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Abstract

Previous research has indicated that modeling language changes over time may offer insights into how concepts and ideas are understood and conceptualized within a society as it undergoes changing societal circumstances (Burgers, 2016; Burgers & Ahrens, 2020; Chen et al., 2022; Chen et al., 2023). In this study, we examine the incremental changes of metaphorical language within the WAR source domain to capture the similarities and differences of the lexical units clustered in semantic space. We also model the patterns of WAR metaphors diachronically in business media discourses (businesswomen-focused) in the three time periods: 1995-2004 as Period I which overlaps with Koller's (2004) research, 2005-2017 as Period II, and 2018-2024 as Period III, which roughly lines up with the MeToo movement that occurred during 2017. Our findings suggest that the use of WAR metaphorical keywords varies over time while the overarching metaphor of BUSINESS AS WAR persists. Additionally, we find that businesswomen's roles as out-group members remain unchanged over time. Moreover, the application of WAR metaphors evolved from conceptualizing female leadership in a military-like corporate structure to increasingly discussing women's struggles to achieve work-life balance and addressing gender inequality issues, particularly around the time of the MeToo movement. This shift indicates that while the BUSINESS IS WAR framing persisted, the specific ways in which WAR metaphors were leveraged to describe businesswomen's experiences became more varied and nuanced over time.

1. Introduction

Metaphors shape our understanding of societal issues. In the field of business communication, Koller (2004) studied how WAR metaphors shape perceptions of women in business, showing that they are often criticized for stepping outside traditional roles, by frequently associating women with "cutthroat" traits. Winter et al. (2020) further investigated perceptions of women's roles and power dynamics in the workplace. Their analysis revealed gender-specific findings that women tend to view aggression as a loss of self-control, while men see it as a means of gaining power. These studies reveal how the use of metaphor reflects societal issues during specific periods.

As society continually evolves, diachronic studies may be employed to monitor ongoing social changes reflected in the use of metaphors, enhancing our understanding of existing societal issues and topics. In recent years, communication scholars have investigated how metaphors function as frameworks for interpreting issues and how changes in metaphor use reflect shifts in the conceptualization of social topics, both theoretically and empirically (De Landtsheer, 2015; Nerghes et al., 2015; Burger, 2016; Musolff, 2017; Burgers & Ahrens, 2020; Zeng et al. 2021). Moreover, Burgers (2016) has suggested that the shifts in metaphors can be modeled in two ways using both qualitative and quantitative methods: (1) fundamental changes, which indicate transformations of metaphors' source domains; (2) incremental changes, which indicate transformation of meanings in a specific metaphor (changes in source-target mapping).

In this paper, we conduct a diachronic case study of business media discourse, specifically focusing on examining the incremental changes of WAR metaphors in content related to

businesswomen. We aim to identify 1) the distribution of WAR metaphors over time in businesswomen-focused business media discourses; 2) the shifting topics around the use of these WAR metaphors; 3) The nuanced changes in the meaning and implications of the frequently used WAR metaphorical keywords over time.

2. Incremental changes in metaphors over time

Metaphors are cross-domain mappings from a source domain (e.g., WAR) onto a target domain (e.g., BUSINESS) (Lakoff & Johnson, 1980; Lakoff, 1993). Previous studies indicated that metaphors within a particular source domain underwent variations in their mappings to the target domain, resulting in incremental changes over time. Burger (2016) defined incremental changes in metaphors as the alteration of a metaphor's meaning over time, which can occur gradually (evolutionary) or in response to a sudden event (revolutionary). In this process, the metaphor itself remains unchanged but its meaning shifts. In other words, incremental change occurs when the meaning of an existing metaphor is either renegotiated or extended through four forms: (a) the metaphor itself may evolve, for instance, "desktop metaphor used in GUI (graphical user interfaces) of personal computer undergone a change from novel to conventional (Isaacson, 2014); (b) its associated meanings can transform, such as the "toxic metaphors" used to conceptualize the specific event "finance crisis" in newspapers changed from the generic and unspecified expression such as "toxic waste" to specific expressions such as "toxic mortgages" (Nerghes et al., 2015); (c) metaphors themselves can be recontextualized in various ways. For example, "Holland," a metaphor initially used to describe a mother's experience with her son who has Down syndrome, has been adapted to represent topics in blogs where parents share their experiences with special needs children. It has also been used to designate sections in theme parks specifically designed for these children (Semino et al., 2013); or (d) established metaphors can be applied to new social issues, for example, technology companies adopt the older metaphor "ether" which described a medium that connected everything to imply the new technology functioned as a conduit for communication among all connected devices (Schaefer, 2013).

Burgers and Ahrens (2020) explored incremental semantic change by focusing on two essential dimensions of concreteness (Iliev & Axelrod, 2017): specificity and physicality of metaphors in each source domain. Their findings indicated that these metaphors are largely physical, representing abstract concepts such as TRADE through concrete entities, including objects and living beings. For instance, "enlarging our foreign trade" conceptualized trade as an unspecified PHYSICAL OBJECT. Similarly, in the LIVING BEINGS metaphor "to fight unfair trade practices", trade is conceptualized as an unspecific enemy needing to be fought. Their findings showed that the metaphors remained both highly physical and notably unspecific during the examined time period.

Zeng et al. (2021) investigated incremental changes in FREE ECONOMY metaphors. Their study found that FREE ECONOMY metaphors have slightly decreased over time. The meanings of FREE ECONOMY metaphors underwent incremental changes in JOURNEY and BUILDING metaphors). For example, in the BUILDING metaphors, Hong Kong politicians focused on "constructing a free economy" before June 29, 2003, but shifted to "completing" it after the CEPA was issued. Similarly, in the JOURNEY metaphor, officials initially highlighted an "ongoing phase" with terms like "explore" and "step" but later emphasized the final goal of "achieving full economic liberalization". These strategies illustrate how political leaders build positive self-images so as to frame their agendas to facilitate economic liberalization in Hong Kong.

In this paper, we turn our attention to the issue of whether such changes in source domains occur outside of political contexts and, if so, how these changes reflect changes in social moves in the business world. We focus on the use of WAR metaphors in business media content related to businesswomen to examine:

RQ1. To what extent do WAR metaphors undergo incremental changes in business media content related to businesswomen?

RQ2. In what ways have the societal topics (target domain) of WAR metaphors in business

media discourse related to businesswomen evolved over time?

RQ3. How have the meanings of frequently used WAR metaphorical keywords shifted within business media content focused on businesswomen over time?

3. Method

3.1 Keyword list

Ahrens et al.'s (2024) gendered metaphor study identified 50 keywords from five frequently source domains (BUILDING, COMPETITION, JOURNEY, PLANT and WAR) based on previous metaphor research (Lakoff & Johnson, 2003), dictionaries such as the Collins Cobuild metaphor dictionary (Deignan, 1995), and source domains identified in professional contexts (e.g., Charteris-Black 2004, 2006, 2011) as well as using the source domain verification methodology in Ahrens & Jiang (2020). Ahrens et al. (2024)'s experimental study on the 50 identified keywords shows that keywords associated with three source domains (BUILDING, COMPETITION, and WAR) were viewed as more masculine, while keywords associated with the source domains of JOURNEY and PLANT were viewed as more feminine.

In this study, we initially adopt the ten WAR metaphorical keyword list from Ahrens et al (2024). In addition, Ahrens et al.'s (2022) finding and discussion on evaluating the influence of metaphor in news on foreign-policy support indicates that the novel metaphors may involve near-synonyms of a conventional mapping. Thus, we include the near-synonyms (by searching strongest matches related to WAR domain from https://www.thesaurus.com/) to generate the keyword list (shown in Table 1) for our data collection.

Moreover, any possible metaphorical expressions identified during reading the texts such as "lost (ground)", "conquering", "demolished", "and ambush" which are not on the list, are also included for further verification. Verified WAR metaphors are also included in the data analysis.

3.2. The collection of word-sentence pairs

We conducted a structured search using the Business Source Complete database via EbscoHost to gather data for our analysis,

including "Bloomberg Businessweek" and "BusinessWeek" (former name), to ensure article relevance. We specifically chose articles related to women in business and female entrepreneurs by using relevant keywords such as "female entrepreneurs" or "women entrepreneurs" or "female business" or "women business".

WAR keywords Ahrens et al.'s (2024)	Near-synonym (strongest matches) from Thesaurus
war	battle, bloodshed, combat, conflict, fighting, hostility, strife, strike, struggle, warfare
army	artillery, battalion, command, squad, troops
assault	aggression, incursion, invasion, offensive, onslaught, rape, strike, violation, abuse, invade, rape, shoot down, violate
battle	assault, attack, bloodshed, bombing, combat, crusade, fighting, hostility, skirmish, strife, struggle, war, warfare
combat	fight, shootout, skirmish, struggle, war, warfare
enemy	adversary, antagonist, attacker, bandit, competitor, criminal, detractor, foe, guerrilla, invader, murderer, opponent, opposition, prosecutor, rebel, rival, spy, terrorist, traitor, villain
military	army, force, navy, service, troop, naval
skirmish	battle, combat, conflict, feud, fisticuffs, fracas, scuffle, strife, tussle, WAR
weapon	ammunition, bomb, cannon, firearm, gun, knife, machete, machine gun, missile, nerve gas, pistol, revolver, rifle, shotgun, sword, tear gas
warrior	fighter, hero, soldier

Table 1. WAR source domain keywords from Ahrens et al. (2024) and their near-synonyms

We searched for these keywords in articles from 1995 to 2024. The identified keywords and their associated sentences were then exported into data files, which were divided into three distinct time periods: Period I (1995-2004)

similar to the time period prior to 2004 researched by Koller (2004), Period II (2005-2017), and Period III (2018-2024) which is the period aligning with the feminist MeToo movement. The relevant articles were saved in text files for context checking and annotation. The total corpus contains 36 articles: 18 from Period I, 11 from Period II, and 7 from Period III. Overall, the corpus contains 66,497 tokens (14,676 types). Specifically, the sub-corpus for Period I includes 31,290 tokens (6,503 types); the sub-corpus for Period II contains 22,651 tokens (4,897 types); and the sub-corpus for Period III includes 12,556 tokens (3,276 types).

3.3 Procedure

We then followed the MIPVU procedure (Steen et al., 2010) to systematically identify metaphorical language usage and remove the non-metaphorical items. Next, we verified source domain (Ahrens and Jiang, 2020) by cross-checking the identified WAR metaphorical keywords with the SUMO (Suggested Upper Merged Ontology) knowledge base and general dictionaries. This ensured that the chosen items accurately represented the WAR conceptual domain. Then, we followed the mapping principles outlined by Ahrens (2010) to identify the target domains and the associated topics for conceptual metaphor analysis. During the process, two annotators with linguistics expertise collaborated to review the initial data sets and verify the WAR source domain. In terms of the WAR source domain verification and the identification of societal topics reflected by target domains, the inter-coder reliability of two coders with linguistic experts was 88.89%. Any ambiguous cases were resolved through discussion to reach a final agreement, and non-relevant instances were removed from the dataset.

The finalized list of WAR source domain keywords and associated sentence-level examples contains 46 occurrences of keyword and sentence pairs in Period I, 23 occurrences of keyword and sentence pairs in Period II, and 12 occurrences of keyword and sentence pairs in Period III.

4. Results and discussion

4.1. The decreasing trend: WAR metaphors in businesswomen's media coverage

Our first RQ considered the extent to which WAR metaphors undergo incremental changes in business media content related to businesswomen. In our analysis of the normalized frequencies of the WAR metaphorical keywords across the three time periods (shown in Figure 1), we observed changes in the presence and prominence of various word vectors. In Period I, the words "battle" and "struggle" dominated with a normalized frequency of 130 per 1000 words, while other words related to military conflicts, such as "force," "rival," and "army," appear less frequently, ranging from 43 to 65 per 1000 words. The total 24 distinct WAR keywords presented in Period I reflect a focus on specific aspects of battle in the use of WAR metaphors in
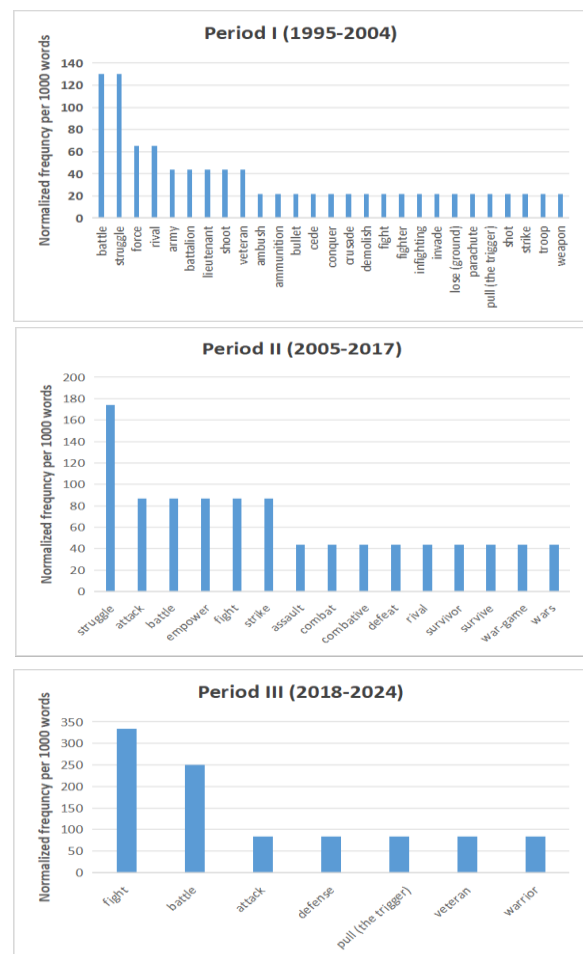

Figure 1. Normalized frequencies of the WAR metaphorical keywords across the three time periods

business media discourses related to businesswomen.

Moving to Period II, "struggle" increased to a normalized frequency of 174 per 1000 words, indicating its central role in the use of WAR metaphors during this period, while "battle" and "attack" both had a normalized frequency of 87. This period saw the introduction of some new words like "empower", "assault" and "combat" for the use of WAR metaphors. However, some words from the previous Period I, such as "ammunition", "bullet", "weapon" and "parachute" which are specific weaponry terminologies and directly related to military and traditional combat scenarios, were noticeably absent from the use of WAR metaphors in the discourses for this period.

In Period III, "fight" emerged as the most frequent term with a normalized frequency of 333 per 1000 words, with "battle" also maintaining a strong presence at a normalized frequency of 250. Metaphorical expressions from Phase 1, such as "pull (the trigger)" and "veteran" reappeared in Period III after being absent in Period II. New WAR metaphorical keywords such as "defense" and "warrior" appeared, while others from earlier phases, such as "force" and "troop," do not appear at all.

Overall, "struggle," "battle," and "fight" were consistently present, highlighting their central role in the use of WAR metaphors within the business media discourses. The absence and re-occurrence of certain words indicated a shifting focus over time. To further explore the diachronic changes, we refer to the cluster visualization of WAR metaphors from 1995-2024 (see Figure 2) for our investigation. Keywords and their associated sentence pairs were input into the BERT (Bidirectional Encoder Representations from Transformers), an open-source machine-learning framework for word embedding (Devlin et al., 2018). This process generated vectors for the keywords, reflecting the complex semantic and syntactic relationships between the words and their contexts.

The advantage of BERT is that its pre-trained model can process language bidirectionally; in other words, it handles the surrounding context of each word at the token level. This results in more accurate and context-aware embeddings, capturing nuanced meanings effectively.
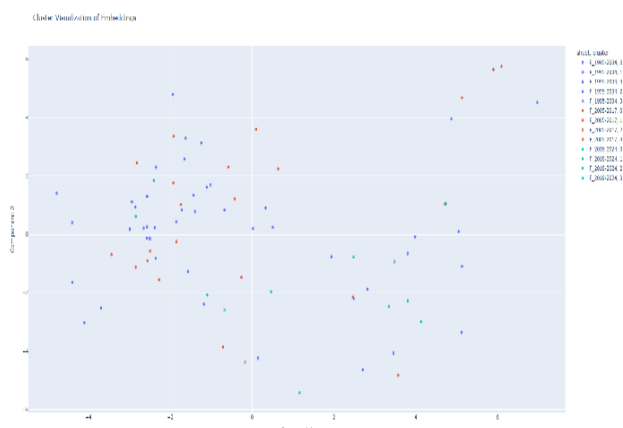

Figure 2. Cluster visualization of WAR metaphors from 1995-2024

Clustering was performed using the K-Means algorithm to group keywords based on their semantic similarities. Firstly, keywords for different periods were lemmatized to standardize different forms of the same word, and their embeddings were aggregated. The optimal number of clusters was determined using silhouette analysis, ensuring that the selected number of clusters best represented the data. The K-Means algorithm was then applied to the embeddings to assign each keyword to a cluster. Finally, the data was visualized in a 2D scatter plot using PCA for dimensionality reduction, with point colors indicating cluster membership.

The overall distribution of the word vectors reflects their relationship in semantic space in the three different time periods. In Period I, words like "ammunition" and "weapon" clustered in an area focused on military action. As time passes, the disappearance of these words shifted the distribution of semantic space towards broader themes, such as "struggle" and "survival."

From the dispersion of vectors, we found that many words clustered together in Period I, more closely in the same direction to form a dense group indicating a more cohesive usage of WAR metaphors to portray a strong military-focus picture in the business media content. The vectors in subsequent periods tended to scatter over a wider space. The absence of certain concrete WAR keywords created a sparser vector space in Period II. However, we observed a re-cluster of vectors "fight" in Period III to form a new semantic center that highlights the new

societal topics in business media during this period.

We also observed an expansion of dimensions in the vector space from the change of WAR metaphorical words over time, with a change from the specific military terms in earlier times to experiential-oriented words such as "struggle", "survive" and "fight". This gradually spreading tendency indicates a broader social change reflecting the evolution of language use over the three time periods, indicating social transformations taking place in the use of WAR metaphors in business media discourses. One potential explanation for this shift could be a growing awareness of businesswomen's experiences under the BUSINESS AS WAR framing as an increasing number of women have pursued careers in business. The more dispersed use of WAR metaphors in later periods may suggest an attempt to highlight women's experiences, the challenges women are facing at work, and the importance of gender equality as an inclusive way for women to achieve professional success.

The following sections will delve deeper into these trends and analyze the implications of the changing use of WAR metaphors in businesswomen-focused media discourses.

4.2. Topics around the use of WAR metaphors

In response to RQ2, we analyzed the conceptual metaphors and topics structured in the three time periods. On the one hand, we found that the overarching concept of BUSINESS AS WAR remained stable under changing societal circumstances. For instance, company teams were perceived as "army", "troop" and corporate conflicts were perceived as "war" and "battle". In addition, businesswomen's roles as out-group members remained unchanged over time. On the other hand, we also observed an evolving role of language with different foci. Businesswomen are not only warriors for their work itself, but they are also battling beyond business for work-life balance and gender equality. As time changed, business media focused more attention on businesswomen's challenges in balancing their careers and personal lives, a topic that had received less discussion in the articles in the corpora in earlier periods. This shift in business media discourse signaled a broader social transformation,

indicating that businesswomen have started to gain greater visibility in public.

4.2.1. Women's unchanged out-group role

Although businesswomen have gained increased public attention in the industry over the past decades, they are still viewed as out-group members by male colleagues, their companies, and the public. This perception of businesswomen as outsiders has remained unchanged over time, as we found expressions such as "aren't always comfortable ceding control to investors" and "not trusted enough to pull the trigger" as negative comments regarding businesswomen's decision-making power.

Business social media also indicated that women, as out-group members (Eubanks, 2000; Koller, 2004), were conceptualized as INVADERS/ENEMY by the "historically dominated men". This has resulted in businesswomen's extra effort to engage in a hegemonic co-option strategy so as to join male-dominated social activities in order to become in-group members in the hegemonic masculine-dominated business world.

Consequently, the persistent view of businesswomen as out-group members has resulted in more challenges for women to achieve professional success at work. Despite the growing presence of women in business, they continue to face obstacles due to this entrenched perception of them as not belonging to the industry.

4.2.2. Transferring topics: Women's battles beyond business (to balance and equality)

In businesswomen-focused media content, the use of WAR metaphors has changed over time while keeping the idea of business as a battlefield. Initially, female leadership was portrayed in a hierarchical, military-like corporate structure using specific military or weaponry terminology. Later, there was a shift towards discussing women's challenges in balancing work and personal life. In the most recent period, there has been increased focus on gender inequality, especially during the MeToo movement.

4.2.2.1 Female's leadership role in military-like corporate structure

WAR metaphors in Period I mainly clustered in the same areas, suggesting similar semantic features when depicting the overall picture of the business world under the overarching conceptual metaphor BUSINESS IS WAR, including CORPORATE AS BATTLEFIELD, TEAM AS ARMY, and the hierarchical roles in corporate which involve female leadership such as FEMALE LEADERS ARE GENERALS and FEMALE LEADERS' SUBORDINATES AS LIEUTENANTS (see Example 1).

Example 1: Stewart rarely appears on magazine covers anymore and is trying to groom some of her lieutenants as media personalities.

Compared with Period I, WAR metaphors in Period II partially overlapped with the area where most of the clustered data in Period I was located, which indicates that a portion of the WAR metaphors still reinforces the conceptual knowledge conceptualized in Period I, when business social media continued to conceptualize businesswomen's leadership under the overarching concept BUSINESS IS WAR. The following Example 2, for instance, aligned with the businesswomen's aggressive leadership, which was conceptualized in Period I.

Example 2: Combative working conditions aren't new for Barra.

In addition, media described businesswomen as FIGHTERS with a more detailed description of the strategy female leaders adopt. Example 3 conceptualizes female business leaders' competitive advantage of expanding network as WEAPON when running a business.

Example 3: A woman entrepreneur's most effective weapon is a constantly expanding network.

4.2.2.2 Women's battle for work-life balance

Moving to Period II, we also observed an evolving role of the WAR metaphors. Businesswomen were not only portrayed as warriors fighting for success in their work, but the metaphorical framing expanded to encompass their battles for work-life balance (see Example 4). In other words, businesswomen were no longer only depicted as combatants in the corporate but also as fighters for integrating work and life together in the workplace.

Example 4: It's when she turns to the fraught question of how women struggle to balance their career and kids that Sandberg reminds you she breathes the rarefied atmosphere of Planet Zuckerberg.

This shift in the use of metaphorical language indicates a growing awareness of and sensitivity to the unique experiences and priorities of businesswomen in the media. The BUSINESS AS WAR framing evolved to better reflect the broader societal and cultural struggles that women navigated as they pursued professional success.

4.2.2.3 Businesswomen's battles for gender equality

Although gender equality was mentioned in Period I, the media placed greater emphasis on gender equality in the later period. A growing number of magazine articles from Period II described businesswomen as "corporate survivors" and discussed their disputes against companies. These articles revealed the reality that "many Wall Street firms assigned women to less prestigious trading desks and divisions with the smallest bonus pool". In Period III, we see the media continue to address the issue of gender inequality, with an increasing amount of media coverage on this topic.

In fact, women's role as out-group members also appears more often to be recipients or targets of the anti-DEI (diversity, equity, inclusion) opposition rather than active participants. As Example 5 suggests, women are facing difficulties due to forces outside their control. Moreover, women are not afforded that level of trust and empowerment, as shown in Example 6.

Example 5. While Vander Marel is hopeful corporate cannabis can turn the tide on its gender problem, she acknowledges it will be difficult. "It's an uphill battle," she says. "It takes years to change boards."

Example 6. Women analysts are trusted to make suggestions but not trusted enough to pull the trigger for the portfolio," she says.

In addition, business media has devoted increased attention to women's legal disputes with companies during this period, framing

these conflicts as a FIGHT or BATTLE. This included extensive coverage of a well-known 13-year lawsuit case between a businesswoman and a Wall Street company, Goldman Sachs. which was portrayed as a "MeToo triumph". The media's tendency to depict these legal challenges faced by businesswomen through the lens of conflict and battle suggested a social shift in how their experiences were being framed and discussed.

4.3. Incremental semantic change of frequently used WAR metaphorical keywords

To answer RQ3, we calculated the frequency of the keywords under the WAR source domain used in the three time periods (see Figure 3). The keywords "battle", "struggle", and "fight" are the most frequently used WAR metaphorical keywords for the three time periods. To examine the 'frequently occurring keywords', we adopted a cutoff cumulative percentage up to 60% as the criteria to cover the top keywords that occupy more than half of our total observations.
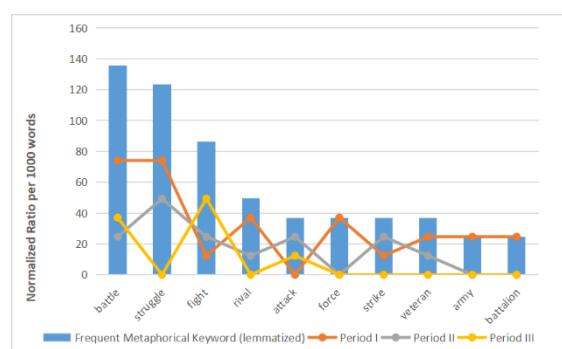

Figure 3.   Distribution of the frequent WAR metaphorical keywords (cumulative percentage up to 60%) in businesswomen-focused discourses in corpora

4.3.1 Semantic changes of "battle"

Over the past decades, "battle" has been used to capture the various challenges women face in the workplace, emphasizing women's resistance and the determination to achieve equality positively. In Period I, the word "battle" primarily symbolized corporate conflicts, particularly highlighting the struggles women encountered in reaching executive positions at work. It also framed the pursuit of gender equality as a proactive endeavor by women to overcome stereotypes. Moving towards Period II, the focus of WAR metaphors

evolved to emphasize more specific challenges, portraying businesswomen's struggles as combat-like efforts to progress and succeed. During Period III, "battle" took on a more situational context, addressing gender issues in corporate environments and highlighting women's future endeavors to overcome conflicts, as well as legal disputes with their (former) employers. Therefore, the semantic changes of "battle" framed women's ongoing challenges in a multifaceted way over time.

4.3.2 Semantic changes of "struggle"

Throughout Periods I and II, the metaphoric meaning of "struggle" consistently reflected the conflicts and challenges faced by women in the workplace, highlighting topics such as work-life balance and the specific difficulties encountered by skilled businesswomen and entrepreneurs. As shown in Table 1, "struggle" emerged as the most frequently used WAR metaphor keyword in Phase II, playing a central role in framing discussions during this period. However, in Phase III, the absence of "struggle" indicated a shift in focus toward broader societal issues, suggesting a movement toward advocating for advancements in gender equality.

4.3.3 Semantic changes of "fight"

In Period I, the metaphorical meaning of "fight" represented a determined and sustained effort by women to achieve their goals, emphasizing personal empowerment. During Period II, the metaphorical keyword "fight" denotes more aggressive and determined confrontations against entrenched gender biases and highlights the need for businesswomen to secure financial resources at the workplace. In Phase III, "fight" expanded its reference to describe the collective efforts of women-led companies to advance equality, ongoing legal battles, and the active defense of women's rights, reflecting increasing attention to the societal issue of gender inequality. This progression illustrated a social change from individual determination to collective endeavors for women's rights and resources.

6. Conclusion

In conclusion, our current analyses of WAR metaphors revealed the evolving use of WAR metaphors over time. The consistently

prominent keywords "struggle," "battle," and "fight" demonstrated how societal issues are related to the challenges women face across different periods. As the language shifted from specific military terminologies to more experiential terms like "struggle" and "survive," these changes reflected broader social transformations. While the persistent out-group role of businesswomen remains evident, the topics addressed have transitioned from hierarchical, military-like views of female leadership to a greater emphasis on work-life balance and gender inequality, particularly in light of movements like MeToo. This semantic evolution has shaped public understanding of women's experiences in the workplace and highlighted the increasing recognition of their struggles beyond traditional business confines. In terms of limitations, this is a small-scale case study that needs future research to explore a broader and more diverse range of texts from business media to gain deeper insights into the evolving role of metaphors related to women in business.

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