$
	(0.19)	(0.21)	(0.21)	(0.23)
Non-disgusting	1.26$_a$	1.19$_a$	1.06$_{ad}$	1.16$_d$
	(0.20)	(0.21)	(0.23)	(0.23)

Note. The different letters, in the same row or column, indicate that the difference between the two means is significant, $p \leq .05$.

Aggressive behavioural intentions. A MANOVA was conducted to analyse the effect of group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition) on participants'

aggressive behavioural intentions. In particular, we used group membership and disgust experiences as independent variables and passive harm and active harm intentions as dependent variables.

The multivariate test revealed a main effect of group membership, $\lambda = .95$, $F(1,185) = 5.01$, $p = .008$, $\eta_p^2 = .05$, a main effect of disgust, $\lambda = .32$, $F(2,185) = 70.93$, $p < .001$, $\eta_p^2 = .43$, and an interaction Group membership × Disgust, $\lambda = .91$, $F(2,185) = 4.63$, $p = .001$, $\eta_p^2 = .05$. The univariate tests showed a significant effect of group membership and disgust on aggressive behavioural intentions.

Analyses showed a main effect of group membership: $F(1,185) = 6.74$, $p = .01$, $\eta_p^2 = .03$, for passive harm intentions; $F(1,185) = 5.02$, $p = .03$, $\eta_p^2 = .03$, for active harm intentions. Participants showed more passive harm intentions when the target was described as an outgroup member ($M = 3.98$, $SD = .15$) rather than an ingroup member ($M = 3.40$, $SD = .16$). Similarly, participants showed more active harm intentions when the target was an outgroup member ($M = 3.42$, $SD = .14$) rather than an ingroup member ($M = 2.97$, $SD = .15$).

The main effect of disgust was significant: $F(2,185) = 48.72$, $p < .001$, $\eta_p^2 = .34$, for passive harm intentions; $F(2,185) = 117.12$, $p < .001$, $\eta_p^2 = .56$, for active harm intentions. Participants showed more passive harm intentions in the physical disgust condition ($M = 4.77$, $SD = .19$) rather than in the moral disgust condition ($M = 4.13$, $SD = .19$), $p = .02$, and in the non-disgusting condition ($M = 2.16$, $SD = .19$), $p < .001$. Participants' mean score in the moral disgust and non-disgusting conditions differed significantly ($p < .001$). Further, participants showed more active harm intentions in the moral disgust condition ($M = 5.24$, $SD = .17$) rather than in the physical disgust condition ($M = 2.79$, $SD = .18$), $p < .001$, and in the non-disgusting condition ($M = 1.55$, $SD = .18$), $p < .001$. Participants' mean score in the physical disgust and non-disgusting conditions differed significantly ($p < .001$).

Finally, we found that Group membership × Disgust interaction was significant: $F(2,185) = 3.90$, $p = .02$, $\eta_p^2 = .04$, for passive harm intentions; $F(2,185) = 5.53$, $p = .005$, $\eta_p^2 = .06$, for active harm intentions (see Figure 4 for passive harm intentions and Figure 5 for active harm intentions).

Figure 4. Study 1: Passive harm intentions as a function of group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition).
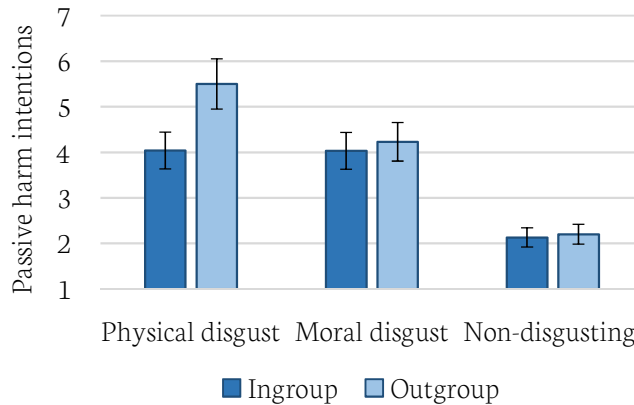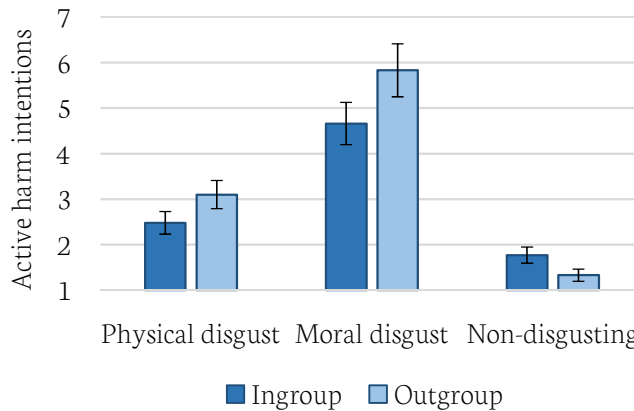

Figure 5. Study 1: Active harm intentions as a function of group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition).

Simple effects showed that, when the target was an ingroup member, the effect of disgust on both passive and active harm intentions was significant:

$F(2,185) = 15.96$, $p < .001$, $\eta_p^2 = .15$, for passive harm intentions; $F(2,185) = 39.13$, $p < .001$, $\eta_p^2 = .30$, for active harm intentions. As reported in Table 2, when the target was an ingroup member, participants showed more passive harm tendencies in the physical and moral disgust conditions than in the non-disgusting condition ($ps < .001$). Mean scores were not different in the physical and moral disgust conditions. Furthermore, when the target was an ingroup member, participants in the moral disgust condition showed more active harm intentions than in the physical disgust and non-disgusting conditions (all $ps < .001$). Mean scores in the physical and non-disgusting conditions did not differ ($p = .06$). Likewise, when the target was an outgroup member, the effect of disgust on both passive and active harm intentions was significant: $F(2,185) = 40.30$, $p < .001$, $\eta_p^2 = .30$, for passive harm intentions; $F(2,185) = 81.30$, $p < .001$, $\eta_p^2 = .47$, for active harm intentions. In line with our assumptions, in the physical disgust condition, participants showed more passive harm intentions than in the moral disgust ($p = .001$) and non-disgusting conditions ($p < .001$). Participants' mean scores in the moral disgust and non-disgusting conditions differed significantly ($p < .001$). Moreover, when the target was an outgroup member, participants in the moral disgust condition showed more active harm tendencies than in the physical disgust and non-disgusting conditions (all $ps < .001$). Participants' mean scores in the physical disgust and non-disgusting conditions differed significantly ($p < .001$).

The analysis of simple effects showed that, according to our hypotheses, in the physical disgust condition, the effect of group membership on passive harm intentions was significant, $F(1,185) = 14.12$, $p < .001$, $\eta_p^2 = .07$, whereas it was not significant on active harm intentions, $F(1,185) = 3.11$, $p = .08$. As reported in Table 2, in the physical disgust condition, participants showed more passive harm intentions towards the outgroup member than towards the ingroup member ($p < .001$). Furthermore, in line with our assumptions, in the moral disgust condition,

the effect of group membership on passive harm tendencies was not significant, $F < 1$, whereas the effect of group membership on active harm intentions was significant, $F(1,185) = 11.75$, $p = .001$, $\eta_p^2 = .06$: in the moral disgust condition, participants showed more active harm intentions towards the outgroup than towards the ingroup ($p = .001$). Finally, in the non-disgusting condition, the effect of group membership was not significant on either passive harm intentions, $F < 1$, or on active harm intentions, $F(1,185) = 1.56$, $p = .21$.

Table 2. Study 1: Means (and standard deviations) for passive and active harm intentions as a function of group membership (ingroup vs. outgroup) and disgust experiences (physical disgust vs. moral disgust vs. non-disgusting condition).

	Passive harm intentions		Active harm intentions	
	Ingroup	Outgroup	Ingroup	Outgroup
Physical disgust	4.04$_a$	5.50$_c$	2.48$_{ad}$	3.10$_d$
	(0.30)	(0.24)	(0.28)	(0.22)
Moral disgust	4.03$_a$	4.23$_a$	4.66$_b$	5.83$_c$
	(0.26)	(0.28)	(0.23)	(0.25)
Non-disgusting	2.13$_b$	2.20$_b$	1.77$_a$	1.33$_a$
	(0.27)	(0.28)	(0.25)	(0.25)

Note. The different letters, in the same row or column, indicate that the difference between the two means is significant, $p \leq .05$.

In line with our assumptions, our findings showed that different disgust experiences in terms of physical and moral disgust affect judgments about others. In particular, the results demonstrated that in the physical disgust condition, participants showed more biologization and passive harm tendencies towards the outgroup member than towards the ingroup member. Additionally, in the moral disgust condition, participants showed more animalization and active harm tendencies towards the outgroup than towards the ingroup, while no significant differences emerged for the non-disgusting condition. In contrast with our hypotheses, we found that disgust experiences affected aggressive intentions and dehumanization not only in reference to the outgroup but also in reference to the

ingroup: simple effect analysis showed that, when the target was an ingroup member, in the disgust conditions (vs. non-disgusting condition), participants showed more passive harm tendencies, whereas, in the moral disgust condition (vs. physical disgust vs. non-disgusting condition), participants showed more animalization and more active harm intentions. These results may be explained by suggesting that group membership is a fundamental part of self-concept and, coherently, in order to protect and enhance their self-esteem, group members may be motivated to protect and enhance the positivity of their group also by distancing and denigrating the ingroup member who performs something disgusting.

Overall, as supposed, the present study empirically demonstrates the relevance of the conceptualization of disgust as "the body and soul emotion" by showing that disgust may represent a consistent component of intergroup dynamics, impacting on perceptions of humanity and on aggressive intentions in relation to ingroup and outgroup members.

4. STUDY 2

Focusing on the relationship emerged in Study 1 between physical disgust and biological dehumanization, Study 2 was designed to extend our findings by measuring biologization through an implicit technique and by investigating whether both physical disgust (vs. moral disgust) and attitudes of social distance are involved in this kind of dehumanizing perception in the intergroup domain. To achieve these aims, participants completed a *Semantic Misattribution Procedure* (SMP, Imhoff et al., 2011), in which they had to guess whether Chinese ideographs had a meaning related to well-being or to disease, and evaluated the outgroup (i.e., black people) on feelings of physical disgust, moral disgust, and attitudes of social distance. In particular, we wanted to test whether the SMP could produce the main effect of greater frequency of guessing "disease" after words related to contagion (objective semantic effect) and after black people pictures (i.e., the outgroup) than

white people pictures (biologization). Furthermore, according to our hypotheses and Study 1, we expected that physical disgust (vs. moral disgust) and attitudes of social distance may be considered a reliable antecedent and a consequence of biologization.

4.1. METHOD

In this study, we used the *Semantic Misattribution Procedure*, a variant of the *Affect Misattribution Procedure* (AMP; Payne et al., 2005), an indirect method for assessing implicit evaluations. In the AMP, participants are instructed to rate the pleasantness of Chinese ideographs that are briefly displayed and then masked. The evaluation of the ideographs is influenced by the valence of the preceding primes: positive primes elicit more positive and negative primes more negative evaluations. In the present study we adapted the AMP (see Imhoff et al., 2011) to get a measure of automatic biologization by changing the task from an evaluative judgement task to a semantic guessing task ("What do you think does the Chinese ideograph mean? Does it symbolize a concept related to well-being or to disease?").

4.1.1. PARTICIPANTS AND EXPERIMENTAL DESIGN

90 (50 females) undergraduates at an Italian university participated in the study in exchange for partial course credit. Participants' age ranged from 18 to 44 years (M = 23.37, SD = 3.26).

4.1.2. PROCEDURE AND MATERIALS

Participants were individually examined, and the experiment was introduced as a task involving impression formation. A within-subjects design was used in which all participants completed the SMP. Then, they completed a questionnaire to evaluate feelings of physical disgust, moral disgust, and attitudes of social distance. As a final task, participants were asked to provide demographic information, thanked and fully debriefed.

Semantic Misattribution Procedure. The implementation of the SMP followed the procedure described in Imhoff et al. (2011). Participants were instructed to intuitively guess whether a Chinese ideograph had a connotation related to well-being or one related to disease without allowing the primes to bias their decisions. More specifically, participants were informed that we were interested in how well they could tell by intuition what the ideograph stood for. As reported in Payne et al., (2005), participants were further warned that the ideographs were preceded by images and words and that they should try their absolute best not to let the stimuli bias their intuition about the meaning of the ideographs.
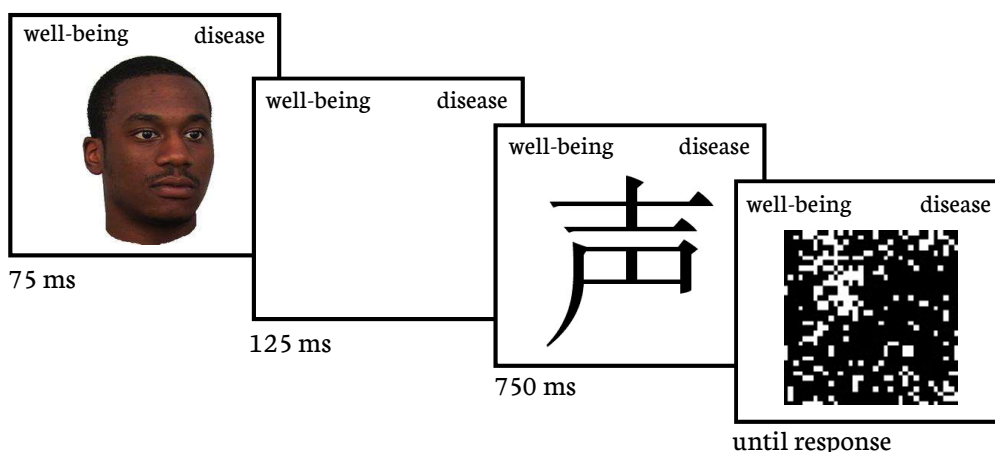

Figure 6. Study 2: Schematic representation of the *Semantic Misattribution Procedure.*

As reported in Figure 6, the primes were presented for 75ms, followed by a blank screen for 125ms, and the Chinese ideographs for 750ms (Vezzoli & Zogmaister, 2016). Then a monochromatic noise mask was presented on the screen until participants completed their ratings by pressing either the left response key ("well-being") or the right response key ("disease").

The SMP consisted of 144 trials out of which 48 trials included primes of each category (words related to the concepts of disease and contagion, black people, white people), followed by 144 randomly chosen Chinese ideographs taken from

the original set used in Payne et al. (2005). The black and white people stimuli (see Figure 7) were 24 pictures (12 black people and 12 white people. 6 males and 6 females for each category) selected from *Face Place*, a face database that includes multiple images for over 200 individuals of many different nationalities (Righi, Peissig, & Tarr, 2012)[2]. The words related to the concepts of disease and contagion (*disease, contagion, virus, contamination, filth, germ, plague, illness, microbe, bacterium, bacillus*) were instead selected from the literature concerning dirtiness and biologization (e.g., Douglas, 1966; Savage, 2007; Speltini & Passini, 2014; Steuter & Wills, 2010; Tipler & Ruscher, 2014).

Figure 7. Study 2: Representative black and white people stimuli used in the *Semantic Misattribution Procedure*.

Feelings of disgust. Perceptions of physical and moral disgust towards the outgroup (i.e., black people) were identified using the same measure that was used in Study 1 (*nausea, revulsion*, $r = .73$, $p < .001$ for physical disgust; *contempt, scorn*, $r = .50$, $p < .001$ for moral disgust).

Social distance. Attitudes of social distance were measured with 4 items, representing the following social relationships to the respondent: neighbour, tenant, childcare provider, and member of the same social circle (Bogardus, 1933; $\alpha = .84$). Using a seven-point Likert scale ranging from *not at all* (1) to *extremely* (7), the respondents were asked to indicate to what extent they would be worried

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[2] Stimulus images courtesy of Michael J. Tarr, Center for the Neural Basis of Cognition and Department of Psychology, Carnegie Mellon University, http://www.tarrlab.org/.

having an outgroup member (i.e., a black person) in the domain of these contact roles.

4.2. RESULTS AND DISCUSSION

Semantic Misattribution Procedure. We performed a repeated-measures ANOVA (prime: words related to contagion, black people pictures, white people pictures) on the frequency of guessing a disease-related meaning (for a similar procedure see Imhoff et al., 2011). As excepted, the analysis showed a main effect of prime, $F(1,89) = 101.07$, $p < .001$, $\eta_p^2 = .53$, indicating that participants guessed a disease-related meaning significantly more often following primes characterized by words related to disease and contagion ($M = 34.91$, $SD = 1.17$) than either of the two human categories ($M = 22.29$, $SD = 1.39$, $p < .001$ for black people primes; $M = 16.51$, $SD = .99$, $p < .001$ for white people primes). More central to the question of biologization, black people pictures evoked more disease responses than white people primes, $p < .001$ (see Figure 8).
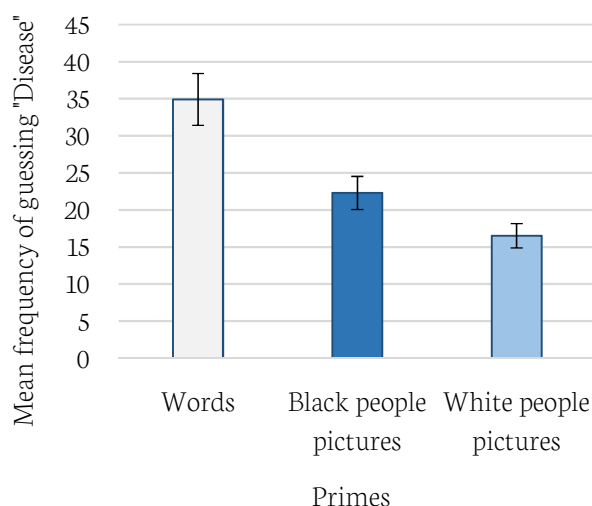

Figure 8. Study 2: Frequency of guessing a disease-related meaning of the Chinese ideograph as a function of the preceding prime category.

The role of disgust and social distance. Table 3 presents correlations for each variable. For the implicit biologization score, we considered the mean frequency of guessing a disease-related meaning after black people primes.

Table 3. Study 2: Correlations for each variable.

Variables	1	2	3	4
1. Implicit biologization	-			
2. Physical disgust	.29**	-		
3. Moral disgust	.18	.53***	-	
4. Social distance	.53***	.30**	.41***	-

Note. ** $p \leq .01$; *** $p \leq .001$.

As expected, the implicit biologization score positively correlated with physical disgust and attitudes of social distance. Importantly, biological dehumanization did not result as directly associated with feelings of moral disgust. Therefore, we expected to find a significant indirect effect on attitudes of social distance via biologization from physical disgust, but not from feelings of moral disgust.

To examine the prediction that physical disgust and social distance might be respectively considered a reliable antecedent and a consequence of biologization, we tested a mediation model in which physical disgust was considered as the predictor variable, implicit biologization as the mediator variable and attitudes related to social distance as the outcome variable. The mediation model (see Figure 9) was tested using Hayes' (2013) PROCESS macros (Model 4) and the bootstrapping method (5,000 resamples).

The analysis showed that physical disgust increased implicit biological dehumanization (b = 2.80, SE = .99, t(1,88) = 2.81, p = .006). In turn, higher level of biologization were significantly related to a higher unwillingness to engage in contact with the target (b = .05, SE = .01, t(2,87) = 5.14, p < .001). As the first support for our mediation hypothesis, the direct effect of physical disgust turn out to be

non-significant in this model, $b = .20$, $SE = .10$, $t(2,87) = 1.76$, $p = .08$, suggesting a "full" mediation of biologization. Crucially, the indirect effect of the physical disgust on attitudes of social distance via biologization emerged as significant: the point estimate was .15, and the 95% CI was [0.0624, 0.2827][3].
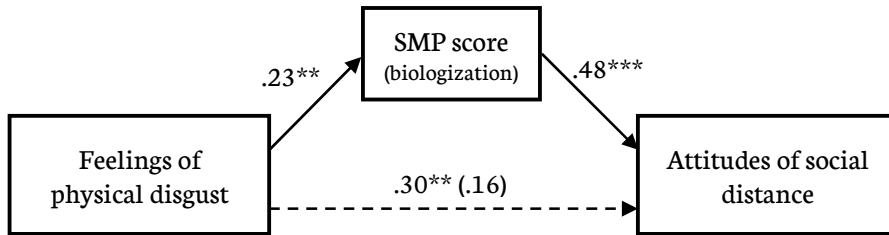

Figure 9. Study 2: Implicit biologization mediates the relation between feelings of physical disgust and attitudes of social distance (the values reflect standardized β coefficients; estimate of the mediated model is in parentheses).
Note. ** $p \leq .01$; *** $p \leq .001$.

Importantly, this mediation pattern did not emerge for feelings of moral disgust (the point estimate was .12, and the 95% CI was [-0.0033, 0.2731]).

Study 2 showed that biologization involved an implicit representation of the other as a contagious entity: in particular, by using the *Semantic Misattribution Procedure*, biological dehumanization of the outgroup was reflected in a higher frequency of guessing that Chinese ideographs stood for a concept related to

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[3] We also tested a mediation pattern in which biologization was considered as the predictor variable, physical disgust as the mediator variable and attitudes of social distance as the outcome variable. The indirect effect of the implicit biologization score on social distance via physical disgust was not significant: the point estimate was .005, and the 95% CI was [-0.0015, 0.0179].
Additionally, we tested a mediation model in which physical disgust was considered as the predictor variable, attitudes of social distance as the mediator and biologization as the outcome variable. The analysis showed that physical disgust increased attitudes of social distance ($b = .33$, $SE = .11$, $t(1,88) = 2.98$, $p = .004$). In turn, higher levels of social distance were significantly related with an increased implicit biologization score ($b = 4.34$, $SE = .84$, $t(2,87) = 5.14$, $p < .001$). Furthermore, the indirect effect of physical disgust on biologization via attitudes of social distance emerged as significant: the point estimate was 1.43, and the 95% CI was [0.3340, 2.9885]. However, considering that our hypothesized model is supported by the literature on the negative effects of dehumanization on attitudes and behaviours (e.g., Esses, Medianu, & Lawson, 2013; Laakasuo, Köbis, Palomäki, & Jokela, 2017; Sontag, 2002), we think that social distance can be considered a reliable outcome of biologization.

disease. Furthermore, in line with our assumptions, the present study provided evidence for the conceptualization of physical disgust (vs. moral disgust) as a reliable antecedent of biologization that, in turn, increased attitudes of social distance towards the outgroup.

5. CONCLUSIONS

The present studies extend the knowledge about biologization by analysing possible antecedents and consequences of this phenomenon in the intergroup domain. By integrating Rozin and colleagues' (1999) conceptualization of disgust as "the body and soul emotion" with the literature on dehumanization (e.g., Volpato & Andrighetto, 2015), across two studies we consistently found that feelings of physical disgust, unlike moral disgust, are significantly related to other-biologization.

In Study 1, our findings revealed that different disgust experiences in terms of physical and moral disgust affect judgments about others. Specifically, the analysis of simple effects of group membership within disgust experiences supported our expectations for both dehumanizing perceptions and aggressive intentions and demonstrated the relevance of Rozin and colleagues' conceptualization of disgust. In particular, we learned that, in the physical disgust condition, participants showed more biologization and passive harm tendencies towards the outgroup member than towards the ingroup member. Additionally, in the moral disgust condition, participants showed more animalization and active harm tendencies towards the outgroup than towards the ingroup, while no significant differences emerged for the non-disgusting condition. With regard to Study 1, it is important to note that, in contrast with our assumptions, we found that disgust experiences affected dehumanization and aggressive intentions not only in reference to the outgroup but also in reference to the ingroup. In particular, simple effect analysis showed that, when the target was an ingroup member, in the

disgust conditions (vs. non-disgusting condition), participants showed more passive harm tendencies, whereas, in the moral disgust condition (vs. physical disgust vs. non-disgusting condition), participants showed more animalization and more active harm intentions. These results may be explained by suggesting that group membership is a fundamental part of self-concept and, coherently, in order to protect and enhance their self-esteem, group members may be motivated to protect and enhance the positivity of their group also by distancing and denigrating the ingroup member who performs something disgusting. In other words, although the original "black sheep effect" (Marques, Yzerbyt, & Leyens, 1988), in which the negative ingroup member is evaluated worse than the negative outgroup member, was not observed in our study, it is plausible to think that we noticed a sort of "black sheep" perception in which unlikeable ingroup members who elicited disgust — a primary, innate, and strong emotion — were negatively evaluated in terms of dehumanization and aggressive intentions. According to Marques et al. (1988), a negative evaluation of dislikeable ingroup members may be an acceptable psychological strategy for preserving one's group's overall positivity. In this respect, despite the unexpected results, these findings may be considered a "sophisticated" form of ingroup favouritism.

In study 1, we demonstrated that, despite some similarities, biologization and animalization are two distinct dehumanizing processes characterized by different antecedents (i.e., physical and moral disgust). In particular, our results support the idea that morality is one of the core dimensions defining human beings and perceiving others as lacking morality may have a crucial role in animalistic dehumanization (Pacilli et al., 2016). Moreover, of relevance to the present research project, our findings confirm the importance of physical disgust and the concepts of disease and the protection of cleanliness in the biologization process (Douglas, 1966; Volpato & Andrighetto, 2015). In this respect, these results are consistent with Speltini and Passini's (2014) statements about ingroup-

outgroup dynamics, according to which ingroup favouritism is usually characterized by the use of dirtiness/impurity as a definition of outgroups and cleanliness/purity as a natural feature of the ingroup.

The link between physical disgust and biological dehumanization was confirmed in Study 2, in which the knowledge of biologization in the intergroup domain was extended in two directions. First, the nature of biological dehumanization was analysed. The results showed that biologization involved an automatic association of the other with the concepts of disease and contagion. In particular, by using the *Semantic Misattribution Procedure* (SMP; Imhoff et al., 2011), this study provided evidence that ideographs were likely to be rated as having a meaning related to the concepts of disease and contagion after pictures of black people compared to white people. The second direction concerns the role of physical disgust on biologization and the knowledge on the possible consequences of biological dehumanization on attitudes of social distance. Specifically, this study revealed a link between physical disgust and increased participants' view of the other as a contagious entity. Furthermore, we found that this increased biologization led to a higher unwillingness to engage in contact with the target. Importantly, this pattern did not emerge for feelings of moral disgust. These results confirmed the role of physical disgust on biologization and provided evidence of a possible consequence of biological dehumanization towards the outgroup. In this regard, it is noteworthy that we found a bidirectional effect between biologization and attitudes of social distance (see Footnote 3, page 42). Despite this our result, the previous literature on the negative effects of dehumanization (e.g., Esses, Medianu, Lawson, 2013; Laakasuo et al., 2017; Sontag, 2002), suggests that this dehumanizing process is perhaps a more reliable antecedent of attitudes related to social distance. For example, research on the dehumanization of refugees has demonstrated that dehumanization and the depiction of migrants as sources and spreaders of infectious disease predict support for their exclusion from one's

country (Esses, Veenvliet, Hodson, & Mihic, 2008). Furthermore, as reported by Esses and colleagues (2013), by perceiving immigrants as a potential threat to members of the host society, one can more easily believe that they deserve negative outcomes and justify their exclusion and mistreatment.

To conclude, throughout the present studies, we analysed biologization by investigating possible antecedents and consequences of this phenomenon in the intergroup domain. Our findings confirmed and expanded the previous theoretically knowledge on this process. Feelings of physical disgust (vs. moral disgust) can lead to other-biologization. Furthermore, biological dehumanization has consequences in terms of attitudes of social distance.

As suggested in Chapter 1, thus far, biologization has been especially examined from a theoretical point of view within intergroup relations. However, considering Nussbaum's (2010) statements about *Dalits*, it is plausible to think that this form of dehumanization may also emerge within other contexts and target different social groups. Therefore, considering that both dehumanization and certain occupations accompanied by negative stigma involve denying a person identity, the next chapter will present four studies that examine dehumanization and biologization in the work domain.

3

Dehumanization and biologization in the work domain

"Dirty workers" and dehumanizing perceptions

1. Introduction

In the modern society, work is a central aspect of human life: it represents one of the main sources of expression of personal identity and worth sense (Bandura, 1995; Cheney, Zorn, Planalp, & Lair, 2008; Erikson, 1959) and is a significant means of self-presentation and self-definition (e.g., Berkman, 2014). However, certain occupations are often accompanied by negative stigma that can be projected onto the workers. The sociologist Hughes (1951, 1958) defined the stigmatized work activities with the term of "dirty work", by specifically referring to occupations that are perceived as disgusting, degrading or immoral. Douglas (1966) extended the Hughes' work (1951, 1958) by explaining the social meaning of this conceptualization. The author posited that the notion of dirt is indeed a cultural construction: work becomes "dirty" when society deems it so. In this respect, the label "dirty" in a work context involves physical dirt but also any other kind of dirt that society normally avoids, such as danger, crime or immorality. In line with these considerations, Ashforth and Kreiner (1999) defined dirty jobs as connected with three different types of taint: social, moral and physical. Social taint arises when a worker occupies low-status and low-power positions and has a

subordinate relationship with others (e.g., butlers or waiters). Moral taint occurs when a worker is thought to employ methods that are deceptive or immoral (e.g., bill collectors or pawnbrokers). Finally, physical taint occurs when an occupation is thought to be performed under particularly dangerous conditions (e.g., soldiers or firefighters) or is directly associated with dirt, garbage, and effluent (e.g., garbage collectors or sewer workers).

More recently, starting from the original theorization proposed by Hughes (1951, 1958), social psychologists and anthropologists focused their research on occupational dirt and identity dynamics (e.g., Ashforth & Kreiner, 2013; Ashforth, Kreiner, Clark, & Fugate, 2007, 2017; Bosmans et al., 2016; Cassell & Bishop, 2014; Filteau, 2015; Johnston & Hodge, 2014; Kreiner, Ashforth, & Sluss, 2006; Meldgaard Hansen, 2016; Selmi, 2012). For example, Dick (2005) explained that being branded as a "dirty worker" may imply a significant threat to the identity goal of seeing themselves in a positive light. Indeed, according to the author, dirt – in all of its meanings – symbolizes what society would like to exclude to maintain an agreeable order. For this reason, occupations characterized by certain defining features that violate societal, moral or physical norms are perceived as tainted, and workers in these occupations are consequently stigmatized.

By extending the abovementioned literature on dirty jobs, the present studies aimed to demonstrate that these tainted occupations may not only lead to stigmatization but also elicit a dehumanizing image of workers. In particular, although several research projects (e.g., Andrighetto et al., 2017; Gruenfeld, Inesi, Magee, & Galinsky, 2008) have investigated dehumanization in the work domain, to date research has not provided a clear systematization of which occupational groups may be associated with which corresponding dehumanizing images. To address this gap, starting from the concept of "dirty work" (e.g., Ashforth & Kreiner, 1999; Hughes, 1951), Study 1 and Study 2 aimed to show the association of different types of occupational taint with distinct dehumanizing perceptions of

workers. Theoretical and practical literature on dehumanization and occupational taint (e.g., Davis, 1982; Goffman, 1963; Haslam, 2006; Henson, 1996; Kelman, 1976) suggest indeed that both dehumanization and tasks labelled as "dirty work" involve denying a person identity, a perception of the person as an individual capable of making choices and underrating one's personal dignity. Thus, the purpose of Study 1 and Study 2 was to demonstrate that laypeople's perceptions of socially, morally, and physically tainted occupations are associated with corresponding dehumanizing metaphors. More specifically, in Study 1 and Study 2, we predicted that occupations characterized by social, moral and physical taint would be associated with three distinct dehumanizing images of workers. That is, we first assumed that social taint should elicit an objectifying image of workers. In particular, we assumed that socially tainted occupations would lead to a greater perception of workers as objects than morally and physically tainted jobs. Supporting this assumption, a set of studies conducted by Gruenfeld et al. (2008) examined objectification as a response to social power and found that in hierarchical work contexts, participants in high-power positions systematically objectified their subordinate partners by seeing them as mere instruments for the attainment of their own purposes. In parallel, Andrighetto et al. (2017; see also Baldissarri et al., 2017; Volpato, Andrighetto, & Baldissarri, 2017 for a review) revealed that (factory) workers performing subordinate activities characterized by repetitive movement, fragmented activities, and dependence on machines were objectified by laypeople, that is, were perceived as instrument-like (vs. a human being) and as less able to experience human mental states. Second, consistent with the literature on dirty work (Ashforth & Kreiner, 1999; Hughes, 1962), we supposed that morally tainted occupations might trigger an animalistic dehumanization of workers. We assumed that morally tainted occupations would lead to a greater perception of workers as animals than socially and physically tainted occupations. Indeed, morality is one of the core dimensions defining human beings, and

perceiving others as lacking morality is an important antecedent of animalistic dehumanization (Haslam, 2006; Kteily & Bruneau, 2017). For example, Pacilli et al. (2016) revealed that within the political domain, the perception of moral distance from political outgroups positively predicts their animalistic dehumanization. Therefore, it is plausible to imagine that in the work domain, occupations perceived as morally tainted are associated with an increase in animalized perceptions of people who perform these activities. Finally, of particular relevance to the present research project, considering that people are associated with disease especially when are perceived as lacking hygiene and in physical contact with dirt (Faulkner et al., 2004), we assumed that physically tainted occupations would be biologized more, that is, that biological metaphors would be used more to describe these workers than to describe workers in socially and morally tainted activities.

Moreover, focusing on physically stigmatized occupations and in line with the considerations of Faulkner and colleagues (2004), in Study 3 and Study 4, we hypothesized that the biologization of physically tainted workers would be elicited by the salience of the dirty environments in which they perform their activities. Importantly, as discussed in Chapter 1 and in line with the conceptualization of disgust as a "projective" emotion (Nussbaum, 2010; Rozin et al., 1986), we expected that the relationship between the salience of dirty work environments and the biologization of workers would be explained by increased feelings of disgust towards them.

2. OVERVIEW OF THE STUDIES

Our hypotheses were tested across four studies. By relying on questionnaires, Study 1 and Study 2 were designed to investigate whether different types of tainted workers would be associated with distinct metaphorical dehumanizing representations. In Study 1, participants were asked to evaluate the

groups on social, moral and physical taint. Furthermore, to test our main hypotheses about dehumanization, participants also rated the groups on items assessing dehumanizing perceptions. Study 2 was designed to replicate and generalize findings of Study 1 by employing the statistical technique of cluster analysis and considering more occupational groups.

Focusing on biologization and its relationship with physically stigmatized occupations, Study 3 and Study 4 were designed to experimentally verify the causal link between degrading work environments and increased feelings of disgust towards physically tainted workers, which, in turn, would lead to increased biological dehumanization of workers. To do so, in Study 3, participants were presented with video clips depicting pre-selected physically tainted workers (i.e., a garbage collector and a janitor) performing their daily work activities. Study 4 employed a less confounding stimulus material (i.e., text vignettes) than video clips. More importantly, this study was designed to provide a more stringent test of our hypothesis on biologization, by verifying whether the link between physically tainted activities and biological dehumanization would be specific for physically tainted workers and not emerge for other types of low-status occupations.

3. PRELIMINARY STUDY

The occupational groups used in our studies were selected through a preliminary study aimed at identifying the most salient tainted occupations in the Italian context.

Thirty-three (18 females; M = 32.36, SD = 15.94) Italian volunteers were asked to list at least one Italian tainted occupation. Before answering, participants received the following definition of "taint" borrowed from the literature (Bergman & Chalkley, 2007, page 251): "a characteristic or mark that is devalued in some social contexts, leading to prejudice against the person who possesses the mark".

Overall, participants reported 46 tainted occupations (see Table 1. See each study for more details about the selected occupational groups).

Table 1. Occupational groups emerged in the preliminary study.

Occupational groups	
Bankers	Lawyers
Beauticians	Leaflet distributors
Blue-collar workers	Magistrates
Bricklayers	Marketing clerks
Butchers	Mayors
Call-centre workers	Mechanics
Caregivers	Nurses
Cashiers	Police detectives
Coroners	Politicians
Customs officers	Priests
Debt collectors	Prostitutes
Dentists	Psychologists
Dishwashers	Researchers
Doctors	Secretaries
Farmers	Shop assistants
Funeral directors	Shopkeepers
Garbage collectors	Show girls
Gravediggers	Social workers
Hair stylists	State workers
Homemakers	Tattoo artists
Insurance agents	Teachers
Janitors	Trade unionists
Journalists	Waiters

4. STUDY 1

The purpose of this study was to investigate whether occupational taint (social vs. moral vs. physical) would shape participants' dehumanizing perceptions of targets. Starting from the preliminary study, we selected 6 occupational groups (i.e., two for each type of taint) and asked participants to rate the groups on items assessing dehumanizing perceptions. In particular, by relying on questionnaires, we supposed that workers in socially tainted occupations would be perceived as

objects (i.e., objectification) more than those in morally and physically tainted jobs, workers in morally tainted occupations would be perceived as animals (i.e., animalization) more than workers in socially and physically tainted jobs, and physically tainted occupations would be perceived as viruses (i.e., biologization) more than workers in socially and morally tainted jobs.

4.1. METHOD

In order to select our targets and classify each of the occupations that emerged in the preliminary study considering the three types of taint (i.e., social, moral and physical), thirty (17 females; $M = 24.10$, $SD = 3.68$) volunteers were asked to assess the extent to which (1 = *not at all*; 7 = *extremely*) each type of work was socially, morally and physically tainted in the Italian society. Before answering, volunteers received a definition of each type of taint (Ashforth & Kreiner, 1999). In particular, participants were asked to rate the extent to which the workers were thought to have a subordinate relationship with others (i.e., social taint), to employ methods that are deceptive or immoral (i.e., moral taint), and to work under particularly dangerous and dirty conditions (i.e., physical taint). Through a series of paired-samples t-tests, for this study, we selected the occupations with the highest score on one type of taint and the lowest scores on the other two (see Table 2). We found that waiter and leaflet distributor jobs were evaluated as more socially tainted than morally ($p < .001$, $d = 5.09$ for waiter; $p < .001$, $d = 5.79$ for leaflet distributor) and physically ($p < .001$, $d = 1.19$ for waiter; $p = .006$, $d = .54$ for leaflet distributor) tainted. Politician and debt collector jobs were evaluated as more morally tainted than socially ($p < .001$, $d = 19.33$ for politician; $p < .001$, $d = 13.51$ for debt collector) and physically ($p < .001$, $d = 19.33$ for politician; $p < .001$, $d = 9.50$ for debt collector) tainted. Finally, garbage collector and janitor jobs were evaluated as more physically tainted than socially ($p = .005$, $d = .55$ for garbage collector; $p <$

.001, $d = .64$ for janitor) and morally ($p < .001$, $d = 5.18$ for garbage collector; $p < .001$, $d = 8.42$ for janitor) tainted.

Table 2. Study 1: Means (and standard deviations) for occupational groups as a function of the types of taint.

	Social taint	Moral taint	Physical taint
Waiters	6.77_a	1.63_b	5.90_c
	(0.50)	(0.96)	(0.80)
Leaflet distributors	6.40_a	1.00_b	5.67_c
	(0.93)	(0.00)	(0.92)
Politicians	1.00_a	6.90_b	1.00_a
	(0.00)	(0.31)	(0.00)
Debt collectors	1.03_a	6.90_b	1.10_a
	(0.18)	(0.31)	(0.40)
Garbage collectors	6.07_a	1.50_b	6.83_c
	(1.26)	(0.86)	(0.38)
Janitors	6.37_a	1.33_b	6.97_c
	(0.96)	(0.66)	(0.18)

Note. Small subscripts compare social, moral and physical taint within jobs.

Considering these results, for Study 1, we selected 6 target groups: waiters and leaflet distributors for socially tainted jobs, politicians and debt collectors for morally tainted jobs, and garbage collectors and janitors for physically tainted jobs.

4.1.1. PARTICIPANTS AND EXPERIMENTAL DESIGN

One hundred and twenty (73 females) undergraduates at an Italian university participated in the study in exchange for partial course credit. Participants' age ranged from 19 to 60 years ($M = 23.88$, $SD = 4.88$). The study was a one-way between-subjects design with three levels (type of taint: social vs. moral vs. physical). Participants were randomly allocated across the three conditions.

4.1.2. PROCEDURE AND MATERIALS

One investigator administered individually to each participant a questionnaire that was presented as a survey on the "impression formation" towards some occupational groups in the Italian context. Depending on the experimental condition, participants were asked to rate the socially (i.e., waiter and leaflet distributor jobs), morally (i.e., politician and debt collector jobs) or physically (i.e., garbage collector and janitor jobs) tainted jobs. For each condition, the order of presentation of the two occupations was counterbalanced. Furthermore, to capture cultural perceptions of workers and to dispel any social desirability concerns associated with our use of explicit measures described below, respondents were instructed to express their judgments about how the considered workers are viewed by Italian society rather than by themselves (for a similar procedure, see Fiske, Cuddy, Glick, & Xu, 2002; Fiske, Xu, Cuddy, & Glick, 1999).

Dehumanizing perceptions. Dehumanizing perceptions of the workers were measured by employing words (i.e., nouns and adjectives) that recalled the three considered forms of dehumanization (objectification, animalization, and biologization). More specifically, respondents were asked to rate the extent to which (1 = *not at all*; 7 = *extremely*), according to the perspective of Italian society, each target was associated with these words and adjectives. Perceptions of each target as object-like were measured employing 6 object-related words (*object, tool, device, thing, instrument,* and *number*; α = .76) borrowed from previous research (e.g., Andrighetto et al., 2017; Rudman & Mescher, 2012). Instead, perceptions of each target as animal-like (animalization) and virus-like (biologization) were measured using, respectively, 4 animal-related adjectives (*animalistic, savage, primitive,* and *beastly*; α =.84) and 4 virus-related adjectives (*filthy, contaminated, infected,* and *contagious*; α = .85) borrowed from the literature concerning dirtiness and

dehumanization (e.g., Douglas, 1966; Savage, 2007; Speltini & Passini, 2014; Steuter & Wills, 2010; Tipler & Ruscher, 2014).

After completing the scales, participants were asked questions about their demographics. At the conclusion of the study, all participants were thanked and fully debriefed.

4.2. RESULTS AND DISCUSSION

For each variable, we computed a single score by collapsing the mean scores of the two target groups for each experimental condition (type of taint: social vs. moral vs. physical).

Dehumanizing perceptions. A MANOVA was conducted to analyse the effect of the type of taint (type of taint: social vs. moral vs. physical) on participants' dehumanizing perceptions of the workers. The multivariate test revealed a main effect of taint, $\lambda = .06$, $F(2,117) = 118.37$, $p < .001$, $\eta_p^2 = .75$. As reported below (see Table 3), univariate tests showed a significant effect of taint on dehumanization scores.

Table 3. Study 1: Means (and standard deviations) for dehumanizing perceptions as a function of the types of taint.

	Social taint	Moral taint	Physical taint
Objectification	1.83_a	1.23_b	1.17_b
	(0.60)	(0.27)	(0.28)
Animalization	1.03_c	1.85_a	1.07_c
	(0.10)	(0.76)	(0.16)
Biologization	1.02_c	1.08_c	3.27_a
	(0.07)	(0.27)	(0.76)

Note. The different letters, in the same row or column, indicate that the difference between the two means is significant, $p \leq .05$.

Regarding objectification, the analysis showed a significant effect of taint, $F(2,117) = 30.93$, $p < .001$, $\eta_p^2 = .35$, indicating that participants who evaluated the socially tainted workers perceived them as more similar to objects than the workers

in the moral, $p = .01$, and physical taint conditions, $p < .001$. Further, the participants' means scores in the moral and physical taint conditions did not differ ($p = .53$).

Regarding animalization, the analysis showed a significant effect of taint, $F(2,117) = 41.53$, $p < .001$, $\eta_p^2 = .41$, indicating that in the moral taint condition, the workers were perceived as more similar to animals than the workers in the physical, $p < .001$, and social taint conditions, $p < .001$. Further, the participants' mean scores in the physical and social taint conditions did not differ ($p = .71$).

Regarding biologization, the analysis showed a significant effect of taint, $F(2,117) = 299.72$, $p < .001$, $\eta_p^2 = .84$, indicating that in the physical taint condition, the workers were more biologized than the workers in the social, $p < .001$, and moral taint conditions, $p < .001$. Further, the participants' mean scores in the social and moral taint conditions did not differ ($p = .57$).

Study 1 provided the first evidence of the association between different types of occupational taint and different dehumanizing images of workers. That is, we found that participants who evaluated socially tainted workers perceived them as more object-like than respondents who evaluated morally and physically tainted workers. Instead, respondents who evaluated morally tainted workers perceived them as more animal-like than the other two types of tainted workers. Finally, participants who evaluated the physically tainted workers perceived them as associated with biological metaphors more than the other tainted workers.

5. STUDY 2

Study 2 was designed to replicate and generalize findings of Study 1 by employing a different statistical technique (i.e., cluster analysis) and considering more occupational groups. Indeed, Study 1 did not allow us to verify whether our results were due to social, moral and physical taint perceptions, or, rather, to factors related to the specific six chosen jobs (i.e., waiters, leaflet distributors, politicians,

debt collectors, garbage collectors, and janitors). Therefore, in this study, we used a sample of 27 occupational groups, namely the most frequent answers (for details, see paragraph 5.1.) resulted from the preliminary study (see Table 1, page 52; for a similar procedure, see Fiske et al., 2002). Participants were asked to evaluate the groups on social, moral and physical taint. Each group, with its score on the social, moral and physical taint dimensions, became a unit in cluster analyses. Reasonable cluster solution derived from standard decision rules. We compared clusters for distributions of groups across the entire space to examine whether social, moral and physical taint perceptions would differentiate occupational groups. Furthermore, in order to demonstrate that social, moral and physical taint perceptions are actually associated with the distinct work features described in the literature on dirty work (e.g., Ashforth & Kreiner, 1999), participants were asked to rate the main criteria used to define the three forms of stigmatization (i.e., social, moral and physical taint): perceptions of subordination, immorality and dirty environment. Finally, to test our main hypotheses about dehumanization, participants also rated the groups on items assessing dehumanizing perceptions.

5.1. METHOD

We considered the occupational groups that were listed by 6% ($N = 2$) or more of the respondents of the preliminary study (for a similar criterion of inclusion see Fiske et al., 2002). They were (in descending order): garbage collectors, politicians, janitors, gravediggers, teachers, bricklayers, prostitutes, call-centre workers, police detectives, state workers, bankers, insurance agents, dishwashers, caregivers, butchers, coroners, farmers, leaflet distributors, tattoo artists, hair stylists, waiters, blue-collar workers, nurses, secretaries, debt collectors, customs officers, lawyers.

5.1.1. Participants and experimental design

One hundred and twenty-six (105 females) undergraduates at an Italian university participated in the study in exchange for partial course credit. Participants' age ranged from 18 to 53 years (M = 23.67, SD = 5.87). Each participant rated 3 of the 27 groups.

5.1.2. Procedure and materials

Participants took part in an online study introduced as a task that involved "impression formation" towards some occupations in the Italian context. Each participant rated the 3 groups on scales reflecting social, moral and physical taint, the main criteria for work stigmatization, and dehumanizing perceptions. As in Study 1, in order to capture cultural perceptions of workers and to dispel any social desirability concerns associated with our use of explicit measures described below, respondents were instructed to express their judgments about how the considered workers are viewed by Italian society rather than by themselves (for a similar procedure, see Fiske et al., 2002; Fiske et al., 1999).

Social, moral and physical taint. Participants were asked to assess the extent to which (1 = *not at all*; 7 = *extremely*), according to the perspective of Italian society, the occupational groups were socially, morally and physically tainted. In particular, as in the previous study, participants were asked to rate the extent to which the workers were thought to have a subordinate relationship with others (i.e., social taint), to employ methods that are deceptive or immoral (i.e., moral taint), and to work under particularly dangerous and dirty conditions (i.e., physical taint).

Criteria for work stigmatization. Perceptions of subordination were measured using 6 adjectives (*independent* (R), *subordinate, subservient, dependent, free* (R), and *autonomous* (R); α = .94) related to the work activity. Perceptions of immorality were measured using 8 adjectives (*immoral, dishonest, polite* (R), *indecent, corrupt, honest* (R), *virtuous* (R), and *fair* (R); α = .89) related to the work methods, and

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perceptions of dirty environment were measured using 8 adjectives (*dirty, degrading, dangerous, damaging, clean* (R), *deleterious, harmful,* and *refined* (R); α = .85) related to the work setting. Participants were asked to evaluate each of the presented occupational groups by rating on a 7-point Likert scale (1 = *not at all*; 7 = *extremely*) the extent to which, according to the perspective of Italian society, the work activity, work methods, and work environment were characterized by these adjectives borrowed from the literature concerning dirty jobs (e.g., Ashforth & Kreiner, 1999).

Dehumanizing perceptions. To measure the objectifying perceptions, participants were asked to rate the extent to which the target was associated, according to the perspective of the Italian society, with the 6 instrument-related words (*object, tool, device, thing, instrument,* and *number*; α = .91) employed in Study 1. Perceptions of the target as animal-like and virus-like were instead measured using 4 animal-related nouns (*animal, savage, primitive,* and *beast*) and 4 virus-related nouns (*virus, contamination, filth,* and *contagion*). Participants were asked to rate the extent to which (1 = *not at all*; 7 = *extremely*) the target was associated with the animal-related nouns (α = .91) and the virus-related nouns (α = .90). In this and following studies, for animalization and biologization we opted for considering nouns rather than adjectives because these dehumanizing processes employ metaphors, and nouns are the most common part of speech used in metaphors (Straker, 2008). Furthermore, according to Carnaghi et al. (2008), despite the surface similarity of nouns and adjectives, nouns have a more powerful impact on person perceptions.

After completing the scales, participants were asked questions about their demographics. At the conclusion of the study, all participants were thanked and fully debriefed.

Two participants were excluded from the study because they did not complete the survey. The final sample considered for the analyses was of 124 participants. Each participant rated 3 occupational groups, resulting in a total of 372 ratings for each scale.

Cluster analyses. To test the relevance of social, moral and physical taint ratings in differentiating tainted work occupations, we examined their three-dimensional array in cluster analyses. To test the frequency of mixed combinations, we examined the distribution of groups into various clusters and assessed differences in social, moral and physical taint ratings for each cluster.

To examine the structure of this three-dimensional space, we conducted two types of cluster analyses of the 27 groups (for a similar procedure, see Fiske et al., 2002). We first conducted hierarchical cluster analysis (Ward's, 1963, method, which minimizes within-cluster variance) to determine the best fitting number of clusters. In particular, we identified a plausible number of clusters using typical decision rules (Blashfield & Aldenderfer, 1988): hierarchical cluster analysis produces an agglomeration schedule that specifies which cases or clusters have been merged in each stage and that provides coefficients indicating distances between each pair of cases or clusters being merged at each stage. According to Blashfield and Aldenderfer (1988), a jump (in coefficients) implies that two relatively dissimilar clusters have been merged. Thus, the number of clusters before the jump is the most reasonable estimate of the number of clusters. Therefore, we used the graphical technique of scree plot as the stopping rule for determining the ideal number of clusters.

For our sample, the last large change came in the break between three and four clusters, so we adopted a four-cluster solution. We then conducted *k*-means

cluster analysis (with the parallel threshold method) to determine which occupational groups fit into which cluster (see Figure 1).
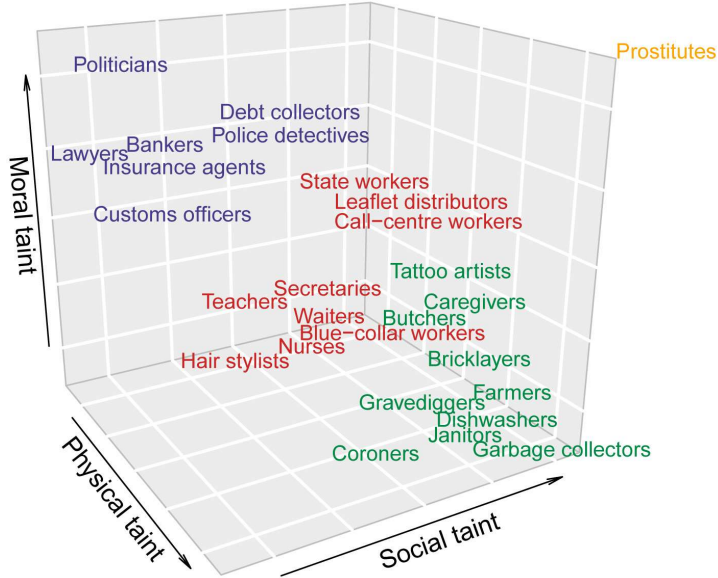

Figure 1. Study 2: Four-cluster solution on a three-dimensional social taint × moral taint × physical taint space. The cluster with the highest stigmatization (i.e., prostitutes) is plotted in orange. Social taint cluster is plotted in red; moral taint cluster is plotted in blue; physical taint cluster is plotted in green.

One cluster included only one group: prostitutes. Another cluster comprised nine groups: hair stylists, waiters, blue-collar workers, leaflet distributors, nurses, call-centre workers, teachers, secretaries, and state workers. Another cluster included seven groups: police detectives, debt collectors, customs officers, politicians, bankers, insurance agents, and lawyers. The final cluster comprised ten groups: dishwashers, caregivers, garbage collectors, janitors, butchers, coroners, gravediggers, farmers, bricklayers, and tattoo artists.

In order to assess differences in social, moral and physical taint ratings for each cluster, we compared the means for the four cluster centres. The cluster with the highest social, moral and physical taint ratings (M_{social} = 6.53; M_{moral} = 6.60; $M_{physical}$ = 6.47) was the one that included only one group (i.e., prostitutes).

Table 4. Study 2: Social, moral and physical taint means for each cluster.

Cluster	Social taint	Moral taint	Physical taint
Hair stylists, waiters, blue-collar workers, leaflet distributors, nurses, call-centre workers, teachers, secretaries, state workers	4.74_{aB}	2.59_{bC}	2.50_{bA}
Police detectives, debt collectors, customs officers, politicians, bankers, insurance agents, lawyers	2.21_{bB}	4.97_{cC}	1.86_{cA}
Dishwashers, caregivers, garbage collectors, janitors, butchers, coroners, gravediggers, farmers, bricklayers, tattoo artists	4.31_{aA}	2.37_{aB}	5.26_{aA}

Note. Small subscripts compare clusters within social, moral and physical taint perceptions; capital subscripts compare social, moral and physical taint perceptions within clusters.

Excluding the prostitute cluster (see Table 4), the cluster with the highest social taint rating was the one that comprised hair stylists, waiters, blue-collar workers, leaflet distributors, nurses, call-centre workers, teachers, secretaries, and state workers. This cluster significantly differed on the social taint rating from the moral cluster ($p = .001$) but did not significantly differ from the physical cluster ($p = .42$). Comparing the scores on social, moral and physical taint of this cluster, matched pair t-tests revealed that social taint rating significantly differed from moral taint rating, $t(8) = 5.30$, $p = .001$, $d = 2.67$, and physical taint rating, $t(8) = 7.22$, $p < .001$, $d = 3.32$.

The cluster with the highest moral taint rating was the one that comprised police detectives, debt collectors, customs officers, politicians, bankers, insurance agents, and lawyers. This cluster's moral taint rating significantly differed from all the other clusters (all ps < .001). Matched pair t-tests revealed that this cluster centre's score on moral taint significantly differed from the social taint score, $t(6) = 8.01$, $p < .001$, $d = 4.04$, and the physical taint score, $t(6) = 11.96$, $p < .001$, $d = 5.89$.

Finally, the cluster with the highest physical taint rating was the one that comprised dishwashers, caregivers, garbage collectors, janitors, butchers, coroners,

gravediggers, farmers, bricklayers, and tattoo artists. This cluster significantly differed on the physical taint rating from all the other clusters (all $ps < .001$). Comparing the scores on social, moral and physical taint of this cluster, matched pair t-tests revealed a significant difference between physical taint and moral taint ratings, $t(9) = 6.59$, $p < .001$, $d = 3.03$, but a non-significant difference between physical taint and social taint ratings, $t(9) = 2.08$, $p = .07$.

Criteria for work stigmatization. A MANOVA was conducted to analyse the difference between participants' perceptions of subordination, perceptions of immorality and perceptions of dirty environment according to the cluster memberships (cluster: social vs. moral vs. physical). Considering that the cluster that included only one group (i.e., prostitutes) was the one with the highest social, moral and physical taint ratings together, we decided to exclude it from the analysis[4]. The multivariate test revealed a main effect of cluster memberships, λ = .43, $F(2,354) = 60.72$, $p < .001$, $\eta_p^2 = .34$. As reported below, univariate tests showed a significant effect of clusters on the three dependent variables (see Figure 2).

Regarding subordination, the analysis showed a significant effect of cluster memberships, $F(2,354) = 40.27$, $p < .001$, $\eta_p^2 = .18$, indicating that in the social taint cluster the work activity was perceived as more subordinate ($M = 5.47$, $SD = 1.27$) than the work activity in the moral taint cluster ($M = 3.64$, $SD = 1.58$), $p < .001$, and in the physical taint cluster ($M = 4.35$, $SD = 1.69$), $p < .001$. Further, the work activity scores in the moral taint cluster and in the physical taint cluster significantly differed ($p = .001$).

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[4] By including in the analysis the cluster that comprised only the group of prostitutes, the same type of results for the social, moral and physical taint clusters were obtained. In the cluster that comprised prostitutes, the work methods ($M = 5.78$, $SD = .71$) and the work environment ($M = 5.68$, $SD = .99$) were respectively perceived as more immoral and dirtier than the work methods and the work environment in the other three clusters (all $ps < .001$). Regarding the work activity, the group of prostitutes ($M = 6.22$, $SD = .66$) was perceived more subordinate than moral and physical taint clusters (all $ps < .001$), while the work activity scores in this cluster and the social taint cluster did not differ ($p = .07$).

Regarding immorality, the analysis showed a significant effect of cluster memberships, $F(2,354) = 53.03$, $p < .001$, $\eta_p^2 = .23$, indicating that in the moral taint cluster the work methods were perceived as more immoral ($M = 4.24$, $SD = 1.35$) than in the social taint cluster ($M = 2.91$, $SD = 1.06$), $p < .001$, and in the physical taint cluster ($M = 2.88$, $SD = .91$), $p < .001$. Further, the work methods scores in the social taint cluster and in the physical taint cluster did not differ ($p = .83$).

Regarding perceptions of dirty environment, the analysis showed a significant effect of cluster memberships, $F(2,354) = 57.22$, $p < .001$, $\eta_p^2 = .24$, indicating that in the cluster with the highest physical taint rating, the work environment was perceived as dirtier ($M = 3.87$, $SD = 1.11$) than the work environment in the social taint cluster ($M = 2.94$, $SD = 1.01$), $p < .001$, and the moral taint cluster ($M = 2.41$, $SD = .97$), $p < .001$. Further, the work environment scores in the social taint cluster and the moral taint cluster significantly differed ($p < .001$).
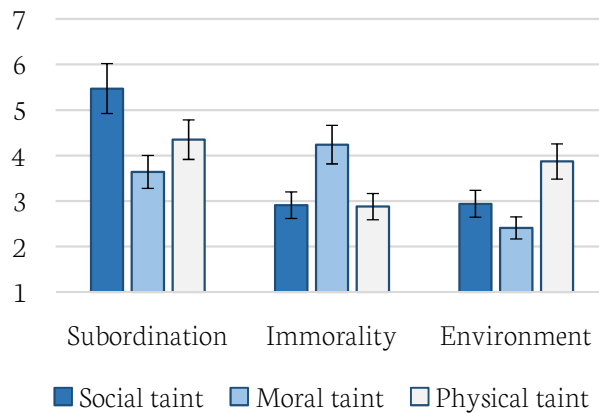

Figure 2. Study 2: Perceptions of subordination, immorality and dirty environment as a function of the cluster memberships.

These results showed that our cluster solution accurately represented tainted work activities. We found that the cluster memberships were associated with different perceptions of the three main criteria used to define social, moral and physical stigmatization. In particular, we found that perceptions of

subordination, immorality and dirty environment significantly differed among the respective types of taint (i.e., social, moral and physical).

Dehumanizing perceptions. A MANOVA was then conducted to analyse the effect of the cluster memberships (cluster: social vs. moral vs. physical) on participants' dehumanizing perceptions of the workers. As in the previous analysis, we decided to exclude the cluster with the highest social, moral and physical taint ratings together, that is, the cluster that included only one group (i.e., prostitutes)[5]. The multivariate test revealed a main effect of cluster memberships, λ = .64, $F(2,354)$ = 29.13, $p < .001$, η_p^2 = .20. As reported below, univariate tests showed a significant effect of the cluster on each dehumanization score (see Figure 3).

Regarding objectification, the analysis showed a significant effect of cluster memberships, $F(2,354)$ = 17.62, $p < .001$, η_p^2 = .09, indicating that participants evaluated workers in the social taint cluster as more similar to objects (M = 3.27, SD = 1.79) than the workers in the moral taint cluster (M = 2.15, SD = 1.27), $p < .001$, and in the physical taint cluster (M = 2.40, SD = 1.35), $p < .001$. Further, the scores in the moral taint cluster and the physical taint cluster did not differ (p = .22).

Regarding animalization, the analysis showed a significant effect of cluster memberships, $F(2,354)$ = 30.57, $p < .001$, η_p^2 = .15. Participants evaluated workers in the moral taint cluster as more similar to animals (M = 2.59, SD = 1.68) than the workers in the social taint cluster (M = 1.48, SD = .89), $p < .001$, and in the physical taint cluster (M = 1.57, SD = .82), $p < .001$. Further, the scores in the social taint cluster and the physical taint cluster did not differ (p = .52).

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[5] By including in the analysis the cluster that comprised only the group of prostitutes, the same type of results for the social, moral and physical taint clusters were obtained. In the cluster that comprised prostitutes, the target was more objectified (M = 5.15, SD = 1.38), animalized (M = 3.93, SD = 1.96) and biologized (M = 4.60, SD = 1.68) than the workers in the other three clusters (all ps < .001).

Regarding biologization, the analysis showed a significant effect of cluster memberships, $F(2,354) = 18.08$, $p < .001$, $\eta_p^2 = .09$, indicating that the workers in the physical taint cluster were more biologized ($M = 2.31$, $SD = 1.59$) than the workers in the social taint cluster ($M = 1.50$, $SD = .94$), $p < .001$, and in the moral taint cluster ($M = 1.51$, $SD = .89$), $p < .001$. Further, the scores in the social taint cluster and the moral taint cluster did not differ ($p = .92$).
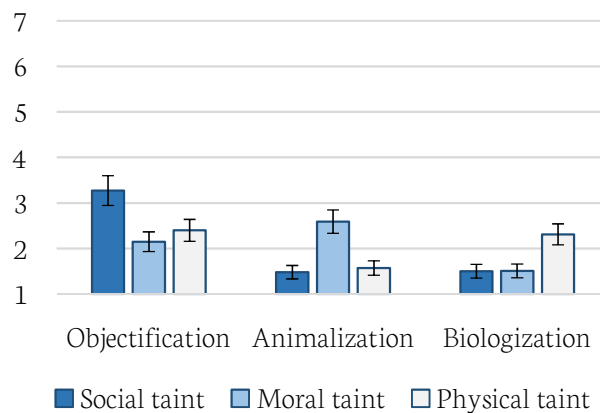

Figure 3. Study 2: Dehumanizing perceptions as a function of the cluster memberships.

In line with our hypotheses and Study 1, these findings revealed that occupational taint led participants' dehumanizing perceptions of targets. In particular, we found that workers in the social taint cluster were objectified more than those in moral and physical taint clusters, workers in the moral taint cluster were animalized more than workers in social and physical taint clusters, and worker in the physical taint cluster were biologized more than workers in social and moral taint clusters.

6. STUDY 3

Focusing on biologization and its relationship with physically stigmatized activities, Study 3 was designed to experimentally verify the causal link between degrading work environments and increased feelings of disgust towards pre-

selected physically tainted workers (i.e., a garbage collector and a janitor), which, in turn, would lead to increased biological dehumanization of workers. To do so, we employed visual stimuli (i.e., video clips) that depicted a garbage collector and a janitor performing their daily activities, that is, sweeping a street and cleaning a restroom, respectively. We manipulated the participants' attentional focus while they viewed these video clips (for a similar procedure, see Andrighetto et al., 2017; Heflick, Goldenberg, Cooper, & Puvia, 2012). Depending on the experimental condition, the participants were prompted to focus on the environment (environment-focus condition) or on the person in the video (person-focus condition). We supposed that if it is true that, as reported in Chapter 1, disgust can be "projective" (Nussbaum, 2010; Rozin et al., 1986), then focusing on the dirty work environment that characterizes physically tainted occupations would promote disgust towards people who work in such an environment. Furthermore, considering that the stimuli that are most capable of eliciting disgust are associated with disease and dirt (Buckels & Trapnell, 2013; Rozin et al., 2008), then focusing on this work environment (vs. the person) would increase perceptions of the targets as associated with contagion and thus reflect biological dehumanization via increased feelings of disgust. Finally, to provide evidence that the effect of work environments via disgust on dehumanizing perception is a peculiar process of biological dehumanization, the other forms of dehumanization (i.e., objectification and animalization) were considered in this study.

6.1. METHOD

Considering that in this study we focused on physically stigmatized work activities, in line with Study 1, the occupational groups were selected on the basis of the highest score for one type of taint (i.e., physical) and the lowest scores on the other two (i.e., social and moral). As reported in Study 1 and Table 2 (see page 54), garbage collectors and janitors were evaluated as more physically tainted than

socially (p = .005, d = .55 for garbage collector; p < .001, d = .64 for janitor) and morally (p < .001, d = 5.18 for garbage collector; p < .001, d = 8.42 for janitor) tainted. Thus, for this study, we decided to employ garbage collector and janitor jobs.

6.1.1. PARTICIPANTS AND EXPERIMENTAL DESIGN

One hundred and sixty (119 females) Italian volunteers participated in the study. The participants' ages ranged from 18 to 49 years (M = 24.17, SD = 4.1). A 2 (focus: environment vs. person) × 2 (target: garbage collector, janitor) design was used, with the target as a within-subjects variable and the focus as a between-subjects variable. The participants were randomly allocated to the experimental conditions.

6.1.2. PROCEDURE AND MATERIALS

The participants took part in an online study introduced as a task that involved "impression formation" of other people. To manipulate the focus, before they watched the video, the participants were instructed to focus either on the environment in the clip (environment-focus condition) or on the target shown in the clip (person-focus condition). Each participant watched two videos: one depicting the garbage collector and the other depicting the janitor. The presentation order of the two videos was counterbalanced across participants. After the participants viewed the videos, they completed a measure assessing feelings of disgust towards the target and a measure assessing the perceptions of the target as virus-like, object-like, animal-like and as a human being. Finally, the participants completed a manipulation check item, submitted their demographic information and were fully debriefed and thanked.

Videos. The two video clips, which were downloaded from freely available online sources, were both 65 seconds long and depicted two non-famous individuals performing their daily work tasks.

The garbage collector clip depicted a man sweeping a street. The janitor clip showed a man cleaning a restroom. Both workers wore their respective work uniforms (see Figure 4).
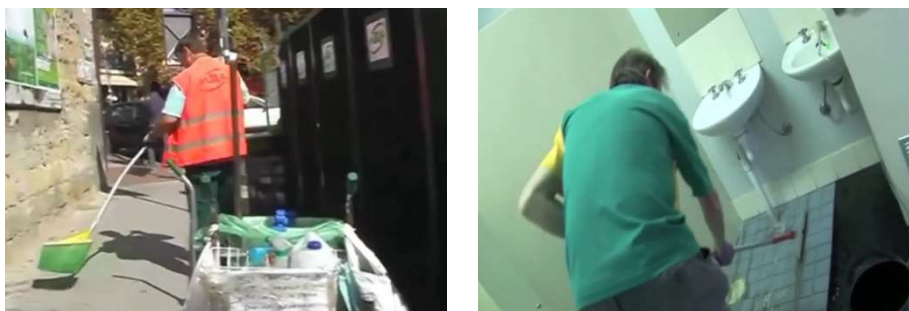

Figure 4. Frames of the clips used in Study 3 (garbage collector's clip on the left and janitor's clip on the right).

These two videos were selected from an initial pool of six clips (three for each occupation). Thirty volunteers (18 women; M = 29.10, SD = 9.81), who were blind to the study aims, evaluated each type of work depicted in the videos in terms of the work characteristics (e.g., *useful* (R), *subordinate*, *boring*; α = .78) and the features of the environment (e.g., *dirty, degrading, dangerous*; α = .90) using a 7-point scale (1 = *not at all*; 7 = *extremely*). We selected the two videos (one for each occupation) with the highest environment score in terms of dirt, and we controlled the chosen clips through a series of t-tests. The results revealed that there were no significant differences between the two occupations regarding work characteristics (t(22) = .38, p = .70) and environment features (t(27) = -1.37, p = .18). Furthermore, the targets depicted in the videos were evaluated in terms of perceived pleasantness, familiarity, and socio-economic status. The participants rated the pleasantness ("How pleasant is the target filmed in the video?") and familiarity ("How familiar is the target filmed in the video?") of the garbage collector and the janitor on a 7-point scale (1 = *not at all*; 7 = *extremely*). To measure the perceived socio-economic status, the participants were asked to indicate the status of the

workers (*low, middle, high*). A series of *t*-tests showed that there were no significant differences between the two targets in terms of the ratings of perceived pleasantness ($t(26) = .22, p = .82$), familiarity ($t(25) = -.36, p = .72$) and socioeconomic status ($t(28) = 0, p = 1.00$).

Focus manipulation. In the environment-focus condition, the participants read these instructions on the computer screen: "You are going to view a video clip. Please focus on the environment filmed in the video while you watch". In the person-focus condition, the word "environment" was replaced with "person".

Feelings of disgust. Perceptions of disgust towards the workers were measured using 6 disgust-related words (*disgust, aversion, pleasure* (R), *revulsion, appreciation* (R), and *attraction* (R); $\alpha = .86$) borrowed from previous research (e.g., Buckels & Trapnell, 2013; Dasgupta, DeSteno, Williams, & Hunsinger, 2009). The participants were asked to rate the extent to which they felt disgust towards each target on a 7-point Likert scale (1 = *not at all*; 7 = *extremely*).

Dehumanizing perceptions. To measure dehumanization, the participants were asked to rate the extent to which the target was associated with different sets of words (1 = *not at all*; 7 = *extremely*). The perceptions of the target as virus-like, object-like and animal-like were measured using the virus-related nouns (*virus, contamination, filth*, and *contagion*, $\alpha = .85$), the object-related words (*object, tool, device, thing, instrument*, and *number*; $\alpha = .85$) and the animal-related nouns (*animal, savage, primitive*, and *beast*; $\alpha = .80$) used in Study 2. Furthermore, considering that dehumanization involves denying humanness to others (Volpato & Andrighetto, 2015), in this study, we decided to consider the perceptions of humanity. In particular, we measured perceptions of the target as a human being by using 5 human-related words (*human being, person, individual, subject* and *citizen*; $\alpha = .93$; see, e.g., Capozza, Andrighetto, Di Bernardo, & Falvo, 2012) and computing a different

index for each dehumanization form. The biologization score resulted from the difference between the virus-related words and the human-related words, the objectification score resulted from the difference between the object-related words and the human-related words, and the animalization score resulted from the difference between the animal-related words and the human-related words. In this respect, higher scores indicated stronger perceptions of the target as virus-like, object-like or animal-like than as a human being (for a similar procedure, see Andrighetto et al., 2017).

Manipulation check. After completing the scales, the participants were asked to indicate what they focused on while viewing the video (environment vs. person).

6.2. RESULTS AND DISCUSSION

Twenty-four participants were excluded from the study because they failed the manipulation check and therefore were not considered in the main analyses.

Feelings of disgust. We performed a 2 (focus: environment vs. person) × 2 (target: garbage collectors, janitor) ANOVA with repeated measurements on participants' perceptions of disgust towards the workers.

The analysis yielded the expected main effect of focus, $F(1,134) = 66.09$, $p <$ .001, $\eta_p^2 = .33$: the participants perceived more disgust towards each target when they were primed to focus on his work environment ($M_{gc} = 4.34$, $SD_{gc} = .83$; $M_j = 4.42$, $SD_j = .78$) rather than on the person himself ($M_{gc} = 3.46$, $SD_{gc} = .60$; $M_j = 3.53$, $SD_j =$ .72; see Figure 5). Instead, neither the main effect of target, $F(1,134) = 1.25$, $p = .27$, nor the interaction of target × focus manipulation, $F(1,134) = .02$, $p = .90$, was significant.
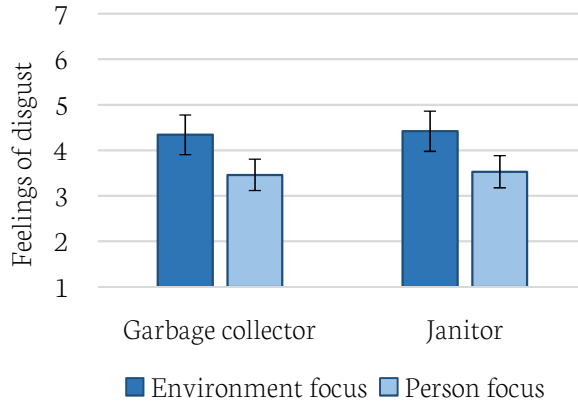
Figure 5. Study 3: Feelings of disgust as a function of focus manipulation.

Dehumanizing perceptions. A MANOVA with repeated measurements was conducted to analyse the effects of focus (focus: environment vs. person) on the participants' dehumanizing perceptions of the workers. The multivariate test revealed a main effect of focus, λ = .63, F(1,134) = 26.24, p < .001, η_p^2 = .37. As reported below, univariate tests showed a significant effect of focus on dehumanization scores.

Regarding biologization, the analysis showed a main effect of focus, F(1,134) = 38.80, p < .001, η_p^2 = .22, indicating that the participants biologized more the two workers when they were primed to focus on the work environment (M_{gc} = -2.39, SD_{gc} = 1.64; M_j = -2.75, SD_j = 1.86) rather than on the person (M_{gc} = -4.59, SD_{gc} = 1.92; M_j = -4.50, SD_j = 2.34). Instead, the main effect of the target was not significant, F(1,134) = 1.64, p = .20. Furthermore, we found that the interaction of target × focus manipulation was significant, F(1,134) = 4.30, p = .04, η_p^2 = .03, indicating that when participants were primed to focus on the work environment, they biologized the garbage collector more than the janitor. Despite this latter unexpected finding, these results overall confirmed our hypothesis: participants dehumanized the two physically dirty workers in a more biological way when they

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were primed to focus on the work environment rather than on the person (see Figure 6).
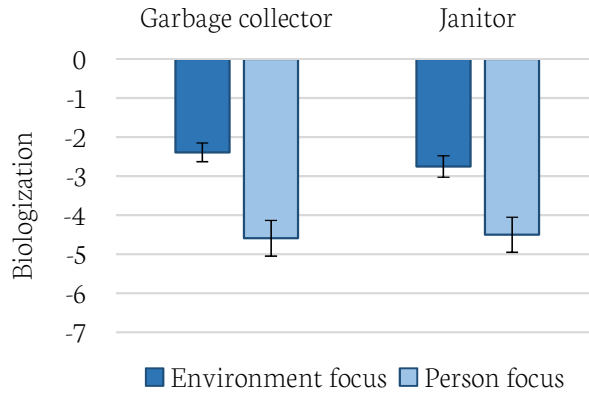

Figure 6. Study 3: Perceptions of biologization as a function of focus manipulation (the biologization score resulted from the difference between the virus- and the human-related words; higher scores indicated stronger perceptions of the target as virus-like than a human being).

Regarding the objectification score, the main effects of both the focus, $F(1,134) = 2.08$, $p = .15$, and target, $F(1,134) = .29$, $p = .59$, were not significant. In the same vein, the interaction of the target $\times$ focus manipulation, $F(1,134) = 2.06$, $p = .15$, was not significant.

Regarding animalization, the analysis did not yield a main effect of focus, $F(1,134) = 1.91$, $p = .17$. Neither the effect of target, $F(1,134) = .41$, $p = .52$, nor the interaction of target $\times$ focus manipulation, $F(1,134) = .16$, $p = .69$, was significant.

The role of disgust in the biologization of physically tainted workers. To investigate whether focusing on the work environment predicted biologization via disgust towards the workers, we tested a mediation model in which the participants' attentional focus (1 = environment, 0 = person) was considered the predictor variable, disgust as the mediator variable and biologization towards the workers as the outcome variable. For each variable, we computed a single score that resulted from the mean of the two targets in each experimental condition. The mediation

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model (see Figure 7) was tested using Hayes' (2013) PROCESS macros (Model 4) and the bootstrapping method (5,000 resamples).

The analysis showed that focusing on the work environment increased the perception of disgust (b = .89, SE = .11, $t(1,134)$ = 8.13, p < .001). In turn, higher levels of disgust were significantly related to a higher biologization score (b = .68, SE = .24, $t(2,133)$ = 2.77, p = .006). As the first support for our mediation hypotheses, the direct effect of focus was still significant but decreased in this model, b = 1.37, SE = .38, $t(2,133)$ = 3.63, p < .001, suggesting a "partial" mediation of disgust. Crucially, the indirect effect of the focus on the biologization score via disgust emerged as significant: the point estimate was .60, and the 95% CI was [0.0928, 1.1604][6].
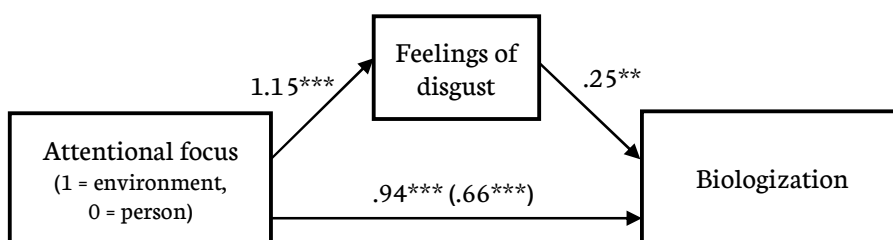

Figure 7. Study 3: Disgust "partially" mediates the relation between focus manipulation (1 = environment, 0 = person) and biologization (the values reflect standardized β coefficients; estimate of the mediated model is in parentheses).
Note. ** $p \leq$ .01; *** $p \leq$ .001.

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[6] We also tested a mediation pattern in which the focus was considered as the predictor variable (1 = environment, 0 = person), biologization as the mediator variable and disgust towards the workers as the outcome variable. The analysis showed that focusing on the work environment increased biologization (b = 1.97, SE = .32, $t(1,134)$ = 6.23, p < .001). In turn, higher levels of biologization were significantly related with an increased perception of disgust (b = .08, SE = .03, $t(2,133)$ = 2.77, p = .006). Furthermore, the indirect effect of the focus on disgust via biologization emerged as significant: the point estimate was .16, and the 95% CI was [0.0180, 0.3535]. However, considering that our hypothesized model is supported by the literature on the role of emotions in dehumanization processes (e.g., Buckels & Trapnell, 2013; Hodson & Costello, 2007), we think that disgust can be considered a reliable mediator of the relationship between dirty work environments and biologization.

Importantly, this mediation pattern did not emerge for objectification (the point estimate was .02, and the 95% CI was [-0.6402, 0.6923]) and animalization (the point estimate was .02, and the 95% CI was [-0.3845, 0.5064]).

In Study 3, despite the mean ratings of each dehumanizing perception being negative in all conditions – indicating a weak association of the targets with virus-, instrument- and animal-related words – we found that focusing on the physically tainted work environment (vs. on the person performing the work) increased the feelings of disgust towards the workers and their biologization. This study revealed a link between the degrading work environment characterizing physically tainted occupations and increased feelings of disgust towards the workers. Furthermore, we found that this increased disgust leads to an increased association of workers with biological metaphors. Focusing on the work environment increased the participants' feelings of disgust, which in turn led to a view of the workers as contagious individuals. Importantly, this pattern did not emerge for objectification and animalization.

7. STUDY 4

Study 4 was designed to further investigate the hypothesized findings of Study 3 by employing a different paradigm and considering different occupational groups. In particular, we aimed to verify the specificity of the link between physically tainted activities and biologization, which we expected would not emerge for other types of low-status occupations. Indeed, Study 3 did not allow us to verify whether our results were due to the physical taint and degrading work environments that typically characterize physically stigmatized occupations (Ashforth & Kreiner, 1999), or, rather, to the subordinate and low-status position of these occupations in the society. Furthermore, we aimed to increase the generalizability of our findings in two ways: by considering a paradigm that used vignettes, a less confounding stimulus material than video clips used in Study 3,

and by employing a female target instead of a male target. For this reason, to prevent possible confounding effects caused by gender, we decided to use a sample of all women in this study. We manipulated the type of work by depicting a janitor (i.e., physically tainted condition), cashier or student to the participants. The cashier was selected as the crucial comparison condition because, similar to the janitor, the work was supposed to be a low-status occupation but was not characterized by a dirty work environment. The student was instead selected as a baseline condition because of its similarity with our sample. In this respect, we assumed that when the participants were shown a description of a cashier (non-physically tainted condition), they would display lower feelings of disgust and lower biologization compared to those assigned to the physically tainted condition but not compared to those assigned to the baseline condition. Consistent with Study 3, we believed that the degrading work environment would lead participants to biologize the target via increased feelings of disgust. More specifically, considering that people in physical contact with dirt are associated with disease (Faulkner et al., 2004), we first expected that exposure to a physically tainted occupation (vs. non-physically tainted occupation vs. baseline condition) would be directly related to degrading work environment perceptions. In turn, such a perception would be positively related to increased feelings of disgust towards the worker. Finally, this emotion would be reflected in a greater tendency to associate the target with biological metaphors.

7.1. METHOD

The occupational groups (i.e., janitor and cashier jobs) were pretested in terms of the perceived work environment (e.g., *degrading, dangerous, polluting*; α = .85), work activity (e.g., *independent* (R), *subordinate, conditioned*; α = .78) and socio-economic status. Fifty participants (41 women; M = 34.79, SD = 10.93) who were blind to the study aims rated the work environment and work activity of the janitor

or the cashier on a 7-point scale (1 = *not at all*; 7 = *extremely*). To measure perceived socio-economic status, the participants were asked to indicate the status of the worker (*low, middle, high*). The independent sample *t*-test showed that there were no significant differences between the two targets in terms of the ratings of perceived work activity ($t(48) = -.86$, $p = .39$) and socio-economic status ($t(48) = -1.92$, $p = .07$). For the perceived work environment, we found a significant difference ($t(48) = 5.03$, $p < .001$, $d = 1.43$) between the two targets, indicating that in the janitor condition ($M = 4.61$, $SD = 1.14$), the work environment was perceived as dirtier than the work environment in the cashier condition ($M = 3.13$, $SD = .91$).

7.1.1. PARTICIPANTS AND EXPERIMENTAL DESIGN

Seventy-one undergraduate students participated in the study. The participants' ages ranged from 18 to 78 years ($M = 30.46$, $SD = 17.06$). The study was a one-way, between-subjects design with three levels (work: physically tainted vs. non-physically tainted vs. baseline condition). The participants were randomly allocated to the experimental conditions.

7.1.2. PROCEDURE AND MATERIALS

The experiment was administered online, and it was introduced as a task involving "impression formation". The participants were first randomly assigned to read one of three vignettes describing a janitor (physically tainted condition), a cashier (non-physically tainted condition) or a student (baseline condition) named Maria[7]. After viewing a picture and reading the description, all of the participants completed a questionnaire using the scales described below. Finally, the participants were asked for their demographic information and were thanked and fully debriefed.

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[7] To further generalize our findings regarding physically tainted workers, we decided to employ a female target.

Picture and vignette description. In all conditions, the target was introduced with a picture[8] that was presented at the centre of the screen (see Figure 8). The selected picture was evaluated in terms of perceived pleasantness and familiarity. In particular, thirty participants (17 women; M = 26.03, SD = 4.70) rated the pleasantness ("How pleasant is the target depicted in the picture?") and familiarity ("How familiar is the target depicted in the picture?") of the target on a 7-point scale (1 = *not at all*; 7 = *extremely*). Results showed that for both the pleasantness (M = 3.90, SD = .30) and familiarity (M = 3.87, SD = .35), the difference between the mean rating and the midpoint (i.e., 4) of the 7-point scale was not significant (t(29) = -1.76, p = .08 for the pleasantness; t(29) = -2.11, p = .07 for the familiarity). Thus, the target was perceived averagely pleasant and familiar.

Figure 8. Study 4: Picture used to introduce the target.

Regarding the vignette description, the participants first read: "Maria is twenty-seven years old and lives in Milan". The subsequent sentence varied depending on the condition. For the physically tainted condition, the participants read the following: "She works as a janitor at the University of Milano-Bicocca". For the non-physically tainted condition, the participants read: "She works as a cashier at the canteen of the University of Milano-Bicocca". Finally, for the baseline condition, the participants read: "She is an undergraduate student at the University of Milano-Bicocca".

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[8] The picture was selected from the *Chicago face database* (Ma, Correll, Wittenbrink, 2015), https://chicagofaces.org/.

Perceptions of the work environment. Perceptions of the work environment were measured using the same 8 adjectives that were used in Study 2 (*dirty, degrading, dangerous, damaging, clean* (R)*, deleterious, harmful,* and *refined* (R); α = .84). The participants were asked to rate the extent to which the considered work environment was characterized by these adjectives on a 7-point Likert scale (1 = *not at all*; 7 = *extremely*).

Feelings of disgust. Perceptions of disgust were identified using the same measure that was used in Study 3 (*disgust, aversion, pleasure* (R)*, revulsion, appreciation* (R), and *attraction* (R); α = .70). The participants were asked to rate the extent to which (1 = *not at all*; 7 = *extremely*) they perceived disgust towards the target.

Dehumanizing perceptions. To measure the dehumanizing perceptions of the target, the participants were asked to rate the extent to which the target was associated with the virus-related words (*virus, contamination, filth,* and *contagion*; α = .66), instrument-related words (*object, tool, device, thing, instrument,* and *number*; α = .83), and animal-related words (*animal, savage, primitive,* and *beast*; α = .23)[9], employed in Study 2 and Study 3. Perceptions of the target as a human being were measured using human-related words (*human being, person, individual, subject* and *citizen*; α = .77) employed in Study 3. As in the previous study, to obtain an index for each dehumanization form, we computed the three scores that resulted from the difference between each dehumanizing score and the human-related score.

Manipulation check. After completing the scales, the participants were asked to indicate the occupation of the target (janitor vs. cashier vs. student).

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[9] Because of its low reliability, for the animalization score, we decided to only employ the two items that we consider the core dimensions of animalization – that is, *animal* and *beast* (r = .25, n = 69, p = .04).

Two participants were excluded from the study because they failed the manipulation check and therefore were not considered in the main analyses.

We performed two one-way between-subjects (work: physically tainted vs. non-physically tainted vs. baseline condition) ANOVAs on the participants' perceptions of work environment features and feelings of disgust.

Perceptions of the work environment. Regarding work environment features, the analysis showed a main effect of work, $F(2,66) = 7.99$, $p = .001$, $\eta_p^2 = .19$, indicating that in the physically tainted condition ($M = 3.44$, $SD = 1.13$), the work environment was perceived as dirtier than the work environment in the non-physically tainted ($M = 2.65$, $SD = .57$), $p = .01$, and baseline ($M = 2.41$, $SD = .92$) conditions, $p = .001$. Furthermore, the participants' mean score in the non-physically tainted and baseline conditions did not significantly differ ($p = 1.00$).

Feelings of disgust. Regarding feelings of disgust, we found a main effect of work, $F(2,66) = 3.27$, $p = .04$, $\eta_p^2 = .09$: in the physically tainted condition ($M = 3.16$, $SD = .87$), the participants perceived more feelings of disgust towards the worker than in the non-physically tainted ($M = 2.73$, $SD = .42$), $p = .02$, and baseline ($M = 2.78$, $SD = .49$) conditions, $p = .04$, while the participants' mean score in the non-physically tainted and baseline conditions did not significantly differ ($p = 1.00$).

Dehumanizing perceptions. A MANOVA was conducted to analyse the effect of the type of work (work: physically tainted vs. non-physically tainted vs. baseline condition) on the participants' dehumanized perceptions of the targets. The multivariate test revealed a main effect of work, $\lambda = .37$, $F(2,66) = 13.70$, $p < .001$, $\eta_p^2 = .39$. As reported below, univariate tests showed a significant effect of work on dehumanization scores.

Regarding biologization, the analysis showed a significant effect of work, $F(2,66) = 5.41$, $p < .001$, $\eta_p^2 = .93$, indicating that in the physically tainted condition,

the worker was more biologized (M = -3.79, SD = 1.72) than in the non-physically tainted (M = -4.63, SD = 1.14), p = .03, and in the baseline conditions (M = -5.01, SD = .86), p = .002. Furthermore, the participants' mean scores in the non-physically tainted and baseline conditions did not significantly differ (p = .30).

Regarding the objectification score, the effect of work, F(2,66) = 4.45, p = .01, η_p^2 = .12, was significant, indicating that participants in the non-physically tainted condition perceived the worker (M = -3.60, SD = 1.70) as more similar to an object than participants in the physically tainted (M = -4.58, SD = 1.64), p = .03, and baseline conditions (M = -4.79, SD = .93), p = .01. Furthermore, the participants' mean score in the physically tainted and baseline conditions did not significantly differ (p = .64) (see Figure 9).

Regarding animalization, the analysis did not yield an effect of work, F(2,66) = 2.77, p = .07.
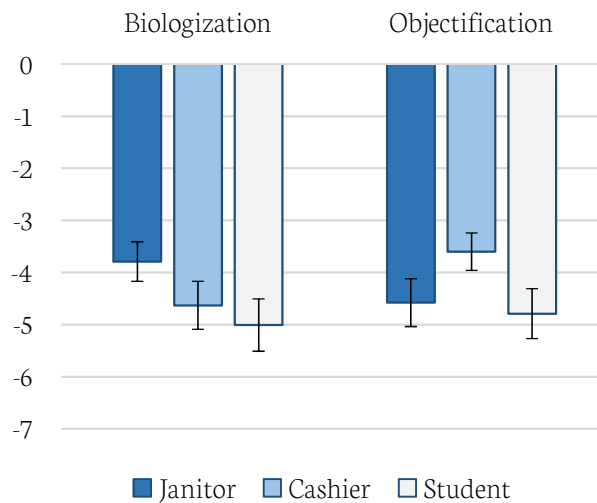

Figure 9. Study 4: Perceptions of biologization and objectification as a function of work manipulation (the dehumanizing scores resulted from the difference between the virus- and object-related words with the human-related words, respectively; higher scores indicated stronger perceptions of the target as virus- and object-like than a human being).

The role of disgust in the biologization of physically tainted workers. To investigate whether the type of work predicted biologization via work environment and disgust towards the target, we tested a double mediation model in which the type of work was considered the predictor variable, the work environment was the first-level mediator, disgust was the second-level mediator and biologization was the outcome variable. The double mediation hypothesis was tested using Hayes' (2013) PROCESS macros (Model 6) and the bootstrapping method (5,000 resamples). Since the independent variable was multicategorical, we used indicator coding. The physically tainted condition was coded as the reference condition and was compared to the non-physically tainted condition (D1) and baseline condition (D2) separately.

As shown in Figure 10, the effects of the physically tainted condition vs. non-physically tainted condition (D1) and of the physically tainted condition vs. baseline condition on work environment perceptions (D2) were significant ($b = .78$, $SE = .27$, $t(2,66) = 2.91$, $p = .005$ and $b = 1.03$, $SE = .27$, $t(2,66) = 3.85$, $p < .001$, respectively), indicating that the janitor (vs. the cashier and vs. baseline condition) was associated with higher perceptions of a degrading work environment. In turn, work environment perceptions were positively related to feelings of disgust ($b = .25$, $SE = .08$, $t(3,65) = 3.12$, $p = .003$). Finally, higher levels of disgust were significantly related to higher biologization ($b = .69$, $SE = .25$, $t(4,64) = 2.71$, $p = .009$). As a first support to our double mediation hypothesis, the direct effect of D1 on biologization was not significant ($b = .43$, $SE = .38$, $t(4,64) = 1.11$, $p = .27$); the direct effect of D2 was still significant but decreased ($b = .81$, $SE = .39$, $t(4,64) = 2.05$, $p = .04$). Importantly, the indirect effect of the physically tainted condition vs. non-physically tainted condition (D1) and of the physically tainted condition vs. baseline condition (D2) on biologization via degrading work environment perceptions and feelings of disgust were significant (the point estimate was .13, and

the 95% CI was [0.0061, 0.5277] for D1; the point estimate was .18, and the 95% CI was [0.0086, 0.6810] for D2), supporting a "full" double mediation model[10].
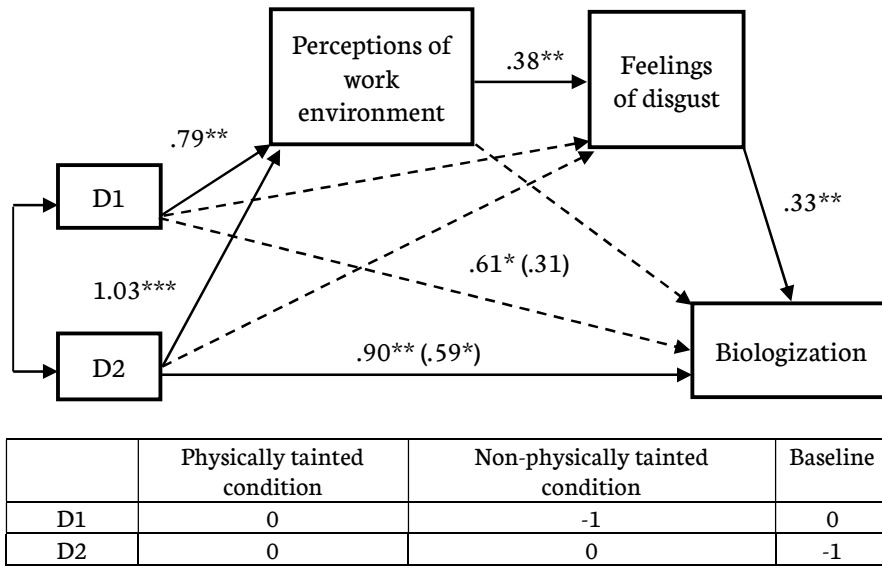

Figure 10. Study 4: Model testing the indirect effect from the type of work to biologization through work environment perceptions and feelings of disgust (the values reflect standardized β coefficients; estimate of the mediated model is in parentheses).
Note. * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

It is noteworthy that this pattern did not emerge when objectification and animalization were entered as dependent variables. Regarding objectification, the point estimate was .11, and the 95% CI was [-0.0041, 0.4398] for D1; the point estimate was .14, and the 95% CI was [-0.0097, 0.5407] for D2. A similar result emerged for animalization: the point estimate was .07, and the 95% CI was [-0.0112,

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[10] We also tested a pattern in which the type of work predicted feelings of disgust via the work environment and biologization. Therefore, the type of work was considered the predictor variable, the work environment was the first-level mediator, biologization was the second-level mediator and disgust was the outcome variable. The indirect effect of both D1 (physically tainted condition vs. non-physically tainted condition) and D2 (physically tainted condition vs. baseline condition) on feelings of disgust via degrading work environment perceptions and biologization were not significant: the point estimate was .04, and the 95% CI was [-0.0002, 0.1625] for D1; the point estimate was .05, and the 95% CI was [-0.0002, 0.2410] for D2, thus not supporting this double mediation model.

0.3160] for D1; the point estimate was .09, and the 95% CI was [-0.0206, 0.4038] for D2.

As in Study 3, despite the mean ratings of each dehumanizing perception being negative in all conditions – indicating a weak association of the targets with virus-, instrument- and animal-related words – by relying on text vignettes describing a janitor, a cashier or a student, in this study, we found that the type of work predicted a biologized view of the worker. In particular, simply reporting a physically tainted occupation (vs. baseline condition) increased the participants' feelings of disgust and biological dehumanization towards the target. In contrast, reporting a non-physically tainted occupation (vs. baseline condition) had no effects on feelings of disgust and biologization of the worker. Thus, the janitors (i.e., physically tainted workers) but not the cashiers (i.e., non-physically tainted workers) appear to be dehumanized in a biological way. Furthermore, in line with Study 3, Study 4 revealed that the physically tainted occupation (vs. non-physically tainted occupation and vs. baseline condition) led to degrading work environment perceptions and, in turn, to increased feelings of disgust. Finally, this increased disgust led to an increased biologization. Importantly, this pattern did not emerge for objectification and animalization.

8. CONCLUSIONS

By integrating the literature on "dirty work" (Hughes 1951, 1958; Ashforth & Kreiner, 1999) with that of dehumanization (Volpato & Andrighetto, 2015), we aimed to demonstrate that tainted occupations may not only lead to stigmatization but also elicit a dehumanizing image of workers. Across four studies, we investigated how dehumanizing metaphors may be used within the work field and shape laypeople's perceptions of certain work-tainted targets.

By relying on questionnaires, in Study 1 and Study 2, the findings showed that specific types of tainted workers are associated with different dehumanizing

images. In particular, we found that socially tainted occupations were associated with a greater perception of workers as objects than morally and physically tainted jobs, morally tainted occupations were associated with an increased perception of workers as animals than socially and physically tainted jobs and physically tainted occupations were associated with an increased perception of workers as viruses than socially and morally tainted jobs. These findings were replicated and extended in Study 2, in which our hypotheses were verified by employing a wider number of occupational groups and the statistical technique of cluster analysis. In line with Study 1, we provided evidence for the assumptions that social, moral and physical taint perceptions were associated with distinct work features and different dehumanizing perceptions. In particular, our findings revealed that the social taint cluster included nine groups (e.g., blue-collar workers, leaflet distributors) for which the work activity was perceived as more subordinate, and the workers were perceived as more similar to objects than in moral and physical taint clusters. The work methods used by workers belonging to the seven groups of the moral taint cluster (e.g., politicians, lawyers) were perceived as more immoral, and the workers themselves were perceived as more similar to animals than in social and physical taint cluster. Finally, the physical taint cluster comprised ten groups (e.g., janitors, garbage collectors) for which the work environment was perceived as dirtier, and the workers as more similar to viruses than in social and moral taint clusters. Our analysis also revealed a fourth cluster in which fell into a single group, the prostitutes. They were in fact perceived as an "outlying" target having the highest social, moral and physical taint ratings. These findings are in line with the theoretical assumptions proposed by Ashforth and Kreiner (2014), according to which prostitutes are among those occupations characterized by all the three forms of stigmatization. Furthermore, as reported in Chapter 1, according to Harris and Fiske (2006), groups stereotyped as low in both warmth and competence (e.g., drug addicts and homeless people) fail to elicit activation of brain regions typically

associated with viewing humans (e.g., medial prefrontal cortex). Starting from these findings, Haslam and Loughnan (2016) suggested that other similar targets seen as impure, tainted or revolting – such as prostitutes – are particularly liable to be thoroughly dehumanized. Accordingly, it is important to note that our results showed that in the cluster that comprised prostitutes, the target was more objectified, animalized, and biologized than the workers in the other three clusters (see Footnote 5, page 66). For these reasons and considering that this profession seems to encompass in people's minds biological subordination, immorality, and disease, it is unsurprising that one cluster included only this occupational category.

Focusing on the association between physically tainted activities and biologization, and the conceptualization of disgust as a "projective" emotion (Nussbaum, 2010; Rozin et al., 1986), in Study 3 and Study 4 we demonstrated that the salience of dirty work environments characterizing certain physically dirty occupations elicits people's disgust towards workers. In turn, disgust would increase the association of these physically tainted workers with biological metaphors. In Study 3, in which the work environment features were made salient using video clips that depicted a garbage collector and a janitor while they performed their manual work activities, we employed an experimental paradigm used in previous research (Heflick et al., 2012; Andrighetto et al., 2017) and found that, compared to those who focused on the workers' person, the participants who focused on the workers' work environment more strongly perceived the targets as virus-like – and thus biologized – and felt more disgust towards them. Importantly, the focus effect did not emerge for the perceptions of workers as object-like and animal-like. Regarding the focus effect, it is noteworthy that when participants were primed to focus on the work environment, they biologized the garbage collector more than the janitor. This unexpected result is consistent with the idea that people experiencing fear of pathogen transference show a significantly greater preference for and valuation of cleansing products (e.g., Galoni & Noseworthy, 2015).

Coherently, when participants were asked to rate the janitor, who works with cleansing supplies and whose activity is to sanitize things, they didn't show the same level of association with viruses as when they were asked to rate the garbage collector. In addition, this study showed that focusing on the work environment increased the perception of disgust, which in turn was significantly related with a higher biologization score. These findings were extended in Study 4, in which the specificity of the link between physically tainted activities and biologization was verified by exposing participants to a description of a janitor (i.e., physically tainted condition), a cashier (i.e., non-physically tainted condition) or a student (i.e., baseline condition). By employing a paradigm that used vignettes, a less confounding stimulus material than the video clips used in Study 3, we found that the janitors – but not the cashiers – were dehumanized in a biological way. Furthermore, in line with Study 3, Study 4 revealed that the physically tainted occupation (vs. non-physically tainted occupation and vs. baseline condition) led to degrading work environment perceptions and, in turn, to increased feelings of disgust. Finally, this increased disgust led to increased biologization. Importantly, this pattern did not emerge for objectification and animalization, confirming that the relationship between the work environment and disgust is a peculiar process that triggered only one particular form of dehumanization, that is, biologization. Regarding this causal path, it is noteworthy that in Study 3, we found a bidirectional effect between biologization and disgust (see Footnote 6, page 75). In particular, we found that focusing on the work environment predicted disgust towards the workers also via biologization. This unexpected, alternative and significant pattern leads us to not exclude the existence of a bidirectional effect between disgust and biologization. However, both the previous literature on the role of emotions in dehumanization processes (see Buckels & Trapnell, 2013; Hodson & Costello, 2007) and the findings of Study 4 – in which the bidirectional effect between biologization and disgust was not confirmed (see Footnote 10, page

84) – suggest that disgust is perhaps a more reliable mediator and antecedent of dehumanizing perceptions, such as biologization. With regard to Study 4, it is important to note that participants in the non-physically tainted condition perceived the worker as more similar to an object than participants in the physically tainted and baseline conditions. In other words, a low-status occupation not characterized by a dirty work environment led to an objectified view of the target. This result is in line with other studies about dehumanization related to the work domain. For example, Gruenfeld et al. (2008) found that in hierarchical work contexts, the participants in high-power positions objectified their subordinates by seeing them as instruments for the attainment of their own purposes. Furthermore, Andrighetto et al. (2017) revealed that (factory) workers performing subordinate activities characterized by repetitive movement, fragmented activities, and dependence on machines were objectified by laypeople. Finally, Study 4 further generalized our findings by demonstrating that the physically tainted occupation led to degrading work environment perceptions and in turn to increased feelings of disgust and increased biologization also when the target was a female worker.

To conclude, we analysed dehumanizing perceptions in relation to different types of occupational taint, with a specific focus on physically stigmatized activities, biological dehumanization, and feelings of disgust. Throughout the present studies, we proposed the first experimental evidence of biologization in the work domain by expanding its analysis in a non-extreme context – that is, in the daily workplace.

4

GENERAL DISCUSSION

1. IMPLICATIONS

The present work makes a novel contribution to the dehumanization research by empirically and systematically analysing, for the first time in the literature, the process of biologization.

By integrating Rozin and colleagues' (1999) conceptualization of disgust as "the body and soul emotion" with the knowledge on dehumanization (e.g., Volpato & Andrighetto, 2015), Chapter 2 documents for the first time that feelings of physical disgust, unlike moral disgust, are an important source of biological dehumanization in intergroup relations. In addition, our findings revealed a link between physical disgust and increased participants' view of the other as a contagious entity that, in turn, leads to a higher unwillingness to engage in contact with the target. The relationship between physical disgust and biologization was replicated in Chapter 3, in which the role of disgust in the biologization process was confirmed in a different field, that is, in the work domain.

Regarding intergroup relations, in Chapter 2, we showed that in the physical disgust condition, participants showed more biologization and passive harm tendencies towards the outgroup member than towards the ingroup member. Additionally, in the moral disgust condition, participants showed more animalization and active harm tendencies towards the outgroup than towards the

ingroup. Through Study 1, we experimentally demonstrated the evolution of disgust argued by Rozin and colleagues (2008): a mechanism for avoiding harm to the body also became a mechanism for avoiding harm to the soul and the social order. Furthermore, to the best of our knowledge, we proposed the first evidence of the effect of different disgust experiences on biological and animalistic dehumanization in the intergroup domain. Crucially, our results expanded theoretical research on dehumanization by demonstrating that, despite some similarities, biologization and animalization are two distinct dehumanizing processes characterized by different antecedents. In particular, our results support the idea that morality is one of the core dimensions defining human beings and perceiving others as lacking morality may have a crucial role in animalistic dehumanization (Pacilli et al., 2016). Moreover, of relevance to the present research project, our findings showed the importance of physical disgust and the concepts of disease and the protection of cleanliness in the biologization process. The relationship between physical disgust and biologization towards the outgroup was confirmed in Study 2, in which biological dehumanization was assessed through an implicit measure, namely, the *Semantic Misattribution Procedure* (SMP; Imhoff et al., 2011). Results revealed that biological dehumanization involved an automatic association of the other with the concepts of disease and contagion. Crucially, in line with Study 1, we found that feelings of physical disgust (vs. moral disgust) led to other-biologization that, in turn, had consequences in terms of attitudes of social distance.

The current research provides the first empirical evidence that the perception of the other as a contagious individual can lead to social distance and this finding is particularly relevant for its possible implications. Some authors (e.g., Bastian & Haslam, 2010; Twenge, Catanese, & Baumeister, 2003) stated, indeed, that being excluded leads to viewing oneself as emotionally inert, cold and rigid. It

has been argued that people enter these states to avoid aversive self-awareness, and when social distance occurs people can feel their humanity is diminished. In this respect, Bastian and Haslam (2010) provided additional insight into the cognitive construction of ostracism: according to the authors, people may experience themselves as locate outside the boundary of humanity when they are ostracized. In other words, in line with our results, it is plausible to imagine that being excluded as a consequence of biologization may lead to a sort of "vicious cycle" of dehumanization and self-dehumanization, in which excluded individuals perceive their self as less human and lacking in self-assertation.

In Chapter 3, across four studies, dehumanization and biologization were investigated in the work domain. We examined how dehumanizing metaphors may be used within the work field and shape laypeople's perceptions of certain work-tainted targets. Our results provided evidence for the assumptions that social, moral and physical taint perceptions were associated with distinct work features and different dehumanizing images. In particular, in Study 1, we found that socially tainted occupations were associated with a greater perception of workers as objects than morally and physically tainted jobs, morally tainted occupations were associated with an increased perception of workers as animals than socially and physically tainted jobs and physically tainted occupations were associated with an increased perception of workers as viruses than socially and morally tainted jobs. These findings were replicated in the second study of Chapter 3, in which the results provided evidence for the assumptions that social, moral and physical taint perceptions were associated with distinct work features and different dehumanizing perceptions. In particular, our findings revealed that the social taint cluster included nine groups (e.g., blue-collar workers, leaflet distributors) for which the work activity was perceived as more subordinate, and the workers were perceived as more similar to objects than in moral and physical taint clusters. The

work methods used by workers belonging to the seven groups of the moral taint cluster (e.g., politicians, lawyers) were perceived as more immoral, and the workers themselves were perceived as more similar to animals than in social and physical taint cluster. Finally, the physical taint cluster comprised ten groups (e.g., janitors, garbage collectors) for which the work environment was perceived as dirtier, and the workers as more similar to viruses than in social and moral taint clusters. By demonstrating the association of social, moral and physical taint with the three main criteria used to describe dirty jobs (i.e., perceptions of subordination, immorality and dirty environment), our findings empirically expand the sociological literature on stigma linked with dirty occupations (Ashforth & Kreiner, 1999; Hughes, 1958). It is important to note that previous literature on dirty work (e.g., Hughes, 1958; Kreiner et al., 2006) has mainly focused on what socially, morally, and physically tainted activities have in common. As a result, this literature portrayed the dirty work as a sort of "monolithic" category. We believe that our findings meaningfully extend this previous research, by showing that the dirty work is indeed an articulated category in which the different forms of dirty occupations are well-distinguished, both in terms of the main criteria used to describe them (Ashforth & Kreiner, 1999) and of dehumanizing perceptions. Showing these differences importantly enhance the understanding of the nature of dirty work itself.

Furthermore, our results complement research about dehumanization related to the work domain. For example, Loughnan and Haslam (2007) found that businesspersons, who are considered as cold and unemotional, are dehumanized in a mechanistic way. Instead, it has been found that subordinated jobs (Gruenfeld et al., 2008) or critical task features, such as fragmentation (Andrighetto et al., 2017), lead laypeople to objectify workers who perform these kinds of jobs. Otherwise, political outgroups are dehumanized in an animalistic way because of the

perceived distance in the moral dimension (Pacilli et al., 2016). In line with this evidence, first, our study confirms the role of subordinate activities and perceived morality in triggering dehumanizing perceptions by finding that socially tainted workers and morally tainted workers are, respectively, objectified and animalized. Furthermore, our research adds a tile to this negative picture of dehumanizing perceptions and their antecedents: we found, indeed, that physically tainted jobs, usually characterized by dirty work environments, led to biologization towards the workers. This latter result was consistently found in Study 3 and Study 4. In Study 3, in which the work environment features were made salient using video clips that depicted a garbage collector and a janitor while they performed their manual work activities, we found that compared to those who focused on the workers' person, the participants who focused on the workers' work environment more strongly perceived the targets as virus-like – and thus biologized – and felt more disgust towards them. Importantly, the focus effect did not emerge for the perceptions of workers as object-like and animal-like. This study also showed that focusing on the work environment increased the perception of disgust, which in turn was significantly related with a higher biologization score. These findings were replicated and extended in Study 4, in which the specificity of the link between physically tainted activities and biologization was verified by exposing participants to a description of a janitor (i.e., physically tainted condition), a cashier (i.e., non-physically tainted condition) or a student (i.e., baseline condition). The results revealed that the janitors – but not the cashiers – were biologized. Furthermore, the physically tainted occupation (vs. non-physically tainted occupation and vs. baseline condition) led to degrading work environment perceptions and, in turn, to increased feelings of disgust. Finally, this increased disgust led to increased biologization. Importantly, this pattern did not emerge for objectification and animalization.

Taken together, we believe that the findings of Chapter 3 make a novel contribution to the literature in different ways. First, by integrating the theoretical assumptions regarding dirty occupations, feelings of disgust and dehumanization, they reveal how certain features related to the work environment are an important source of dehumanizing perceptions in terms of biologization. Through the present studies, we proposed the first experimental evidence of biologization and expanded its analysis in a non-extreme context – that is, in the daily workplace. We found that physically tainted workers who operate in particularly dirty environments can be perceived by laypeople as infected and contagious. Furthermore, these studies expand the sociological literature on stigma linked with dirty work. Our findings appear to confirm some theoretical assumptions (Ashforth & Kreiner, 1999; Hughes, 1962; Nussbaum, 2010) regarding the contagious disposition of dirty work: when the dirtiness is pervasive, the occupation is perceived as dirty work, and by extension, the individuals who perform it become dirty workers, in a literal sense. In particular, the workers' work environment increases the participants' feelings of disgust towards the targets who are seen more as virus-like than instrument- and animal-like. This process can have detrimental consequences for workers who perform dirty work because they can be excluded from social interactions because of the threat of infection (Ashforth & Kreiner, 1999; Nussbaum, 2010).

Beyond advancing the dehumanization literature, our findings provide an important contribution to the research on this field. To our knowledge, no previous research has empirically assessed the biological perceptions related to metaphors concerning disease and contagion. Thus, we provided the first experimental evidence of this unexplored form of dehumanization in two different domains and by using both blatant and subtle measures. Furthermore, by integrating the theoretical literature on biologization (e.g., Savage, 2007; Sontag, 2002) with that

on disgust (Rozin et al., 2008; Russel & Giner-Sorolla, 2013), we demonstrated that physical disgust is a critical factor in generating this kind of dehumanizing process.

2. LIMITATIONS OF THE PRESENT RESEARCH

Despite the novelty of our findings, it is important to acknowledge that all our studies have a number of limitations that might restrict their generalizability and interpretation.

Regarding Study 1 of Chapter 2, considering that moral disgust is usually implicated in severe reactions, especially in combination with anger (Mackie, Devos, & Smith, 2000; Simpson et al., 2006), it is possible to argue that the stronger intentions of active harm in the moral disgust condition could depend on the fact that participants also felt anger. Future research could corroborate our findings by employing different scenarios and controlling for anger feelings. Further, it is noteworthy that some participants (N = 13) were excluded from the analyses because they failed the group manipulation check. This outcome could be explained by the fact that we conducted the experiment online and thus we did not have great control over participants' attention. Laboratory studies may grant a more controlled setting.

The studies of Chapter 3 also have methodological limitations. First, regarding the jobs that were retained by the preliminary study, despite results showed that some differences exist, both physically and socially tainted jobs are rated as high on both dimensions. In this respect, in the second study of Chapter 3, the results on the comparison among the means of the cluster centres showed that workers in the physical taint cluster are also rated as high on the social taint dimension. From our point of view, these data represent the complexity of the reality in which physically stigmatized activities are usually subordinated and in which socially tainted occupations often come into contact with dirt; future research should support our findings by using different categories. Furthermore,

we believe that further studies could cross-culturally test our model: it is possible indeed that the association between tainted occupations and dehumanizing metaphors would be confirmed when tested in different countries, even if the occupations in each cluster could change according to the cultural context.

A second issue concerns the stimulus material employed in Study 3, although we pre-tested the video clips, we cannot exclude the possibility that the different participants' perceptions of the targets were determined by factors beyond the work environment. Indeed, videos are very rich stimuli that lead respondents to draw their own meaning from the exposure to a greater extent than another kind of material (Hughes & Huby, 2004). Future research should corroborate our results by employing a variety of videos different than those used in the present work or, even better, it could be relevant to create ad-hoc videos in which the possible effects of confounding variables are minimized. A third issue concerns the participants who were excluded from the analyses because they failed the manipulation check (N = 24). As previously reported, this could be explained by the fact that we ran the study online, and thus, we did not have sufficient control over the participants' responses or their attention to the presented video clips. A more controlled setting may be facilitated through laboratory studies.

Another issue concerns Study 4, and it is related to the fact that we used only the cashier target as a comparison condition. Although we considered it a suitable comparison given the low-status position without a dirty work environment, it is important to replicate our findings by taking into account different comparison work categories.

Finally, it is noteworthy that in all the studies in which we used dehumanization-related explicit scales, the mean ratings of each dehumanizing perception (i.e., biologization, objectification, and animalization) – despite varying according to our manipulations – were moderately low in all conditions, indicating

a weak association of the targets with virus-, instrument-, and animal-related words. However, as previously mentioned, it should be noted that our scales assessed the association between the target and dehumanizing perceptions using a self-report measure, which may have been affected by the participants' desirability concerns (e.g., Crowne & Marlowe, 1964; Nederhof, 1985). Aware of the limitations related to this kind of measurements, in the present research project (i.e., Study 2 of Chapter 2), we decided to consider the *Semantic Misattribution Procedure* (SMP; Imhoff et al., 2011). The results showed that biologization involved an implicit representation of the other as a contagious entity. Future research should demonstrate a reliable relationship between implicit and explicit measurements and replicate our findings by demonstrating that greater associations between the target and the concepts of disease and contagion may also emerge in studies that use different implicit techniques.

3. FUTURE DIRECTIONS

Although our set of studies provided the first empirical evidence of biologization in different domains, further research is needed to obtain a complete picture of this phenomenon.

For example, future directions should analyse other-biologization by examining the processes that drive this kind of dehumanizing perception. Our results showed that physical disgust could be considered an antecedent of biological dehumanization. Considering that some authors (e.g., Laakasuo et al., 2017; Navarrete & Fessler, 2006) revealed that the association between feelings of disgust and negative attitudes towards others was mediated by a fear of being contaminated by outgroup members, an interesting future step may be to study whether this mechanism may also be considered an underlying process of the relationship between feelings of disgust and biologization.

Coherently, to understand the possible impact of other-biologization, future research should examine if the biological process can influence attitudes towards others not only in intergroup relations but also in the work domain. In this respect, could be interesting to verify whether biologization and its consequences can influence company policies and decisions towards workers. A relevant step in this direction has been done by Ashforth and colleagues (2017). The authors showed how managers may help workers adjust to "dirty work". In particular, by interviewing managers across 18 dirty work occupations, they identified different managerial tactics aimed at enhancing individuals' congruence with their work environment. Managers of those in stigmatized occupations may have a particularly important role to play in normalizing the taint (Shantz & Booth, 2014) and, in this respect, as above-mentioned, future research should pay attention to the dehumanizing effect that degrading work environments can have on the workers in order to direct the managerial practices so that managers can help employees perceive a greater fit with their stigmatized occupations and their work identity.

Furthermore, we believe that it would be interesting to extend our findings considering self-biologization. The process of self-dehumanization has been largely analysed. For example, a cross-sectional study (Baldissarri, Andrighetto, & Volpato, 2014), in which the phenomenon of self-objectification was analysed in a hierarchical real-work setting, revealed that when subordinate workers perceived that their superiors viewed them as mere instruments, they internalized this objectifying gaze and, thus, objectified themselves. Accordingly, Baldissarri, Andrighetto, Gabbiadini, and Volpato (2017) found that performing a manual or a computer task that was repetitive, fragmented and other-directed is a relevant antecedent of working self-objectification per se, which leads people to objectify themselves more than when performing a corresponding but non-objectifying

activity. In line with these results, future research should investigate the process of self-biologization by examining whether degrading work environments and the dehumanizing gaze can lead workers to associate themselves with metaphors concerning disease and contagion.

Finally, an interesting future direction could be to extend the scope of biological dehumanization as a concept. Our research provides the first empirical evidence of this phenomenon, especially through biologization-related explicit scales. Rather than applying extreme cases of antipathy, in which the denial of humanness to others is explicit, future investigations should examine this process also by using different dimensions. For instance, regarding animalization, Haslam (2006) proposed a model according to which animalistic dehumanization occurs whenever individuals or outgroups are ascribed lesser degrees of uniquely human attributes (i.e., characteristics define the boundary that separates humans from animals) than the self or ingroup, whatever or not they are explicitly represented as animal-like. Similarly, several authors (e.g., Kouchaki, Dobson, Waytz, & Kteily, 2018; Morris, Goldenberg, & Boyd, 2018) conceptualized objectification considering that mind is ascribed along two separate dimensions (Gray, Gray, & Wegner, 2007). "Agency" includes mental capabilities such as thinking and self-control, whereas "experience" includes attributes such as emotions and personality. In other words, the mind perception framework conceptualizes objectification as mind denial or "dementalization" (Kozak, Marsh, & Wegner, 2006). For example, Baldissarri et al. (2017) found that working objectification involved an automatic association of the worker with an object and a full denial of humanness related to both agency and experience. In line with these considerations, as above-mentioned, future research should pay attention to the concept of biologization considering this dehumanizing process from a different point of view.

Conclusions

This research contributes to providing empirical evidence of other-biologization in the intergroup and work domain. Although this dehumanizing process is highly relevant in modern human society, social psychological literature has largely neglected it so far. Among the different forms of dehumanization, biologization has been theoretically investigated within conflictual intergroup relations. In our work, we showed that it also emerges within non-extreme contexts.

Our findings support the idea that feelings of disgust can lead to other-biologization in both intergroup and work fields. In line with Nussbaum's (2010) statements, disgust expresses human discomfort that is usually politically used to subordinate and socially exclude vulnerable minorities. Similarly, dehumanization processes occur when people perceive others as belonging to a lower order of humanity. They are therefore a powerful means of legitimizing social inequalities. We view the present research as a valuable starting point for future investigations that may enhance our understanding of other significant consequences of emotions and dehumanizing perceptions of others.

With regard to the work domain, feelings of disgust and biologization of workers engaged in a physically stigmatized activity are functional for doing such jobs socially acceptable and justify the fact that these individuals are not treated as human beings but excluded, at least partially, from the moral community (Opotow, 1990). In this respect, studying the conditions under which work becomes an "enemy" for workers and transforms them into non-humans is a compelling task for scholars. According to Zawadzki (2018), dignity in the workplace is an inalienable component of humanity and usually depends on self-esteem and autonomy. In this regard, humanization in organization management plays a

crucial role in protecting dignity and well-being of individuals. In line with these considerations, there are examples of companies that try to break away from workers reification terminology: they change concepts such as "human capital" or "human resources" with less objectifying "human relationship" or "human capabilities" (Boselie, 2010). Moreover, some firms emphasize the importance of opinions of the lower level employees, their democratic representation and decision-making capabilities regarding organization leadership (Hodson, 1996; Jałocha & Zawadzki, 2018; Valcour, 2014; Zawadzki, 2018). Such examples demonstrate the practical commitment of businesses to protecting dignity in the workplace. We believe psychosocial and organizational research should join efforts to increase the understanding of the antecedents and consequences of workers' dehumanization. In particular, a greater understanding of the impact of this phenomenon on workers' identity is essential in order to prevent the negative consequences of particularly degrading work environments and encourage the development of labour policies aimed at promoting their well-being.

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