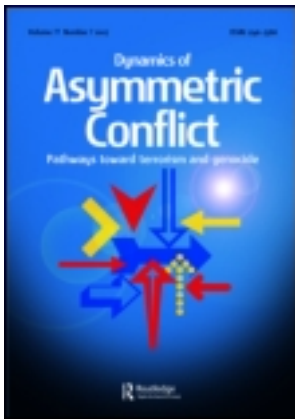


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Dynamics of Asymmetric Conflict

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rdac20>

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Available online: 17 Nov 2011

To cite this article: Lucian Gideon Conway III, Laura Janelle Gornick, Shannon Houck, Kirsten Hands Towgood & Kathrene R. Conway (2011): The hidden implications of radical group rhetoric: Integrative complexity and terrorism, *Dynamics of Asymmetric Conflict*, 4:2, 155-165

To link to this article: <http://dx.doi.org/10.1080/17467586.2011.627938>

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The hidden implications of radical group rhetoric: Integrative complexity and terrorism

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(Received 10 March 2011; final version received 27 September 2011)

We compared the public rhetoric of two terrorist groups to ideologically-similar non-terrorist groups on integrative complexity and its two sub-components (dialectical complexity and elaborative complexity). We further attempted to use these constructs to understand when the two focal terrorist groups engaged in violent acts. Results suggested that terrorist group rhetoric was uniformly simpler than non-terrorist rhetoric, and that this simplicity was especially in evidence for elaborative forms of complexity. Secondly, results more weakly suggested that a pattern of complex thinking associated with *defensive* thinking – namely, higher elaborative and lower dialectical complexity – became more prevalent in terrorist rhetoric as a violent act became imminent. These results demonstrate that scoring the complexity of public rhetoric can potentially be used to understand the psychology of terrorist groups from a distance.

Keywords: terrorism; rhetoric; content analysis; integrative complexity

If inciting people to do that [9/11] is terrorism, and if killing those who kill our sons is terrorism, then let history be witness that we are terrorists.

Osama bin Laden

Armageddon is not around the corner. This is only what the people of violence want us to believe. The complexity and diversity of the world is the hope for the future.

Michael Palin

As the above quote by British actor and writer Michael Palin implies, it is perhaps natural to associate violence with simplicity and peace with complexity. And, in fact, a great deal of evidence suggests that in international conflicts, a peaceful resolution is preceded by increases in complex thinking in the primary leaders, while a violent outcome is preceded by simpler thinking (e.g., Suedfeld et al., 1977; Suedfeld & Bluck, 1988; for reviews, see Conway, Suedfeld, & Tetlock, 2001; Suedfeld et al., 2005).

By extension, this might suggest that terrorists, who explicitly endorse and practice violence, may be more chronically simple in their thinking than less violent persons, and furthermore might be especially prone to simple thinking immediately

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prior to engaging in a violent attack. It is the purpose of this paper to address these twin questions: (1) Are terrorist texts simpler than texts of those less prone to violence? (2) Do terrorist texts become simpler as a violent attack nears? To tackle these questions, we use the most widely used and validated measurement of the complexity of thought: integrative complexity.

Integrative complexity

Integrative complexity evaluates the complexity of spoken or written statements based on the underlying structure of the rhetoric, rather than on its content (see, e.g., Conway, Suedfeld, & Clements, 2003; Conway et al., 2008; Suedfeld et al., 2001; Suedfeld & Rank, 1976; Suedfeld, Tetlock, & Streufert, 1992; Thoemmes & Conway, 2007). It is scored on a scale between 1 and 7; the score is determined by the level of *differentiation* and *integration* inherent in the statements being assessed (see Baker-Brown et al., 1992). Differentiation occurs when different dimensions are present in the statement (resulting in a score of 3). Integration is present when connections are made between these differing dimensions, potentially resulting in the formation of an overarching stream of thought related to the subject (resulting in scores between 4 and 7).

Dialectical and elaborative complexity

Because integrative complexity is concerned with the underlying structure of a statement (and not its overt purpose per se), multiple statements that describe the same subject from different angles may receive the same score. While this breadth contains many strengths, it also can cause some limitations when it comes to understanding *why* a passage is complex. In response to these limitations, Conway et al. (2008) proposed two additional sub-constructs called *elaborative complexity* and *dialectical complexity*. As *elaborative* and *dialectical complexity* are part of the integrative complexity construct, they are scored on the same 1 to 7 scale. Procedurally, a passage is first scored for overall integrative complexity and then trained coders assess how much of that score is due to elaborative complexity or dialectical complexity (see Conway et al., 2008, for details).

Elaborative complexity emerges when one singular point of view is defended in a complex manner. For example, consider the following statement, which would receive a 3 for integrative complexity (meaning differentiation but no integration): "Peanut butter is great, not only because it is delicious, but also because it makes for a healthy meal." The viewpoint that *peanut butter is great* itself is never challenged or qualified, but rather is defended with two different dimensions (taste-related, health-related). Thus, this differentiation would be elaborative because it develops a singular viewpoint about peanut butter with two differentiated dimensions. *Dialectical complexity*, on the other hand, occurs when a given topic is described from multiple points of view. Consider, for example, this statement: "Peanut butter is delicious, but I don't like how it gets stuck on the roof of my mouth." In this case, two dialectically-opposing views of "peanut butter" are presented, one positive and one negative. While such viewpoints do not have to be *directly* in opposition to be scored as dialectical, they do have to be at least implicitly in tension with each other (see Conway et al., 2008, for more details).

Research on these new constructs suggests the *type* of complex thinking matters: Dialectical and elaborative complexity are differentially associated with

psychological extremism, lying, and attitude heritability (Conway et al., 2008; Conway, Dodds, Towgood, McClure, & Olson, 2011).

Integrative complexity and terrorism

Little direct research to date exists relative to terrorism and complexity. The research that does exist supports the notion that terrorist rhetoric is fairly simple. Suedfeld and Leighton (2002) found that infamous terrorist bin Laden was consistently lower than Western leaders on integrative complexity during the 9/11 crisis (both before and after the actual attack). Further, Smith, Suedfeld, Conway, & Winter (2008) – using the same comparison groups discussed here – determined that terrorist groups consistently scored lower on integrative complexity than comparable non-terrorist groups.

Other less direct work demonstrates that *extremists* (a category that is arguably inclusive of terrorists – more on this later) tend to be less integratively complex than their moderate counterparts (e.g., Tetlock et al., 1994; but see Conway et al., 2008; Van Heil & Mervielde, 2003).

Elaborative/dialectical complexity and terrorism

It is interesting to note that most of the theory and research related to both terrorism and extremism, though couched within the integrative complexity construct, has tended nonetheless to focus on more *dialectical* aspects of complexity when explaining these results. This makes sense: One would more naturally expect extreme groups to show less dialectical complexity (compared to more moderate groups) because they are less likely to consider alternative viewpoints that might contradict their own cherished belief system.

While no research contradicts this assertion, some recent research does extend it by suggesting that psychological extremism does not affect all forms of complexity equally. In particular, Conway et al. (2008) demonstrated that, although holding extreme attitudes does indeed decrease dialectical complexity, it simultaneously *increases* elaborative complexity. Thus, psychological extremism produces an unwillingness to consider alternative points of view, but also produces more complex defenses of the cherished point of view.

How might this map on to terrorism? To the degree that terrorists can be construed as psychologically extreme groups, one might expect a similar pattern of low dialectical and high elaborative complexity. However, it is worth noting that a preliminary analysis in Smith et al.'s (2008; footnote 8) paper suggested that terrorists were lower on both forms of complexity. Here, for the first time, we report on the fully updated dataset in depth on these two constructs.

The current project

The past research just outlined provides an excellent beginning, but it is in need of extension. Here we aim to provide the largest and most in-depth study of terrorism and complexity to date. In addition to increasing and updating the dataset from Smith et al. (2008), we here for the first time offer an in-depth look at both dialectical and elaborative complexity in relation to terrorism. Further, we extend this work to include our second focal question pertaining to complexity markers and impending terrorist violence. Indeed, although drops in integrative complexity are often

associated with aggressive international actions (e.g., Suedfeld et al., 1977; Suedfeld & Bluck, 1988; Suedfeld et al., 2005), this idea has never been directly tested with terrorists specifically – no small gap to fill, given the importance of understanding terrorism in the modern world. It has also never been tested on *any* group while including the sub-components of dialectical and elaborative complexity.

Expectations

Given this sparse set of data and theory for this difficult-to-study group, our expectations entering the project were not overly confident. However, we originally expected that (1) terrorist groups would have lower overall integrative complexity compared to non-terrorist groups, and that (2) this would be particularly evident for dialectical forms of complexity. What we expected for elaborative complexity was less clear, but based on prior work on psychological extremism (Conway et al., 2011), we expected that (3) terrorists would show equal or potentially even higher elaborative complexity than non-terrorist groups. As we shall see, the latter expectation proved false.

Finally, we expected parallel patterns to emerge for the prediction of violent episodes within terrorist organizations, with (1) lower integrative complexity as an attack neared, (2) this pattern especially in evidence for dialectical complexity, and (3) perhaps non-existent or even reversed for elaborative complexity.

Methods

Overview and design

We focus here on two primary questions. First, using a 2 (Group Type: Terrorist versus Non-Terrorist) \times 2 (Context: Transnational versus Local), we attempt to determine if terrorists are more or less complex than their non-terrorist counterpart groups (see introduction to this volume for a description of the groups and their documents). Second, to understand *when* terrorists might attack, we use four categorical time distinctions representing how close to an attack by that group a document occurred, as well as some analyses with continuous measures of attack proximity.

Preparing the documents for integrative complexity coding

From each of the 316 available documents, five paragraphs were randomly sampled for inclusion in the coded sample. (If fewer than five paragraphs were available, all paragraphs in the document were used). These paragraphs were then adapted so that human scorers could code them without being aware of the specific identity of the document/group author, the group affiliation of the document author, or the date the document was issued (e.g., names of persons and regions were removed and replaced with generic phrases like “[terrorist leader]” or “[nation]”).

Coding for integrative complexity and the two sub-components

The present work was coded in two different phases. Phase One (part of which was reported in Smith et al., 2008, though here we offer a far more in-depth analysis focusing on a broader range of questions and measures) involved roughly 2/3 ($N = 202$) of the documents in the present dataset, while Phase Two (including the updated documents) involved the remaining 1/3 ($N = 114$).

At Phase One, selected paragraphs were presented in a random order and scored by five trained coders (each of whom had previously attained a .85 reliability score with an expert scorer). At Phase Two, selected paragraphs were similarly presented to another set of six trained scorers (who had also each attained at least a .85 reliability score with an expert). At each phase, any score in which a coder was extremely different (>2) from the average coders' score was removed and replaced with the mean document score. The resulting summary scores showed adequate inter-rater reliability for each of the three complexity variables at both Phase One (alphas = .82, .81, and .72) and Phase Two (alphas = .84, .82, and .70). To minimize the possibility of differences between phases impacting the results, three of the coders from Phase One also were coders at Phase Two. To further minimize the possibility of differences between phases impacting the results, all scores presented for all complexity variables were first standardized within-phase (thus making the phase means on each variable identical, and ensuring our results cannot be accounted for by mean differences between phases).

Results and discussion

Differences between terrorist and non-terrorist groups

General analytic strategy

To answer our first inquiry about the difference between terrorist and non-terrorist groups in terms of cognitive complexity, we set up a 2 (Terrorist Group: Yes versus No) \times 2 (Context: Transnational versus Arabian Peninsula) ANOVA. From this ANOVA we looked at two main things: (1) the main effect of terrorism, which helps answer our first focal question about differences between terrorist groups and their non-terrorist counterparts. (2) The interaction between terrorism and context, which lets us know if the effect of terrorism differed in the two locations (Transnational versus Arabian Peninsula). Note that below and in the Figures, we present descriptive statistics on the raw (unstandardized) data for ease of understanding and comparison to other data, but when computing inferential tests, we use the scores standardized within "phase" (described earlier).

For these results, we removed several lengthy terrorist book chapters which seemed very different from the rest of the materials (and for which no analogous non-terrorist materials existed), some documents that were alternative translations of existing documents, and one document that was an outlier in terms of its date (it was 10 years older than the rest of the set). That left 290 documents for the final sample below.

Primary results

These results, presented graphically in Figure 1, demonstrated that terrorist groups are overwhelmingly (and significantly) lower than non-terrorist groups on both Integrative Complexity and Elaborative Complexity, terrorism main effect F 's > 35.0 , two-tailed p 's $< .001$. No interactions emerged on either variable, F 's < 0.5 .

Dialectical Complexity showed a similar but weaker pattern, with terrorists lower than non-terrorists; however, this main effect only approached statistical significance, $F(1,286) = 3.00$, $p = .085$ (note that a one-tailed p would be .043 and thus statistically significant; although we err on the side of being conservative here, a one-tailed test is likely justified due to the clear directional hypothesis for dialectical

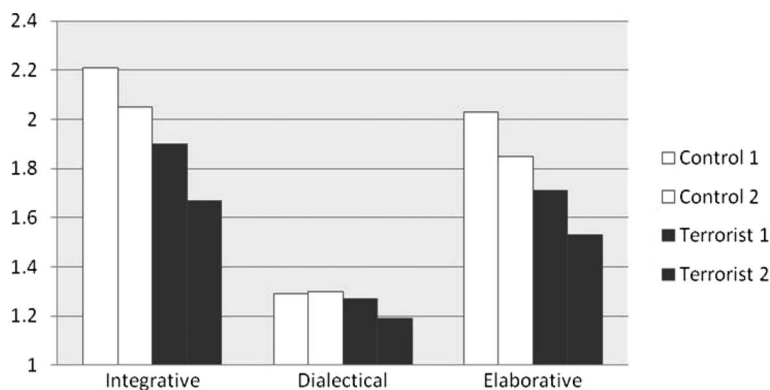


Figure 1. Terrorist vs. non-terrorist groups and cognitive complexity.

complexity). Further, this effect was qualified by a marginal interaction ($F = 2.96$, $p = .086$) between context and terrorism, such that the dialectical effect was stronger in the Arabian than the Transnational context.

Overall, however, these data suggest that strong differences exist between terrorists and non-terrorists on complexity. As in prior research, terrorists scored lower than ideologically similar non-terrorist groups on integrative complexity. The present research further validates, however, the somewhat surprising finding that, although existing for both sub-types of complexity, the effect is clearly driven more by lower *elaborative* complexity for terrorists. We return to this distinction in the discussion.

Clues to when terrorist groups will attack

General analytic strategy

For all analyses below, we present two parallel sets of analyses. First, we present analyses giving a single categorical score for each document representing the number of months it occurred from an attack by the particular group in question: (1) One month or less before an attack, (2) between one and two months before, (3) between two and three months before, and (4) more than three months before an attack. Second, we present a continuous measurement of proximity in days to the next attack.

For both strategies, we use a method that combines both terrorist groups into one analysis and (for Central al Qa'ida) includes affiliated and inspired attacks. This method essentially is asking the following question for each document: How close in time was the document in question to an impending attack *by the group that released it* (or an affiliated or inspired group)?

For these analyses, we also further standardized complexity scores within-group, and only used materials from the three source types (written statements, speeches, and interviews) for which substantive materials were available across multiple time frames. That left 140 documents for analyses.

Integrative complexity

An ANOVA using the categorical *Months to Next Attack* did not yield a significant effect for integrative complexity, $F(3,136) = 1.90$, $p = .133$. However, as can be seen

in Figure 2 , a pattern emerged suggesting that integrative complexity tended to increase as an attack neared. And, indeed, the continuous proximity measurement suggested this was the case, with the proximity-integrative complexity correlation significantly positive, $r[140] = .22, p = .011$.

Dialectical and elaborative complexity

For dialectical complexity, the omnibus ANOVA yielded a significant effect of Months to Attack, $F(3,136) = 2.87, p = .039$. This same test was not significant for elaborative complexity, $F(3,136) = 1.73, p = .164$.

As can be seen in Figure 3, however, dialectical and elaborative complexity showed divergent patterns over time. In particular, while both types of complexity

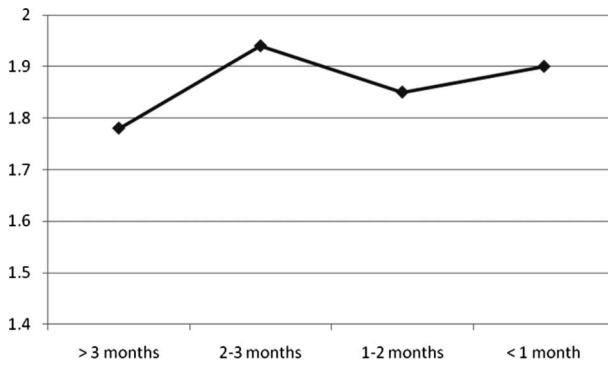


Figure 2. Integrative complexity by months until next attack.

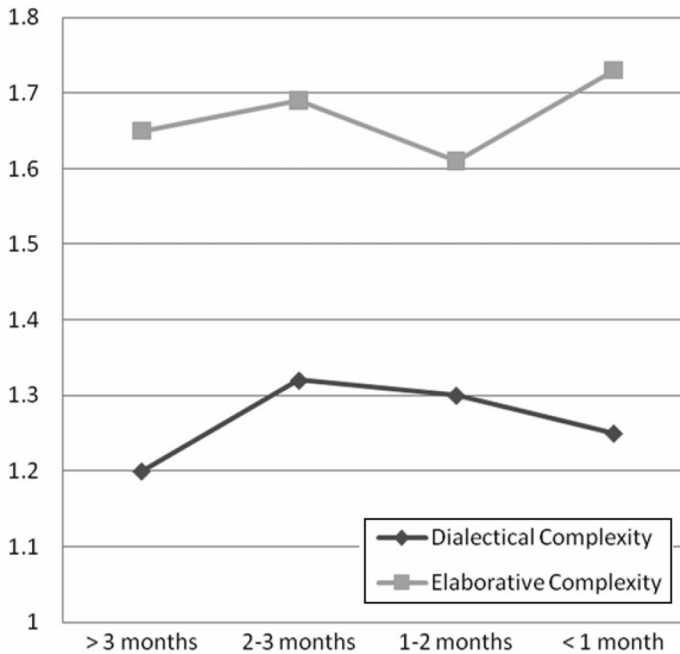


Figure 3. Dialectical and elaborative complexity by months until next attack.

tended to increase from >3 to 2–3 months before an attack, dialectical complexity tended to drop in the month before an attack and elaborative complexity tended to rise. To more directly test these divergent patterns over time for the two sub-constructs, we further conducted a 2 (Type of Complexity) X 4 (Months before Attack) Repeated Measures ANOVA. This ANOVA yielded a significant interaction between type of complexity and month until next attack, $F(3,136) = 3.10, p = .029$. This suggests that the divergent pattern over time between the two types of complexity is not likely due to chance.

Further tests of this pattern were conducted using continuous measurements. Elaborative complexity was significantly positively related to the continuous measurement of proximity to attack ($r[140] = .18, p = .037$), while dialectical complexity was positively but non-significantly related ($r[140] = .11, p = .216$). We further computed a “defensive complexity” measurement (elaborative complexity – dialectical complexity) to capture the degree that a document contained *relatively* more elaborative than dialectical complexity. This measure was positively but non-significantly related to continuous proximity ($r[140] = .12, p = .164$).

However, a more focused test of the divergence at one month seen in Figure 3 would compare the one month category to everything that came before it. We computed such a one-month proximity measure, and it did indeed yield a larger discrepancy between elaborative and dialectical complexity that resulted in a significant correlation between defensive complexity and proximity to attack ($r[140] = .17, p = .048$).^{1,2}

Discussion

Comparing terrorist and non-terrorist groups

First and foremost, these data overwhelmingly suggest that terrorists are lower in the complexity of their rhetoric than their non-terrorist (but ideologically-similar) counterparts. Interestingly, and opposed to our hypotheses, this effect was clearly more in evidence for elaborative forms of complexity than for dialectical forms. What are we to make of this finding?

One implication seems clear. Because research suggests that attitude extremism is defined by *higher* levels of elaborative complexity, it would appear as if terrorists were not necessarily uniformly more *extreme* than their non-terrorist counterparts. If they were, one would have expected them to be lower on dialectical complexity (which they were, albeit weakly) and higher on elaborative complexity (which they were not, being lower on all forms of complexity). In a sense, this validates a key assumption of the present work; namely that, ideologically speaking, the terrorist and comparison groups represent roughly equal ideologies – or, at the very least, the terrorist groups are not *more extreme* in their ideology than their non-terrorist counterparts. The difference then is more likely to lie solely along the *endorsement of violence* dimension in particular.

So why might this pattern emerge, since it does not fit the typical “extremist” prototype? One speculative answer involves the sheer cognitive strain of engaging in the terrorist lifestyle. Producing consistent cognitive complexity takes more effort than producing cognitive simplicity (see, e.g., Suedfeld, 1992; Conway et al., 2008, for discussions). It is possible that the lifestyle led by terrorists is simply more draining (planning for and executing attacks, hiding from authority figures) and as a result makes it more difficult for them to consistently produce complex statements.

Predicting terrorist violence over time

Although predictably weaker and less consistent, our results also at least suggest the possibility that terrorist rhetoric shifts in complexity as an attack nears – though not exactly as we expected. Indeed, in contrast to our prediction, *integrative complexity* showed a tendency to rise as an attack nears. What are we to make of this finding? It is possible that it reflects an information processing model (see, e.g., Hermann & Gerard, 2009) or a cognitive manager model (e.g., Suedfeld, 1992), whereby more cognitive energy is spent during planning phases of an attack; although these models would also likely predict a decrease in complexity as an attack became especially close (something that did not clearly occur in our results).³

However, we think the effect makes more sense in light of the two sub-constructs. Indeed, a complementary view to the information processing model might suggest this increase in complexity as an attack nears is due to a kind of “battening down of the psychological hatches” that occurs when people shift from trying to make a decision to the actual implementation of (and defense of) the decision. Imagine that you are trying to decide between several alternatives for peanut butter. At the point you are *trying to decide*, you are more likely to weigh the pros and cons of the various peanut butter types (thus increasing both dialectical complexity and elaborative complexity as you pursue a deep understanding both across and within peanut butters). However, once you have *made* the decision to choose *one specific* peanut butter, you no longer weigh the various pros and cons of the chosen brand; rather, you are more likely to elaborate complexly (and positively, one would presume in this case) on the peanut butter you chose, but less likely to dialectically weigh various peanut butters’ strengths and weaknesses.

Thus it may be for terrorists as they shift from deciding on their attack plans to actually implementing those plans once the decision is made. And indeed, the results presented here on the interaction between dialectical and elaborative complexity over time (and parallel results on the change in defensive complexity over time) are loosely consistent with this model. As an attack gets especially close (within one month), terrorists use more elaborative complexity *relative to* dialectical complexity. This suggests a tendency for terrorists to use a pattern of complexity associated in prior research (Conway et al., 2008) with both *belief defense* and *lying* as attack nears. Impending violence may indeed cause terrorists to “batten down the psychological hatches” as they defend cherished beliefs and committed decisions with elaborative complexity but are comparatively less likely to look dialectically across different points of view.

Of course, these effects are fairly weak and this interpretation of them is based on some assumptions that we cannot prove (e.g., at what point did terrorists decide to attack place X in a certain way?). So we urge caution. It may ultimately be that the effects observed here are due to chance, or exist for an entirely different reason than we have yet guessed.

Concluding remarks

However interpreted, these results taken as a whole do suggest that complexity can be a useful marker of terrorist rhetoric. This is important for multiple reasons. First, terrorists are notoriously hard to study. To the degree that we can learn about them from a distance through their sometimes-limited public rhetoric, that is an important leap. In addition, complexity in particular is a mostly-implicit variable that lurks in

the background of rhetoric. As a result, it is unlikely the result of direct manipulation and thus may be a kind of window into the psychology of terrorist groups that goes beyond simple and straightforward content issues.

Acknowledgements

This material is based upon work supported by the US Department of Homeland Security, Science and Technology Directorate, Human Factors/Behavioral Sciences Division under Inter-Agency Agreement HSHQDC-07-X-00793, made to the Oak Ridge Institute for Science and Education (ORISE). The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the US Department of Homeland Security or ORISE.

Notes

1. Using defensive complexity in a one-way ANOVA for “months to next attack” with the four-category approach yielded a near-significant ANOVA, $p = .070$. This is another way to statistically test the same interaction between type of complexity and month before attack reported in the manuscript text. Although not significant, it does suggest that different ways of parsing the same data yield similar results. In the main here, measurements that capture the divergence over time between elaborative and dialectical complexity yielded somewhat similar results.
2. If one uses only al Qa’ida attacks that were attributed to the central group itself (that is, excluding affiliated and inspired attacks), results are in the main descriptively similar to those reported in the text, albeit inferentially weaker. We present the data in the text in part because of their consistent strength. Indeed, it is worth noting that there are multiple ways to parse these data, and we only present a selected stream here that made sense and told a coherent story. We want to acknowledge that this selective approach increases the odds that our findings might be due to chance. This is one of several reasons we urge caution throughout in terms of interpretation with regards to the prediction of violence storyline. That said, it is worth noting that the pattern we report with defensive complexity, though quite small in terms of effect size, does seem somewhat robust across different ways of cutting up the data – not necessarily in inferential statistical terms, but rather in terms of the descriptive pattern. (It is also worth noting that these concerns do not apply to our results comparing terrorist groups to their non-terrorist counterparts.)
3. This descriptively appeared to depend on the *type* of material – for written statements, integrative complexity did seem to drop somewhat in the last month (compared to the prior two months), but for interviews, it seemed to rise in the last month. Though interestingly suggesting that different complexity levels may “leak” out during spontaneous versus planned materials, the inferential statistics for this implied interaction were fairly weak overall, and thus we opted to focus on the main storyline that collapses across type of material.

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