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A COMPARATIVE ANALYSIS OF THE IMPLICIT MOTIVATIONS OF VIOLENT EXTREMIST GROUPS

by

REBECCA A. WILSON

Under the Direction of Sarah L. Cook, PhD and Anthony Lemieux, PhD

ABSTRACT

Terrorism represents a national security threat to most countries. Recent research has demonstrated the ability to determine when groups are most prone to engage in violence through textual analysis. Using the Information, Motivation, Behavioral Skills (IMB) Framework and McClelland's Three Needs Theory of human behavior, we compared implicit motivation as expressed through textual online propaganda of three jihadist groups. This model posits that all people are driven by three primary implicit motivations: affiliation, achievement, and power. This study analyzed 58 magazine issues (*Inspire*, *Dabiq/Rumiyah*, *Gaidi Mtaani*) from three extremist Arabic-speaking groups (Al Qaeda in the Arab Peninsula, Islamic State, and Al Shabaab) with a history of violent attacks to measure and compare implicit motivations between groups. Findings show that overall, each group had a distinctive motivational linguistic signature and there is a predictable pattern of implicit power motivation and time-to-attack across all three groups.

INDEX WORDS: Motivation, Implicit Motives, Terrorism, Group Processes, Prediction

A COMPARATIVE ANALYSIS OF THE IMPLICIT MOTIVATIONS OF VIOLENT
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by

REBECCA A. WILSON

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

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2018

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May 2018

DEDICATION

To my mom, sisters, and husband who have always supported me in any endeavor I have chosen. Thank you for all your encouragement and love. I wouldn't be who I am today if it weren't for all of you.

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1 INTRODUCTION

Terrorism is a defining phenomenon of the 21st century. It has shaped government foreign policy, international economic policy, and national security structures and spending. It has cost nations enormous amounts of time and money to protect citizens, public figures, and vital installations such as airports, schools, churches, or public arenas (Combs, 2011). Terrorist acts detailed in newspapers, radios, and television affect daily lives, impacting travel and commerce and overdosing the general public on fear—an intended and favorable outcome for terrorists. This study explores the role of implicit motivation in terrorism, and how implicit motivation may predict future terrorist attacks.

No universal and comprehensive agreement on the definition of terrorism exists. Various legal systems and government agencies use different definitions, and are reluctant to formulate an agreed upon, legally binding definition because the term is politically and emotionally charged. In this study we use what Matusitz (2012) has termed a “most universally accepted” definition: the use of violence aimed at noncombatant targets (i.e., civilians or iconic symbols) to create fear (i.e. terror, psychic fear) for political, religious, or ideological reasons (Matusitz, 2012). The ultimate objective of terrorism is to achieve the greatest attainable publicity for a group, cause, or individual.

International security is grappling with the challenge of returning jihadist fighters and the resurgence of other terrorist groups around the world. Academics have struggled to understand the motivation to join an insurgent group as well as what motivates group members to commit extreme violence. Central to radicalization is the question of what is motivating individuals to join. Broadly, radicalization refers to the process of developing extremist ideologies and beliefs. Literature on radicalization has primarily focused on the question of why someone comes to

adopt beliefs and behaviors that support his or her engagement in subversive and terrorist activity (Borum, 2011).

Recent in-person interviews with jihadists highlight the importance of “pull factors” or the promise of something more in life than material comfort and ordinary domesticity (Dawson & Amarasingam, 2017). Interview responses suggest that alternative interpretations should attempt to understand the ways jihadist fighters use religious ideas to comprehensively frame their experiences – that, in effect, their religiosity is pivotal to understanding their motivations (Dawson & Amarasingam, 2017). It appears that within this religious ideology comes a sense of belonging, sense of purpose, significance, and social identity, all of which factor into a person’s motivation to join a violent group (Atran, Axelrod, Davis & Fischhoff, 2017). These concepts are deeply embedded in the psychology of human existence, particularly explicit motivation. A return to fundamental concepts of psychological motivation that additionally include implicit motivation may further our understanding of what drives individuals to join a violent group, commit violent acts, and potentially predict extremist violence.

To date, researchers have applied the Information, Motivation, and Behavioral skills model of behavior change (IMB) with success in the health domain to motivate an individual to adhere to and maintain health protocols. The IMB model posits that social–cognitive antecedents such as knowledge, attitudes, and social norms predict willingness to learn behavioral skills, and the sum of these constructs, motivate behavior. For example, prior analysis of Al Qaeda’s magazine *Inspire*, demonstrated significant similarities between the theoretical framework and propaganda content (Lemieux, Brachman, Levitt, & Wood, 2014). This approach has been productive to deconstruct why humans are motivated to start and maintain goals outside of the health sector. While much research on terrorism focuses on how much information is produced

and disseminated by extremist groups, less research has explored the relationship from information consumption to motivation in terrorist behavior. To expand on this theoretical approach, this study deconstructs the motivation construct of the IMB model present in jihadist propaganda. This analysis focuses specifically on the unconscious (implicit) motivational elements, which can be reliably measured through text. Implicit motivation is a part of the Three Needs Theory that holds all human beings, regardless of culture, age, or gender are driven by three primary motivations: Affiliation, Achievement, and Power (McClelland, 1988).

1.1 The Information, Motivation, Behavioral Skills Model of Behavior Change

The information, motivation, and behavioral skills model (IMB; Fisher & Fisher, 1992) is a behavioral change theory that relies on all three components (Information, Motivation, and Behavioral skills) to motivate behavior (Aronowitz, Lambert, & Davidoff, 2012). Existing research on jihadist propaganda has already highlighted the efficacy of social media information and dissemination with less attention paid to the motivation construct within this framework. In the context of the IMB model, information is defined as, “an initial prerequisite for enacting a health behavior” (Misovich, Martinez, Fisher, Bryan, & Catapano, 2003). Information includes behavior-related material as well as myths/heuristics that permit automatic or cognitively effortless behavior-related decision-making (Fisher, Fisher, & Harman, 2003). Motivation is defined through attitudes, perceptions of social norms, and perceptions of vulnerability and susceptibility to consequences of problems (Fisher, Fisher, & Shuper, 2014). The third determinant in the IMB model is behavioral skill defined as, “skills necessary for performing a particular health behavior” (Fisher, Fisher, & Shuper, 2014). To facilitate behavioral change, the IMB model emphasizes the enhancement of an individual’s skills and increased perceived self-efficacy (Fisher et al., 2014).

The three constructs of the IMB model (Fisher & Fisher, 1992) overlap with McClelland's (1988) Three Needs theory providing a unique opportunity to take an in-depth examination of human motivation within the context of violent extremist behavior.

1.2 Three Needs Theory

Similar to the IMB model of behavior change, McClelland's (1980) research on human motivation suggests that people learn knowledge, skills, strategies, beliefs, rules, and attitudes within their social environment. McClelland (1980) argued that, at any given time, individuals possess several, often competing needs that motivate behavior when activated. McClelland's research and development of the Three Needs Theory identified two aspects of motivation: implicit and explicit motives. Implicit motives are unconscious and assessed indirectly. Explicit motives are conscious and assessed through self-report (Shah & Gardner, 2008; McClelland, Koestner, & Weinberger, 1989). McClelland et al. (1989) proposed that implicit motives respond to task-intrinsic incentives and influence operant behaviors (e.g., behavior controlled by consequences). Conversely, self-attributed (or explicit) motives respond to social incentives and influence respondent behaviors (behavior that occurs in response to some stimuli) (McClelland et al., 1989). McClelland (1989) showed that much of human processing and motivation occurs at the unconscious level and highlighted the importance of understanding motivation from both a conscious and unconscious perspective.

Implicit motivation is rooted in sophisticated evolutionary cognitive, affective, and behavioral systems. These motives are guided by what is aversive and what is pleasant (Schultheiss & Brunstein, 2001; Schultheiss, 2008). Implicit motives are involved in unconscious cognitive and affective processes such as attentional orienting (the cognitive process of selectively concentrating on a discrete aspect of information), implicit learning (the learning of

complex information in an incidental manner, without awareness of what has been learned), and hedonic evaluation (evaluation of ones' state of pleasure and well-being) (Schultheiss & Brunstein, 2001; Schultheiss, 2008).

1.2.1 Affiliation Motive

The affiliation motive is broadly concerned with the need for establishing and maintaining friendly relations with others. Individuals high in affiliation tend to enjoy interacting with others and actively look for opportunities to do so as it satisfies the underlying implicit motive (McAdams & Constantian, 1983). Individuals with a strong affiliation motive enjoy working in groups with partners similar to themselves, but do not like working with others they perceive to be too dissimilar (Byrne, 1961). When working in groups, these individuals will try to put a lot of effort into the task to increase harmony and cohesion within the group, which often results in high engagement if the work requires cooperation (Atkinson & O'Connor, 1966).

These findings might seem to indicate that a high level of affiliation motivation would be associated with a preference for nonviolence, and thus would be uncharacteristic of groups that engage in terrorist violence. However, it's important to note that no empirical studies have distinguished between affiliation aimed towards the in-group versus the out-group (Smith, 2008). Winter's (2005) work on war and peace illustrates the complexity of affiliative motivation. On the surface, war seems to be associated with power motivation, whereas peace is related to affiliative motivations (Rokeach, 1973). However, continued exploration of the affiliation motive suggests that this motive is a double-edged sword. The positive aspect as denoted above is characterized by a desire for closeness and pleasure in being with others (Weinberger, Cotler, & Fishman, 2010). The negative aspect is marked by fear of loss and anxiety about relationships (Weinberger et al., 2010). Further, persons characterized by fear of loss or anxiety become

desperate when faced with social rejection and resort to any means available, including maladaptive ones such as aggression, to address the issue (Weinberger et al., 2010). Therefore, affiliation may act to augment and enhance hostility toward outsiders if the group's affiliation motive is directed inward.

1.2.2 Power Motive

The power motive is concerned with the need for having an impact, control, or influence over others. The need for power is characterized by a desire for power to control other people and describes people high in this trait as seeking no approval from others, rather agreement and compliance (McClelland, 1985). Compared to people who value affiliation or achievement, individuals with high power scores tend to be more argumentative, more assertive in group discussions, and more likely to experience frustration when they feel powerless or not in control of a situation (Conger & Rabindra, 1988). Adapting his power motive scoring system for use with any kind of running text, Winter (1991) found that US presidents whose inaugural speeches were more saturated with power motivation imagery were more likely to wage war, to be assassinated, and to be rated as great by historians than US presidents with fewer power images in their inaugural speeches. Increases and decreases of power motivation assessed in political documents have also been shown to be associated with peaceful and violent outcomes of international crises (Winter, 1987; Winter, 1993).

1.2.3 Achievement Motive

The need for achievement involves the desire to independently master objects, ideas, and other people, and to increase one's self-esteem through the exercise of one's particular talents (Wallace, Goldstein & Nathan, 1987). The achievement motive appears to reflect (not in totality) Atran et al.'s, (2017) notion of purpose. Individuals high in achievement motives; 1) like situations in which they take personal responsibility for finding solutions to problems, 2) tend to

set moderate achievement goals and take calculated risks, and 3) want concrete feedback about how well they are doing (Atkinson, 1966).

Like the affiliation motive, achievement also consists of positive and negative aspects. McClelland (1961) suggested that an increase in the level of achievement might lead to social disruption within a society. Examination of cross-national achievement levels between 1948 and 1954 determined that instability predominantly characterized countries increasing in implicit achievement motivation, whereas those decreasing in achievement were primarily stable (Feierabend, Feierabend, & Sleet, 1973). The authors suggest that achievement may represent a general "energizer" for societal change and growth and thus may produce desired (economic growth) and undesired (social unrest) effects (Feierabend, Feierabend, Sleet, 1973).

There are several parallels between the IMB model and Three Needs theory. Generally, the IMB framework and implicit motivation involve complex systems of decision making and activating behavior that are rooted in social, emotional, and reward/punishment-oriented systems. The focus of this research is to understand motivation to violence within the framework of these human motivational theories. Analysis of jihadist propaganda provides us with a unique opportunity to reliably measure implicit motivation across extremist groups. In doing so we will be able to quantify each jihadist groups' motivational "identity", compare the behavior of the groups, and analyze motivational drives of each group with recent attacks.

1.3 Current Study

This research has two primary aims; 1) to measure and compare the implicit motivations of three jihadi groups, and 2) examine whether a link exists between implicit motivation and attacks conducted by each group. We make several hypotheses about the presence of implicit motivation in jihadist literature. First, we hypothesize that authors of jihadist propaganda across

all three groups will express significantly different levels of implicit motivation. Second, we hypothesize that power will be the dominant linguistic characteristic. Third, we hypothesize that each group will have a different affiliation motivation signature. Finally, we hypothesize that differences in levels of implicit motivation can be used to predict attacks.

2 METHOD

2.1 Sample

The sample contains text from three Arabic-speaking extremist group magazines; *Inspire*, *Dabiq/Rumiyah*, *Gaadi Mtaani*. Each of these magazines represents the official media published in English by each respective group.

Inspire magazine is an English online magazine published by Al Qaeda in the Arabian Peninsula (AQAP). It is among the first online propaganda magazines created by a jihadist group and has served to motivate international and domestic extremist violence with radical interpretations of Islam.

Dabiq and *Rumiyah* magazines are English online magazines published by the Islamic State of Iraq and al-Sham (ISIS). It is regarded as one of the most effective propaganda campaigns launched by a terrorist group.

Gaidi Mtaani is an online magazine written in both English and Swahili published by Al Shabaab (AS). While not as comprehensive as the AQAP and ISIS collections, Al Shabaab has published 9 full length magazines detailing their ideology and objectives. We additionally included 4 newsletters published online by AS discussing their movements between the years 2009-2011 in order to increase our sample size.

Our sample includes $n = 17$ issues (*Inspire*), $n = 28$ issues (*Dabiq & Rumiyah*), and $n = 9$ issues (*Gaidi Mtaani*), $n = 4$ (Al Shabaab newsletters) for a total of $N = 58$ magazines/news

reports. We collected these communiqués from September, 2016 to August, 2017, available on a public, but secure website – jihadology.com.

2.2 Analyses

The introduction of a text analysis program that specifically measures McClelland's (1980) implicit motivations provides a unique opportunity to reliably measure and compare the motivation profiles of three separate jihadist groups. In addition to this, research has begun to harness textual analysis abilities to predict behavior (Pennebaker, 2011). For example, prior research has demonstrated a strong correlation between levels of implicit motivation and predicting aggression (Winter, 1996; Pennebaker, 2011). We used Linguistic Inquiry Word Count2015 (LIWC2015) to investigate implicit motivational constructs present in each magazine. LIWC is a software program developed in the early 1990s by Pennebaker and colleagues, with further revisions undertaken to streamline the dictionaries included (Tausczik & Pennebaker, 2010). The program automatically opens and analyzes text files calculating the percentages of each LIWC category present in the dictionary in the chosen unit of analysis, in this case, the issue (Vergani, 2015). LIWC is particularly appropriate to investigate motivation because it captures the structure of the language that reveals implicit motives present in text (Vergani, 2015; Tausczik & Pennebaker, 2010). Additionally, the LIWC program provides a unique opportunity to transfer data into a statistical program like SPSS in order to test the relationship between groups. We chose to conduct a quantitative analysis by running LIWC data through SPSS followed by multivariate analyses to test the relationships within and between groups.

2.3 Constructs and Variables

Except for Word Count (WC) and Words per Sentence (WPS), all LIWC variables are expressed as percent of total words. Measurement of implicit motivation was originally derived from the Thematic Apperception Test (TAT) and the Picture Story Exercise (PSE) both of which are valid and reliable in distinguishing individual's implicit motivations. The LIWC text analysis program has demonstrated reliable and valid estimates of implicit motivation across more than 80,000 documents (Tausczik & Pennebaker, 2010). For the purpose of a baseline comparison, Table 1 reflects grand means and standard deviations for implicit motives reflected in over 80,000 writers/speakers narratives from Blogs, Expressive writing, Novels, Natural Speech, NY Times, and Twitter totaling over 231 million words (Pennebaker, Boyd, Jordan, & Blackburn, 2015). Strong evidence for the validity of the power motive measure comes from research on political behavior and between-group processes (Winter, 1980, 1991, 1996, 2007). For our analysis we measure three implicit motivation constructs: Affiliation, Achievement, and Power within each respective issue of each group. Variables represent the total word percentage of each construct per issue.

2.4 Data Collection, Management, and Analysis

We converted each magazine pdf to a word document, which was then cleaned per LIWC instructions prior to running the data through the LIWC program. Cleaning entailed deleting numbers or graphics within the text. Next, we imported each set of group magazines into LIWC creating a master excel spreadsheet complete with measurements of all LIWC variables.

Each spreadsheet was saved as a CSV file and imported into SPSS for further statistical testing. In SPSS, we conducted multivariate analysis to measure the three implicit motivation variables across the magazine text as well as analyze the differences between magazine text. We

report the overall statistic as well as Bonferroni multiple comparisons as it is the most conservative test.

We then selected three major attacks conducted by each group that was situated at a middle time point within their publications. For AQAP, we selected 1) November 2, 2010 series of bombings in Baghdad; 2) April 28, 2011 bombing that killed 15 people in Marrakesh, Morocco; and 3) October 10, 2014 suicide bombing in Sana'a. For ISIS, we selected 1) January 2015 Corinthia Hotel attack in Libya; 2) February 2015 beheading of 21 Egyptian Christians and burning of Jordanian pilot; and 3) October 2016 Quetta Hospital attack in Pakistan. For AS we chose 1) January 29, 2013 suicide bombings near Somalian presidential compound; 2) April 14, 2013 attacks in Mogadishu; and 3) March 12, 2015 attacks on government offices in Baidoa, Somalia. Consistent with previous research, we established a baseline of implicit motivation measurements that was 6 or more months prior to the attack, a 2-6 month pre-attack measurement, and a 1 month pre- attack timepoint (Pennebaker, 2011). Using statistical analyses, we conducted repeated measures factorial ANOVA's in order to analyze implicit motive dimensions of each group in relationship to time-to-attack.

3 RESULTS

3.1 Assumptions

Mauchly's test indicated that the assumption of sphericity had been violated for the main effect of implicit motivation, $\chi^2 = 11.83$, $p < 0.01$, and terrorist groups, $\chi^2 = 8.40$, $p < 0.05$, but not for Time variables, $\chi^2 = 2.75$, $p = 0.25$. Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = 0.84$ for implicit motivation and $\epsilon = 0.83$ for terrorist groups) (Field, 2012). Means and standard deviations along with significance levels of

multivariate results of implicit motivational differences across all three group magazines are presented in Table 2.

3.2 Results

3.2.1 *Hypothesis 1 Authors of jihadist propaganda across all three groups will express significantly different levels of total implicit motivations (Affiliation + Power + Achievement) within their writings.*

A multivariate test revealed a significant main effect for the frequency of implicit motivations expressed in text (Affiliation + Power + Achievement) across all three magazine samples, $F(1.67, 91.92) = 220.28, p < 0.001, r = 0.71$. Table 2 shows means and standard deviations of each groups' implicit motivations across magazines. Al Shabaab's magazine *Gaidi Mtaani* expressed the highest overall percentage of implicit motivation at 8.03%. In other words, 8% of every issue of *Gaidi Mtaani* contains implicit motivation language related to either affiliation, power, or achievement. Al Qaeda averages 7.27% implicit motivational language per issue and the Islamic State averages 6.37% per issue. Calculation of the percent difference between implicit motivation measured in jihadist content (Table 2) and implicit motivation in non-jihadist propaganda (Table 1) additionally support our findings. Power motivation linguistic markers are employed 40% more frequently in Al Shabaab and Al Qaeda propaganda and 57% more frequently in Islamic State propaganda than average online content. Similarly, all three jihadist groups use achievement motivated language more frequently (AS = 21%, AQ = 7%, IS = 0.7%) than in average online content. Affiliation motivation rhetoric was used (AS = 8%, AQ = 14%) more frequently in Al Qaeda and Al Shabaab propaganda than in online content. However, Islamic State propaganda contains significantly less (IS = -22%) affiliation motivation language than average online content.

3.2.2 Hypothesis 2 Power motivation will be the dominant linguistic characteristic of the three extremist groups.

Contrasts revealed that the frequency of power, $F(1,55) = 148.10, p < 0.001, r = 0.73$ and affiliation, $F(1,55) = 41.22, p < 0.001, r = 0.43$ were significantly higher than achievement motivation. The highest level of implicit power motivation was in Al Shabaab's magazine at approximately 4.22% per issue. Al Qaeda expresses the second highest level of implicit power motivation in their magazine *Inspire* at 3.50% per issue, and the Islamic State expresses 3.43% per issue. Figure 1 presents a graph of the estimated marginal means of each groups' specific motivational signature.

3.2.3 Hypothesis 3 Levels of Affiliation in text will be significantly different between groups.

Analysis of the affiliation motive revealed significant differences in the frequency of affiliative text between each groups' magazine corpora, $F(2,57) = 11.23, p < 0.001, r = 0.16$, although the effect size is small. Bonferroni multiple comparisons revealed that Al Qaeda was significantly different than the Islamic State ($p < 0.001$), but not Al Shabaab, ($p = 1.00$) in the linguistic expression of affiliation motivation. The Islamic State and Al Shabaab were significantly different in their use of affiliation rhetoric ($p < 0.01$). Further analysis determined Al Qaeda expressed the highest percentage of affiliation motivation per text (2.36%), then Al Shabaab (2.21%), then the Islamic State (1.62%).

3.2.4 Hypothesis 4 Differences in levels of implicit motivation can be used to develop predictive attack patterns.

Multivariate tests revealed a significant main effect of time on implicit power motivation, $F(2,12) = 5.30, p < 0.05, \eta^2 = 0.61$ but not on affiliation, $p = 0.49$, or achievement, $p = 0.53$ across

all three groups' propaganda. Contrasts revealed that the frequency of implicit power motive rhetoric at the 2-6 month time point, $F(1,6) = 23.03, p < 0.01, \eta^2 = 0.79$ and the 1 month before an attack, $F(1,6) = 6.20, p = 0.05, \eta^2 = 0.51$ were significantly higher than the baseline timepoint. Table 3 shows significant contrasts between implicit power motives across three time points for Al Qaeda, Islamic State, and Al Shabaab.

Examination of Figure 2 illustrates these significant patterns between the expression of power motivation and time-to-attack. Data for affiliation and time-to-attack was non-significant as evidenced by no reliable patterns within or between groups. The first consistent pattern is within each groups' specific signature power motivations across three of their individual group attacks. In the month preceding an attack for both Al Qaeda and the Islamic State, text about power significantly increased from baseline to the 2-6mo before attack timepoint and decreased from the 2-6mo to 1mo pre-attack timepoint in *Inspire* and *Dabiq/Rumiyah* magazines. The pattern for Al Shabaab was different. Text signaling power motivation in *Gaidi Mtaani* magazine significantly increased from baseline to 2-6mo period prior to an attack and from the 2-6mo to 1mo pre-attack points. The most intriguing finding is that across all three attacks for all three groups, implicit power motivation significantly increased at the 2-6mo timepoint. Similar to previous research on linguistic analysis and terrorist attacks, our results demonstrate a consistent pattern during the 2-6mo period prior to multiple attacks, where all three groups' magazines significantly increased in text related to power motivation. Moreover, calculated effect sizes reveal large effects for each multivariate test between time and power motivation at the 2-6mo timepoint.

3.3 Discussion

We believe this study is among the first to measure the implicit motivations of violent groups, compare the patterns of motivations they employ, and examine the temporal relationship of implicit motivation to terrorist attacks (Pennebaker, 2011). This study is important for several reasons.

First, 21st century terrorism has changed with the advent of the internet, creating an accessible global platform for extremist propaganda. Despite lack of research and arguments for and against the relationship between social media and radicalization (Conway, 2017), the IMB model stresses the efficacy of accessible information paired with motivation and behavioral skill constructs to elicit behavior change. All three of these constructs are present in online jihadist propaganda (Lemieux, Brachman, Levitt, & Wood, 2014), supporting the idea that indeed online extremist content can impact the behavior of the consumer. Counter-narratives have been largely unsuccessful. Reconstructing narratives that utilize the IMB model framework may prove beneficial in countering the impact of current jihadist online content.

Second, identifying implicit motivations may further inform the development of effective counter-narratives. Less research has been conducted on the relationship between the motivation and information constructs within the IMB model. Identification of implicit motivations can define (at least in part) an individual or groups' motivational status which may also provide insight into messaging resonance for those reading the propaganda. Narratives that are rife with power or affiliation motivation inform practitioners that these are the constructs most important to the group conveying the message and subsequently most important to the consumer. Constructing counter-narratives, then, that contain the same implicit motivational messaging may benefit efforts to counter online extremist propaganda.

Finally, implicit motivation patterns may provide signals for upcoming attacks. Prior research demonstrates the predictive ability of implicit motivation (Pennebaker, 2011; Winter, 1996). Specifically, the ability to predict aggression from implicit power and affiliation motivation (Winter, 1996).

As hypothesized, significant main effects for the frequency of implicit motivation (achievement + power + affiliation) was present in all three terrorist groups' propaganda. Overall, power is the dominant linguistic marker across all three groups' propaganda. We can therefore expect that these groups will continue to express power concerns through strong forceful actions, produce media that provides unsolicited help to readers, or try to control or regulate others' behavior (Winter, 1973; Shultheiss, 2007). Individuals with a strong power motive experience the consummation of the "impact on others" incentive as pleasurable and rewarding indicating that unless power motivated behavior is associated with an unrewarding experience, these groups will continue to exercise aggressive, violent behavior.

In addition to power motivation, all three groups expressed significantly different patterns of affiliation motivation within their respective magazine corpora. Al Qaeda expressed the highest levels of affiliative language, then Al Shabaab, and the Islamic State.

Contrary to the power and affiliation motives, achievement motivation (although significant) was the least frequently used linguistic motivation marker. This finding supports prior research that extremist groups demonstrate higher levels of power and affiliation motivation rather than achievement. It appears that extremist groups are largely more concerned with making an impact on others through their behavior rather than how well they might execute a task.

Analysis of implicit motivations and time-to-attack revealed data that may be useful in predicting future attacks. Our finding regarding the 2-6mo time point revealed a consistent pattern that for all three groups where power motivation significantly increased at the 2-6mo pre-attack timepoint. Similar analyses of jihadist literature found that certain language features covaried with attacks in the future and in the recent past (Pennebaker, 2011). Specifically, language factors that may predict attacks 2–6 months in the future for two jihadist groups, however the pattern of effects was different for each group (Pennebaker, 2011). The results of our analyses found a pattern that was consistent across all three groups and their linguistic expression of implicit power motivation.

Admittedly, measuring language is tenuous as communication styles between violent groups are different making reliable prediction of violence unlikely. However, measuring implicit motivations in text are reliable in their predictive abilities. Therefore, it is important to note a developing pattern across three different groups and their expression of implicit motivation in relation to attacks. In this case, our data demonstrates specific motivational signature patterns across groups and time. Although there are differences in the frequency of expression of implicit motives specific to each group, all three group signatures are defined by first power motivation, then affiliation motivation. A notable consistency across groups and power motives compared to time was also determined. Specifically, our data revealed the same pattern for all three groups across 12 attacks that showed a significant increase in power motivation 2-6mo and 1mo prior to an actual attack compared to baseline. An increase of implicit power rhetoric at 2-6mo and 1mo pre-attack could be a strategic move to consolidate group member motivation and preparation prior to an attack. This signature may also have implications for outside recruitment. Implicit power language is largely concerned with

expressing control, influence, and authority over others, making high levels of power rhetoric attractive to anyone who is either disenfranchised or enjoys the feelings of dominance. For researchers studying and monitoring online extremist literature, continued testing of implicit power motivation in propaganda and time-to attack may assist in the development of a predictive model that can accurately indicate an upcoming attack.

3.4 Conclusions, Limitations, and Future Direction

At the most basic level, this study has shown that in addition to information and behavioral skills of the IMB model, motivation is an intricate part of understanding why groups adhere to violent ideologies. Moreover, this study highlights the importance of including unconscious motivational processes in understanding and predicting group behavior. We have determined that each violent extremist group in this study has its' own specific linguistic motivational signature. This is important for the development of prevention/intervention responses and policies. Recent attempts to construct counter narratives have not been successful. Nor have big tech companies been able to keep up with the amount of violent extremist propaganda flooding social media. Subsequently, the need for a deeper understanding of the constructs within violent group narratives and ideology that resonate and promote behavioral change and adherence is necessary. Survey data and in-person interviews with war criminals or individuals within a criminal justice system, present limitations like biased, inaccurate responses. Returning to fundamental psychological theories on human motivation, particularly unconscious motivation, presents a unique opportunity to deconstruct and assess behavior in an unbiased, valid method. In this case, the ability to define specific groups motivational signatures reveals what drives group behavior (i.e. affiliation, power, achievement) and enables tailoring of counter-narratives to reflect the same motivations in a much less destructive manner. Further,

stemming the flow of propaganda has proved only mildly successful. Harnessing the mass amounts of propaganda emitted by current violent extremist groups can also clue practitioners into motivational patterns that ultimately predict attacks.

Current jihadist ideology and ability to recruit is as complex as the study of human motivation itself. Scientists have grappled with human motivation for decades and have made strides in parsing out the intricacies and interactions of both explicit and implicit motivation. The IMB model of behavior change has consistently demonstrated success (individual adherence to a goal) within the health domain. Fisher & Fisher (1997) defined a model of human behavior that demonstrates the importance of providing information, proper motivation, and tangible behavioral skills in order to elicit behavior change. The information and behavioral skill constructs are relatively clear. However, motivation and the relationship of motivation between the other two constructs is opaque. In addition to the complexity of motivation is the current phenomenon of joining and adherence to a violent ideology. We sought to add to a nascent understanding of what implicit motivations define violent groups, inherent qualities of implicit motivation that might attract individuals to join and commit acts of violence, as well as determine whether a potential to predict violent group behavior exists.

The exploration of implicit motivation using computer analysis has both strengths and weaknesses. The strength of LIWC2015 software is that it removes subjectivity from scoring linguistic texts because it counts the frequency of words matching a predefined dictionary (Pennebaker et al., 2007). For example, power can be quantified in terms of the frequency with which power words are used (Rude, Gortner, & Pennebaker, 2004). Furthermore, the LIWC program is flexible in that it works well with a variety of text sources (Tausczik & Pennebaker, 2010).

However, computer methods do not do a great job in identifying things like demographic traits of the authors, deception, and up until now, predicting violent attacks. Despite language use being a dynamic system that is constantly changing (making it an ever-shifting predictor of future behavior) there is research demonstrating the reliability of measuring implicit motives in text. This is because power, affiliation, and achievement motives have been found to become aroused by and respond to nonverbal cues rather than to verbal stimuli (Schultheiss, 2001). This has tremendous implications, then, for validating implicit motive measurement across different mediums for the purpose of predicting group violence. As with any other research approach, the more cases and the more language samples you are able to analyze, the more trustworthy your predictions. Future research to replicate implicit motivation measurement across multiple groups and media compared to time-to-attack time points may prove beneficial in preparing for future extremist group violence.

Table 1 Grand Means and Standard Deviations of implicit motivation (N = 80,000)

Category	Blogs	Expressive Writing	Novels	Natural Speech	NY Times	Twitter	Grand Means	Mean SDs
Affiliation	2.20	2.45	1.39	2.06	1.69	2.53	2.05	1.28
Achievement	1.27	1.37	0.91	0.99	1.82	1.45	1.30	0.82
Power	2.07	2.02	2.46	1.72	3.62	2.17	2.35	1.12

Note. Taken from LIWC2015 Output Variable Information. Pennebaker, Boyd, Jordan, & Blackburn (2015).

Means = Percent of text containing implicit motives compared to total word count.

Table 2 Means(SD) and MANOVA results of implicit motivation across Jihadist Propaganda

Jihadist Groups	N(39)	Affiliation	Achievement	Power
Al Qaeda	13	2.35(0.52)**	1.40(0.20)	3.52(0.50)*
Islamic State	13	1.64(0.30)**	1.31(0.20)	3.42(0.40)*
Al Shabaab	13	2.21(0.84)**	1.60(0.80)	4.22(1.30)*

Note. ** = $p < 0.001$ MANOVA results indicate significant differences in affiliation motivation between group magazines, * = $p < 0.05$ indicates significant differences in power motivation between group magazines

Table 3 Significant Contrasts between Implicit Power Motives at different Time points

Source	Time	<i>SS</i>	<i>MS</i>	<i>df</i>	<i>F</i>	<i>p</i>
Time	2-6mo pre attack vs. baseline	2.50	2.50	1	23.03	<0.01
	1 month pre-attack vs. baseline	2.24	2.24	1	6.20	<0.05
Error	2-6mo pre attack vs. baseline	0.64	0.11	6		
	1 month pre-attack vs. baseline	2.20	0.40	6		

Table 4 Significant mean difference t-tests of implicit power motivation at baseline and 2-6 month pre-attack timepoints across groups

Timepoint	Effect	Compare	Mean Difference	95% Simultaneous Confidence Interval	
				Lower	Upper
Baseline (>6mo bf attack)	Implicit Power	2-6mo before attack	-0.52*	-0.88	-0.16

*Note. A Bonferroni correction has been applied for multiple comparisons, * $p < 0.01$*

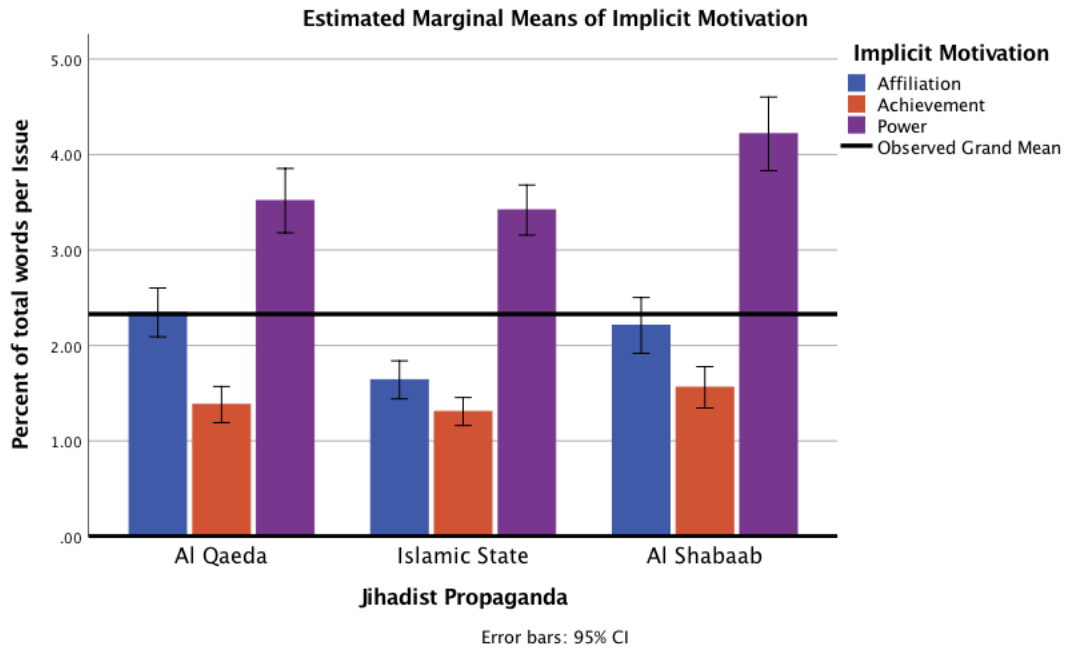


Figure 1 Estimated marginal means of unique implicit motivational signatures of jihadist groups

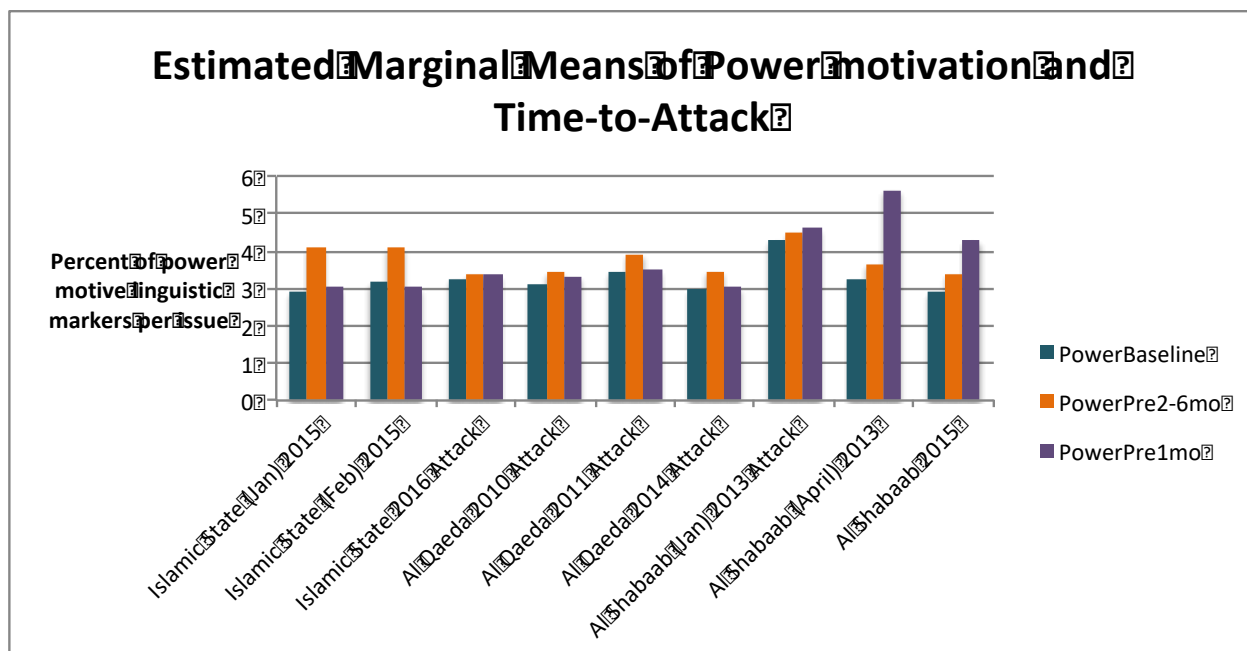


Figure 2 Factorial ANOVA results between power motivation linguistic markers and time to attack

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