

Chapter 2

Introducing Generation R

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*Well, it was you, it was me, it was every man,
We've all got the blood on our hands.
We only receive what we demand,
If we want hell, then hell's what we'll have*

Jack Johnson (2003)

Things never have to be the way they are forever. Consider a certain 14-year-old boy from the Bronx in New York City. He lives in a community where the rate of asthma is significantly higher than usual, which corresponds with air pollution from a bus terminal in a nearby neighborhood. By volunteering with other residents to map out the incidence of asthma, he was able to convince city officials to address the pollution from bus emissions (Coburn 2005). As a result, the boy's neighborhood now suffers less from degraded air and people there have a lower rate of asthma. Historically, only a small praxis is needed, by people who share some of the responsibilities for changing a community.

Many stories of youth activism go untold. Even though these stories may become obscured in the news, youth are taking responsibility for changes in their local schools and communities. These changes may become more widespread when challenged further by community and environmental issues poised to disrupt young

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lives. As youth acknowledge a spectrum of vibrant emotions for their community and environment, including positive feelings of happiness and joy, they will continue to push against social responsibility and increase activism as they organize, strategize, innovate, and become more involved. It is worth asking, what sort of person will want to get involved and want to participate more fully in the choices or democracy of a community, particularly as more problems surface from environmental concern? This “participation” should not be misunderstood as the guarantee of an opportunity or as a freedom to participate that guarantees equity and social justice through youth involvement in the market (Tobin 2010): it is a deeper participation we refer to, not merely effort to achieve for economic prosperity. Too often, school policy is guided by financial matters, even when this pathway hampers our choices in school policy.

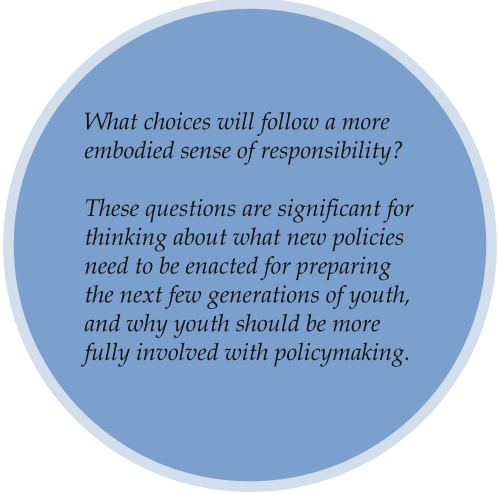
In this chapter, our aim is to open the dialogue to a plausible transition for youth in the USA, from “complacency” towards a condition of greater civic responsibility—a condition in which citizens increasingly feel the presence of toxic chemicals and other disruptions in their bodies and decide to take action as more embodied and valued individuals in relation to others (Thayer-Bacon 2000, 2003). Thayer-Bacon (2000) explains that

Although we are certainly greatly affected by our communities—indeed we learn our language and our culture, even our sense of who we are as individuals, through our communities—this does not mean we are socially determined by our communities. (p. 162)

As many people decide that they enjoy the tastes of organic foods and the feeling of natural and local products in and on their bodies, they will learn how to bring more of these things into their homes and become engaged to help others feel good and healthy, as well.

In this chapter, we highlight the emergence of a new *Generation R (for responsibility)*, despite the challenges of labeling such a future peoples’ movement. As is true for previous generations, Gen R will have many unique affiliations, dissident identities, and cultural diversities, which are continually in process. However, we do not live without others: “we are first of all social beings who are greatly affected by others, but we also greatly affect others with our individual influence, right from the start” (Thayer-Bacon 2003, p. 251). Embedded within the larger understandings of social, cultural, and historical contexts of all generations will be many perspectives. The key point of this chapter is to explore how Gen R youth might be better prepared to more fully engage in social responsibility and social activism.

With respect to the emphasis on social responsibility, we do not suggest that previous generations (X, Y, MTV, and Millennials)—namely, Generation Rs’ parents—do not feel a sense of love and commitment for the community. They do. Many espouse it deeply. What we address here is why what Generation R youth learn and know will influence how they act; how these choices and community decisions will affect themselves, others, nonhuman species, and physical environments; and how future people will know when they have a significant responsibility.



What choices will follow a more embodied sense of responsibility?

These questions are significant for thinking about what new policies need to be enacted for preparing the next few generations of youth, and why youth should be more fully involved with policymaking.

We want to make the point clear up front that Generation R youth will recognize their mounting responsibility for social action early in their lives. They will recognize the rapidly increasing tensions between cultural systems (e.g., economic, ethical, or political) and natural systems (e.g., species and physical habitats). A problem with prosperity will be identified early, while the vast majority of people ignore their responsibility with prosperity and talk about population pressures as other nations become prosperous (e.g., China and India). Gen R youth will reclaim a conversation with the elderly in their community and learn about the cultural traditions and ceremonies that are being lost forever with elderly. They will learn about the rapidly increasing reliance on the market that other generations of youth such as the Millennials were raised. Are these things crises? Not really. They are more opportunities for responsibility than anything else. More importantly, Gen R youth will be the first generation to really consider the prospects of future generations of people through their education in schools. This idea does not mean that there are groups of people now concerned with the vulnerability of cultural traditions, ceremonies, events, aspirations and narratives, or the threat to environments. Indeed the authors of this book are deeply concerned about the future of youth in America and whether youth will even know that their cultures, communities, or environments are being degraded. With maturity and responsibility, concerns in the community are acknowledged and explored with more acuity; however, Gen R cannot be raised like their parents if they will engage our society. They will need to think, practice, and actually do what the authors of this book are calling for in terms of issues-based curricula within environmental and science education, where the focus is on learning for the sake of evaluating choices, consequences of action, and eventually taking action—even if it is to damper consumerism. Equally important, Generation R youth will build confidence in their choices and trust that the decisions they make will impact schools and their children's children for a long time. Teachers are now being prepared to engage children in these exercises, and it is only a matter of time that

these policy ideas will reach fruition if we want to activate a new generation of youth whose focus is responsibility.

Can youth be trusted for their ideas? Jonathan Kozol (2005) writes that he continues to rely heavily on children's narratives about the world around them, because youth often offer less tainted perspectives than do most adults. Perhaps this idea holds some merit, when we consider and debate the larger environmental issues of educational policy. In terms of what they might offer, consider how some children are more sensitive to environmental problems developed along with the hormones and antibiotics given to factory farm livestock to increase net meat production. Earlier development of breast tissue for girls may correspond with hormones in milk and may even be contrived with increasing adolescent, preteen, and teen problems of sexuality in our schools. There is a long history of sugar intake and high fructose corn syrup and vegetable oil use in the USA, and this has surely left its mark on youth. Today, more teens suffer from obesity and related health problems such as earlier signs of heart disease (Schmidt et al. 2010). More recently, the US military has reported that it will try to avert problems with obesity by recruiting children at an earlier age (Boscia 2010). Military recruiters are finding fewer high school graduates who are now healthy enough to send into the service. Correspondingly, youth body image concerns have significantly increased. According to the American Society of Plastic Surgeons 2010 Report of 2009 Statistics, more children seek plastic surgery during their preteen and teenage high school years for breast reconstruction, nose jobs, tummy tucks, and Botox injections (cf. Zuckerman and Abraham 2008). Medical and psychological prescriptions to control behavior in schools have rapidly emerged as a "solution" for keeping students sitting in their seats. These problems are directly related to the health of children and cannot be separated from the school policies currently enacted.

The background context of youth schooling also should be considered. How will educational policy change in science education as people become more interested in the environmental efforts to be "green?" Are youth cognizant of how corporations already are taking advantage of the increase in green awareness and excitement over "organic, local, and natural" products, revolutionary diets, and ways to save money? Today's kids are being raised in a media frenzy of "green is good" and everything green is "good for us." In other words, green now equates with what is perceived as good, right, beautiful, and strong, and this idea corresponds with the emergence of a group of future people who will make their decisions based on an increasing level of awareness and responsibility for their bodies and environment. Already, many adults, particularly generations X and Y mothers, are concerned with using green household products, detergents, and food. Recycling, clipping coupons, and thrift store shopping are becoming trendy as people try to save money. Kids see this.

A rising consciousness around green trends will certainly influence how people associate with bodily well-being and this can be extended to whether soils and nonhuman animals are also well. For example, through documentaries such as *Food, Inc.* and elsewhere, children are becoming more aware that the treatment of the land and animals in factory farming can have a significant effect on their health. The food choices being made degrade soils and mistreat livestock: in short, we can

choose to make a difference in what we eat, which will make a difference for the soils and forests of the future. Peter Singer and Jim Mason (2006) offer suggestions where youth can learn more about ethical food, farming, fishing, and fair trade. As tomorrow's children grow up in a culture more concerned with their health, and a corresponding health of nature, they will begin making choices based on an embodied knowledge of exponential relations. The cultural norm of social activism may be embraced and valued in much the same way it was during the 1950s and 1960s with the Baby Boomers. Let us explain further.

A Cultural Norm of Social Responsibility and Activism

According to Cornell West (2004), today's youth feel a sense of despair and hopelessness that is woven with many stories of crisis. West believes that youth are facing a huge sense of nihilism, or the idea that they no longer possess control over what will happen. What are youth to do when facing so many troubling issues daily? Are they being prepared properly in schools or at home, and in society, to do something about what they will face—the residue of times past? We believe that tomorrow's youth (Generation R) will be ready and open-minded, but they must begin to feel a means within their body. The means for social activism will be generated through experiences, reflective of both good and bad community and environmental situations, and comprised of a spectrum of feelings. The body is the important difference that makes Gen Rs' distinct. Generation R will be a humanity of deeply embedded transactions, but current generations' family, friend, and intergenerational matrices are too loosely threaded together to matter in terms of cultivating a stronger sense of social activism. Thayer-Bacon (2003), who writes extensively about relationships, notes that “it is not possible to establish caring relationships with a large number of people” (p. 247). While Internet technologies have definitely afforded increasing opportunities for collaboration and social activism (e.g., Facebook), they have also weakened the ties between people as face to face is subjugated for digital expression. We will come back to this point later on.

Baby Boomers: A Generation of Social Activism

Now let's turn to a prior generation known for social activism. Baby Boomers lived during the post-cold war era when economic, industrial, and technological innovations were envisioned and developed across the USA. They are known for their gatherings in San Francisco city parks and Woodstock where peace, love, sex, and other virtues were celebrated. These things were idolized by youth. Living together in common, or within a commons, was celebrated and promoted as virtues associated with teenagers in the mid to late 1960s. These same people gathered under desks during their elementary years in preparation for an attack from the USSR. They

grew up under the shadow of the atomic bomb, which stimulated a fear of the enemy. While these experiences are memorable for many generation Boomers, they are not the experiences of everyone in this group, despite that they are experiences which are essential aspects of this generation. But this is true of every generation. Some experiences inevitably will be more powerful or influential for some than others. Boomers, for example, were the last generation of kids to learn to read before watching television—an experience that almost all relate to.

For Boomers, the 1964 world's fair displayed the promises and social imagination of tomorrow and unlimited prospects for the future. Boomers envisioned earning vast amounts of money and having a plentiful supply of jobs and were confident that new technologies would replace many household duties. Today, the Baby Boomers are called “Ageless,” because they continue to seek many of the Viagra-like treatments and painful reconstructive surgeries that keep them looking vibrant and youthful (Grossman 2000). Interestingly, this enduring generation of people has taken the ideology of limitless possibilities into what comprises much of the middle class. Today, many Baby Boomers are retirees living in large houses that line the streets in many middle-class suburban cities—and yet, they are also retirees seeking more government services and care. They run the spectrum from increasingly poor to increasingly rich.

Baby Boomers were not always so self-consumed. Not being selfish people, this generation paid attention and had faith in the idea that they could choose to do some things and had the ability to change disparities in society. Although their parents, many of which were WWII veterans, created freedoms such as the pathway for feminist freedoms, civility, new music, and media, the Baby Boomers went down these paths towards new adventures in music describing loneliness, anger, and other feelings which united them in a march towards liberations—the Civil Rights Movement, Woodstock, and the Vietnam War. Churches and schools became the venues for promoting social activism, and interestingly, many Boomers took on occupations within preaching and teaching as a way to protest the Vietnam War. Despite the diversity of how Boomers came to be, they took on many socially responsible advocacy roles with and for society, and they became vehement voices of social change within all sorts of government policy. They often took on different positions—left and right, conservative and liberal, with the commonality of creating change. Boomers got involved and engaged. They were a culture of making choices for the better (or worse) of our society. These choices emerged from a deep care for the communities and environments where they live, and from patriotism, regardless of the side of the issues they argued. The key point is that Boomers lived during a time when there was an emphasis on making decisions to participate more fully in choices: this became the cultural residue of the Baby Boomer generation.

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decisions to participate more fully*

Over the years, things have changed for Boomers. For the first time in many years, Baby Boomers cried “crisis,” when, in 1979, there was an economic downfall and gas prices soared. For many Boomers, endless limits and possibilities had perceived ends and faltered aspirations and dreams of living with more. A culture of taking action that emerged with youth began to degrade slowly as they made their way into adulthood. Consider how many Boomers supported Martin Luther King Jr.’s protest during the Civil Rights Movement of the 1960s. King asked who would march for the movement?—and it was the youth who began marching in nonviolent protests. The youth stood up—some younger than seven! While hate mounted, Baby Boomer youth took responsibility for change and actions, and desegregation happened. Love was the message, but hate was experienced as members of the KKK planted bombs and initiated hate missions across the South. Today, there are four million Boomers unemployed and facing shrinking incomes, but they continue to work. Retirement is not an option for many Baby Boomers and we all know someone who probably fits this generation. Boomers grind their teeth in frustration over failing health and job loss, and they are turning to free clinics as health-care costs climb.

Over time, Baby Boomers set lofty trends for generations to follow, such as the standard size of homes (increasing from 1,500 sq. ft to over 4,000). Boomers went from a mostly non-materialist standard to buying things on loan. This is not the way their parents, who lived through the Great Depression, taught them to live. What remains today is a cultural residue of social activism and responsibility with many Boomers. They worry about tomorrow’s generations of youth—evidenced by their messages in online blogs. They do not want to leave an unbearable burden on their children and their children’s children. Many Boomers believe they set the bar too high for future generations and suspect that perhaps they should lower it.¹ Today, there is more support than ever for the idea that tomorrow’s children need to be raised with the understanding that they do not need to have the same indefinite notions for themselves. But consider how difficult it might be to cultivate these standards of living for individuals who have dealt so long with poverty and despair. Why would Gen Rs accept the mantra of living with less and sharing and living in commons?

Back to the Future: A Renewed Sense of Social Activism

Although technological matrices (e.g., Facebook) are already in place for fostering a renewed sense of social activism, the online conditions of social networking are much less strong than the face-to-face organization and strategic planning of the Baby Boomer activists. Despite that their parents are participating more frequently online in social networks and making small changes, online activists remain mostly complacent and quiet, allowing others to speak for them. Many children these days live with a sense of entitlement. They are dubbed “trophy kids” because they expect to get a trophy for everything they get involved with. They have faith that the government, or

science or technology, will solve their problems or that they can buy their way out of concerns. Today's youth, and tomorrow's, are being taught to value and respect the US economy and their financial welfare. There is a reason why today's children do not go great lengths to get involved with higher-risk social activism and policy choices: they think that they should be able to earn enough to buy these actions. Ideally, this idea focuses on purchasing choices which will not be long lived. Consequently, youth may suffer if they are not taught to reengage the world through their bodies—which also means they need to be engaged with an ethical priority and commitment for social responsibility. This is where Generation R youth may differ from Baby Boomers and their parents: they must feel a renewed sense of responsibility.

Embodied Knowing and Generation R Youth

How can we imagine a new generation of youth premised on the idea that they should share some responsibility for school policy? And what is responsibility? Responsibility implies that one should be burdened with the state of their community or environment. It is an obligation to act fully. Some authority is assumed for those who are responsible. Responsible people are expected to care deeply and love what they are responsible for. When one assumes responsibility for action, he/she may also deny others of the possibility for action—especially when individual competition is emphasized (Tobin 2010). Some responsibilities are given to members of a cultural community, such as the obligation to do what a person's parents ask them to do, or demonstrating responsibility to handle the knowledge one is taught. This sense of responsibility also comes with baggage. A person who is responsible may need to demonstrate that he/she can be reliable or that people can depend on him/her for making the right choices. Responsible people rarely miss their obligations to debtors. There is also a sense of time associated with responsibility, as people who share responsibility are often aware of their time. Time and accountability for what students learn and what they need to succeed in college are things that most teachers feel obligated to spend time doing, even if “responsibility” is not mentioned in their curriculum standards. When citizens serve their country in the form of military service, they are sometimes called responsible for the freedoms and opportunities of others. Responsibility often is discussed as an individual's civic duty. However, it is also shared between individuals as they envision or create ways to take action.

A shared sense of responsibility is similar to a general feeling about what actions should be taken in society. These responsibilities are also called civic duties or acts, and they involve choices. It is similar to the experiences in general of a particular generation. Thus, to a large degree, responsibility is the defining characteristic of youth generations of the future. In other words, a shared sense of responsibility can be advocated in the future as a cultural norm or standard of living in the same way that it was with the Baby Boomers. When this cultural standard is shared with youth through the activities they participate in, they will also begin to share ownership of the shaping of this—do not forget, today's children will be parents tomorrow.

Many school policies focus on the development of the person or individual child through testing and competition. These priorities deemphasize a shared sense of responsibility. Concomitantly, teachers often emphasize trends in society to enhance the relevance of their teaching for enduring understandings. With the green movement now very much a part of North American life, teachers are beginning to emphasize the green priorities of schools. They prioritize recycling, gardening, Leadership in Energy and Environmental Design (or LEED) certification for schools, nature clubs, hiking teams, and afterschool extracurricular projects, and use metaphors and analogies derived from visits to the local farmer's market or a restaurant using local produce to teach these science concepts. Our visits to the classroom and science teacher websites evidence these trends are beginning to intensify. Students are becoming more aware of green concerns and the importance of making choices that will reduce their impact on Earth. These things surely enhance learning, while environmental concern is increasingly advertised, marketed, and highlighted in a variety of media outlets. Youth today are growing up with both a sense of entitlement and the emerging sense that they will need to do things differently than their parents. They are being raised to think more about ecological value. What aligns with what youth perceive as good for their community and environment is sure to influence their policy decisions for schooling and social activism, in and out of schools.

Where the school curriculum and testing priorities deemphasize or ignore community health and food choices, for example, it follows that youth who embody the "green knowledge is good" mantra will want to make choices more aligned with their previous experiences and knowledge developed around increasing green understanding. Will these children advocate for educational policy if it does not align with their lifelong experiences centered on the environment? Consider how many people advocate for the community and environment in what they say online, for example, but then these ideas do not influence action. Think about those who cry, "SAVE THE EARTH," but then leave it to others to do the saving. It is more plausible that Gen Rs will advocate for things that they need to survive and reproduce, with the Earth in their purview. They will take increasing responsibility for the things they care deeply about, and with an increasing focus on the environment, the Earth will likely become a significant item in policy decisions they make. If the curriculum does not center on what they are putting into their bodies (if their bodies are getting sick), they will create policy changes that reflect the betterment of their bodies and community.

Science teaching and school policy will become aligned with what is necessary for Gen Rs to share more responsibility for these things. Correspondingly, we can identify an increasing aesthetic motivation for psychological and subjective well-being, and many people are already promoting the cultural norms or standards of living more influenced by environmental intrigue. These movements are likely to continue and become more deeply entrenched within the next few generations. As they do, they will influence youth actions and their behaviors towards others in all directions. With entrenchment, these beliefs will lead to better choices based on an increasing critical mass of leadership, organization, and strategic responsibility, similar to the face-to-face social activism embraced and valued by the Baby

Boomers. For example, Gen Rs may see that national security is compromised when there are not enough qualified individuals who can go into the military or who serve their community in various capacities. The “fitness” of youth may be deemed the culprit. If national security matters to Gen R youth and they take responsibility for it, they will begin arguing for policy that emphasizes choices that correspond with better health and foods. Ultimately, these things correspond with subjective well-being. National security, mood, food, and health are transactional entities.

During changing economic conditions, youth will be poised to make better decisions by embodying a responsibility for policy. Today, the number of children who work to support their families indicates that society is stressing children to contribute to income. If science education changes in such a way, say, students could reduce their parent’s reliance on the marketplace for their needs (which is a cultural legacy of previous generations). Then perhaps there will be less emphasis to support family with income. Spending more time with family, friends, and nature could help rebuild the relational bonds and face-to-face communications that have been degraded by today’s busy lifestyles, to which Americans have grown accustomed. Digital technologies may one day serve as *tools* to enhance higher-risk social responsibility and activism in a way never envisioned today, rather than exclusive two-dimensional contexts for imaging relations.

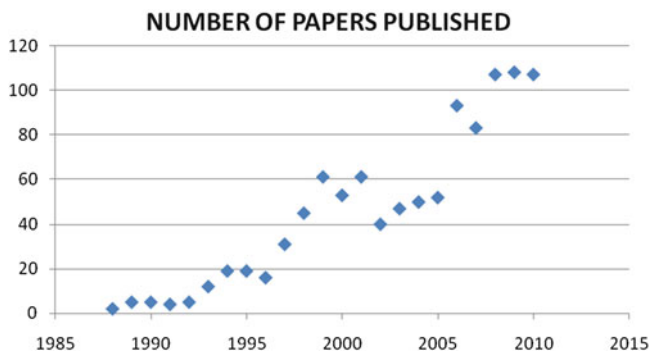
School Policy in Science Education

In order for the ideas summarized above to work, science education should shift priorities. Learning how to supplement basic family needs by relying on shared community knowledge and experiences in relation to learning from other cultural communities around the world begins fueling a curriculum centered on students’ lives. Youth may learn how to garden and become more self-sufficient or trade with their neighbors who are also growing food. They may learn from farmers in Malawi, who now are using cellular technologies to teach children about organic farming practices (Glasson 2010). Social responsibility and activism must become a norm for school administrators, scientists, teachers, and business people who want to strengthen the matrices for community actions. Tomorrow’s youth will need to demonstrate responsibility, and the obligation for using responsibility wisely may be assessed by education research. Similar to the Baby Boomers, there will be Gen R leaders and those who cultivate a wider emphasis on social activism and responsibility.

The top-down No Child Left Behind mentalities cannot work for preparing tomorrow’s children to the degree that they can monitor their bodies, cultures, communities, and natural systems, and the subjective well-being of people in relation to these systems. Tomorrow’s children will likely advocate for new science curricula and can be expected to play a large role in co-constructing their schools (Tobin 2010). Policymakers, we predict, will change with the more embodied experiences of generation R youth, as things taught in schools fail to meet the new view of needs.

When teachers are rewarded for going beyond the tests that comprise schooling today, to include assessments of social responsibility and activism, the tensions of preparing children for life in the workforce may lessen as children prepare to reenter the life of their village.

Gen R's parents already embody this renewed sense of social activism: they are starting to participate more fully in learning about whether their environment needs advocacy. This idea is evidenced by the increasing number of websites, books, and magazines dedicated to social parenting for ecological health. It is evidenced with a quick Web of Science search to see how many scientific papers turn up, by year, when the search phrase "ecosystem health" is used. In this search, the number has increased from two papers in 1988 to 107 papers in 2010.



The above graph indicates that there is a growing attentiveness by scientists for "ecosystem health" as a proxy for a more holistic view of ecosystem problems.

When this idea is viewed in terms of justice and fairness for future peoples, the revitalization of intergenerational norms can be seen as *ecojustice* (Mueller 2009). From an ecojustice perspective, the looming conditions of children's bodies developed over the last three decades, in particular, should spark interesting conversations around our prior actions and whether there is a need to analyze the limits of natural resources.

With society's heightened awareness of degraded fisheries, forestry, and other resources, we are beginning to pay more attention to issues of urban sprawl, agricultural practices, conservation, recycling and waste disposal practices, and genetically modified organisms, to name a few. We are becoming more aware of natural limits and boundaries, and these discussions are starting to diffuse into the schools. Correspondingly, the enjoyment and satisfaction of engaging in diverse community and cultural events, the traditions of elders and oral narratives of older people, and how to protect habitats are emerging in our society. There are conversations around how to get children to play outside more than a few years ago, when the latest technological fads outweighed such discussion. Perhaps we are experiencing to a lesser degree what Generation Rs will likely experience when they have to rely on themselves for policy.

The Intellect of Embodied Reasoning

A point of scrutiny for embodied knowledge is sure to arise with the downplay of intellect in this chapter. For this reason, we want to be clear that the embodied knowing we describe above is a transaction of mind and body for the full realization of epistemic development in Gen Rs. Some, if not most, Gen Rs will need to be taught how to feel and what to feel and how to monitor their bodies in relation to mind, because a disassociation of mind and body occurs commonly in schools today. Mind and body are considered largely separate and conflicting entities in education, with the mind being assumed a priority or main focus of schooling. Thayer-Bacon (2003) describes this epistemic approach as *caring reasoning* or the “art of generously and attentively listening to the other, presuming and maintaining differences (pluralism), recognizing the important of valuing and respecting the other, while at the same time acknowledging and appreciating our commonalities and our interconnectedness with each other” (p. 211). Embodiment is the transactional joining of mind and body, and the integration of reason and sensibility of rationality and emotion: for reading and thinking in the traditional sense (already captured in learning) cannot help but shift Gen R’s thinking to better choices, responsibility, and activism efforts. Deeply analyzing the meanings of words, concepts, and metaphors is a virtue for influencing appropriate and significant embodiment. This embodiment of rationality is not limited to pure reason (Thayer-Bacon 2000), and it can be a motivating factor for influencing responses (e.g., policy with others to decrease pollution). For others, it is learning about the conditions of factory farms that motivates when we focus beyond our own body.

In order to cultivate and teach embodied knowledge, we need a more holistic educational policy that reaches beyond the natural sciences. Science teaching must embrace a more conceptual emphasis on intellect, fostered through interdisciplinary and dynamic schools, yet not be limited by the rapidly increasing subject area specialization. Science education that engages the body-mind will begin to tap into the epistemic journey for Gen Rs. As noted by Atkin (2007), perspectives of the humanities, such as the use of literature and poetry in science education, will develop this embodied knowledge. Wendell Berry (2000) notes that the arts and sciences are not separate outside of schools or school policy: “it may be more or less possible to know and do nothing, but it is not possible to do and know nothing. One does as one knows. It is not possible to imagine a farmer who does not use both science and art” (p. 124).

The humanities will help Gen Rs evaluate their methods of social responsibility and activism with greater clarity. Through the humanities, Gen Rs can use caring reasoning to further assess the oral narratives and printed stories of the young and old, past and present, and the minds of future thinkers. In science education, this emphasis might cultivate a metaphorical, *transformative secondary skin* for sensing and thinking that helps Gen R youth develop the understanding that they can and should change the world, in the past, present, and future of things, even if that means staying with the course or conservation of practices of an older way of life

(e.g., such as Nature Study). This transformative secondary skin will likely challenge the forms of science and science education in schools that do not provide epistemic practice for body rationality.

Traditional science education tends to disembodify thinking apart from feeling. This tendency encourages a sense of fearfulness and nihilism. School policy in science education that challenges complacency can contribute to the praxis of strengthened social networking and transaction with friends, family, neighbors, and community leaders. If science classes are going to be successful at preparing the youth needed to become embodied friends, neighbors, and community leaders, or to monitor their bodily, cultural, and community health, a stronger emphasis on learning through relations and experiences is needed.

So, we are reminded to cultivate embodied responsibility. Clearly, evaluating the technological advances and social networking matrices that have already enabled thousands of individuals to share embodied knowledge for responsibility and social activism has the potential to provide a shape and scope for future initiatives.

Note

1. The authors thank the Baby Boomers who offered their insights and guidance for the construction and development of this chapter.

References

- Atkin, M. J. (2007). What role for the humanities in science education research? *Studies in Science Education*, 43(1), 62–87.
- Berry, W. (2000). *Life is a miracle: An essay against modern superstition*. Washington, DC: Counterpoint.
- Boscia, T. (2010, October 19). Climbing obesity rates threaten U.S. national security by hampering military recruitment. *ScienceDaily*, n.p. Retrieved October 19, 2010, from http://www.sciencedaily.com/releases/2010/10/101018165430.htm?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+sciencedaily+%28ScienceDaily%3A+Latest+Science+News%29
- Coburn, J. (2005). *Street science*. Cambridge, MA: MIT Press.
- Glasson, G. E. (2010). Developing a sustainable agricultural curriculum in Malawi: Reconciling a colonial legacy with indigenous knowledge and practices. In D. J. Tippins, M. P. Mueller, M. van Eijck, & J. D. Adams (Eds.), *Cultural studies and environmentalism: The confluence of ecojustice, place-based (science) education, and indigenous knowledge systems* (pp. 151–164). New York: Springer.
- Grossman, T. (2000). *The baby boomers' guide to living forever: An introduction to immortality medicine*. Golden: The Hubristic Press.
- Johnson, J. (2003). *Cookie jar. On and on* [CD]. New York: Universal Records.
- Kozol, J. (2005). *The shame of the nation: The restoration of apartheid schooling in America*. New York: Three Rivers Press.
- Mueller, M. P. (2009). Educational reflections on the “ecological crisis”: Ecojustice, environmentalism, and sustainability. *Science & Education*, 18(8), 1031–1055.

- Schmidt, M. D., Dwyer, T., Magnussen, C. G., & Venn, A. J. (2010). Predictive associations between alternative measures of childhood adiposity and adult cardio-metabolic health. *International Journal of Obesity*. doi:[10.1038/ijo.2010.203](https://doi.org/10.1038/ijo.2010.203).
- Singer, P., & Mason, J. (2006). *The way we eat: Why our food choices matter*. New York: Rodale.
- Thayer-Bacon, B. J. (2000). *Transforming critical thinking: Thinking constructively*. New York: Teachers College Press.
- Thayer-Bacon, B. J. (2003). *Relational "(e)pistemologies"*. New York: Peter Lang.
- Tobin, K. (2010). Global reproduction and transformation of science education. *Cultural Studies of Science Education*. doi:[10.1007/s11422-010-9293-3](https://doi.org/10.1007/s11422-010-9293-3).
- West, C. (2004). *Democracy matters: Winning the fight against imperialism*. New York: Penguin.
- Zuckerman, D., & Abraham, A. (2008). Teenagers and cosmetic surgery: Focus on breast augmentation and liposuction. *Journal of Adolescent Health*, 43, 318–324.

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