

ARTICLE

***Whatsapp*: A Boundary Object in The Mediation and Production of Boundaries in Organizations**

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ABSTRACT

This study aims to analyze the ways in which *WhatsApp* mediates and inserts itself as a boundary object in the production of borders in the public organization Approve (fictional name). This research criticizes the predominant studies on boundary objects that fail to highlight the networks of relations that produce uses, the characteristics of objects, and boundaries as part of the boundary mediation process. We contribute to filling this gap by way of a qualitative study on *WhatsApp* using semi-structured interviews, observations, netnography, and data spiral analysis. Results evince *WhatsApp* as a boundary object that is inserted in productions with negative implications for people based on boundary mediation and produced in networks of relations that can use the application to produce and mediate boundaries.

KEYWORDS

WhatsApp, Boundary objects, Organizations, Communication

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RESUMO

O objetivo deste artigo é analisar as maneiras pelas quais o *WhatsApp*, enquanto um objeto de fronteira, media e se insere na produção de fronteiras na organização pública *Approve* (nome fictício). Criticamos os estudos predominantes sobre objetos de fronteira que não colocam em primeiro plano as redes de relações na produção de usos e características dos objetos; e a produção de fronteiras como parte do processo de mediação de fronteira. Contribuímos para preencher essa lacuna ao estudar o *WhatsApp*, por meio de uma pesquisa qualitativa, utilizando entrevistas semiestruturadas, observação, netnografia e análise da espiral de dados. Como resultados, evidenciamos o aplicativo como um Objeto de Fronteira que é inserido em produções de implicações negativas para as pessoas a partir da mediação de fronteiras e produzido em redes de relações que também podem usar o aplicativo para produzir e mediar fronteiras.

PALAVRAS-CHAVE

WhatsApp, Objetos de fronteira, Organizações, Comunicação

1. INTRODUCTION

WhatsApp is a personal and group communication application that has transformed the work environment due to its multiple possibilities of interactions (Carvalho & Fort, 2017). It was inserted in networks of relations, mediating borders and enabling people from different groups (some of whom disagree on the use of this application) to interact in the most diverse ways, (re) producing information in fast, fluid, and cheap communication manner (Lapa & Girardello, 2017). Such interactions favor the emergence of new cultural and spatial aspects (Oliveira, 2017) as they can coexist between established cultural and spatial boundaries.

In these cross-border environments, and in several simultaneous practices, we argue that *WhatsApp* configures a boundary object (BO) that belongs to relations in which groups of heterogeneous actors deal with their differences toward cooperation (Star, 1988; Star & Griesemer, 1989). This study also treats this BO as manifesting a specific potential in the networks in which it is inserted; studies on the subject often leave in the background: its relation to the production of new differences in their mediation, creating boundaries as it mediates them.

This potential to create boundaries and differences in organizational relationships refers to the features of the app that instantly enable individuals or groups to exclude or include themselves in a group in different ways (blocking people, avoiding reading messages, refraining from posting messages, etc.), as well as exclude other individuals or groups, and organize new groups. This study discusses how these resources can further the discussion on BO, which in turn enables us to develop the understanding of the implications of using this application in organizations.

The prevailing view on BO defines them as a means to deal with multiple points of view that distinct groups articulate to solve complex problems (Star, 1988). For this, these concrete or abstract objects (e.g., museums, bookstores, and scientific atlases or maps) maintain their common identity between groups with enough plasticity to adjust to different points of view.

According to Star (2010), objects must have specific intrinsic characteristics for this. This proposal has been adopted in different ways in the last three decades to show how certain phenomena and/or heterogeneous communities articulate BOs, enabling cooperation amidst difference (Star & Griesemer, 1989; Carlile, 2002; Star, 2010; Whitson, 2018).

This study agrees with Lainer-Vos (2013) and stresses that these characteristics are neither intrinsic or specific to objects or the arrangements of objects, nor defining of relationship networks leading to cooperation. Boundary objects depend on the productions of networks in which they are inserted. That is why similar objects in different networks may act or not act as boundary objects (Lainer-Vos, 2013).

Studies usually place only the role of BOs in the mediation of differences in the foreground, leaving in the background its production of borders, seeing it as a dysfunctional characteristic to be corrected (Carlile, 2002; Whitson, 2018). These studies fail to delve into how some BOs produce cultural differences by discontinuing interactions — i.e., boundaries (Akkerman & Bakker, 2011) — as they act as the BO of that production.

This study contributes to filling this gap by considering the evaluated BO as part of a double movement of mediation and production of differences. To illustrate the potential to investigate this movement, we empirically confronted these propositions in this study on *WhatsApp*. It inserts itself in this double movement between objects belonging to the creation of a network of action flows marked by the relations between object, technology, and human action (Mello Filho & De Araújo Júnior, 2021). This occurs because of the aforementioned potential of its resources to be used in the networks of relationships in an organization to mediate differences for, e.g., enabling communication between distinct groups to cooperate or to produce more differences by, e.g., producing and or intense manifesting behaviors and ideas related to the use of the application, such as “too many good mornings” or “political satire” online, which leads to further fragmentation and creates different groups using the application resources for this.

We approach these relationships by the following guiding problem: how does *WhatsApp*, as a BO, mediate and insert itself in the production of boundaries in a network of relationships in an organization? To address this question, this study aims to analyze the ways *WhatsApp*, as a BO, mediates and inserts itself in the production of boundaries in the public organization Approve (fictional name). For this, a qualitative field research with semi-structured interviews, observation, and netnography was conducted. Data spiral analysis organized the produced data (Creswell, 2014).

As a result, this study contributes to society by evincing the changes over the last few years with the emergence of *WhatsApp* and its application in organizations. It shows a process in which intra and extra-organizational boundaries demarcate differences between groups, produced in part on *WhatsApp* and coexisting in it with varied virtual and social distances between them. It is necessary to reflect on certain implications for society due to this, especially on a fluidity in which the separation between the personal and the professional gives space

to other separations, such as the professional that has or lacks the authorization to invade the personal and vice versa.

Regarding contributions to the field of study of BO in organizations, this study shows *WhatsApp* as a) a BO involved in negative implications for people in organizations as it mediates borders and b) inserted in the double movement of mediating and producing differences in the networks of organizational, personal, and professional relations, belonging to the composition of the very borders it mediates.

This broadens the multiple relationships considered in previous studies on BOs and enables researchers to investigate the implications for the networks of relations that insert other BOs in this double movement within organizational phenomena. Thus, we propose the concept of “bordering” to express this continuous movement of connection and separation between social worlds — previously treated as static borders (Akkerman & Bakker, 2011) —, within which we position objects and displace the concept of BO.

To offer these contributions, we discuss the insertion of *WhatsApp* in society and organizations and the role of BOs in mediating and producing borders. Next, we describe the paths taken during our empirical research, analysis, discussion, and final considerations.

2. WHATSAPP IN SOCIETY AND ORGANIZATIONS

Brian Acton and Jan Koum created *WhatsApp* in 2009 to transmit messages free of charge and dispense with telephone networks. In its first four years, *WhatsApp* gained 400 million registered users. By 2022, it amassed two billion active users worldwide (Carvalho & Fort, 2017). In addition to its system of sending and receiving messages by text, voice, photos, or video, the application enables the creation of contact groups that can exchange messages and files and make online voice and video calls.

Remembered by many for its acceptance, universalization, and normalization (Matassi et al., 2019), *WhatsApp* works both on mobile and desktop, only requires an internet connection, and has a user-friendly interface. It also informs when and if users are interacting with each other, whether they are online, typing a message, recording audio, or having read a message (Porto et al., 2017). It enables people to express their emotions and feelings by specific features (such as emojis) and goes far beyond just messaging (Primo et al., 2021).

For Porto et al. (2017), the application provides a new way of communicating by different and unexpected contexts and senses, expanding interactions in instant times and spaces as it enables one click to change between pages and interlocutors in distinct contents, connecting all of them. Lapa and Girardello (2017) broaden this understanding by arguing that *WhatsApp* brings formed groups together, “creating a space of instantaneous and private exchanges that amplify the possibilities of interaction in the absence of spatial and temporal conditions” (Lapa & Girardello, 2017, p. 31).

These characteristics refer to the potential of the application to mediate boundaries of distinct practices and spaces in an interaction that can be collaborative and, therefore, fit the concept of BO (Carlile, 2002) by configuring different practices at the same time and leading to a dynamic of its own between practices. For this, BOs must have basic aspects in their architecture (Star, 2010): interpretive flexibility, in which groups can interpret these objects in different ways; the material or organizational structure specific to its type, which may be

concrete or abstract with different structure levels and types; and an appropriate scale and scope, defined in dynamics ranging from poorly structured to personalized uses in distinct groups (such as in organizational work relationships and at different levels of detail). Marked by these characteristics, BOs are multidimensional, “at once temporal, based in action, subject to reflection and local tailoring, and distributed throughout all of these dimensions” (Star, 2010, p. 603).

By manifesting these aspects in certain socio-technical networks, *WhatsApp* is characterized as a BO, taking a role of agency and continuous formation (Gherardi, 2016). A type of agency that, according to Primo et al. (2021), is so important that it can lead people to suffer when unable to access it, to harming work activities, or to cause individuals to ignore others in a same room due to the attention they pay to *WhatsApp*. This ambiguous process evinces an application that, although used in an organization to facilitate work, can also hinder it and interfere with the social relations involving its users.

The application changes human groupings, which are increasingly characterized by a networked society, in which technologies and social and organizational life coexist and modify each other, facilitating communication not only in the personal sphere but also in professional use, transforming the work environment into a democratic and collaborative space (Carvalho & Fort, 2017). These technologies can connect boundaries between social and interprofessional worlds, incorporating the possibility of people working individually and collaborating in the same task at a distance (Beck et al., 2021).

This connectivity involving the use of *WhatsApp* creates flows of cooperative action, as with other objects involved in the relations between objects and human action (Mello Filho & De Araújo Júnior, 2021). The application also provides more superficial and ephemeral interpersonal connections, marked by people who are more physically distant in groupings that can be (re)organized quickly across the functional and hierarchical boundaries in organizations (Carvalho & Fort, 2017). The connections it enables can involve the most diverse instances of life — the organizational sphere, family, friends outside work, among others —, involving broader dynamics of social mediation in everyday life and its consequences (Matassi et al., 2019).

The intensification of network interactions in contemporary society enhanced this process, leading to the construction and reconstruction of concepts by the invasion of multiple spaces in different relationships and sustaining distinct pedagogical practices in interactions conducive to new discoveries (Oliveira, 2017). Even if conversations take place online via the application, this requires a greater cognitive effort from the interlocutors, especially while maintaining several conversations with different people or groups that may be resumed at any moment either online or in person, characterizing the application as a creator and potential enhancer of ties or a source of suffering if people face difficulties to deal with the pressures generated in the relationships produced with it (Primo et al., 2021).

According to the authors, suffering can come from a need to respond quickly to a message. In this scenario, notifications constitute a trigger for many, giving rise to the need to use the application immediately. On the other hand, individuals develop tactics to circumvent this excess of information, such as turning off their phones, putting them on airplane mode at night or on weekends to avoid receiving messages; muting groups, or assigning different ringtones to receive family messages. People purposely tailor the app resources to manage the

boundaries between presence and absence (Mols & Pridmore, 2021), which enables them to cope with the aforementioned suffering and the intrusion of work time into their personal lives via the app.

Some findings on *WhatsApp* can also split existing groups and/or create new ones, producing boundaries when people outside the reference conversation in a group begin to interact in parallel conversations (Primo et al., 2021), using the app resources to build segmentations between different contexts (Mols & Pridmore, 2021) and shape the extent and form of a conversation (even including politics) among members (Zhu et al., 2022).

This occurred, for example, in the fragmentations of social groups during the 2022 Brazilian presidential elections. According to Pereira et al. (2022), the application constituted a vital and politically charged media that can fragment groups of friends, family, and professionals at work and create others with their elements. They mainly stemmed from the use of *WhatsApp* to attack political opponents and criticize or defend the government in the face of criticisms of its performance in crises such as the COVID-19 pandemic (Ozawa et al., 2023).

Studies on BO often highlight this potential to fragment and create new groups only regarding cooperation between boundaries, rendering the production of boundaries as unimportant and deeming it as a dysfunction to be corrected. As we will discuss, this study considers this process a part of some networks containing certain BOs as it is relevant to understanding the insertion of BOs in these networks.

3. BOS IN THE MEDIATION AND PRODUCTION OF BOUNDARIES

Star's (1988) precursor study defined BOs as a means scientists created to reconcile source heterogeneity. Thus, several experts address distinct aspects of a complex problem based on common goals. Star and Griesemer (1989) drew on Star (1988) and used the concept of BO to propose a complementary view to that of Callon (1984) and Latour (1987) and to more broadly understand phenomena linked to the reciprocal relations considered in the analysis of the translations of actors' objectives.

Latour (2005) points out that objects, rather than mere intermediaries of human action, configure actors that resemble human ones in their interactions and mediations, establishing inseparable tangled relations between them. For the author, investigating a phenomenon requires addressing the ties produced in a network of relations. These networks produce translations that align different interests from a translation into a common language via these objects in practices mediated by their materiality and situated in specific histories, times, and spaces that must be considered so that they can be understood by untying the knots of human and non-human relations and agencies, i.e., practices.

Among the objects in this network, Latour (1987, 2005) highlights immutable mobiles, objects that can inscribe information in combinations and comparisons and move without altering their basic information. They disseminate scientific knowledge by crossing different instances and, from them, objects and people relate to other objects and people (Latour, 1996).

The relation of this concept with the idea of BO is evident. As Whitson (2018) points out, they are an extension of Latour's (2005, 1987) idea of immutable mobiles. BOs, despite being considered as distinct in different communities in which they are present, show an immutable content between these communities, enabling them to find common goals, a union

in difference, and a way of relating between the borders of different communities (Star, 1988; Whitson, 2018).

Lainer-Vos (2013) argues that the BO approach converges with the idea of symmetry and distributed agency between human and non-human actors that stands out in Actor-network theory (ANT) (Callon, 1984; Latour, 1987, 1996, 2005; Law, 1992). This process is evident when one assumes that the dissemination of a technology, such as the use of *WhatsApp*, belongs to a socio-technical dynamic in which materiality and sociability are a single production, one is unable to exist without the other (Akrich et al., 2002). Law (2002) explains that technology is being disseminated in a network of relations until the network can no longer maintain the relationships between its actors or expand itself. When this occurs, the technology stops spreading based on that inner working. For the author, this process enables us to understand the transformations in technologies, including changes in actors and the relations that involve them.

Despite the convergence between ANT and boundary objects, it is worth highlighting that the latter distanced itself from the former since the seminal studies that first proposed it. Although they agree with Latour (1987) on the importance of analyses considering the social life and the networks of participants in which objects and concepts flow, Star and Griesemer (1989) criticize the limitations of considering that the objectives of different actors are being narrowed and mediated to a narrow and obligatory point of passage (scientists or entrepreneurs exemplify these points) to tell a single story, thus establishing the translation between objectives of the allies in the network.

When Callon (1984, p. 196) discusses the process of translation, the author makes this focus clear in a story, stating that “four ‘moments’ of translation are discerned in the attempts by these researchers to impose themselves and their definition of the situation on others [...]” Alternatively, Star and Griesemer (1989) insert BOs into their analyses to show a relation in which multiple obligatory crossing points and histories coexist in translational movements.

The authors suggest that translation should be seen as the ways BOs enable the maintenance of translations at multiple mandatory crossing points, referring to the translations of the objectives across allies who can negotiate these points. The relations between these multiple points of passage involve actors in several simultaneous translations in a broader environment (for example, a company as a whole), rather than dealing specifically with a point of view, such as that of scientists or researchers, as in Latour (1987) and Callon (1984).

Their proposal articulates this distinction by assuming that BOs inhabit different communities of practice, meeting their demands for information as they interact with each other (Whitson, 2018). In this perspective, the concept of BO renews conventional thinking about cooperation, dissociating it from the idea of consensus as they enable cooperation and the exchange of knowledge amidst dissent (Lainer-Vos, 2013). For this, the involved communities of practice or social worlds must recognize them as a means of translation (Star, 2010).

From this movement, studies on BO composed a body of knowledge independent of ANT, as in research that disregards mentioning precursor authors or this approach, such as Carlile (2002) and Yakura (2002). This study, by agreeing with Star and Griesemer’s (1989) criticisms and ignoring ANT, defends the adoption of the BO approach aligned with Lainer-Vos’ (2013) position, who recognizes the contributions of the authors who proposed ANT,

such as Callon (1984), Latour (1987, 1996, 2005), and Law (1992), when adopting the BO approach.

Although this position considers the contributions of ANT to the discussion of BO, it should be recognized that they are part of a body of knowledge on their own in different study fields. Organizational studies have articulated BOs with specific focuses (Kertcher & Coslor, 2020), including influences from authors focused on theories of practice and who adopted theories on materiality to understand the role of objects (Nicolini et al., 2012). Thus, the insertion of the discussion on BOs in organizational studies drew attention to non-humans in organizations as a way to break with the precursor studies of the field, which treated organizations as consisting only of humans (Lainer-Vos, 2013).

Although organizational studies began to question human determinism via BOs, some studies accepted a different determinism: the characteristics of the BO. Even when considered dynamic, these characteristics are treated as determining movements of resistance or of going beyond borders. Whitson (2018) evinced this by studying the role of game development software as a BO, which game developers can change, although the object resists the developers and enables cooperation with other such professionals due to its specific characteristics.

According to Lainer-Vos (2013), this determinism occurs in studies — such as Akkerman and Bakker (2011) — that fail to treat action as a relational production involving humans and non-humans in organizations. Even in studies that recognize the condition of BO as part of a network of relationships, such as Carlile (2002), cooperation failures are attributed to an inadequate characteristic of the BO, which can and should be corrected since its purpose is only to mediate borders (Whitson, 2018). However, this study defends that the production of new boundaries and possible cooperation failures only reflect the movements in the networks that produce borders and BOs, a characteristic those interested in BOs must address.

Since Star's (1988) precursor study, addressing BOs, rather than diminishing boundaries or differences, involves enabling cooperation with the production of difference. Therefore, the production of difference should avoid testifying against a BO as it can be part of the network that produces it as BO and uses it to mediate and produce borders. Thus, our proposal agrees with Lainer-Vos (2013), for whom, BOs go beyond their fixed or specific characteristics in the relational production of action, manifesting temporary, dynamic, interdependent meanings in their relations with human actors, seeking to establish cooperation in organizational heterogeneity.

This study will accept this relational emphasis to show the dynamics by which a BO relates to these dual movements of mediating and producing heterogeneity to compose organization boundaries. Thus, we are interested in discussing the concept of boundary in social studies, which involves the approach of broader units of analysis to address ways of going beyond borders (Akkerman & Bakker, 2011), involving varied views of actors and institutions (Star & Griesemer, 1989).

By retrieving this interest, we recognize the contributions of several studies that consider the temporality of BO, its ability to mediate borders, enable collaboration between them, and eventually lose this capacity and even produce heterogeneity (Akkerman & Bakker, 2011; Carlile, 2002). However, these studies fail to treat this movement as a condition that can potentially be an effective part of the use of these BOs in networks of ever-moving relationships, thus entailing

the need to highlight the relations in which BOs are inserted in the creation of boundaries in their ordinary relations.

To turn to this discussion, the adopted concept of boundary recognizes its dynamic character, seeing it as “a socio-cultural difference leading to discontinuity in action or interaction. Boundaries simultaneously suggest a sameness and continuity in the sense that within discontinuity two or more sites are relevant to one another in a particular way” (Akkerman & Bakker, 2011, p. 133). Borders belong to two simultaneous worlds, thus they both connect and separate. Unfixed, that continuous process, in which the BO may or may not be part of a creative process arising from the contact of elements of contexts separated by borders and leading to the composition of new borders, defines and redefines them (Akkerman & Bakker, 2011).

Our proposal reinforces the understanding that different groups can have the same object acting in different ways (Nicolini et al., 2012; Kertcher & Coslor, 2020) due to a certain fluidity in the definition of situations by people involving several factors, such as the place or position (Star, 1988) and the time (Carlile, 2002) in which they are inserted. Our criticism lies against putting the agency of heterogeneous networks in which humans and non-humans articulate — in a process in which the FO can permeate (Lainer-Vos, 2013), produce, or reinforce boundaries — in the background. We assume that the condition of the BO mediating or producing borders, rather than configuring its specific characteristics, is something attributed to them in the networks of relations involving these characteristics.

From this theoretical argumentation, we propose that, depending on the networks in which they are inserted, BOs such as *WhatsApp* can manifest a double movement in which they mediate and insert themselves in the production of boundaries. To empirically confront this theoretical proposition, we adopted the methodological paths below, focusing on analyzing and showing the ways *WhatsApp* configures itself as a BO in this double movement between different organizational boundaries.

4. TRAVELLED PATHS

As the focus of our analysis requires studying the lived experiences of groups of people using *WhatsApp*, a qualitative approach was chosen as it can approximate this use. Approve (fictional name) was the organization chosen as the locus of this research, a federal public agency with some units in Espírito Santo. In this study only the headquarters in the city of Vitória was addressed. The name of the organization was altered to avoid exposing participants.

Currently, despite a determination to use another messaging application as an official form of internal communication, *WhatsApp* is a widely used work and leisure tool in this institution (in some cases against the individuals' will at the request of superiors and colleagues).

Data were produced from January to August 2022 on non-subsequent days using observations, netnography, and semi-structured interviews. Field notes were taken during our observations and netnography, which enabled us to register what was being observed and organize these registries.

The research began after authorization was obtained from the organization. Interviewees (individuals who were observed in person and the members of the organization who belonged to the *WhatsApp* groups in which the netnography was performed) were approached in the

organization, agreeing to participate in this research by signing informed consent forms. This was possible because netnography was limited to *WhatsApp* groups within the organization. Within this empirical delimitation, an author of this study carried out the observations, the netnography, and the interviews.

During the observation, the ways *WhatsApp* inserted itself among the other communication tools in the workplace were verified since people had other ways to communicate besides the application. Our focus centered on people's behavior and their use of their cellphones and the app throughout their workday.

Netnography turned to the uses of the application itself and the ways these uses involved groups, their convergences, and divergences in the organization. This was possible because netnography produces data based on the virtual environment as researchers participate in social media, experience, and analyze the communicational processes aimed at the online exchange of written information, i.e., human behavior in online social groups (Donna & Silva, 2014).

During the netnography, the dynamics of *WhatsApp* work groups (including in private chats) and participants' behavior were observed for at least eight hours a day on several periods, especially regarding their self-expression in these groups, post content, and relationships with other members. It should be noted that our netnography of participants' eight-hour use of *WhatsApp* fails to mean that the researcher interacted with participants for eight continuous hours as people post messages on *WhatsApp* intermittently. The process consisted of following up with the groups whenever someone made a post throughout the workday.

The notes taken during the face-to-face observations, and the netnography—experiencing the interaction as a participant in *WhatsApp* groups—were recorded in field notes on the *Word* software. Sent messages that could generate some kind of response or question from other members of the group were included in that file daily.

To complement the production of data with specific information on participants, semi-structured interviews were adopted (Donna & Silva, 2014) with a flexible script and 12 questions related to *WhatsApp* use. During these interviews, participants' verbal and non-verbal communication were observed, including gestures, body language, behavior during answers, emphasis on certain points of speech, tone of voice, among others. All interviews were recorded on audio and transcribed in full to *MSWord*.

Participants (who were interviewed, observed, and approached by netnography) were chosen according to convenience and the following criteria: 1) work as an intern or a server – full, hired, or demanded – at the chosen body; 2) have *WhatsApp* installed on their cellphones; 3) use *WhatsApp* to communicate with friends and family and as a work tool; and 4) belong to the *WhatsApp* newsletter of the chosen agency. Based on these criteria, 12 people were selected, of which six were men and six were women, residing in the Greater Vitória area, aged from 21 to 56 years, and working in different sectors, positions, and hierarchical levels. The interviews were conducted until a certain recurrence or saturation was observed in the data (Minayo, 2017) after the 12th interview. Data recurrence or saturation was found when interviewees' answers became repetitive, showing that new respondents failed to add other relevant elements to the objective of this study.

Data were treated by the spiral method of data analysis Creswell (2014), in which the researcher “engages in the process of moving in analytic circles rather than using a fixed linear approach”

(Creswell, 2014, p. 148). According to this method, even after the data were organized, they were continuously analyzed and categories were formed with detailed descriptions of what was seen within the investigated context. Themes were developed according to our interpretations of the data, our personal experiences during this research, and our theoretical framework to answer the proposed research question.

During this analytical process, five themes were found after several re-readings of the material produced in the interviews and our observations. These themes permeated the contents in the collected material and were organized as follows: the content that most related to a given theme was classified as part of that theme even if they had an indirect relation with other themes as few contents are completely isolated from each other in day-to-day practice. The evaluation of how much a particular piece of content was closer to a theme was based on what Creswell (2014) describes as researchers' interpretation based on their theoretical basis and experience during research. Despite the recognition of the importance of the theoretical basis to define these themes, it should be noted that an a priori definition based on the theory was avoided. Thus, these themes are considered a posteriori categories as they stemmed from data production during analysis. The following categories were identified: (1) social interactions; (2) post content and language on *WhatsApp*; (3) relationship between *WhatsApp* use and the organization; (4) feelings when using *WhatsApp*; and (5) *WhatsApp* uses and control.

The technical operationalization toward these five categories consisted of organizing data contents as excerpts from the interviews and the field notes in columns on an *Excel* spreadsheet according to the themes that were interpreted to relate more to certain content. At each re-reading, adjustments were made in the categories until all contents with some relation to the proposed research question were categorized.

Continuing the spiral method Creswell (2014), after this first categorization, cross-cutting themes between contents in all categories linked to the proposed research question were sought. The sense of transversal theme refers to a theme that pervades all categories and shows how the content in them involves the proposed research question. Thus, it integrates the contents between the categories to rescue the relations between them and the research question.

In the operationalization of this stage, this spreadsheet with the contents in the five categories was part of the re-readings of the produced content. The reading of contents separated into categories in an organized fashion facilitated the identification of two transversal themes that permeated these contents and enabled us to address the proposed research question: (1) *WhatsApp* as a BO border mediator and (2) *WhatsApp* inserted in the production of boundaries as a BO. From them, the results of this research will be discussed.

5. WHATSAPP AS A BORDER-MEDIATING BO

Our field notes and most interviewees indicate that people from several sectors and with different experiences and backgrounds (some of which do not even effectively know each other) use *WhatsApp* to cooperate in issues related to leisure, day-to-day issues, and work throughout much of their day.

All respondents reported using *WhatsApp* daily; belonging to at least three *WhatsApp* groups related to the Approve organization; and partaking in the official and more formal NOTÍCIAS

DA APPROVE (APPROVE NEWS), in which only the group administrator sends messages and communications. In total, 10 of the 12 interviewees belong to GALERA DA APPROVE, a group consisting of more informal servers which have no hierarchy and in which everyone can comment and send messages about the issues under discussion. These different groups belong to the Approve networks.

These networks evince the capillarity of the application in the institution in several manifestations: E9 stressed that the application “is very practical, easy to access, and, therefore, ends up strengthening relationships.” E12 mentioned that “the exchange of ideas can happen regardless of everyone being physically present, facilitating contact between people”; and E1 points out that the app “shortens distances.” We find the mediation of boundaries between people with different capacities to use communication technology by the practicality of the application and its overcoming of physical distance, such as translations performed on the network for cooperation.

We agree with Porto et al. (2017) in that *WhatsApp* provides a new way of communicating, writing, and understanding messages that escapes the traditional one, expanding interactions regardless of time and space conditions. E3 recalls that, during a recent crash in the application, she realized how important it has become in social interactions. “The day *WhatsApp* went offline, I realized that we no longer see even the functionality of the phone for calls. For all communications we use *WhatsApp*, whether in life or work. I could only see people wondering: ‘Wow, how am I going to talk to so-and-so now?’ It was actually funny.”

Our field notes indicate that this potential for interaction goes beyond the limits of the networks in Approve, with interactions between external heterogeneous boundaries. E8 reported one such example: “I apply to public admission exams in Brazil. And groups are created from these exams and people interact on various questions and help each other. I talk to people from all over the country, who (even without knowing each other personally) agree via *WhatsApp* to share transportation to take the tests and even lodging, in addition to checking templates and discuss doubts about the questions.” In this report, *WhatsApp* configures a space rich in discoveries because of its interactivity within the heterogeneity of unknown people as its use enhances the search for innovative alternatives (Oliveira, 2017).

This creativity involves the ways networks interpret its functions. For example, incorporating stickers into messages gives the network what E2 calls fun by ensuring that the day “gets a lot more fun when you talk to your friends through stickers;” as did E7, who says she uses this feature a lot, “especially when you want to be funnier, vent a little, give a contrary opinion, or make some kind of joke.”

Another example involves its functionality of informing when and if users are interacting with each other: if they are online, typing a message, recording audio, or having read a message (Porto et al., 2017). E1 points out that people confuse “online with being available at any time of day.” E12 reinforces the negative aspect of this confusion by stating that “my dream is to be online in the application and no one seeing that I am online. *WhatsApp* has become a demand, right? You unfortunately can’t choose the messages you receive. You end up being open to anyone who wants to message you.” E9 finds it a trigger for anxiety crises: “It [*WhatsApp*] triggers anxiety in me, the need to meet others in the best and fastest way possible. So, it intensifies that.” In the interactions between people and *WhatsApp*, the network configures something that captures and takes away the freedom of its members. The report above draws near the idea of the production of agency and formation from a practice and its elements over people (Gherardi, 2016). This process in the networks in our field notes is illustrated by E3 considering that the fact E12 pointed out creates a culture of immediacy, whether in the organization or in personal life.

However, this relationship fails to mean that the human is controlled by the non-human or that the former is subservient to the latter. The mentioned apparent subservience, anxiety, and potential discomfort, rather than being produced by the non-human, stem from the relationships in the network, in which humans from different sides of the application interact with each other, with the latter mediating the boundaries that separate them, including in the use of the application. These network relationships define what happens to the application as a BO (Lainer-Vos, 2013).

E10 offers an example of the different uses of applications according to different network relations as he faces different behaviors when faced with different relationships: “I see a difference in my behavior on *WhatsApp*, which also tracks some of my offline life. In the work groups, I try to be a more formal person, to give less vent to intimacies, to jokes that can be misinterpreted. I leave these practices to the more informal and personal groups or even to individual conversations.” E10 indicates that the application allows for changes in its uses according to interpretations about network relations.

These heterogeneous interpretations and uses in network relations stem from the plasticity of the application mediating differences. Our field notes show that other humans, unlike E10, use the resources interpreted by them as informal in all groups, albeit with different intensities. For example, the aforementioned stickers appear in all network boundaries at Approve. A group has dialogues based on and ironies built only with stickers as comments to some post (usually the image or the link of some current news). However, our field notes evince a greater use of them in more informal groups and that, at the same time, the knowledge produced in these groups about the use of stickers (and other features) and their effects on the communication at Approve are used in the other groups in the organization.

This flexibility the relationships in the network attribute to *WhatsApp* as it moves between formality and informality belongs to the role of traditional BOs, which mediate boundaries (Carlile, 2002; Whitson, 2018). However, in the relations at Approve, its use went beyond that.

6. WHATSAPP INSERTED IN THE PRODUCTION OF FRONTIERS AS A BO

Our netnographic observation focused on events in the GALERA DA APPROVE group, relations that evince the use of the application as a BO simultaneously inserted in the production of boundaries. Created in 2014 by a server, this group had 78 participants on January 19, 2022 and enables any member to post messages and reports related to work, leisure, and other matters unrelated to the institution. It has no specific regulation but a plea for common sense.

During the research period, up to July, the demands in the group were limited to requests for information about work (such as system functioning) and specific facts, such as notices about events, book launches, or requests for medical appointments. Its members always interacted orderly and peacefully. In August, a recently added server joined the group. This person began to daily send images and “good morning” messages containing motivational and/or sound bites in the group. In the first week, two or three people always responded to the messages, one of them even using audio. However, from the following week onward, the discontent of some members with this type of message began to be noticed in at least two ways.

In a smaller, more restricted group with a few GALERA DA APPROVE members, some people complained about the attitude of the new server (characterizing it as clueless) and threatened to leave the main group. Moreover, three people left the main group. When asked why they had this attitude, they replied that the “too many ‘good mornings’” was the main reason for it.

That same practicality with which humans could enter groups using the application manifests itself as they leave them, establishing boundaries in these relations, such as the “too many ‘good mornings’” without, at the same time, ceasing to mediate other boundaries.

At the end of August, another situation shows how the BO *WhatsApp* can also produce differences: as the elections for President of Brazil drew near, a political post sent images of a presidential candidate with jokes or derisive messages. In fact, two people with opposing views responded to what they considered a provocation. Due to that discussion, three other people left the group that day. The reports of two respondents illustrate the thinking of the dissatisfied: “Unfortunately, people with social media and electronic tools are getting a distorted sense of what respect and limit are. This has made people think that they can say what they want, when they want, the way they want, and that respect is us accepting it without getting upset” (E4). This is what is hardest for me” (E4); “A lot of people are wasting time discussing situations or offending others, and that saddens me a lot [...] I had to get away from the group” (E3). On that day, the number of participants in the group was 72 – six less than at our initial collection.

These two examples from GALERA DA APPROVE reflect the production of divergences in network relations in the use of *WhatsApp*. Despite producing boundaries, this production is established from the same attributions these networks offer to the application during boundary mediation, such as BOs, especially interpretative flexibility. It enables them to adapt to different points of view and interpret them in different ways according to the group and its use (Star, 2010).

The ways networked relationships configure *WhatsApp* as a BO enable us to visualize the creation of a specific action flow. It mediates the boundaries within the relationships in the organization when this mediation brings to the surface, by the application, behaviors of group members with which one disagrees, previously hidden differences openly manifest themselves in the networks, creating fractures and producing boundaries.

7. DISCUSSION: “BORDERING” IN THE NETWORKS OF RELATIONS

Results enable a deeper discussion of three aspects related to the objective of this study: the characteristics of *WhatsApp* related to those of typical BOs in studies on the subject; the characterization of *WhatsApp* as a BO involved in negative impacts on people; and *WhatsApp* in the production of BOs and boundaries in the networks of relationships. Tables 1, 2, and 3 synthesize each of these aspects, respectively.

Table 1 theoretically supports that *WhatsApp* provides communication, broadens interactions, goes beyond limits (Porto et al., 2017; Lapa & Girardello, 2017), and produces innovative discoveries (Oliveira, 2017). This involves its material structure as per the resources made available (Primo et al., 2021; Porto et al., 2017) that can displace information and emotions to the most diverse instances of personal and professional life and to the groups that compose it (Matassi et al., 2019). These characteristics converge with those of BOs (Table 1) for they refer to the potential of the object (the application) for simultaneous and instantaneous translations, involving groups that, although distinct, relate and find common goals due to the immutable content of the object (Star, 1988; Star & Griesemer, 1989; Whitson, 2018).

This content becomes immutable when it is registered in the application and enabled to be shared by those in different interrelated groups in the organizational or an even broader scope, involving family and friends outside the organization (Matassi et al., 2019). The object can assume different interpretations in these groups, such as a tool of communication, work, pressure, leisure,

expression of emotions, as evidenced at Approve and illustrated in Tables 1, 2, and 3. It should be noted that by virtue of its material structure, even if the author of the post later deletes it, it is now part of the network and its multiple possibilities of copying and/or remembering the content, bringing it closer to something that can no longer be changed after being posted despite this possibility, i.e., the characteristics attributed to BOs are evident in *WhatsApp*: interpretive flexibility, material structure, scale, and scope (Star, 2010).

Table 1

Characteristics of WhatsApp related to those of typical BOs in the literature

WhatsApp in studies on the subject	BOs in studies on the subject	WhatsApp as a typical BO in Approve
<p>A new way of communicating in different and unexpected contexts and meanings, expanding interaction in instantaneous times and spaces and without clear limits, (re) producing information from communication (Porto et al., 2017; Lapa & Girardello, 2017).</p> <p>A space rich in discoveries because of its interactivity within the heterogeneity of unknown people. Its use enhances the search for innovative alternatives in the use of the application, favoring the emergence of new cultural and spatial aspects (Oliveira, 2017).</p> <p>Its material structure informs if users are online, typing or recording messages, if the messages have been read, enables jumping from one interlocutor or group to another between distinct contents, and connects all or some of them via groups (Porto et al., 2017)</p> <p>It enables the expression of information and emotions by various resources, such as emojis (Primo et al., 2021). The scope of the connections it enables can involve the most diverse instances of life, including the organizational one and family and friendships (Matassi et al., 2019).</p>	<p>They enable the maintenance of simultaneous translations of the objectives of actors in multiple mandatory crossing points, which can be negotiated between different communities and without consensus to still cooperate in a broad environment (e.g., a country or a company) as they offer an immutable content between communities, which enables them to find common goals to relate between their borders (Star, 1988; Star & Griesemer, 1989; Whitson, 2018).</p> <p>Basic aspects of architecture (Star, 2010): interpretive flexibility –groups can interpret them in different ways; material or organizational structure specific to its type – concrete or abstract; scale and scope suitable for use as BO – defined by unstructured, unstructured, tailored, or group uses, in which it is applied. Their temporality and ability to mediate boundaries favors collaboration between them. However, this capacity may be lost, producing heterogeneity and discontinuing interactions, which configure dysfunctions to be corrected (Carlile, 2002; Akkerman & Bakker, 2011; Whitson, 2018).</p>	<p>At Approve, people from several sectors and with different experiences and backgrounds (some of which do not even effectively know each other) use <i>WhatsApp</i> to cooperate in issues related to leisure, day-to-day issues, and work throughout much of their day.</p> <p>The application provides interactions between external internal heterogeneous boundaries. For example: when it was inserted in a network of relations between actors unknown to each other and spread throughout Brazil who cooperate in the translation of the common objective of enabling participation in public exams, sharing specific content on topics such as transportation and lodging, which permeate everyone (E8); or when it enables even people with difficulties to use technology to insert themselves in the translation of common goals by this route due to its ease of use (E9); or when it goes beyond the boundary of physical distances (E1; S12). The different interpretations regarding the use of the material structure of the application occurred in the reports by E2, E7, E10, and other members of Approve as they manifested different meanings about the behaviors when they came across different relationships in the network, including different ways of using or not using the stickers in the application to express humor, contrariety, fun, and irony and make jokes in a scope that includes relationships in and out of work and more formal or informal groups.</p> <p>The importance of these elements in the Approve networks was evident on the day the application stopped working as a BO and people had difficulties to relate, as reported by E3.</p>

Source: Prepared by the authors.

This understanding supports the basic argument of this article: *WhatsApp* has the potential to be a boundary object, configuring itself as such at Approve. The studies on BOs in Table 1, which support this understanding, take a position that stems from the seminal development of the concept by Star (1988) and Star and Griesemer (1989), configuring the typical position in this field of study. However, this position leaves aside the negative impacts of these objects on people, identified here from the second aspect discussed in this topic and treated in Table 2: the characterization of *WhatsApp* as a BO involved in negative impacts on people.

Table 2

WhatsApp as a BO involved in negative impacts on people

Characteristics of WhatsApp related to BOs and with negative impacts on people in the studies on the subject	WhatsApp as a BO involved in negative impacts on people at Approve
<p>Capable of causing people to suffer for being unable to access the application, of harming work activities, and leading people to ignore others in the same room due to the attention given to it (Primo et al., 2021)</p> <p>People may have difficulties dealing with the pressures stemming from the relationships produced with it, such as the need to respond quickly to a message (Primo et al., 2021).</p> <p>Due to the negative impacts of the app, some people end up tinkering with its resources to manage the boundaries between presence and absence (Mols & Pridmore, 2021).</p>	<p>Approve evinced <i>WhatsApp</i> as a BO that also negatively impacts people by the way it mediates boundaries. For example, it relates to a culture of immediacy (E3); confusing being “online” and “being available at any time of the day” (E1); with a demand open to everyone who wants to “send a message to you” (E12); with the potentiation of anxiety in “attending to the other of the better and faster” (E9).</p>

Source: Prepared by the authors.

Table 2 shows criticisms of studies on *WhatsApp* that address the organizational context. Studies on *WhatsApp* address its potential use to blur the boundary between work and personal life and the negative implications for people when this actually occurs (Mols & Pridmore, 2021; Primo et al., 2021), i.e., when a BO (the application) works by mediating borders. At Approve, the empirical manifestations of these negative implications (Table 2) arise due to boundary mediation, but authors who deal with this BO functioning, such as Star (1988, 2010), Star and Griesemer (1989), and Whitson (2018), put the possible negative implications from border mediation on people in the background. Therefore, in this study, we propose the understanding that boundary mediation should also be observed regarding its negative implications for people as a contribution of *WhatsApp* studies to the field of study on BO.

Another contribution proposed to the field of study of BO relates to the third aspect in this topic: *WhatsApp* in the production of BO and borders in the networks of relationships. Table 3 shows elements to support this discussion.

Table 3

WhatsApp features related to the production of BO and boundaries in social networks

Characteristic of the use of WhatsApp based on studies on the subject	Production of BOs in networks of relations in studies on the subject	WhatsApp as a BO of the networks of relationships in Approve that use it in the production of boundaries
<p>It coexists with life in the organization and in a networked society as a whole, modifying each other by providing communication in the personal and group sphere with multiple more superficial and ephemeral possibilities of interactions and interpersonal connections, marked by more physically distant people in groupings that can be (re)organized quickly between functional and hierarchical boundaries in organizations (Carvalho & Fort, 2017). It can insert itself into the division of existing groups and/or the creation of new ones when people who avoid participating in the reference conversation in a group interact in parallel conversations (Primo et al., 2021), using the functionalities of the application to build segmentations between different contexts (Mols & Pridmore, 2021) and shape the extent and forms of conversation – including politics – among themselves (Zhu et al., 2022). During the 2022 presidential elections, it configured a vital and politically charged medium that could divide groups of friends, family, and professionals at work and created other groups with these elements (Pereira et al., 2022).</p>	<p>A more relational and ANT-aligned emphasis (Callon, 1984; Latour, 1987, 1996, 2005; Law, 1992) recognizes that networks of relations in which inserted objects are produced may be boundary ones and attest to the symmetry between human and non-human actors as they share agency (Lainer-Vos, 2013). It lies within the network of action flows marked by the relations between object, technology, and human action (Mello Filho & De Araújo Júnior, 2021).</p>	<p>The networks in which the application is inserted at Approve produce it as capable of creating borders as it mediates them and facilitates a double movement in the network, for example:</p> <ul style="list-style-type: none"> - when a new group was created with dissident members of a previous group who continue to interact in both, but in the new one they discuss and define what posts from a member in the previous group they should ignore and about what contents they will or will not comment, establishing boundaries to the dialogue within difference, producing more difference; - when a new server joined the group and it daily sent images and morning greetings containing motivational and/or effect phrases, some responded to the messages, others, disgruntled, complained about it in a smaller, more restricted group in the application and threatened to leave the larger group. In fact, three left the group for what they called “too many ‘good mornings’”; - When a political post was made mocking a presidential candidate, two people opposed it by considering it a provocation and three left the larger group for what respondents called a “distorted notion of what respect and limit is. This has made people think that they can say what they want, when they want, the way they want, and that respect it us accepting it without getting upset” (E4).

Source: Prepared by the authors.

Table 3 theoretically supports that *WhatsApp* can insert itself in the mediation of the internal hierarchical and functional boundaries of organizations and in society as a whole (Carvalho & Fort, 2017) in a way that converges with Table 1. However, Table 3 complemented the first aspect (treated in studies on the application). In addition to mediating borders by inserting itself into relationships, it can also simultaneously facilitate rapid (re)organizations by segmenting contexts, divisions, and group creation (Carvalho & Fort, 2017; Primo et al., 2021; Mols & Pridmore, 2021). This occurs for a variety of reasons, including clashes due to electoral political disputes in society (Zhu et al., 2022; Pereira et al., 2022).

According to Table 3, Approve empirically evinced these movements at different times, leading to the creation of a new group and the departure of members of one group, who remained in another, smaller one. Rather than only causing displacements between groups, it also shows a concept in which social differences and questions on behavior and ideas that lack a consensus demarcate the produced boundaries. However, this failed to prevent the mediation of these differences and cooperation within them since the links across common members to different groups enabled the transit of information and the translation of common objectives due to the material structure, interpretive flexibility, scale, and scope of the application, which characterize it as a boundary object (Star, 2010) and manifested themselves in the insertion of the application at Approve (Table 1).

However, the authors who address BOs in Table 1 fail to deal with this simultaneity between mediation and boundary production. For these authors, a BO should only mediate boundaries; something else (such as boundary non-mediation or production) configures a dysfunction that requires corrections (Carlile, 2002; Akkerman & Bakker, 2011; Whitson, 2018). However, Approve had no interruption of mediation, even with the production of new boundaries, going against the understanding of these authors if we assume, as we do, that *WhatsApp* is a BO. We argue that certain BOs are inserted in networks of relations that produce them with the potential to mediate and produce boundaries. This distances us from the aforementioned authors and brings us closer, in part, to the ideas of Lainer-Vos (2013) and Mello Filho and De Araújo Júnior (2021).

These authors assume a more relational logic about these objects. Although they fail to address how this logic sustains the production of boundaries by mediation, they describe BOs as produced by networks of relations. This article further this understanding to argue that, in addition to producing the BO, networks of relationships can also produce boundaries using these objects. This is how a BO engages in the production of boundaries.

This perspective brings the discussion about BO closer to ANT, placing objects as non-human actors that can interact and mediate relation just like humans, with symmetry and agency distributed between them (Callon, 1984; Latour, 1987, 1996, 2005; Law, 1992). Studies should address the ties between them in networks of relationships (Latour, 2005). This network produces BOs (Lainer-Vos, 2013) and they can also use this production to produce boundaries. This occurs to the extent that humans and non-humans experience the world in multiple and mutual relations (Latour, 1996), in which sociability and materiality are a single production (Akrich et al., 2002). By analyzing *WhatsApp* as BO and boundaries in this perspective, we understand that both show a joint procedural dynamic based on the productions on the network, which are always in progress.

Thus, both the object and the boundary are in constant (re)production, in a continuous process of “bordering.” This study suggests this neologism to encompass the sense that it is not a matter of producing or mediating one boundary and then another and so on as completed instances, in a sense in which it would be appropriate to use the verb “border,” already accepted by dictionaries. This study adopted the term “bordering” to refer to the recognition that BOs, boundaries, and mediations are in constantly mutual (re)productions in the production of these relation networks. Within this logic, we can think of boundary objects as objects in “bordering” as, rather than belonging to a boundary, they are inserted in the process that continuously (re) produces borders.

8. FINAL CONSIDERATIONS

This study aimed to analyze the ways *WhatsApp* mediates and inserts itself as a BO in the production of boundaries at the public organization Approve. The characteristics *WhatsApp*

manifested at Approve place it as a typical BO — defined by Star (2010, 1988), Star and Griesemer (1989), among others, who demarcate much of the prevailing understanding in the field. Because of its interpretive flexibility, different groups at Approve attribute formalism, personhood, positive connotations, negative feelings and impacts, among many other constructions to it. Although people refuse to abandon the use of the application in their networks of relations for this reason, these relations produce boundaries with the creation of new groups, an action facilitated by the application, separated by what is or is not tolerated between certain boundaries.

These findings led to the three contributions of this study. The first was its characterization of *WhatsApp* as a typical BO in studies on the subject. It made it possible to bring *WhatsApp* closer to studies on BO and to take advantage of advances from one field to another. This study avoids intending to exhaust these opportunities for research and discussion. Thus, it suggests that future studies advance other aspects of these mutual contributions in addition to those discussed here.

The second contribution of this study articulates the approximation between two fields of knowledge to criticize the studies on BO that leave the negative implications of boundary mediation for people in the background, something that has prevailed over the decades in which this theme has been developed by authors such as Star (1988, 2010), Star and Griesemer (1989), Carlile (2002), and Whitson (2018). Studies on *WhatsApp* addressed these negative implications of app-related boundary mediation in several ways (Primo et al., 2021; Mols & Pridmore, 2021) and fostered that discussion of the manifestation of this phenomenon at Approve (Table 2), which can be accomplished for other BOs and organizations. Therefore, we suggest that future studies on BO focus on the negative aspects of boundary mediation on people in organizations, as in this study.

The third and main contribution of this study articulates the aforementioned approximation between two fields to highlight the way studies on *WhatsApp* recognize its ability to insert itself in the connection and separation of groups and people as part of its use as a social medium (Carvalho & Fort, 2017; Primo et al., 2021; Mols & Pridmore, 2021; Zhu et al., 2022). We find a mediation and simultaneous production of boundaries when we approach these studies to those that address BO.

This position contrasts with that of authors who approach the BO and treat the production of boundaries or their non-mediation as dysfunctions to be corrected for proper mediation (Carlile, 2002; Akkerman & Bakker, 2011; Whitson, 2018). The empirical evidence from Approve (Table 3) and the theoretical support based on the aforementioned studies enables us to criticize this position and propose a more relational view of BOs — already adopted in studies on the subject (Lainer-Vos, 2013; Mello Filho & De Araújo Júnior, 2021) — but with a focus these studies ignore: to recognize that the relationship networks that produce BOs can also produce boundaries, including using the BOs they produced for this purpose.

This perspective also enables us to criticize the studies on *WhatsApp* that attribute its potential to mediate and produce boundaries to its material resources and the use people make of it (Carvalho & Fort, 2017; Primo et al., 2021). Moving away from this perspective, we propose to recognize *WhatsApp* and any other BOs as another object in the networks of human and non-human relations in mutual and multiple relations, which occur during the experience of the world (Latour, 1996). These networks continuously produce BOs (Lainer-Vos, 2013) and boundaries without separating sociability and materiality (Akrich et al., 2002).

This understanding led to the questioning of the use of the terms boundary and BO to refer to the continuous process of (re)production in which they are inserted in mutual, incomplete relations that are always in progress in the networks of relations. As an alternative, future

studies should adopt the concept of “bordering,” in which relations produce social worlds that are linked and separated into mutual productions in which objects are inserted, objects in the “bordering.” The movements that can be interpreted as ruptures or the emergence of new boundaries stem from this continuous process of “bordering” the relation networks between humans and non-humans. This is the way “bordering” and the objects in it simultaneously produce the connection and separation between social worlds, previously seen as static boundaries (Akkerman & Bakker, 2011).

By developing these contributions we evince a process for society in which its changes in its use of *WhatsApp* permeate alterations in organizations, including its use in work practices. These changes reciprocally link the external networks to organizations, which also change, conflict, and fragment groups that fail to necessarily stop collaborating with each other and use the application for this. This finding gives rise to a phenomenon to be investigated further in future studies: the insertion of *WhatsApp* in the mediation between the personal and the professional, with multiple combinations of possible interpretations between these intermingling dimensions, such as how networks authorize or not the professional to invade the personal or vice versa in the use of this application.

This exemplifies the open space for researchers’ creativity recognizing that “bordering”, by permeating several simultaneous social worlds, at the same time, binds, separates, and offers elements to produce new social worlds, including as part of their mediation. For the field of study on BOs in organizations, our proposal broadens the view on the multiple relationships hitherto considered in previous studies that addressed BOs and offers space for researchers to investigate the implications of other networks of relations with other “bordering” objects and their peculiarities and implications in society and organizations.

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AUTHOR’S CONTRIBUTION

AG: methodology, formal data analysis, project administration, validation and writing of this original text and collected data. **AS:** methodology, formal data analysis, project administration, validation and writing of this original text and did the final review.

CONFLICTS OF INTEREST

The authors declare no conflict of interest in the publication of this article.

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