

Mindset Analysis of GBV Survivors' Narratives :

Understanding Agency
with the Use of Big Data
and Natural Language
Processing

Lina Tafur Marín

Susana Martínez Restrepo, PhD.

Juan Guillermo Ocio

Caroline Brethenoux

Patrick Furey

Orlando Rivera



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Authorship

Lina Tafur Marín
Susana Martínez Restrepo, PhD.
Juan Guillermo Ocio
Caroline Brethenoux
Patrick Furey
Orlando Rivera

Style review: Maria Paulina Zuleta
Design and layout: Carolina Yara Hoyos
Photographs: Pixabay, Pexels

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Executive Summary

Based on online narratives, we analyzed the *mindsets* of 4.7 million survivors of gender-based violence (GBV) between 2016 and 2020 in Colombia. Thanks to the virality of the #MeToo movement, a growing number of women are talking online about their experiences of GBV, yielding a rich data source. Between 2017 and 2018, the #MeToo hashtag had been shared 19 million times by GBV survivors of GBV recounting their stories of sexual, physical, and psychological abuse.

Natural language processing (NLP) allows us to understand the relationship between *mindsets* and the process of empowerment (or lack thereof) of women survivors according to Kaber's framework. *Mindsets* can influence the way people can allocate resources or exercise *agency*, that is, their decision-making power in overcoming a situation of GBV. Specifically, a survivor's *mindset* could explain their decisions and process of empowerment after they experience abuse. Big Data and NLP offer an opportunity to further understand this relationship by providing insights into women's personal stories about violence as well as into its economic, social, and emotional consequences. These personal stories also can reveal belief systems and decision-making motivations that are key to women's empowerment process. Indeed, previous studies have found a strong correlation between the Big Five personality traits identified using surveys and those identified using NLP analysis of online conversations.





Results indicate that a significant majority (47%) of the narratives could reflect a *responsibility mindset*, 38% could demonstrate a *survival mindset*, and only 15% show a *growth mindset*. Narratives with a *responsibility mindset* mostly focus on survivors' duties and obligations. GBV survivors' accountability to others compromises their ability to make strategic decisions. Although responsibility *mindset* narratives often explicitly refer to fulfilling the needs of the survivor's children, for example, they do not imply a possible transformation in living conditions.

Narratives with a *growth mindset* portray mechanisms of resilience that enable survivors to move past the experience of GBV by recognizing self-growth and self-care as necessary to positively change their life conditions and overcome GBV. These survivors address economic independence and self-growth through upskilling and reskilling. They may initiate or advance a productive project, such as an entrepreneurial project or a professional career.

Lastly, narratives with a *survival mindset* portray the distress resulting from GBV and reflect survivors' challenges in making strategic decisions. These survivors seem unable to transcend any concerns beyond basic, urgent survival needs.

This study provides two new innovative contributions to the literature. First, the *mindset* of a survivor can be related to the empowerment process. In psychology, mindsets are associated with conditioning individuals' responses to specific situations, especially to crises. Second, by enabling analysis of millions of survivors' narratives, Big Data and NLP can be important tools to understand the empowerment process and the role of *mindsets* following the experience of GBV, although more research is needed into identifying noncognitive traits, specifically *mindsets*, using spontaneous online narratives.



1. Introduction

In Colombia, 66% of women have undergone some type of *gender-based violence* (hereafter GBV)¹ during their lifetime (DHS, 2015). While this indicates a high prevalence, traditional reports to the police and hospitals do not account for its absolute magnitude and consequences. Indeed, according to Palermo et al. (2013), reporting bias is high. Their study showed that only 14% of women victims of GBV report their cases to official entities such as health institutions or the police. In addition, the most widely available GBV survey, the Demographic Health Survey (DHS), does not measure the economic consequences of GBV, nor does it assess women's social-emotional skills (personality traits or soft skills), such as *mindsets*. Since any intervention relies on research, this lack of data becomes a barrier to the development of successful remediations.

Big Data from online sources can fill this information gap. Sources such as social media and topical sites play an increasingly important role in the daily lives of millions of people, and interest has grown online in the topic of GBV. Between 2017 and 2018, the #MeToo

hashtag was shared 19 million times by survivors of GBV, who recounted their stories of sexual, physical, and psychological abuse (Anderson and Toor, 2018).

This phenomenon is also growing in Colombia, which had more than 30 million active social media users by December 2020 (Shum Xie, 2020). Online movements like #MeToo² #MiCuerpoDicelaVerdad, #ElMachismoMata, and #UnVioladorenTuCamino are meant to lead to "empowerment through empathy" (MeToo, 2020). The stories shared by survivors can be profoundly personal, referring both to the violence and to its economic, social, and emotional consequences, and can even reveal belief systems and motivations related to decision making that are key to the women's empowerment process (Martínez-Restrepo et al., 2021).

To understand the exercise of *agency*, we should consider adding social-emotional skills such as *mindsets* into the framework of empowerment. *Mindset* is related to empowerment and can influence the way people exercise their *agency* and

¹ Traditionally, GBV refers to gender-based physical, psychological, sexual, economic, and patrimonial violence against a person.

² The #MeToo movement was created by Tarana Burke in 2007 and then taken up by Alyssa Milano in October 2017 to uncover sexual harassment in Hollywood. This hashtag was deemed appropriate to demonstrate the prevalence of sexual harassment experienced by women. In Spanish, #YoTambién was used.



access and allocate their resources, since *mindsets* establish attributes for dealing with difficulties (Haimovitz and Dweck, 2016). The *mindsets* evident in survivors' narratives allow us to understand their process of overcoming the psychological impact of adversity.

Big Data creates an opportunity to study the relationship between *mindsets* and the empowerment process of survivors of GBV by analyzing their narratives³ using natural language processing (NLP) and other machine learning techniques. To the best of our knowledge, no studies to date have used Big Data to conduct *mindset* analysis of survivors' narratives, allowing us to examine the ramifications of *mindset* for women's livelihoods and their empowerment after GBV. Most studies using Big Data to study GBV through narratives focus on sentiment analysis, and studies using machine learning techniques to investigate *mindsets* have not focused on GBV. Studies using NLP for *mindset* analysis have focused mostly on educational success (Stone et al., 2019), decision-making (Perez-Rosas et al., 2017), or survivors' perceptions of a specific topic (Falcone, et al, 2020). Similar studies using NLP and *natural language understanding* (NLU) have identified the Big Five personality traits from online conversation (Gourav Das and Das, 2015; Olivares et al., 2018).

This paper contributes to closing the information gap around the use of Big Data to understand GBV's consequences for women's lives (Data2x, 2021). Big Data and methodologies for its analysis, like NLP, are fast-moving and the feminist economics literature and social sciences disciplines are far behind its

developments. This paper proposes including *mindsets* to understand the empowerment process framework and particularly the exercise of agency of survivors of GBV. The study of *mindsets* allows the exploration of barriers to and enablers of empowerment. This paper aims to respond to the following research questions: What are the different *mindsets* portrayed in narratives written by GBV survivors? How do mindsets relate to women's empowerment process? What are the policy and methodological implications of measuring or identifying survivors' *mindsets* through online narratives?

Using Big Data and NLP, we analyzed 4.7 million online narratives of GBV survivors and classified them by an algorithm according to the *mindset* implicit in each narrative. Results found that the greatest proportion (47%) of the narratives reflect a *responsibility mindset*, suggesting most women's decisions are not strategic because they feel compromised by their duties to others—primarily children and family—as well as by social norms and standards. The next most prevalent, the *survival mindset* (38%), showed that survivors' ability to transform their living conditions and leave a violent relationship is affected by the immediate impact of GBV. Finally, a minority (15%) of narratives showed a *growth mindset*, implying that only a small percentage of survivors can take full control of their lives and transform their living conditions through productive projects or by advancing their careers and education.

³ Throughout the text, reference is made to survivors' narratives and not to conversations because one conversation can contain different thematic or opinion (feeling) narratives. This enables a more precise classification.



2. Conceptual Framework: *Mindsets* and the Process of Empowerment Among Survivors of GBV

A *mindset* is a non-cognitive (or soft) skill that, in psychology, is associated with conditioning individuals' responses to a specific situation, especially to crises (Dweck, 2007). Non-cognitive skills have been crucial in developing the concept of emotional intelligence (Goleman, 2000). Beliefs shape the *mindsets* people have about the nature of human characteristics (Dweck, 1999) and *mindsets* in turn shape people's motivation to act (Dweck, 1999; Plaks et al., 2005). The literature differentiates between two *mindset* types: *growth mindset* and *fixed mindset* (Blackwell et al., 2007; Dweck; 1999).

A *fixed mindset* orients people towards performance goals and striving to gain favorable judgments of their competence (Blackwell et al., 2007), whereas a *growth mindset* orients people to believe that they can substantially change through learning and experience (Dweck, 1999). A *growth mindset* is associated with greater resilience and greater likelihood of employment and educational success, as well as with lower levels of stress, depression, and social exclusion (Yeager & Dweck, 2012).

Studies argue that *mindsets* are not static and can be cultivated over time. A *mindset* develops instinctively and unconsciously in response to a stimulus—positive or negative—or consciously when people choose to adopt a certain *mindset* (Mackay, 2015). Indeed, a person may consciously find alternative or more adaptive *mindsets* to replace old ones established in response to negative stimuli. Other factors can also affect *mindsets*, including social resources (such as mentors and social connections) and economic and material resources (such as education, transportation, and financial capital) (Dweck & Yeager, 2019).

Mindsets are related to economic empowerment and *agency* in that they are central to decision-making as drivers of behavior. In theory, they could shape the approach a survivor takes to overcome a situation of abuse. According to Naila Kabeer's (1999) framework, empowerment is a process consisting of three dimensions: *resources*, *agency*, and *achievements*. Access to and control of *resources*—including material, human, and social—



are a precondition for empowerment, as controlling these elements allows individuals to make strategic life choices (Kabeer 1999; 2005). According to Kabeer, *agency* "is the process by which individuals set goals, negotiate, make strategic decisions and choices and act upon those choices" and is measured through goal setting, self-confidence, and decision making that can positively transform a survivor's status quo. It is essential to consider that *agency* in the process of empowerment in feminist economics needs to be transformative in nature (Martinez-Restrepo and Ramos-Jaimes, 2017). Lastly, achievements result from strategic choices that can transform survivors' lives and promote their well-being (Kabeer, 1999).

As in psychological studies, our approach can represent and analyze a *growth mindset* as a proxy for *agency*. The *growth mindset*, based on the premise that individual qualities can be cultivated through effort, arises from Carol Dweck's work studying the relationship between *mindsets* and effort in regard to children's intelligence (Dweck, 2006). People who exhibit a *growth mindset* put more effort and time toward achieving their goals and focusing on reskilling and the learning process.

Our model proposes two additional *mindsets*: *responsibility* and *survival*. The *responsibility* or *accountability mindset* is based on the belief that others are counting on the individual to achieve an outcome, connoting acceptance of the obligation to perform and achieve something specific (O'Brien, 2016). It is related to conscientiousness—one of the Big Five personality traits⁴—which refers to a preference for following rules and schedules,

keeping engagements, and being hardworking, organized, and dependable (Nyhus and Pons, 2005). Conscientiousness has been consistently associated with the capacity for self-control, the ability to delay instant gratification, and positive performance in a productive context, thereby promoting the achievement of personal goals under specific circumstances. According to Li and Bates (2019), this *mindset* advances a commitment to specific goals based on an explicit pressure for accountability.

Survival mindset is defined by the ideas put forward by Mullanaitan and Shafir (2013) about mental scarcity. Emotional or mental distress compromises the mental resources or bandwidth required for careful, rational, long-term thinking. Instead, people in a distressed state rely on fast, agile, intuitive mental processes, making it harder for them to make strategic decisions and choices that improve their well-being. Given this premise, female survivors who are heavily mentally taxed by their experiences of GBV find themselves unable to extend the scope of their decision-making beyond urgent survival matters to set long-term goals and make positive life-changing decisions.

This study presents evidence about the different *mindsets* of GBV survivors. *Mindsets* demonstrate survivors' empowerment process and how they overcome violence and leave behind abusive relationships. *Mindsets* are by no means static, and the differences among *survival*, *responsibility*, and *growth mindsets* could also represent different stages of empowerment.

⁴ The Big Five personality traits are extraversion, agreeableness, openness, conscientiousness, and neuroticism. The Big Five theory tries to narrow down personality traits to five core categories that are remarkably universal (Cherry, 2021).

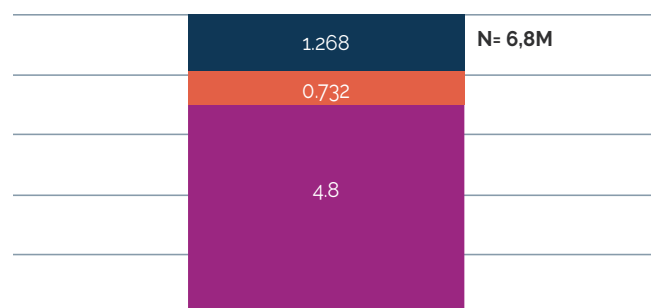


3. Data and Methodology

Using data mining techniques⁵ and NLP, we analyzed 4.7 million online GBV survivor narratives that emerged in Colombia between November 2016 and February 2020.⁶ We conducted a *mindset* analysis using NLP to understand the barriers to and mechanisms of the empowerment process in the aftermath of GBV.

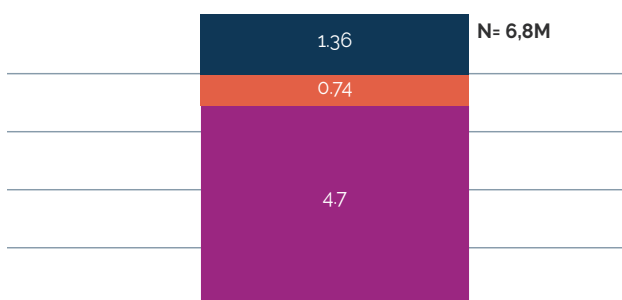
Most of the narratives—90%—were from women (Figure 1). Due to the aim of this study, we included only survivor narratives (those told in first person) (4.7 million) (Figure 2).

Figure 1. Narratives by gender



Source: Authors own elaboration

Figure 2. Narratives by author



Source: Authors own elaboration

3.1. Data Characteristics

Data mining allowed us to collect a data set of 6.8 million online narratives on GBV. Five parameters guided inclusion of narratives in the data set. Included narratives 1) were on the topic of GBV; 2) came from any site on the internet; 3) were posted during the three years and four months between November 2016 and February 2020; 5) came from within the Colombian territory as indicated by the IP address of the user(s); and 6) were written by survivors of GBV.

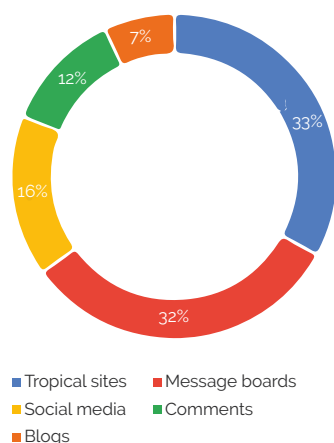
As shown in Figure 3, most of the narratives were retrieved from topical sites (33%) and message boards (32%). Additionally, most of the narratives were written by women from the most urbanized areas in Colombia, Bogotá, Antioquia, and Valle del Cauca, where there is increasing access to the internet relative to other areas in Colombia (Figure 4).

⁵ Data mining consists of applying statistical techniques to massive volumes of data to identify recurring patterns, thus generating classification and grouping models that make sense of and organize the information.

⁶ A span of three years and four months was determined for data collection in order to capture the increase in discussions and narratives about GBV related to the #MeToo movement.

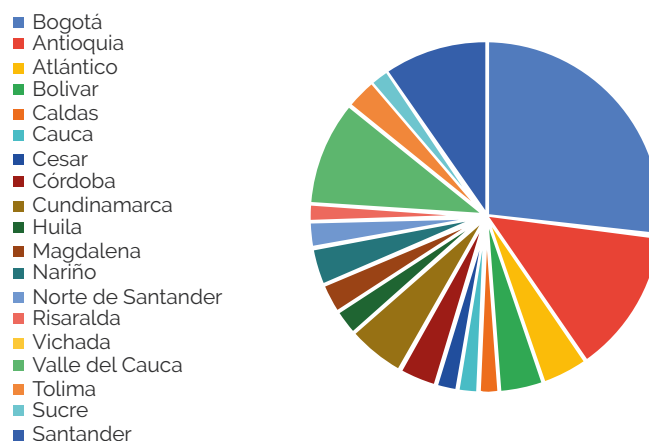


Figure 3. Origin of the data



Source: Authors own elaboration

Figure 4. National representation



3.2. Data Analysis

To ensure optimal NLP analysis, the study established a set of vocabulary⁷ and hashtags specific to GBV and particular to Colombia. We accomplished this through an extensive qualitative literature review of the original narratives created by rural and urban women in Colombia⁸ as part of an informed machine learning strategy. The algorithm was trained through the study of a corpus of online narratives. This strategy used automation and data-driven technologies to systematically label massive data sets with the criteria of a gender expert, thus emphasizing expert knowledge in the machine learning pipeline (Von Rueden et al, 2019). Applying informed machine learning joined the data-driven and free-of-assumption model to analyze the data set of words and narratives that indicated GBV in the context of Colombia. In this way, the gender expert provided input on the algorithm's detection of cognitive

categories as predictors of *mindsets*. We repeated this process until the outputs precisely predicted the cognitive categories central to the different *mindsets*. This analysis intended to replicate qualitative analysis on a larger scale rather than replacing the established judgment of experts.

With this strategy in place, we employed data mining and collection using advanced search techniques (web spiders, crawlers, and site scraping) across topical sites, blogs, social networks, and message boards where relevant discussions were taking place. Data collection encompassed a complete range of social discussion channels, including sites aimed at selected segments and those directed by (but not limited to) their predefined topic of interest (GBV). We then extracted and identified topical and tagged data by origin and user⁹ before creating a large, unstructured Big Data set.

7 A vocabulary of 181 terms used colloquially throughout Colombia was identified based on qualitative studies on GBV. This vocabulary refers to topics such as the following: violence, sex work, sexual orientation, sexual violence, sexual harassment, psychological violence, physical violence, murder, drug trafficking, control, conflict, alcohol, and abortion.

8 Some examples include documents from the National Center of Historical Memory (CNMH) with interviews that describe the use of women's bodies to establish dominance between armed actors and communities, as in the case of the Bahia Portete massacre or sexual violence in Arauca, for example.

9 One significant concern about Big Data is privacy, especially regarding minority populations. Therefore, it is necessary to de-identify any data retrieved from the internet to safeguard people's privacy.



To analyze each narrative precisely, conversations or online posts were first tokenized—broken down—into sentences and sentences into individual words. Each sentence or group of sentences were understood as narratives, depending on their thematic focus. Since sequences may not be modeled, we employed deep sequential learning methods to analyze sequences of words when tokenizing. These analyses were human-assisted and included repeated training, testing, and reviewing of the program output.

Next, we used an open vocabulary approach including both standard classifiers and deep recurrent neural networks to measure the three *mindsets* previously mentioned, each of which had different non-cognitive traits. The model identified most diagnostic language features associated with each trait to explain how these traits manifest in language. This was done to cast the detection of different cognitive traits as a three-category classification task.

3.3. Measuring *Mindsets* with Natural Language Processing

The NLP model identified three types of *mindsets* among survivors of GBV: growth, responsibility, and survival. This identification was based on the prior theory of empowerment and *mindsets* as well as on a simplified grounded theory¹⁰ approach to coding (Charmaz, 2006). After gathering the data, we analyzed it with an algorithm trained to identify these three *mindsets*. To avoid problems around discriminant validity when coding the conversations online, we took apart each narrative to fully understand its *mindset*. This meant that one conversation might contain several narratives or small stories. However, *mindsets* often overlapped, because the narratives were coded for multiple traits and *mindsets* can have overlapping traits. Indeed, it proved challenging to extract a single factor to measure non-cognitive skills, a task that is easier when measuring cognitive skills (Brunello and Schlotter, 2011).

We defined certain central characteristics or traits central to measure each *mindset*. This allowed us to identify the *mindset* driving each narrative, as seen in Figure 5.

¹⁰ Grounded theory means that analysis and development of theories happens after the data is collected. The design of the model and methods are dependent on the data collected (Tie et al., 2019). This is a common qualitative methodology.

**Figure 5. Mindsets and their identification**

Type of Mindset	Definition	NLP identification strategy
Growth	<p>It captures narratives that highlight:</p> <ul style="list-style-type: none"> • Improvement of a survivor's conditions with a focus on strategic goals • Development of skills • Self-improvement • Sense of responsibility towards oneself • Emphasis on resources beyond money <p>Top correlated words (n-grams): learn, skill, work, grow, study, continue/move on, kids/daughter/son</p>	<p>NLP identifies a vocabulary specific to the theme (GBV) that can signal different <i>mindsets</i>, particularly growth-driven, responsibility-driven, and survival-driven.</p> <p>To externally validate the algorithm's results, this process uses characteristics that comprise each <i>mindset</i> as defined through a psychosocial lens by experts on GBV.</p>
Responsibility	<p>It captures narratives that highlight:</p> <p>Improvement of a survivor's conditions as a result of setting personal goals</p> <ul style="list-style-type: none"> • Validation of one's abilities • Sense of responsibility towards others • Resilience as a mechanism for resilience <p>Top correlated words (n-grams): kids/daughter/son, caretaking, family, continue/move on, responsible</p>	
Survival	<p>It captures narratives that highlight:</p> <ul style="list-style-type: none"> • The urgency of the psychological impact of abuse • Short-term planning • Perception of vulnerability and fear of repetition • Goals focused on accessing resources without guaranteeing control or strategic use <p>Top correlated words (n-grams): leave, lose, family, kids/daughter/son, end, sad</p>	

Source: Authors own elaboration



3.4. Limitations

The data does not represent all women survivors of GBV in Colombia. A data set of spontaneous narratives offered online implies the invisibility of people who do not share their stories online, who do not have the information technologies or resources to do so, or who are not aware of their situation. Therefore, the data set does not necessarily represent the most vulnerable, rural, or older women who do not have the necessary digital connection or digital skills to share their stories. The voices of women who are currently experiencing abuse also may have been excluded because they cannot share their stories, as may those of women who are not aware of suffering GBV due to its normalization. Moreover, it is important to highlight that NLP technologies can fail to reveal online narratives about GBV within the framework of the armed conflict in Colombia, since a narrative must explicitly reference GBV in the context of the armed conflict in order to be labeled as such.

There also are limitations to measuring people's *mindsets* with NLP versus with psychometric tests. Psychometric tests measure *mindset* through surveys specifically designed to capture people's understanding of traits, such as effort, that are central to theory (Devaux and Sassi, 2016). NLP considers people's accounts of their experiences online and tries to figure out which *mindset* is driving the narrative through its vocabulary, grammar, and context. This means that the algorithm sees only what the creator of the narrative wanted to share in a specific moment. Additionally, NLP analysis of online posts on GBV cannot track people's *mindset* changes over time. Such tracking only is possible with traditional qualitative methods and longitudinal studies.

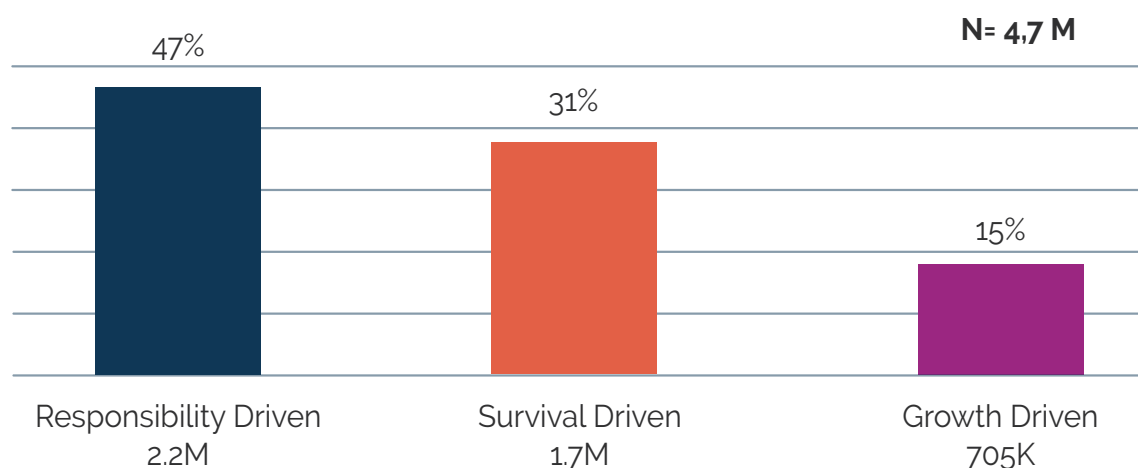


4. Mindset Analysis

This study used NLP to examine the mindset of survivors of GBV and to attempt to understand how survivors' *mindsets* could enable or disable their empowerment process after GBV by looking at how they narrated their experience of moving past GBV. NLP analyzes the way survivors narrate their stories and classifies their narratives into *mindsets*.

This analysis identified three mindsets: 1) growth, 2) responsibility, and 3) survival. Most narratives (47%) portrayed the *responsibility mindset*, implying that survivors' narratives generally emphasize accountability to others (for instance, their kids) instead of focusing on themselves to transform their current position (*growth mindset*) or on addressing the urgency of the psychological impact and using resources as a means to survive (*survival mindset*).

Figure 6. Mindsets identified in survivors' narratives



Source: Authors own elaboration

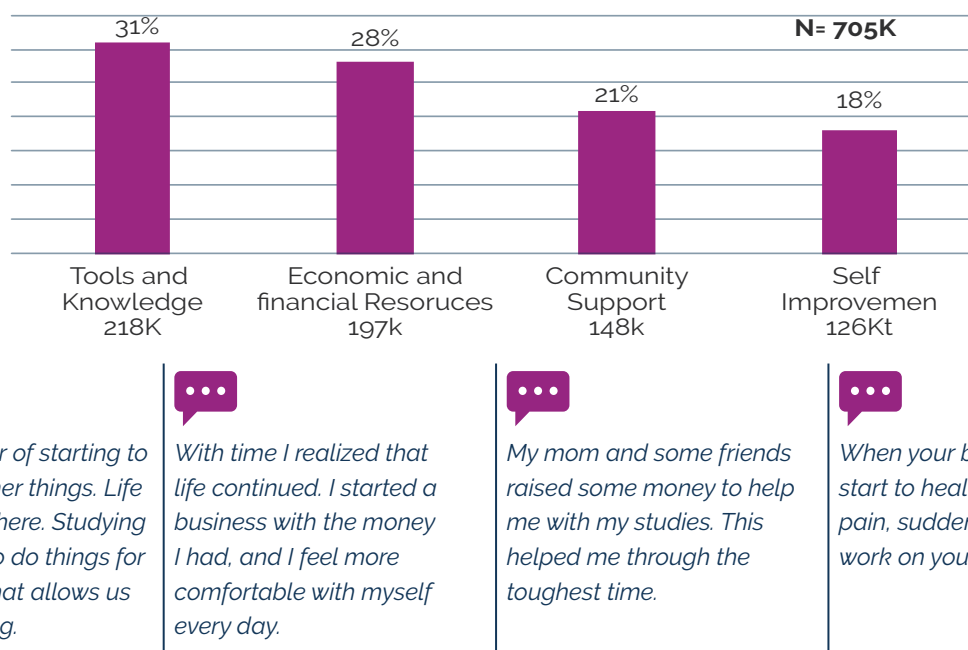
4.1. Growth Mindset

A *growth mindset* promotes improvement of an individual's abilities and a sense of accountability to oneself, therefore enabling individuals to set strategic goals (Bandura, 1983). This *mindset* commonly is seen as optimal for educational and work environments, resulting in a greater likelihood of success and lower levels of stress, depression, and social exclusion (Yeager & Dweck, 2012). Our conceptual framework used the growth mindset as a proxy for *agency* for empowerment due to its transformational nature. Survivors with a *growth mindset* want to leave the abusive relationship and transform their lives positively.

The *growth mindset* accounted for only 15% of survivors' narratives. The topics covered by these narratives suggested that the most important aspects of this *mindset* in overcoming GBV and achieving positive transformation were tools and knowledge (31%), economic and financial resources (28%), community support (21%), and self-improvement (18%) (Figure 7).



Figure 7. Themes in narratives with a *growth mindset*



Source: Authors own elaboration

Narratives with a *growth mindset* portrayed mechanisms of resilience. The narratives demonstrated how survivors adjust to life after GBV. These survivors recognized that their ability to resist, to embrace personal growth, and care for their mind and body was necessary to transform their lives overall. As seen in Figure 7, survivors described in their narratives how they addressed economic independence and self-growth by upskilling and reskilling to improve their prospects. This is central to the *growth mindset*, according to Dweck, since people establish learning objectives to meet goals, validate or test their abilities, and develop their potential (Dweck & Yeager, 2019). These activities facilitate the initiation or growth of a productive project, whether that is an entrepreneurial undertaking or advancement in their professional career.

According to Klomek et al. (2007), individuals with a *growth mindset* understand social labels as constantly changing and not reflecting their character. Thus, when survivors of GBV subscribe to a *growth mindset*, a limiting element such as stigma might not weigh so heavily on them as they move their lives forward. This *mindset* can ameliorate the stress caused by

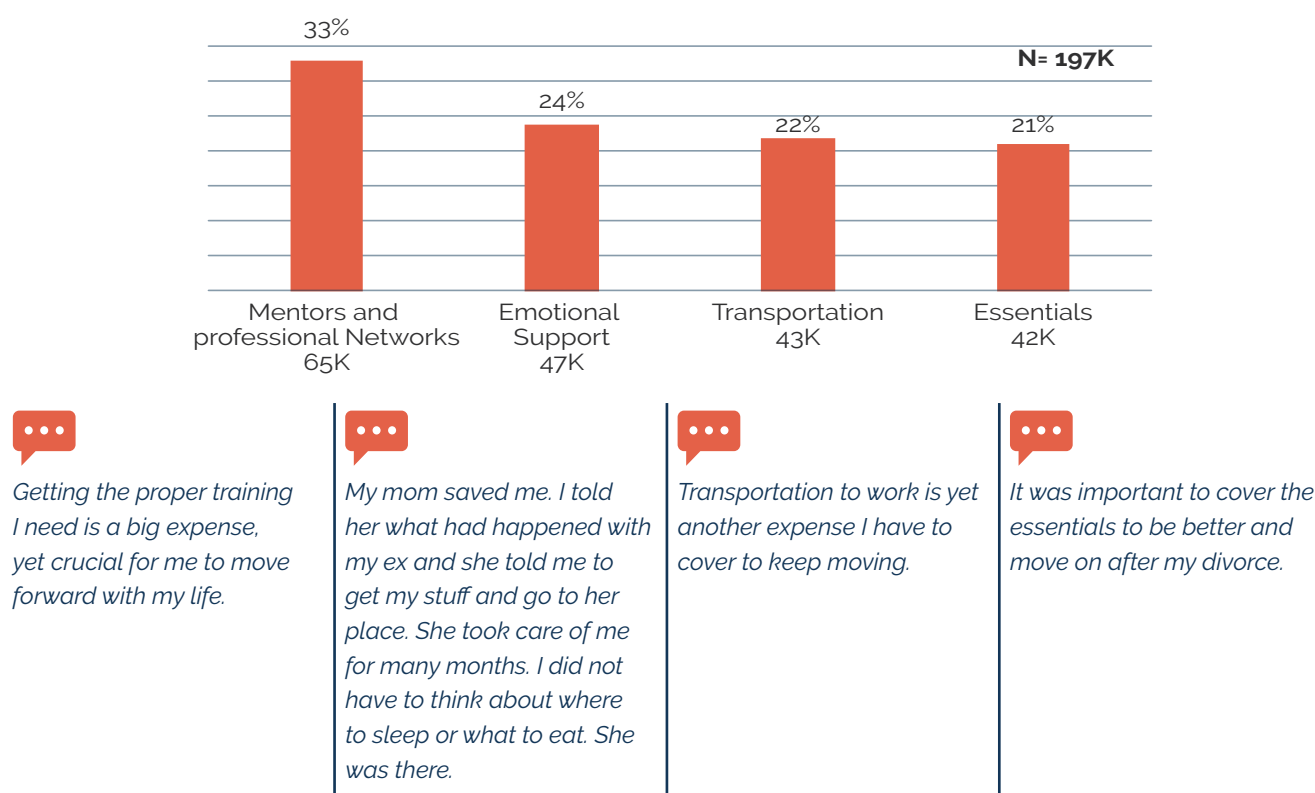
social stigma (Klomek et al., 2007), translating into a greater tendency for survivors to seek immediate help from their community, family, friends, and women's organizations. Survivors embracing a *growth mindset* can more quickly reconstruct social bonds and undergo a collective process of *agency* to reach individual *agency*. This can, in turn, decrease the risk posed by leaving a violent relationship (Cavanagh, 2003).

Economic and Financial Resources

A look at economic and financial resources in the *growth mindset* narratives shows that survivors focus on issues beyond money. This is important because economic empowerment is a multi-layered process. According to Agarwal (1997), women need material and human resources to bolster their bargaining power and provide a fallback position, enabling them to reach better deals for themselves within and outside the household. Narratives related to economic and financial resources focused on four themes: mentors and professional networks (33%), emotional support (24%), transportation/mobility (22%), and essential needs (22%) (Figure 8).



Figure 8. Main themes in narratives on economic and financial resources with a *growth mindset*



Source: Authors own elaboration

Growth mindset narratives centering on economic and financial resources showed that survivors prioritize personal growth and responsibility. Their narratives referred to personal growth when addressing professional advancement through mentors, networks, and skills improvement, which is central to the *growth mindset* (Dweck & Yeager, 2019). Narratives also included transportation and mobility, which can provide a survivor a way to escape the spaces frequented by a perpetrator and the possibility of acquiring a better-paying job by accessing other areas of the city/region/country (Borker, 2018).

Survivors' narratives also focused on their responsibilities. The narratives highlighted essential needs and the importance of maintaining social bonds to move forward and transform life conditions. In these narratives, survivors referred to responsibilities such as supporting family members while looking for emotional support, which, as mentioned, is crucial after surviving GBV (Martínez-Restrepo et al., 2021).

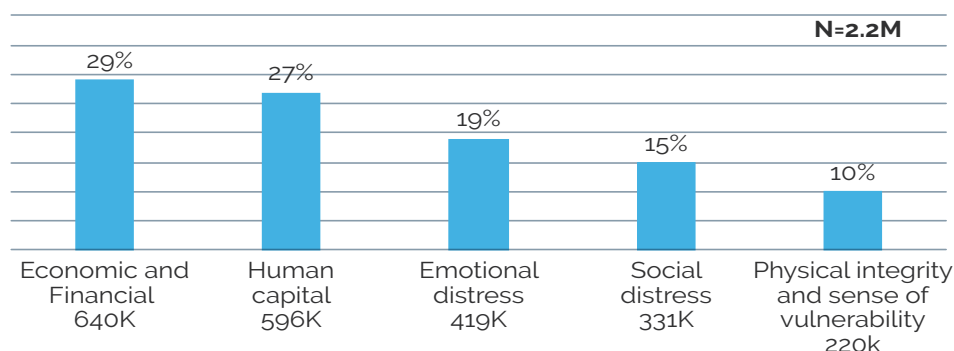
4.2. Responsibility Mindset

A *responsibility mindset* promotes commitment to specific goals based on an explicit pressure for accountability (Li and Bates, 2019). Even though a *responsibility mindset* is crucial for productive projects, a person driven by this *mindset* might not transform their life conditions. While responsibility and duty are fundamental characteristics of the *growth mindset*, they must be accompanied by reskilling and motivation to improve rather than prove.

The greatest proportion of narratives studied reflected a *responsibility mindset* (47%). The topic analysis of these narratives revealed a focus on: economic and financial responsibilities and needs (29%); human capital needs (27%); and the barriers to fulfilling these responsibilities, such as emotional stress (19%), social stress (15%), and survivors' physical integrity and sense of vulnerability (10%) (Figure 9). In this case, survivors understood GBV only as an obstacle to fulfilling these responsibilities, which made it challenging for them to think long-term and consider future opportunities.



Figure 9. Main themes in narratives with a *responsibility mindset*



Nothing made any sense anymore, but seeing my kids and knowing I had to give them something to eat the following day was more than enough to leave the sadness behind.



This man would hit me at any time, and no one would say a thing about it. I couldn't go to work anymore, I didn't know what excuse to tell my boss. I couldn't take care of myself. I was going to lose my job.



I felt like my life was worthless. I could not do anything for myself, less so for others. I thought about killing myself. My mom would take care of my kid and that was enough.



No one knows what we go through. After you are raped there are enemies everywhere. Now imagine being responsible for a whole family in such conditions.



Some days my body would ache so much I could not move, but my kids' presence made it possible.

Source: Authors own elaboration

Narratives with a *responsibility mindset* showed survivors' sense of duty and urgency around meeting their goals. However, these narratives described the urgency to overcome the impact of GBV as a decision compromised by other's needs or undertaken to ease social and economic pressures. For instance, the narratives repeatedly referred to survivors' responsibilities to their kids. Studies show that kids' material needs, wishes, and feelings influence women to remain in—or return to—abusive relationships (Cavanaugh, 2003). In this sense, *responsibility mindset* achievements merely manifest women's unequal ability to make choices, rather than exemplifying strategic choice-making (Kabeer, 1999).

As a consequence of social pressures, responsibility weighs heavily on survivors to make decisions that maintain their current positions. Survivors act responsibly because circumstances force them to do so, not because they make a deliberate choice. This can be understood as a disempowering context for choice. Still, we can view actions undertaken in this

context as resistance strategies. Such actions may include withstanding and opposing abusive behavior (Cavanaugh, 2003; Anderson and Danis, 2006) because of risks such as homicide or the economic and social problems involved in leaving (Daly and Wilson, 1988). Although a survivor's ability to resist, manage, or reduce violence implies a potential for agency (Cavanaugh, 2003), the *responsibility mindset* does not affect a transformation of survivors' life conditions.

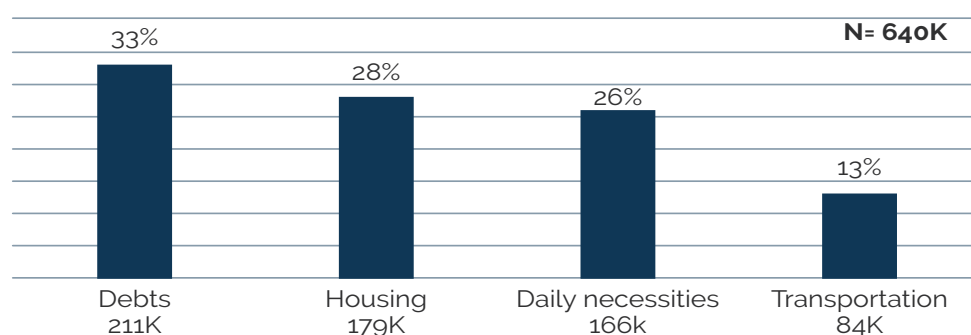
Like narratives related to *fixed mindsets*, narratives with a *responsibility mindset* portrayed survivors setting goals to validate and test their abilities rather than to develop them (Ellito & Dweck, 1988; Bandura, 1983). Such narratives also portrayed a need to validate socially transmitted practices and expectations surrounding the institution of the family (Kabeer, 1999). Accountability alone, even when it may promote professional success or productive ventures, is not sufficient to counter adverse events and may lead individuals to eventually give up (Heslin et al. 2018; Li & Bates, 2019).

Economic and Financial Resources

Narratives centered on economic and financial responsibilities and needs made up almost one third of those with a *responsibility mindset*, showing the importance of these concerns to addressing survivors' needs. Debts were the most significant concern (33%),

followed by housing (28%), daily necessities (26%), and transportation/mobility (13%). Compared to the *growth mindset* survivors' narratives, the *responsibility mindset* allows survivors only to cover essentials, for themselves and others, without seeking to transform their position.

Figure 10. Economic and financial issues in narratives with a *responsibility mindset*



The dude I was going out with would help me with my student debts. The first time he raped me, I remember thinking I would have to leave university.



I needed to take my family out of the house, but I needed money to rent another place to be assured of their safety.



If I reported my dad to the authorities... who would place food on the table? With time I realized I had to do both things.



I had to take my kid to school, but had no money ... I knew that if I asked for money he would abuse me as payback.

Source: Authors own elaboration

The topics under this *mindset*—debts, housing, and daily necessities—demonstrated a lack of basic means and should be highlighted. Narratives with a *responsibility mindset* could show that survivors feel pressure to stay in violent relationships to pay debts, maintain stable housing, and obtain daily necessities. Economic dependence has been identified as a risk factor for women for prolonged abuse because of the lack of subsistence options outside of the relationship (Dhungel et al., 2017). Empowerment is partly enabled by access to and control of material resources because women with income or assets tend to have a better fallback position, which decreases their risk of domestic violence (Agarwal, 1997).

Compared to the *growth mindset* narratives, survivors' narratives classified as having a *responsibility mindset* lacked a deliberate choice of personal goals, indicating a low *agency* level. According to these narratives, relationships preexisting the victimizing episode engendered a sense of obligation that motivated survivors' behavior. While survivors' narratives with a *responsibility mindset* contained some of the elements essential to overcoming GBV that were present in the *growth mindset*, they lacked its sense of transcendence. Narratives with this *mindset* showed survivors' tendency to maintain the status quo and lacked accounts of the transformative decisions required for women's economic empowerment (Kabeer, 1999; Martinez-Restrepo, Ramos-Jaimes, 2017).



It is possible that in Colombia, widespread poverty and limited access to basic necessities create the conditions that lead to developing *responsibility mindsets*, as people become exhausted just figuring out how to make ends meet. Survivors with a *growth mindset* also could be individuals with greater economic means or family support and greater mental bandwidth due to lack of scarcity (Shafir and Mullainathan, 2011).

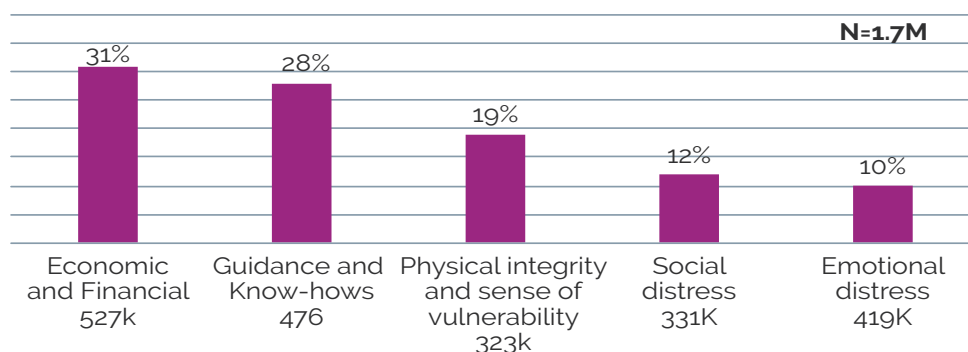
4.3. Survival Mindset

Survivors' narratives with a *survival mindset* showed that these survivors committed all their psychological resources to the immediate psychological impact of GBV and stopped planning for the medium and long

term. Many of these narratives referred to immediate economic and financial hardships because the mental burden of dealing with the psychological impact of GBV precluded further planning. Many of these survivors were looking for guidance on what to do after they had been victimized, as well as expressing increased physical, emotional, and social vulnerability.

Financial and economic issues accounted for 31% of the narratives grouped under this mindset, followed by institutional resources (28%), physical integrity and sense of vulnerability (19%), social impact (12%), and emotional impact (10%). The narratives' *mindset* showed there was not only a concern about basic needs, but also an experience of great social and emotional consequences when compared to survivors' narratives with other *mindsets*.

Figure 11. Main themes in narratives with a *survival mindset*



What I needed at that time was to get another job to earn enough money to leave and never return to that house. It was a life or death situation.



One of my co-workers tried raping me... The worst part started afterwards. I didn't know how to seek help. I didn't know if I had to report it or not. In the end, I left my job. I did not feel safe in that environment.



After my husband hit me, I didn't feel safe in my own house. I would make up excuses to leave the house.



Every time I reached out to someone to talk about what had happened, I felt judged. People would not believe me; they made me think it was my fault. I decided to not talk to anyone about it, if anyway they would just judge me.



I had never felt so sad in my life, ever. It was as if my aggressor had taken everything from me—my will to keep living, to go to work, to go out... I just wanted everything to end.

Source: Authors own elaboration



This *mindset* seemed to represent the state in which survivors found themselves shortly after the victimizing event. However, we could not establish this timeline because the narratives showed only a one-time picture of survivors. Still, the narratives revealed a survivors' perception of a high level of vulnerability and imminent fear of repetition.

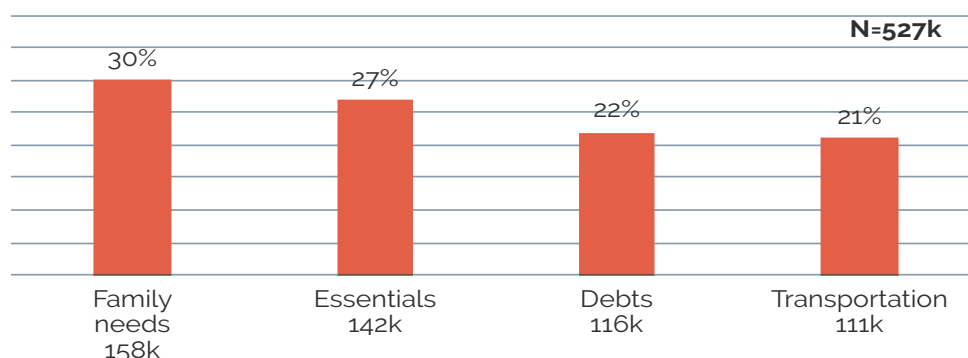
Survival mindset narratives convey the psychological impact of GBV as a mental weight for survivors, leading them to make automatic, fast, and intuitive decisions rather than thinking rationally. According to Mullainathan (2016), such spontaneous thinking is more prone to bias and error and compromises decision making. This inhibits survivors from making

strategic decisions that can positively affect their well-being and also lessens the probability that they will embark on the sustainable path of self- and skills-development that characterizes the *growth mindset*.

Economic and Financial Resources

The economic and financial topics mentioned in *survival mindset* narratives referred to merely being able to access material resources, without guarantees that the survivor could control or use resources strategically. These survivors focused on the same topics as those in the *responsibility mindset*: family needs (30%), basic needs (27%), debt (22%), and transportation/mobility (21%) (Figure 12).

Figure 12. Main themes revealed in the economic and financial in narratives with a *survival mindset*



I had so many things on my mind before I could even think of leaving. I had to think of my kids, if they had food to eat, a school to go to.



No one knows what it is to choose between death from abuse or hunger.



The worst thing about being abused by your boss is that reporting him would mean losing my job and then how would I pay my debts?



My family lives in another city. I really needed to reach them to get some help, but I didn't have the means.

Source: Authors own elaboration



5. Conclusions and Recommendations

The *mindset* analysis of narratives written by survivors of GBV using NLP is innovative and presents new ways of understanding the process of women's empowerment.

Other *mindset* analyses have focused on educational success, decision making, or people's perceptions of specific topics. In the context of GBV, this type of analysis could explain survivors' decisions and their empowerment process as they move beyond abusive situations. Previous studies have found a strong correlation between the Big Five personality traits as revealed through surveys and as uncovered using NLP analysis of online conversations (Gourav Das and Das, 2015; Olivares et al., 2018).

The greatest proportion of survivors' narratives reflected what we have characterized as a *responsibility mindset*. These narratives suggested that survivors with this *mindset* focus solely on their obligations, which could become a barrier to strategic decision making and to an eventual positive transformation of women's living conditions.

The *survival mindset* portrayed the distress that GBV causes. These narratives reflect the difficulties of

making strategic decisions because survivors with this *mindset* seem unable to transcend urgent or essential survival concerns. It is possible to infer that *survival mindset* narratives were written by survivors who experienced GBV more recently or who experienced more complex forms of GBV.

The least common *mindset* among narratives was the *growth mindset*, which portrays mechanisms of resilience and transformation after an experience of GBV. Self-growth and self-care through upskilling and reskilling are central to this *mindset*. These elements facilitate the initiation or growth of a productive project such as an entrepreneurial venture or career advancement. We may infer that, in contrast to women with other *mindsets*, women expressing *growth mindset* narratives have participated in psychosocial processes, experienced GBV longer ago, or have family, institutional, or economic resources that allowed them to focus on growth rather than on urgent survival needs. This interpretation is consistent with topic analysis showing family needs and debts were among topics most important in a *survival mindset*.

Nevertheless, many of these conclusions are hypotheses that need to be proved with additional



data and other research methods. For example, the unstructured nature of Big Data means it is not possible to evaluate factors such as the time elapsed between the last GBV episode and the online narrative, the socio-economic status of survivors, or differences between those who received psychological support and those who did not. More research needs to be done in these areas. While this study using Big Data and NLP does not replace existing qualitative and quantitative methods, it can shed light on important new measures to include in surveys like the DHS and can provide the basis for new research questions.

The study of *mindsets* using psychometric testing could be introduced into the mainstream feminist economics literature to help us further understand the process of empowerment, and particularly the *agency* of women survivors. We could include in this analysis new variables such as the year the abusive situation happened, the resources women had at that time (a proxy for fallback position), and their exposure to therapy. None of this is yet possible with the existing ongoing surveys widely used to measure the causes and effects of GBV, like the DHS.

As well, Big Data and NLP can be further developed to aid understanding of this phenomenon. For example, future studies need to train algorithms using existing or new qualitative studies of women talking about their empowerment process after a situation of abuse. Ideally, cognitive psychologists would tag the conversations and structured interviews with what they define as a *growth mindset* in these specific cases. Our NLP algorithm likely lacked the necessary local and subject tuning, leading to loss of important information about the empowerment process of women survivors. Although we included vocabulary specific to GBV and colloquial Colombian language, and supervised the training of the algorithm, training and development data sets about GBV survivors' experience should be available in Spanish, English, and other languages. This way, NLP algorithms could be tuned to grasp local idiosyncrasies. Feminist economists, psychologists, and data scientists need to team up to get the best results from this kind of study.

Big Data analysis and NLP promise many opportunities for improving the study of women's empowerment using Big Data and AI.



6. References

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