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USING TURBULENCE THEORY TO GUIDE ACTIONS

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Ethical dilemmas and their possible resolution are a consistent issue facing educational leaders at all levels in today's pre-K through graduate schools. While these dilemmas are serious, they are not all of the same magnitude, and the question often relates to the intensity of any given issue. It is in this vein that turbulence theory[1] has been successfully applied as an aid in understanding and responding to challenges of ethical decision making in educational settings around the world. This chapter will examine the origins of turbulence theory, the four levels of turbulence, and the use of the turbulence gauge, the underlying dynamics that escalate and reduce levels of turbulence, and turbulence theory's relevance to ethical decision making for educators.

IT STARTED ON A NEW YEAR'S EVE FLIGHT

As a child, I *was* a good flyer. From the time of my first flight in 1956 from Idlewild Airport in New York (later renamed in honor of President Kennedy) to Nassau in the Bahamas, and throughout his teenage years, getting on an airplane was nothing short of a dream trip in a modified spaceship. Even as a small child, he always held fast to the idea that no matter how cloudy, rainy, or snowy the surface conditions, a few minutes after takeoff, and a few thousand feet of altitude, the sun was shining and he would be able to look down on a vista of earth unimaginable only a hundred years earlier.

This enthusiasm came naturally enough. My grandfather had the same perspective and was one of the first builders of biplanes when he worked for the Glenn Curtiss Company, an early competitor to the Wright brothers. Later, during World War I, he joined the navy and was sent to southern France to assemble early naval aircraft, where his unit entertained then Assistant Secretary of the Navy Franklin Delano Roosevelt during FDR's tour of the front.[2] A generation later, during World War II, my father left the infantry to join the precursor to today's Air Force, the Army

Air Corps. Showing an inherent ability with multi-engine airplanes and leading a crew, he became a pilot in the 8th Air Force flying 30 missions over occupied Europe, including the D-Day invasion in a B-17 named *Wolf Pack*. Among his many medals at the end of the war was the Distinguished Flying Cross. To add to this list of airborne enthusiasts closely connected to me is the case of my father-in-law, a graduate of the Chinese Air Academy, a national hero for his daring fighter-pilot exploits against the Japanese in World War II, a general in the Republic of China's Air Force, and later commandant of that nation's air academy.

With this background, and with scores of beautiful flights behind me, I anticipated a lifelong love of flying. That was an illusion and it was with that illusion fully intact that I cheerfully boarded a jet bound from Miami to Philadelphia on New Years Eve, 1970. Sitting next to me was a retired couple, who seemed nervous. "Oh, please don't pay much attention to us," said the wife, "it's just that this is our first airplane ride and we're a little on edge." It was not hubris but a sense of community that inspired me to reply: "Look, I have been on airplanes since I was 6 years old, here and around the world. You're never going to be safer than you are right now. The ride to the airport was by far the most dangerous part of the trip." Reflecting on my little speech now, I sounded like a brainwashed lobbyist for the airlines, but this was a genuine enthusiasm and proved correct until dinner was served (please remember, it was a different era and hot meals were still the norm, even on 2-hour flights). There were the passengers with hot turkey, mashed potatoes, and brilliant green peas steaming in front of them. My new friends and I were enjoying the meal and I even got the husband to wink at his wife as he was teased about his recent angst. Then, with the suddenness of a runaway rollercoaster careening down a vertical drop, the plane fell. Turkey, mashed potatoes, and peas became airborne, quickly decorating the passengers' clothing. Screams and panicked cries foreshadowing gruesome deaths spread throughout the cabin and the elderly man sitting next to me, his dentures rocking wildly in a half-spilled glass of water in front of him, started to cry.

A quality that later helped me to become a caring teacher took over. As the plane steadied itself, I tried to keep a calming dialogue going (which ended up being nothing more than a monologue). "Oh, that was terrible, but it was only an air pocket. It happens now and again but is nothing serious. We'll be there soon and all we've had was a scare and a little dinner spread over our clothing." It was useless. The man's crying did slow but I could see by the couple's nervous frowns that their brittle confidence in flying, and in my advice, was shattered. My counsel to them was really my own way of dealing with the fissures now evident in my idealistic image of flight. By the time I reached my parent's home and started to mix into their New Year's Eve party, I knew the damage was done. I felt traumatized and now would look at flying as a risky business. In truth, I had my first experience with severe turbulence.

For years, I was a white-knuckled flyer, not ceasing flight altogether, but dreading it. As in other cases of trauma, even a small stimulus, like the report of thunderstorms en route, let alone a small amount of bumpiness on board, was enough to reawaken my fears and unleash squadrons of menacing butterflies in my stomach. I became so focused on the fear of turbulence that I once asked my father if he shared my concern when he was flying missions over Nazi Germany. With an amused, kindly, but ironic

expression, my father replied, "Actually, Steve, compared to flak and enemy aircraft, turbulence was not exactly high on my list of worries."

I had fear but no context for the next 25 years. All of that changed at a place called The World's Biggest Bookstore in Toronto, Canada. I was in town doing research on a book about initiating serious innovation in public schools and, frankly, I was in a bit of a funk. The high school I was studying seemed to match an emerging and disturbing pattern. No matter how thoughtful the change in curriculum, instruction, and assessment, and no matter how carefully and sensitively the plans were constructed with the surrounding community, there always seemed to be a strong level of disturbance associated with significant change. Why? I felt that it was somehow unfair for these considerate, talented educators to have to face angry groups of parents as they unveiled their designs for school reform.

Certainly, I understood that change always brought with it opposition. I had enough theory and philosophy to see that Hegel's (1892) dialectic applied and that these new concepts could easily be labeled as today's antithesis resulting from the current thesis leading to some new synthesis that, in turn, would attract a new antithesis. That, however, was little comfort as I tried to frame the world of educational innovation. What I needed was a way of understanding four looming questions:

- How might the levels of disturbance facing innovating schools be described so that different degrees of challenge could be compared?
- How might the emotional strength of that disturbance be more thoroughly understood?
- How might the school look at its own disturbance in a measured way so that reasoned action could be more likely?
- Might there be a positive aspect to the disturbances facing schools that decide to innovate? Or was turbulence always a detrimental force always to be avoided or at least diminished?

I had come to this mother of all bookstores simply to wander in a comfortable space. Aimlessly browsing among countless aisles filled with books was like a balm and freed me to let my mind float. It was nearly closing time when I happened on the how-to section of the store and spotted a manual for beginning pilots. Given my attitude about flight, I had no idea why my hands reached for it so automatically. I rapidly turned the pages to the section on turbulence and there it was, a pilot's set of definitions for turbulence. Of course, there were times when there seemed to be no movement at all during flight, the book stated—this was known as smooth-as-glass flying. But, normally, there were four levels of turbulence: light, moderate, severe, and extreme. The text went on to describe each of the four levels:

- *Light:* little or no movement of the craft
- *Moderate:* very noticeable waves
- *Severe:* strong gusts that threaten control of the craft
- *Extreme:* forces so great that control is lost and structural damage to the craft occurs

Even in texts dedicated to the study of turbulence under many conditions, these four basic levels were fundamental (Lester, 1994).

The more I thought about it, the more these categories started to have meaning for the problems facing innovating schools. Continuing my research trips to schools in North America, I began to apply the four levels of turbulence to conditions that I witnessed.

During that year of investigations, I found clear examples of three turbulence levels. For example, one elementary school found it difficult to engage all families, since they came from two disjointed communities, one upper-middle-class living near the campus and the other a working-class community residing miles away. This was a concern to the school leaders, and the local PTA, because it meant that one group of parents would have access to the school and be able to influence it, while the second might feel disenfranchised. While no immediate crisis existed, the issue of a disjointed community led to a series of responses and regular monitoring. In this way, it was much like the light turbulence level, since there was little disturbance but attention needed to be paid.

A high school in the study seemed to face a more concentrated challenge. While this school was doing well and was following through on its innovative ideas, it suddenly had to absorb students from a sister school in the same district that was forced to close. This issue was hardly a case of light turbulence, since the consequences of not accommodating the new students and their families would be serious for the school and its reform agenda. Responding to this challenge, the school leaders made welcoming new students their highest priority and took the position that the new students had the right to influence their new school as much as they had the obligation to be influenced by it. A pre-semester in-service for the school's professional staff led to specific responses, including an orientation for new students, inclusion of the school's student advisory program, and a buddy system linking new to current students. This school faced and responded to moderate turbulence. The influx of many new students represented a noticeable wave to the school. This was not a case of business as usual but a specific issue requiring focused attention. It is useful to note that cases of moderate turbulence compel action, sensitivity, and creativity. Often, existing committee structures, called to action in time and given clear focus, can respond to this level of turbulence.

A Midwest district faced a qualitatively different challenge. This district was known for its high performance, including its solid results in state sponsored tests. School and district leaders worked for several years to infuse new curriculum and instructional practices into their programs. While many community members supported the new set of learning objectives, another group found these too close to the principles of outcomes based education (OBE) (Spady, 1988). Since OBE had become a politically charged issue, it was not long before the two camps saw each other as diametrically opposed. Soon, names were hurled across the growing divide, tempers flared, and long-time friendships withered in the heat of acrimonious debate. Neither light nor moderate turbulence could describe this condition, since the shockwaves of this crisis threatened the entire reform program of the district and its schools.

It was clear that short of an intense effort to regain control, the district was headed for disaster. Fortunately, district and community leaders did rally. A highly respected

community member, not identified with either side, became board chairperson. Another community member, with professional group facilitation skills, organized and conducted a series of forums including all sides in the debate. These meetings were taped and broadcast over the local cable access channel. After weeks of intensive listening and sharing, the community saw that their common interests outweighed their differences. Compromises and a modified direction were found. The community and its school district experienced an episode of severe turbulence. The entire enterprise was at risk in much the same way as severe turbulence threatens the aircraft with total loss of control. In the air, extraordinary maneuvers may be required to recover from this level of turbulence. This applies to reforming schools as well. No existing organizational structure was used to get this district back on its reform flight path—new leaders inventing new responses were needed.

The original study making up "Staying Centered: Curriculum Leadership in a Turbulent Era" (Gross, 1998) did not uncover an example of extreme turbulence. This was not surprising, since extreme turbulence would mean the destruction of the reform program and I was only studying ongoing innovations. My speculation on the existence of extreme turbulence kept the place open for such a possibility and I was certain that eventually I would find such a case, since regrettably, educational reform often missed its mark (Sarason, 1990).

It was not long before an example did reveal itself (Gross, 2000). On my initial visit to this school, I found a smoothly working reform that had a well-organized curriculum, strong parental support, solid teacher participation, well-coordinated after-school programs, and positive relations with the area superintendent. Given the challenges of high levels of poverty in the families the school served, their success was even more remarkable. What a contrast my next visit turned out to be only 2 years later. Gone was the relationship with the district after the departure of the supportive area superintendent. On top of that, the school was compelled to grow too rapidly in size and in grade level. Instead of a small K–5 elementary school, the building now accommodated grades K–8 in much larger numbers. This growth led to hiring many new teachers, some of whom did not seem to support the original reform agenda. Adding to the stress was the problem that one of the grades had not performed adequately on a state test, thereby placing the entire school on a need-to-improve list. Finally, the foundation that financed the original reform was ending its support, since the funding cycle was at its end. When I arrived, I found that the gifted principal, who initiated the reform, was preparing to retire. With a degree of regret, I concluded that I had found an example of extreme turbulence leading to the destruction of the reform itself. Like extreme turbulence in an airplane, this condition does more than grab attention—it creates a crisis that even the inventiveness of talented school and community leaders may not be equal to.

With the example of extreme turbulence, the metaphor seemed complete. Each level of turbulence had an equivalent from the data on innovating schools. Just as important, there were responses to each of the first three levels (light, moderate, and severe) that seemed instructive to academics and practitioners. Answers to three of my four questions were starting to emerge. With turbulence, I could now describe different degrees of challenge facing innovating school. Likewise, I could speak to the

relative emotional strength of disturbances. By using the four levels of turbulence, schools could reflect upon their issues in measured ways and pursue responses that reflected their current condition. While all metaphors are limited (Morgan, 1997), the metaphor of turbulence seemed to fit three of my questions well and I gained a new vocabulary to share with fellow educators.

THE POSITIVE ASPECTS OF TURBULENCE

Giving a paper on turbulence theory and its relationship to ethical decision making at a University Council of Educational Administration (UCEA) conference with my co-author, Joan Shapiro (Shapiro & Gross, 2002), led to a question that pushed my thinking further. A colleague in the audience challenged the idea of turbulence being simply a negative force that leaders needed to defend against. "Steve, isn't turbulence also the force that opens up new possibilities for the organization?" Two aspects of this question immediately struck me. First, it seemed quite credible. Why would turbulence merely be a problem? Weren't the very innovations that attracted my initial research a kind of turbulence compared with the traditions that they sought to replace? In fact, the concept of turbulence being a positive force had recently been described in the literature on business management (Gryskiewicz, 1999). I also recalled that Lewin's (1947) pioneering work in action research involved unfreezing, change, and refreezing in organizations. This can also be seen as the purposeful escalation of turbulence in an organization aimed at positive change.[3]

Almost at once, I saw that at the micro level, turbulence was needed for flight to occur in the first place. Lift simply could not occur in a vacuum. Molecules of air, moving faster over the top of the wing than the bottom, are required (Braybrook, 1985). It also became obvious that even modern aircraft take off and land facing the wind. The turbulence of that air movement is needed to send airplanes aloft and help them to land safely. Out of control, turbulence could lead to disaster, but well understood and monitored, it was an essential element of life in the air.

Further thought caused me to see where I had limited my perspective. My own traumatic experience caused me to color my attitude toward disturbances. Until challenged by this question, I had created categories that made turbulence a problem for innovators to avoid or handle, just as I hoped that radar and good piloting skills would help aircraft avoid or handle turbulence. Now, I realized that this was important but not the complete story.

I needed to deepen my understanding of the nature of turbulence and so I opened myself up to considering its different manifestations that might add new dimensions to the existing metaphor beyond air movement and airplanes. I expanded my explorations as soon as the 2002–2003 academic year ended and I had the opportunity to literally go into the field back home in Vermont. At first, I tried to simply look at air movement closer to the ground and spent time watching the impact of even small bursts of wind on plants and trees. Although I did learn a great deal from these observations, such as the uneven impact of barely perceptible breezes, I was not satisfied with this tack. Hiking in the Green Mountains National Forest one morning, I heard the sound of a brook and stopped to

simply enjoy it. While I had walked past this small body of water scores of times, on that day it had an unanticipated attraction. What I saw was a complex swirling of water, first moving rapidly, and then slowing, taking twigs and leaves along, only to treat these differently as its motion shifted. Throughout that summer, I spent weeks observing creeks, rivers, waterfalls, and small streams. I recorded everything that I could possibly see each day, waiting until much later to attempt to analyze my observations. I allowed the flowing bodies of water to show new aspects of this kind of turbulence. In the spirit of grounded theory (Glaser & Strauss, 1967), I allowed insights gained from one day's fieldwork to inform my perspective on the following day's work.

POSITIONALITY

One new element of turbulence theory, emerging from expanding the metaphor to include the behavior of flowing water, was *positionality.* I noticed that a moving river did not have the same impact on twigs and leaves at its center as it did on those similar objects at its edges. In fact, careful examinations caused me to see that the impact of the water's flow had many varying levels of impact, all depending upon the position of the object relative to the center of the stream or its banks. Leaves at the center of the flow moved rapidly, while leaves the same size on the sides might move much slower, get caught on the banks, or become trapped in small whirlpools.

Position mattered in bodies of moving water and I soon found parallels in organizational turbulence. Turbulence might seem uniform viewed from far away, but at the level of the specific case where one was, in relation to the organization, it seemed very meaningful. Reflecting on my earlier work on turbulence in the air, it was clear to me that my own sense of concern when the seat belt sign illuminated was likely far greater than that of the pilot. In schools, the case of severe turbulence described above meant different things to the superintendent, the high school principal, the parents, and area business leaders.

Defining Positionality in Turbulence Theory

This variety of movement in the same stream with objects the same size seemed very much like the concept of positionality theory (Alcoff, 1991–1992; Hauser, 1997; Kezar, 2000; Maher & Tetreault, 1993) and standpoint theory (Collins, 1997) used in social science.

Recent scholarship has revealed a debate between these two perspectives. Defending standpoint theory, Collins (1997) states:

> First, the notion of Standpoint Theory refers to historically shared, group experiences. Groups have a degree of permanence over time such that group realities transcend individual experiences. For instance, African Americans, as a stigmatized racial group existed long before I was born and will probably continue long after I die. While my individual experiences with

> institutionalized racism will be unique, the types of opportunities and constraints that I encounter on a daily basis will resemble those confronting African Americans as a group.
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> (p 375)

Countering this claim for the utility of standpoint theory, Kezar (2000) describes the utility of positionality theory:

> Positionality Theory acknowledges that people have multiple, overlapping identities, and thus make meaning from various aspects of their identity, including social class, professional standing, and so forth. Therefore, it is more complex and dynamic than Standpoint Theory while retaining its epistemological concerns. Positionality Theory assumes that power relationships can change and that social categories are fluid, dynamic, affected by history and social changes.
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> (p. 725)

The type of positionality I suggest for turbulence theory combines elements of both of these perspectives. When thinking of positionality as developed in turbulence theory, it is important to understand the relative situation of individuals in the organization in *a multidimensional fashion.* In the case of educational institutions, this means not only attempting to be empathetic to the turbulence as students might experience it, for example, but also acknowledging that groups of students (as organized by gender, race, age, socioeconomic status, or years in the community**,** for instance) may experience it differently. Equally, it means seeing individuals in each of their group affiliations and simultaneously as separate beings. This is not a linear, easily nested process.

While this sounds perplexing at first, the result can become a systematic process in which those facing a dilemma can ask a series of questions leading to a richer understanding of the authentic positions and perspectives of others without condescending or, as Alcoff (1991–1992) describes it, *speaking for others.* A reasonable sequence of questions to illuminate positionality during turbulence might be:

1. What different groups exist in our organization (younger students, older students, staff, faculty, administration, parents)? How might the current turbulence affect each of them?
2. What different demographics exist in our organization (e.g., gender, race, social class, neighborhood, English as a second language, special education)? In each group? What might their perspectives be?
3. What do we know about individual situations? How might this alter the way this turbulence is perceived?

While light or moderate levels of turbulence might allow for detailed speculation, data gathering, and analysis, as a means of working through the problem, severe or the threat of extreme turbulence is likely to offer no such opportunity, since the need for a rapid, well-considered response is too acute. Therefore, a deep, ongoing understanding of this type of positionality within our organizations is highly recommended.

CASCADING

The second addition to turbulence theory, coming from my examination of flowing water, was *cascading*. Anyone who has seen even a small river or creek is familiar with the nature of water as it tumbles over a series of small rocks. While I had experienced this all of my life, it was not until I took the time to think about this phenomenon as a metaphor that I saw its meaning for the study of organizations and the people in them. Water picks up speed as it cascades. The turbulence of the water is easily increased as it moves from one downturn to the next.

The effect of cascading had its parallel in organizations facing turbulence. In the case of extreme turbulence described earlier in this chapter, none of the destabilizing blows facing the innovating school—rapid growth, disappointing test results, withdrawal of superintendent support, loss of foundation funds, and departure of the founding principal—were isolated. Each, in turn, escalated the level of turbulence facing the school just as a series of vertical drops amplifies the speed of water as it cascades. The same phenomena could be seen in the horrifying firestorms created by massive bombing in World War II in cities like Dresden, Germany (McKee, 19842). Each explosion intensified city fires, thereby raising the air temperature. Hot air rising sucked cool air from the ground into the fire, thereby fueling fires and causing them to grow, thereby magnifying the intensity of the fire. The combined forces led to ground winds with such power that people were literally hurled into an inferno. A third example of multiple forces assembled to heighten turbulence through cascading is the case of massive student protests in France during 1968. Kurlansky (2004) notes:

> In chemistry it is found that some very stable elements placed in proximity to other seemingly moribund elements can spontaneously produce explosions. Hidden within this bored, overstuffed, complacent society were barely noticeable elements—a radicalized youth with a hopelessly old-fashioned geriatric leader, overpopulated universities, angry workers, a sudden consumerism enthralling some and sickening others, sharp differences between generations, and perhaps even boredom itself—that when put together could be explosive. (p. 218)

With these examples in mind,[4] the concept of cascading, like positionality, became a new addition to turbulence theory that helped me to understand dynamic forces within organizations in a richer context. For those experiencing turbulence even at the light level, it is important to consider forces in the environment that may propel that turbulence to higher levels. Community concern over a new social studies curriculum in isolation may represent a moderate level of turbulence. However, that same issue in the wake of a badly handled labor dispute, a rise in property taxes, and a report of failure in standardized tests is quite another matter. Therefore, understanding cascading is a matter of understanding context and the force of a series of turbulent conditions. By using turbulence theory and carefully measuring the degree of turbulence represented by each issue, it is possible for educational leaders to prioritize their response.

STABILITY

Cascading and positionality are clearly related to turbulence, but something was nagging me because something seemed missing. A third force that also might escalate or diminish turbulence levels became clear as I compared pairs of schools going through roughly the same kinds of challenges yet experiencing different levels of turbulence. What could account for the difference?

I reflected on one earlier study (Gross, 1998) that included the case of Verona, Wisconsin, a community just outside of Madison. Verona schools went through a serious clash of opinions about what direction they should take—so serious, in fact, that it threatened to turn the district upside down. In an early interview, one district leader said that if the schools had not developed a reputation for being successful, things might have gotten out of hand. In other words, the schools had a solid reputation coming into the turbulent period. A different district, facing the same issues but without the advantage of a solid reputation, would likely suffer greater fallout from the same kind of turbulence. The third force became much clearer. Besides cascading and positionality, schools seemed to differ in the degree of their perceived *stability.*

Just as I used physical examples to study the rudiments of cascading, new examples seemed relevant to examine stability. Recalling the famous case of the Tacoma Narrows Bridge illustrates the point. This suspension bridge, over Washington State's Puget Sound, first opened in July 1940 and collapsed only 4 months later in the face of high winds. Even before construction was completed, the span earned the infamous nickname of Galloping Gertie. Although the reasons for the collapse are complex, the general problem can be described as a lack of rigidity of the bridge's deck, thereby making the whole structure inherently unstable. Fortunately, its replacement does not have the same structural weaknesses and has withstood conditions at the site since opening in 1950.

Stability, therefore, appears to be a relationship between the object we are examining (e.g., an organization, a bridge, a country, a person) and the dynamic force(s) confronting it. More stable organizations appear to withstand the dynamic forces confronting them, and their reputation for stability seems to insulate them from some of the harshest turbulence. That explains the case of the Verona school district. Organizations operating as learning systems seem to take this a step further by turning the turbulent experience into an opportunity to reflect and actually profit, thereby further enhancing their resilience and stability.

But there is a serious difference between stability and simply being stuck in behaviors that seem to repeat themselves. Stability in turbulence theory is a dynamic concept. It is achieved and sustained through movement, not by being rigid. In fact, a rigid response may appear to be solid, and an artifact of stability, but it rarely is. Think of a deer "frozen in headlights" and you'll get the idea. Confidence in the inherent worthiness of the organization, when it is authentically felt, provides the needed energy to respond in measured, flexible ways.

In March 1933, Franklin Roosevelt assumed the office of President of the United States. The nation was experiencing the severe turbulence of the Great Depression. The whole banking system seemed ready to collapse. FDR's famous words "The only

thing we have to fear is fear itself" embodied the spirit of his inaugural address, aimed at creating a sense of needed stability. Yet, while we remember that phrase nearly 80 years afterward, the greatest response from the crowd at the time was the President's insistence on action and flexibility needed to respond to the crisis. In his words, "This Nation asks for action, and action now" (Grafton, 1999). FDR's real recipe to infuse stability was his reliance on vigorous experimentation to create needed change, and the first hundred days of his administration, leading to the creation of many New Deal programs, is still held up as a yardstick for all incoming administrations.

In one high school (Gross, 2001), I found that a culture emphasizing dialogue, democratic practices, and innovation helped to create stability, even when the school faced the turbulence of conflict with city and state education officials wanting to interfere with its operation.

But there are limits to stability. I considered the case of a downed branch I saw one day while walking in Vermont. Clearly, this was a result from the previous day's thunderstorm. From the look of it, there was some degree of rot where the branch once connected to the rest of the tree, perhaps making that point the weak link. So, what happened? A forceful thunderstorm came through that neighborhood. It came in contact with the branch and broke it off. We could say that relative to the force of the wind, the branch was unstable, meaning that it could not stay connected to the tree, and so it fell.

In the physical world, stability is found in structures able to withstand the forces to which they are exposed. In normal circumstances (late spring thunderstorms with high winds are to be expected in this part of the world), that branch (or that part of the tree's organization) broke off. Relative to normal forces, it was inherently unstable. Now, if a tornado touched down (tornados, though rare in Vermont, were predicted), an abnormal condition would exist. Relative to that force, nearly everything in its path would be unequal to the tornado's force, meaning that nearly everything would be unstable. So, we are back to the idea of stability being a concept best described in relation to the dynamic forces that impact upon it. Nothing is stable in an unqualified sense. The universe itself came into being through the very unstable moment we refer to as the Big Bang. Given sufficient dynamic force, all organizations will become unstable, as is the case of business collapses and social revolutions.

Moving from the universe to schools and universities, stability may be seen as:[5]

- Reputation in general, status, awards received
- Academic achievement of students (real or perceived)
- Size, numbers of students, numbers of campuses (applying more likely to higher education)
- Exclusivity, selectivity of admission (applying to selective independent schools, magnet public schools, selective charter schools, and selective higher education institutions)
- Reputation of the faculty
- Reputation for efficient and transparent management (especially in K–12 public schools)[6]

To summarize, stability includes three key ingredients:

First, things are stable in relation to the forces acting upon them. Stability is only a relative, not an absolute, condition.

Second, achieving and maintaining stability requires flexibility and change. This may sound ironic but it is clearly the case.

Third, at some point, stability will always give way to sufficient dynamic force acting upon it. This is the problem facing designers. What is the likely threshold that a given structure is ever going to face? Normally, one would build for something reasonably beyond that level. But that is not as simple as it sounds *because conditions change.*

THE THREE FORCES COMBINED

Positionality, cascading, and stability therefore impact systems, both physical and human, in ways that can increase or decrease turbulence. It is important to view these forces in combination with one another, and not in isolation, to grasp their effect on turbulence levels. Asking simple questions such as, How are different people in this situation experiencing events? What has happened in this organization's recent past? In general, how stable are things around here? can go a long way in starting the process of seeing these forces as powerful drivers of turbulence. It can also start an analysis of how to act in ways that might modify the current levels of turbulence as you respond to ethical dilemmas at hand.

TURBULENCE THEORY'S RELATIONSHIP TO CHAOS THEORY

While it is beyond the scope of this chapter to enter into a detailed comparison and contrast between turbulence theory and related concepts, some brief mention at the chapter's close seems useful. Below, Gross describes his perspective on turbulence theory's connection to, and distinction from, chaos theory as well as reflecting on turbulence theory's strengths and limits as a metaphor.

I am often asked to describe the differences between turbulence theory and chaos theory and usually begin my answer by sharing some of the similarities that I see. Both focus upon the combined importance of seemingly small changes, thereby asking us to remember that detail and pattern matter, especially in complex systems. Both make us think about the ebb and flow of life from seeming instability to renewed and transformed models of stability. Both seem to be elements in the natural world with strong parallels in our organizational lives.

Yet, key differences also exist between turbulence theory and chaos theory. Though inspired by natural phenomena,[7] turbulence theory is designed to help us better understand life in micro and macro human organizations. Further, turbulence theory's use of a turbulence gauge (Gross, 2004), and its combination with rich concepts such as multiple ethical paradigms, make it operational for people in organizations to employ it when they wish to observe, plan, and act. Turbulence theory recognizes complexity but is constructed to provide useful tools to help those employing it to flow with rapidly evolving change, thereby taking advantage of its benefits and minimizing its potential for harm.

Besides pointing to the similarities and differences between turbulence theory and chaos theory, it is useful to explain that the two theories can be combined with potentially beneficial results. For example, we might consider an escalating pattern of turbulence as an episode of an organization being stuck on one side of a Lorenz attractor (a kind of swirling figure 8 wherein each side behaves like a powerful whirlpool). Further consideration of the benefits of combining these theoretical lenses seems worthwhile, since, in their application to organizations, they are each metaphors with strengths and limits.

TURBULENCE THEORY AS A METAPHOR

Morgan (1997) describes the use of metaphors in understanding organizational life in rich, flexible ways:

> Metaphor is often regarded just as a device for embellishing discourse, but its significance is much greater than this. The use of metaphor implies *a way of thinking* (original emphasis) and *a way of seeing* (original emphasis) that pervade how we understand our world generally.
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> (p 4)

Noting the limits of any given theory, Morgan cautions:

> In recognizing theory as metaphor, we quickly appreciate that no single theory will ever give us a perfect or all-purpose point of view. We realize that the challenge is to become skilled in the art of using metaphor: to find fresh ways of seeing, understanding, and shaping situations that we want to organize and manage.
>
> (pp .5–6)

In this context, turbulence theory is a metaphor for both the episodic and continuing forces that we live with each day in our organizations. As Morgan observes, each successful metaphor, each well-considered theory, illuminates an aspect of reality. Coinciding with this illumination, however, each metaphor simultaneously obscures something of reality. Turbulence theory illuminates levels of change in our organizations and helps us to frame them. This chapter describes some of the ways in which it can be used to gain a deeper understanding of these forces. However, turbulence theory is not intended to be, in Morgan's words, an all-purpose point of view. The careful application of turbulence theory is intended to add a new dimension to our understanding of organizational life and, in the context of this book, to our understanding of the forces surrounding ethical dilemmas.

GUIDANCE FOR THE APPLICATION OF TURBULENCE THEORY

While not intending to impose a formulaic approach to using turbulence theory, some guidance is in order. As the earlier parts of this chapter indicate, there are key variables to consider when using turbulence theory. These include contextual

forces, such as positionality, stability, and the possibility of the cascading of events, the degree of turbulence in any given situation, and the possible consequences of a changed level of turbulence. Each of these variables, in turn, is made up of several elements that are described below. At the conclusion of each, summary questions are suggested.

Contextual forces. Early on, it is important to explore contextual variables surrounding any given situation. In turbulence theory, the relevant issues of context include cascading, relationships among key individuals, and the current stability or volatility of the organization. When examining cascading, it is useful to collect data on the forces that are at play in the current situation. If a school is facing an ethical dilemma over a controversial new curriculum, for instance, other seemingly unrelated events might contribute to turbulence such as a teacher strike, budget defeat, poor test scores, or a combination of all three. What is the relationship among them? How have they emerged in the recent past? What does this particular organization's history tell us about the potential for cascading to have a serious impact on turbulence? Seeing relationships between key individuals in context causes us to ask similar questions. What past history exists, both constructive and combative, between these individuals that bears on this situation? Remembering the architectural example of Galloping Gertie, we come to the issue of the current stability or volatility of the organization itself. This requires considering its recent history from an internal and external perspective. One way of viewing this contextual variable is to ask the question, Is the current turbulence an exception or part of a larger pattern of disruption?

Positionality. Once the contextual forces have been explored in some detail, a series of questions about positionality will further illuminate turbulence as different individuals and groups within the organization may be experiencing it. The purpose of the discussion on positionality earlier in this chapter was designed to define that term as it applies to turbulence theory. Clearly, one's position in an organization during turbulence is also a key variable, and one that deserves examination from multiple perspectives suggested in the questions raised earlier. As those questions imply, there are three places to begin to explore positionality as it relates to turbulence. First, there is the job of defining the functional groups involved in the issue. In schools, functional groups typically include younger and older students, faculty, staff, administration, parents, board members, and the wider community. What does the dilemma look like from each of these perspectives? While this is crucial information, stopping at this point risks overgeneralizing about individuals within these functional groups and assuming that every teacher, for instance, will feel similarly about a given turbulent issue. Therefore, the next lens of positionality is one of demographics. This includes categories that are obvious, such as gender, age, ethnicity, race, religion, sexual orientation, level of formal education, and social economic status. It also includes perspectives not so commonly considered, such as years living in a given community. Judgment needs to be exercised in this phase of

analysis, since an individual's multiple demographic affiliations are complex. Larger patterns that relate to the specific turbulent condition are what matter most. Finally, there is the position of the individual. Does this turbulence mean something of particular significance to one or more of the key actors in the current situation?

Establishing the current level of turbulence. After the forces of context and positionality are considered, it is more likely that a reasonable estimate of the level of turbulence may be made. The turbulence gauge can be seen in Table 1. Having thought through contextual and positionality variables, it is now time to look at the four levels of turbulence (light, moderate, severe, and extreme) found in the left-hand column as well as the corresponding general definitions found in the second column and select the closest fit. Those working through the problem may then describe their situation in the appropriate cell of the right-hand column entitled *Turbulence as it is applied to this situation.* The turbulence gauge is completed when all of the cells in the right-hand column are filled in. This is normally done by estimating the conditions one would find if turbulence was either higher or lower than the current level. Since establishing a level of turbulence is the result of complex conceptual analysis, it is highly useful for individuals to compare their findings at this point and explore their insights through dialogue. This will allow divergent views to be aired and may lead to greater confidence in the current level of turbulence.

Possible consequences of changing levels of turbulence. Context, positionality, and current level of turbulence are obviously key variables whose qualities and interactions merit early analysis. However, since turbulence theory is not a static construction, change in turbulence level is an additional variable requiring attention. Individuals or groups working through turbulence would be wise to explore questions such as these: What is likely to happen to the current level of turbulence if no attention is paid to the situation in the short and medium term (raising the issue of cascading)? Would more turbulence help or harm the organization's pursuit of its goals (reflecting the potential for positive results from turbulence)? How might contemplated actions reduce the level of turbulence (when that level is considered too high and, consequently, harmful)? This exercise will help formulate relevant predictions of turbulence.

Table 16.1 The generic turbulence theory gauge

Degree of Turbulence	General Definition	Turbulence as Applied to this situation
Light	Associated with ongoing issues, little or no disruption in normal work environment, subtle signs of stress	
Moderate	Widespread awareness of the issue, specific origins	
Severe	Fear for the entire enterprise, possibility of large-scale community demonstrations, a feeling of crisis	
Extreme	Structural damage to the institution's normal operation is occurring	

By carefully examining the key variables—contextual forces, positionality, current level of turbulence, and consequences of changing levels of turbulence—in this order, relationships between pairs and among groups typically emerge, leading to a richer understanding of the flow of turbulence in a given situation. Using turbulence theory in this way fulfills four of the relevant requirements that Glaser and Strauss (1967) make for theories described in Chapter 1 of this text. Contextual forces and positionality help to explain and interpret turbulence in multidimensional ways that capture the dynamic flow of volatile conditions in our schools. Determining the current level of turbulence and possible changes in turbulence helps scholars and practitioners make relevant predictions that can guide decision making. In so doing, turbulence theory has become a useful tool applied to dynamic, challenging conditions that abound in the schools of our era.

CONCLUSION

That evening, long ago, when I experienced a few moments of severe turbulence in flight thrust me into a new way of looking at the world. Today, it seems that nearly everyone accepts that we live under turbulent conditions of some kind. Events like September 11, 2001 and its aftermath are easy to spot. So are natural crises like Hurricane Katrina and the tsunamis that killed over two hundred thousand people in December 2004. The fast pace of change, represented by the post-industrial information economy and its dislocations, seems to fit this metaphor as well. The purpose of turbulence theory transcends the need to describe these sudden, and sometimes wrenching, changes. It is meant to help us gain perspective on this movement, see potential benefits, and retain needed flexibility. The hope of turbulence theory is that it may help us work with the conditions of our era.

NOTES

1. This chapter is adapted from a chapter in Shapiro and Gross (2013), *Ethical Educational Leadership in Turbulent Times* (New York: Routledge). The author is grateful to Routledge for granting permission to use this version of the work in the present handbook.
2. Those interested in Roosevelt's personal story will remember that it was on the return to the US from this European tour that Eleanor Roosevelt, opening his trunk, came across romantic letters sent to her husband from her personal secretary Lucy Mercer.
3. Yet, the concept of positive change resulting from turbulence is relative. Traditionalists in that same organization may see the action research process as an unwelcome interference with the normal life of the group.
4. Cases of cascading during turbulence are connected to the process of positive feedback loops in organizational theory (Senge, 1990) wherein trends seem to reinforce and increase one another's impact. This is the case of the firestorm, since it only grows more deadly due to its own cycle described above. In an earlier study (Gross, 2004), I found that avoiding just such a positive feedback loop was a crucial adjustment for reforming schools to make if they hoped to sustain innovations over time.
5. Note that in most of these examples, perceptions may be subject to a lag time before moving on one way or another—so that a school once considered unstable but which has improved markedly may remain unstable in the minds of people for some time after things have actually gotten better. The reverse is also the case.
6. Note that each of the ways stability may be seen in schools and universities is relative to some dynamic, opposing force and that achieving and sustaining stability requires flexibility and action, due to the need to respond to or utilize the energy of that force in a planned manner.

7. While illustrations supporting turbulence theory may derive from the movement of small particles such as the turbulent flow of water droplets in a stream or the dynamics of molecules on an airplane wing, we may learn just as much about turbulence from examples in architecture. One illustrative case is of the Tacoma Narrows suspension bridge nicknamed Galloping Gertie, which fell apart in a graphic demonstration of extreme turbulence (Levy & Salvadori, 2002).

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