Original Paper

Mentoring Millennial Women in Academia

Donna A. Blaess[1*], Claudia Santin[1], Lisa K. Bloom[1] & Kathryn G. Hollywood[1]

[1] College of Business, Concordia University Chicago, River Forest, IL, USA

[*] Correspondence, Donna A. Blaess, 7400 Augusta Street, River Forest, IL 60305 USA

Abstract

The COVID-19 pandemic created a host of simultaneous, ongoing ramifications for institutions of higher education. One of the most prominent and critical is financial. Although increasing retirement among senior faculty and upper level administrators is inevitable, strategies to rapidly reduce personnel costs include early retirement programs. As a result, younger faculty, especially female millennials, may be poised to transition into more active leadership roles. To ensure an effective transition, succession preparedness, including mentoring opportunities, is recommended. Women in higher education continue to be underrepresented in tenured and leadership positions. Millennial women represent a substantial talent pool who are eager for professional development and advancement opportunities as well as a female role models and mentors. Mentoring develops future leaders; fosters cross-generational and cross-campus knowledge transfer; and, contributes to the acquisition of critical organization skills. Administrators can capitalize on the potential benefits by offering up-to-date, institution and incentive-based mentorship training, guidance, and a deliberate curriculum designed to promote excellence. The recent applications of neuroscience research to the mentoring process are substantial. The challenges facing both women mentors and mentees in academia; the collective benefits of mentoring to institutions, mentees, and mentors; and, the contributions of neuroscience to the mentoring process are discussed.

Keywords

mentoring, higher education, millennial women, neuroscience

1. Introduction

As members of the boomer-generation (i.e., those born between 1946 and 1964) increasingly retire from upper administration and tenured faculty positions, higher education is experiencing an insurgence of millennials (i.e., those born roughly between the early 1980s and 2002) into lower administrative and faculty ranks. Collectively, millennials seek workplaces that are technologically

sophisticated, collaborative, communicative, clear about roles and policies, diverse and inclusive, and socially responsible (Kelly, 2007; Wicks, 2017). Although one must be wary of stereotypes, as a generational cohort millennials in academe also desire faculty development opportunities, openness to innovation and change, clear rules and guidelines for promotion, rapid and shared decision making, campus communities that transcend traditional silos, shared governance, and meaning and purpose in their work (Gardner, 2016; Kelly, 2007; Noel & Arscott, 2020; Wicks, 2017).

Millennial faculty members represent different and perhaps creative as well as innovative ways of thinking about higher education. Members of the millennial generation bring many strengths as well as challenges to current campus environments. Undoubtedly, millennials will eventually influence as well as be influenced by the campus communities in which they serve through faculty and administrative leadership.

At the time of this writing, we would be remiss if we did not acknowledge that we are in the midst of a global pandemic, COVID-19, that continues to have a devastating effect on human lives, including physical as well as psychological health. The pandemic is deeply intertwined with deleterious economic repercussions; the amplification of systemic and structural inequalities, racism and social injustice; and, rancor involving political partisanship as well as widespread distrust of leadership. Higher education institutions have not been immune to the impact of COVID-19. In the face of such unprecedented and simultaneous challenges, the very survival of many institutions is at risk. At first glance, the need for or value of mentoring may seem irrelevant. Given deeper consideration, however, faculty mentoring, whether conducted face-to-face with appropriate social distancing or virtually, may be essential as a source of solace and refuge empathically mitigating uncertainties, fears, and anxieties during these stress-filled times. More importantly, when paired with strategic succession planning, evidence based mentoring approaches are a means of preparing future leaders, maximizing human capital, and ensuring institutional sustainability (Davis, n.d.).

2. The Collective Benefits of Mentoring

In recent years, mentoring has taken on an almost overwhelming number of forms and designations including formal, informal, situational, natural, supervisory, trainee, peer, distance, group and reverse. Here and in previous publications we argue that the traditional distinction between mentoring and coaching has become blurred. Previously, we discussed *holistic mentoring* that consists of a relatively structured, formal, one-on-one relationship between an individual with experience and expertise in a specific field who assists in the career development of a less experienced individual (Blaess et al., 2017; Hollywood et al., 2016). Mentor and mentee are matched and assigned through a program or by mentee choice and mentor agreement. A mentor serves as a coach by providing advice to enhance the mentee's professional development and performance. An effective mentor also functions psychosocially to serve as a role model (American Psychological Association (APA), 2006) and an intellectual as well as emotional support system.

When intentionally and thoughtfully executed, formal mentoring programs benefit institutions, mentees, and mentors. From an institutional perspective, mentoring programs can attract, engage, and retain talented millennial faculty. Mentoring improves teaching effectiveness, research productivity, morale, overall performance, motivation, and innovation (Columbia University, Office of the Provost, 2016). Mentoring may promote a more positive organizational climate mitigating generational tensions and "silo" mentality. Mentoring serves to develop future leaders, broadens perspectives, and may enhance knowledge transfer so that institutions retain the practical experience, core values, and cultural wisdom acquired by long-term employees (Gwoke, 2019). Mentoring also may groom relatively new faculty in acquiring critical organization skills such as gaining political savvy, maximizing diversity, managing difficult conversations, and promoting professional goals. When mentoring is made an integral part of institutional culture, it demonstrates commitment to the value and development of employees (Hollywood et al., 2016; National Institutes of Health (NIH), n.d.).

The COVID-19 pandemic shows little sign of rapid abatement. Higher education institutions are likely to continue to face the heightened need for efficient and effective strategies to maximize both financial and human capital. Millennials, especially millennial women, represent a substantial, academically prepared talent pool eager for advancement opportunities. Thoughtfully developed and well executed, evidence-based mentoring can serve to flatten the learning curve and elevate the leadership potential necessary for institutional sustainability. Advances in neuroscience in recent decades have contributed to the understanding of the biological basis for thoughts, behaviors, and emotional processes. Mentors can be trained to understand neural networks and appropriately leverage both psychological and neuroscience-based techniques that intentionally contribute to mentee personal and professional development.

The process of mentoring, especially cross-generational mentoring, exposes both mentor and mentee to new pathways for learning that productively contribute to the institutions in which they work. For many years, mentoring has been recognized as a powerful career advancement strategy for mentees. Research has consistently demonstrated that individuals who have been mentored are more satisfied and committed to their professions (APA, 2006; Wanberg et al., 2003). "Mentored individuals tend to earn higher performance evaluations, higher salaries, and experience faster career progress than non-mentored individuals" (APA, 2006, p. 5). Mentoring can offer mentees opportunities to develop their strengths and discover skills and dispositions in need of improvement (Hollywood et al, 2016). Mentoring is also related to greater career satisfaction and is especially valuable for women and minorities in developing professional confidence and feelings of inclusion (Postlethwaite & Schaffer, 2019).

Mentoring is a reciprocal relationship in which the benefits also extend to those who mentor. Serving as a mentor can increase the self-efficacy of both mentee and mentor (Abbajay, 2019; Hollywood et al, 2016; Saffold, 2005). Mentors also can be challenged to bridge differences in generational, ethnic, or racial understanding and the prevailing perceptions of the status quo, thus leading to alternative

possibilities for campus life. Mentoring may extend campus networks to build more collaborative communities across administration-faculty, college or school, and department divides. Mentees may encourage mentors to re-evaluate and renew their ideas, assumptions, and leadership roles (Page, 2015; University of California, Davis, n.d.). Perhaps, however, the greatest source of satisfaction in mentoring may be derived from the intangible, generative gratification of contributing to the growth, development, and advancement of junior faculty and to the legacy of higher educational institutional communities as a whole.

3. Mentoring Challenges Facing Women

In recent years, millennial women, representing close to 60% of college students, have outpaced their male counterparts in obtaining college degrees (Pianin, 2017). As of 2015, women in the US earned more than 50% of all PhDs (Okahana & Shou, 2018) and represented 51.5% of assistant professors. Although women constitute a substantial portion of the talent pool in academia, regardless of generational affiliation, they remain underrepresented in tenured academic faculty and leadership positions such as department chairs, deans, and presidencies. In the EU and US, the percentage of female tenured faculty hovers between 20% to 33% and as low as 5% in the fields related to science, engineering, technology, and mathematics. When women are hired, more frequently than not they are placed in lower-paying, non-tenured track positions (Houser, 2019).

Women, including millennial women, continue to be hampered in their careers by conscious as well as unconscious biases. Women continue to be critiqued in ways that men are not, such as appearance and voice, and encounter numerous challenges and barriers that impact their academic career aspirations including explicit and implicit gender biases consisting of judgments about being less competent, less effective as teachers, less effective as researchers, and less effective as leaders than their male counterparts. The prestige index or perceptions of lesser quality of publications with women as first or senior authors remain consistently lower than those of male authors (Cardel et al., 2019). Young women have to work harder to prove their competency. Young men are promoted based on their potential, whereas more often than not young women are promoted only after they have demonstrated accomplishments (Schmitz, 2020). Women face considerable barriers from recruitment to rising in rank and as a result abandon their academic careers at a higher rate than men (Cardel et al., 2019; Schmitz, 2020). As in other economic sectors, women leaving academia may not only constitute a loss of talent and institutional dedication, but also a significant economic loss.

Millennial women seek female role models with whom they resonate and from whom they welcome and expect regular feedback. Millennial women seek learning and development opportunities (PricewaterhouseCoopers (PwC), 2015), career advice, challenges, and mentors (Ms. Career Girl3190, n.d.). Most notably, the lack of mentors has been identified as an obstacle to career development among women (Cardel et al., 2019). Women who have successfully navigated the obstacles to advancement and are well seasoned in academe may by disposition or the desire to pay it forward seek to mentor

millennial faculty for growth and empowerment opportunities, especially mentees who are female.

Experienced female mentors, too, face many challenges. Gender-based marginalization excluding women from key mentoring opportunities is common in higher education and may compromise the advancement of female millennial faculty members (Arora & Rangnekar, 2015; Bower, 2007; Faurer et al., 2014; Phillips et al., 2016; White et al., 2010; Yim & Waters, 2015). Effective mentoring requires dedication, time, and considerable emotion work (Hochschild, 2012) for which recognition and compensation are rare in academe. Mentoring work may be fulfilling, but it is not necessarily as career advancing as scholarship or leadership, especially in institutional contexts in which women typically are assigned or expected to fulfill more service work such as involvement in committees, student advising, and student organizations (Bartel, 2018). Nonetheless, women experienced in navigating institutional structures, cultures, processes, and gendered boundaries have much to offer those who are less experienced.

Despite the multitude of strengths that they bring to the work place, millennials may lack an understanding of academic traditions and hierarchies deeply rooted in the history of higher education institutions that are often difficult and slow to change. In an effort to have their opinions and ideas heard, millennial women may seem brash, disrespectful, and impatient (Wicks, 2017). One of the of the most challenging, nonviable generational behaviors on the part of new millennial faculty is the gap in understanding that higher educational institutional cultural knowledge is relatively slow to be gained, but fundamental to success and upward growth, mobility, and initiating change initiatives. Comprehending and working within the existing institutional culture is instrumental to the gradual process of institutional change as well as professional advancement.

Another challenging generational behavior among millennial women may be expectations of entitlement. Expectations of entitlement are not necessarily detrimental individually, organizationally, or socially. Entitlement and the courageous advocation for change by women (e.g., suffrage) has fueled conviction, consciousness, and social advancement (Beaton, 2016). If not moderated by strategic patience, persistence, and personal responsibility, however, entitlement in academic contexts may lead to nonviable behaviors that preclude an appreciation for diligent and collaborative work over time. Such nonviable behavior may result in the failure to develop intrapersonal resilience as well as a professional network, interpersonal infrastructure, and organizational political acumen all of which contribute to future professional and personal development and success (Bolman & Deal, 2017; Ibarra, 2015).

4. Mentor and Mentee Readiness

It is well documented that the foundation of a productive mentoring dyad is the relationship between the mentor and mentee (Boyatzis et al., 2019; Rochat, 2003; Turban & Lee, 2007; Zachary, 2009). Just as the mentor must be willing as well as intellectually, emotionally, and psychologically prepared to enter into a reciprocal and mutually beneficial learning experience, the mentee must be willing and

prepared. To promote mentorship excellence, faculty benefit from institution-based mentorship training, guidance, and a deliberate curriculum designed to develop and sustain career success (Columbia University, n.d.). Because effective mentoring represents a significant investment of time, energy, resources, and affective labor the reputation of an institution is likely to profit from recognizing, awarding, and perhaps compensating faculty who demonstrably enhance junior faculty recruitment and success (University of Nevada Medical Center, Reno, 2016).

In order to maximize the opportunities from a mentoring relationship, from the onset mentees must be aware of their goals, needs, and expectations. Mentees must be willing to commit to and pursue their own development. Moreover, mentee readiness refers to the capacity to be receptive to support and guidance. Receptivity entails an open mind and openness to self-discovery and the willingness to clarify one's goals, boundaries, and intentions as well as to take action (Hollywood et al., 2016). Perhaps the most important aspect of mentee readiness is the being prepared to change in order to take actionable steps and sustain the achievement of personal goals (Boyatzis et al., 2019).

5. Mentoring as an Antidote to Stress

In 2018, the World Health Organization (WHO), in the 11th revision of the International Classification of Diseases (ICD-11) classified burn-out as an occupational phenomenon in a chapter entitled, *Factors Influencing Health Status or Contact with Health Services.* Burn-out is described as follows:

Burnout is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions:

- Feelings of energy depletion or exhaustion;

- Increased mental distance form one's job, or feelings of negativism or cynicism related to one's job; and

- Reduced professional efficacy (WHO, 2019).

Stress can affect individuals physically, cognitively, emotionally, and behaviorally. Unchecked, stress can lead to a host of health problems including high blood pressure, heart disease, obesity, and diabetes. A few of the common effects of stress include anxiety, irritability or anger, lack of motivation or focus, drug or alcohol misuse, fatigue, depression, and social withdrawal (Mayo Clinic Staff, n.d.) Job related stress undeniably places additional burdens on the health care system within the US.

An online survey conducted in 2020 under the auspices of Tone Networks, a digital executive coaching platform, among 400 US adults aged 18 to 54 years, found that access to role models and mentors may be instrumental in lowering perceived stress levels and increasing workplace confidence among millennial women. Sixty-five percent of the respondents ranked work or career pressure as the second highest source of perceived stress. Two out of three (68%) millennial women reported that access to mentors and leadership development tools would assist them in reducing stress and engaging more confidently in their work. Two out of five (44%) millennial survey respondents also noted that their workplaces do not provide adequate access to mentors and 43% reported that their workplace does not

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provide adequate access to role models (HR Daily Advisor, 2020; Ms. Career Girl3191, n.d.).

6. Making the Most of Mentoring Through Neuroscience

Although there are several exceptions (Blaess et al., 2017; Boyatzis & Jack, 2018; Boyatzis et al., 2019; Jack et al., 2013; Love, 2014; O'Connor & Lages, 2019), the literature on mentoring has focused predominantly on the importance of psychosocial aspects of the mentor-mentee relationship: matching with regard to gender, ethnic, and racial similarities; mentor and mentee dispositional readiness to establish, maintain, and further a productive relationship; the importance of both mentor and mentee emotional intelligence. Much less attention has been given to the factors contributing to the challenges of pair bonding posed by cross-generational issues. Even less attention has been given to neuroscience and its potential contribution to the mentoring process.

The inclusion of neuroscience in the mentoring and coaching literature is fairly recent and broadly based on the premise that a neurobiological approach to mentoring may capitalize on biological systems and optimize the transformative effectiveness of the relationship for both mentor and mentee. Brain based mentoring strategies are slowly infusing both literature and practice to inform mentoring guidance and training aligned with how the endocrine and nervous systems react to stimuli (Blaess et al., 2017; Boyatzis et al., 2014; Boyatzis et al., 2019; Jack et al., 2013a; Love, 2014). Neuroscience in mentoring often corrects erroneous assumptions and conventional wisdom, or confronts uninformed practices regarding effective mentoring strategies. For example, in the absence of adequate information or institutional training, mentors are likely to rely on methods that they experienced as mentees or take a reactive approach and transform negative mentoring experiences into reverse strategies (Ambrosetti, 2014; Gadbois & Graham, 2012). Although well intentioned, mentors may be overly quick to judge and attempt to correct mentee perceptions and behaviors, propose tasks that are misaligned with mentee aspirations or goals, impose their own goals on the mentee, or attempt to fix problems by proposing solution strategies.

The introduction of neuroscience into the mentoring and coaching literature followed the application of functional imaging of human subjects during specific tasks. Prior to the use of functional imaging studies, the brain was understood to have distinct areas relegated to specific functions. Anatomical knowledge was gained through pathology, injury, surgical outcomes, dissection, and anatomical imaging studies such as computerized tomography (CT), plain film radiographs, and magnetic resonance imaging (MRI). In contrast, functional imaging such as positron-emission tomography (PET) and functional MRI (fMRI) or physiologic studies identified areas of activation in the brain through visual images of metabolic activity.

Functional imaging prompted research on brain mapping that led the discovery of brain networks. A brain network consists of various areas of the central nervous system that activate together in response to a specific thought or stimulus (Boyatzis et al., 2019; Fox et al., 2005; Jack et al., 2013a; Jack et al., 2013b; Hamilton et al., 2011; Posner & Raichle, 1998). The research revealed the existence of

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anticorrelated networks in the nervous system (Fox et al., 2005; Jack et al., 2013; Raichle et al., 2001). Anticorrelated networks demonstrate the neurological principle of reciprocal inhibition; the activation of one network inhibits the opposed network. Anticorrelated networks exist in multiple areas of the nervous system (Fox et al., 2005). The autonomic nervous system is an example of an anticorrelated where strong activation of the sympathetic nervous system (SNS) for fight-or-flight responses inhibit digestive activity mediated by the parasympathetic nervous system (PSNS).

7. Default Mode and Task Positive Networks

The default mode network (DMN) is the baseline activity of the brain when an individual is at wakeful rest (Raichle et al., 2001). An individual may be simply daydreaming, thinking about others or self, reflecting on the past or planning for the future, or visioning. The DMN also activates with moral concern, intrinsic motivation, and positive assessment (Boyatzis et al., 2014; Boyatzis et al., 2019; Jack et al., 2013a). Boyatzis et al. (2019) posit that the DMN is a social network that is activated when communication and relationship-building occur. The DMN responds to socio-emotional oriented stimuli known as positive emotional attractors (PEAs; Jack et al., 2013a; Jack et al., 2013b; Boyatzis et al., 2015). The health benefits and physiological effects of positive emotion are well documented in the literature (Davidson, 2003; Kiken et al., 2017; Sheldon & Lyubomirsky, 2006; Tugade et al., 2005).

DMN activation is associated with the parasympathetic nervous system functions associated with digestion, lower heart rate, lower respiration, and other systems activated when the body is at rest (Boyatzis, 2019). The DMN has been demonstrated to activate during specific mentoring approaches related to the attainment of professional goals (Boyatzis et al., 2019; Jack et al., 2013a; Jack et al., 2013b). Whether the DMN is activated or not may depend, however, on whether a specific event, task, or intervention is perceived and approached with enthusiasm or trepidation. If allowed to activate without balanced brain network activity, the DMN also is associated with depression and rumination (Hamilton et al., 2011; Hamilton et al., 2015; Zhu et al., 2017).

The identification of baseline network activity (i.e., DMN) in the brain is accompanied by the identification of another task-specific, network, the task positive network (TPN). It is now widely accepted that the DMN and TPN are two distinct neural networks within the brain. The TPN activity, in contrast to the DMN, is concerned with analytical and logical reasoning. TPN is anticorrelated to the DMN and activates when focus, analysis, and logic are required for problem solving and task-oriented stimuli. The TPN also is activated by negative emotional attractors (NEA) that are associated with extrinsic motivation, attention to behaviors in need of improvement or shortcomings, and critical evaluations (Boyatzis et al., 2014; Boyatzis et al., 2019; Jack et al., 2013a; Jack et al., 2013b). TPN and NEA activate the sympathetic nervous system (SNS). The SNS is associated with the neuroendocrine response of fight-or-flight and elevates respiration, heart rate, and blood pressure. Broadly, activation of the TPN invokes the neuroendocrine survival network in response to threat.

Boyatzis et al. (2014) refer to the DMN and TPN as antagonistic systems to represent their

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anticorrelated qualities. In other words, it is assumed that the DNM and TPN cannot co-active. However, research also reveals that activation of the DMN may not always correlate to inhibition of the TPN (Jack et al., 2013b ; Raichle et al., 2001). The DMN and TPN do not seamlessly fit the definition of anticorrelated networks. In fact, there may be a shared region between both networks, the dorsolateral prefrontal cortex (DLPFC), that allows an individual to readily switch between or balance the ability to attend to relationship and task demands (Hill, 2014). The dichotomy between the DMN and TPN may not be as clear-cut as originally supposed (Rochford, n.d.).

8. DMN and TPN Mentoring Strategies

Psychosocial versus task oriented coaching strategies have been discussed in the literature for many years (Husband, 1985; Livi et al., 2008; Boyatzis et al., 2014; Boyatzis et al., 2019). The collective work by Boyatzis and Jack (2013) identified a neurological basis for the effects of these opposing coaching styles.

Research evidence suggests that using PEAs in mentoring and coaching contexts activate the DMN. In essence, PEAs focus on the mentee and her vision of ideal self, aspirations, and core values. PEAs underscore compassion for the mentee's hopes, dreams, strengths, and personal vision. PEAs elicit positive emotions such as joy, hope, gratitude, and curiosity that serve to enhance motivation, creativity, and sustained behavioral change (Boyatzis, 2008; Botayzis et al., 2019; Howard, 2015; Jack et al., 2013a). Initially and periodically activating the DMN during mentoring is likely to enhance pair-bonding as well as mentee trust and motivation.

In contrast, TPN oriented mentoring and coaching focuses on externally defined criteria for success or criteria determined by a mentor, compliance, and an individual's shortcomings or areas in need of improvement. NEA mentoring tends to activate the TPN and the SNS. NEAs arouse negative emotions or defensive reactions and rarely result in sustained behavioral change (Botayzis, 2019; Howard, 2015). Overall, the research demonstrates the benefits of psychosocial, PEA focused mentoring versus problem-focused mentoring in generating sustained behavioral changes accompanied by positive emotions (Boyatzis, 2019; Howard, 2015). The activation of the DMN through PEAs is more likely to lead to effective mentoring outcomes and sustained behavioral changes as a mentee identifies and is encouraged to work towards her ideal self. Mentoring that targets the TPN and elicits NEAs appears to be less successful (Akrivou & Boyatzis, 2006; Boyatzis et al., 2019; Love, 2014).

The impact and outcomes of mentoring clearly depend on the predominant focus and interventions of the mentor. Knowledge of the neurological and physiological effects of the use of PEAs and NEAs provides mentors with a deeper understanding of the impact of the strategies used with mentees. Mentoring that is overly task-oriented using NEAs and targeting the TPN is unlikely to serve as a panacea to the career related stress experienced by millennial women and may induce and increase stress. Moreover, mentoring using predominantly task-oriented strategies may serve to further undermine mentee confidence. Relying too heavily on the DMN and the elicitation of PEAs during the

mentoring process, however, may delay or impair a mentee's motivation to take action to achieve specific goals.

Boyatzis et al. (2014) note that "an over-emphasis on task-oriented leadership may prove deleterious to the social and emotional aspects of leadership. Similarly, an overemphasis on the DMN would result in difficulty focusing attention, making decisions, and solving known problems" (para. 1). A balance and the ability to change focus between the DMN and TPN are encouraged. Mentors may best serve their mentees by becoming adept at sensing, recognizing, appraising, and managing the emotional flow and immediate situational determinants of the relationship by strategically activating the DMN or the TPN.

9. Chemical Opportunities

The mentoring relationship ideally evolves as an authentic partnership involving mutual learning based on the intrapersonal as well as interpersonal awareness, honesty, and openness of both the mentor and mentee. Although mentees are ultimately responsible for determining and accomplishing goals and their overall professional development, mentors are largely responsible for developing trust, encouragement, and support as well as providing guidance, direction, and challenge.

Garvey and Alred (2003) observed that mentees most often seek mentoring during transitional experiences (e.g., dissolution of a relationship, death of a beloved family member, change of career or position, or geographic relocation). The experience of liminality and liminal spaces, the experience of being situated between what was and what will be, can be exciting, but most often is uncomfortable, anxiety arousing, stressful, and even painful. Liminality is experienced in transformative moments in life, evokes strong emotions, and is typically associated with NEA, rather than PEA activity. The experience of liminality can be an opportunity for transformation, growth, creativity, and innovation. With regard to cross-generational mentoring of millennial women, liminal spaces offer a vantage point from which both participants may activate PEAs through envisioning and constructively challenging time honored, but questionable or outdated traditions and structures in academe.

It is important to note that hormonal effects accompany both external and internal events, including memories, thoughts, and expectations as well as the neurological impacts of PEA and NEA. Boyatzis et al. (2019) associate the production of oxytocin during DMN, PEA, and PSNS events. However, it is well documented that the neuropeptide oxytocin is also produced during emotional stress, which is associated with TPN, NEA, and SPNS events (Huber et al., 2005; Love, 2014; Onaka, 2004; Sripada et al., 2012; Viviani et al., 2011; Zhu & Onaka, 2003).

Oxytocin functions as a hormone and a neurotransmitter and is produced in response to environmental and interpersonal stress. The supraoptic and paraventricular nuclei of the hypothalamus stimulate the release of oxytocin from the posterior pituitary gland in response to stimuli (Onaka, 2004; Rodrigues et al., 2009; Zhu & Onaka, 2003). Oxytocin mediates cortical fear responses by diverting signaling from the brain stem and limbic system to the forebrain facilitating higher levels of assessment of stressful situations (Blaess et al., 2017; Huber et al., 2005; Sripada et al., 2012). Oxytocin also is associated with

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interpersonal bonding (Olff et al., 2013).

Another relevant chemical mediator is the neurotransmitter, dopamine. Dopamine is implicated in the reinforcement of memory that attributes motivational value and salience to events (Baik, 2013; Baliki et al., 2013; Wise, 2004). Although dopamine has been associated with the emotional state of happiness, there is research suggesting that dopamine may be more accurately associated with the desire to be rewarded (i.e., motivational salience) and the expression of affiliative behaviors (Berridge & Robinson, 1998; Love, 2014). Essentially, dopamine is responsible for the positive, feel good emotions that are generated when tasks or goals are accomplished and serves as a chemical catalyst for future goal attainment. In contrast, oxytocin is released when the sense of care, connectedness, and companionship are experienced by an individual (Sinek, 2017).

Cross-generational and cross-cultural dyads may differ in their values, perceptions, and expectations. Mentors may be seen as authority figures, questionable superiors, or allies. Moreover, the perception of what is enjoyable or stressful differs among individuals. For example, some mentees may perceive TPN strategies as stressful, and other mentees may perceive the same TPN strategies as expected interventions. Some mentees may react to the evocation of emotion as unnecessary or as a threat, while others welcome the opportunity for emotional expression or validation. This point is fundamental to accurately assessing the personality, cultural values, and maturity of the mentee in application TPN and DMN strategies. Some mentees may initially react more positively and produce more dopamine in response to the compliance oriented TPN strategies than they do to DMN ideal-self, vision-oriented strategies. As Boyatzis et al. (2019, p. 35) suggest, a wise and adept mentor must discern whether a mentee is articulating a vision of who they think they should be and what they should do, rather than who they want to be and want to do. Experienced and adept mentors must learn to optimally discern and time the introduction of DMN and TPN strategies. Effective mentors genuinely listen to a mentee exercising self-awareness and emotional self-control both of which require intention, vigilance, and effort (p. 145) as well as cognitive, emotional, and behavioral empathy (p. 147).

10. *O-Zones* and Dynamic Mentoring

The mentoring process is not linear, predictive, or isolated from current events. Participants, especially mentors, need to be prepared to adapt and respond not only to the liminal spaces in mentees' lives, but also to unexpected institutional, local, national, or global events. Incidents of campus violence, natural disasters, and crises such as the COVID-19 global pandemic exemplify the intensity of sudden change that can leave a lasting impact on individuals and institutions. Mentoring, as life itself, is a dynamic and ever-changing process.

The neurological and physiological responses to sudden change and other experiences of liminality are complex. For example, stress reactions are chemically sustained through elevated serum cortisol levels for several hours after the stressor occurs (Hannibal & Bishop, 2014). The ability to detect and respond to nuances in neuroendocrine chemistry offer a mentor a substantial and dynamic edge.

Individuals can and do interpret events differently. Sudden change and experiences of liminality may be perceived by some as energizing and exciting, whereas others may react with anxiety, fear, and vulnerability. Depending on a mentees' reaction, a TPN or DMN approach may best capture the moment and initiate mentee progress. In fact, the inappropriate application of a task-oriented or unwarranted, ubiquitous positivity approach may undermine mentor credibility and be detrimental to the relationship.

A mentor's ability to temporarily suspend or moderate her own reactivity and engage in the demanding affective labor (Hochschild, 2012) of engaging, probing through questioning, validating, and empathizing with a mentee during liminal and often stressful experiences can strengthen the bond and amplify trust in the relationship (Gordon et al., 2008). Increased trust between mentor and mentee has been positively correlated to successful mentoring outcomes (Anderson & Shannon, 1988; Ambrosetti, 2014; Bean, Lucas, & Hyers, 2014; Bower, 2007; Faurer et al., 2014; Qian et al., 2014; Shollen et al., 2014; Wang et al., 2010; White et al., 2010).

Mentoring moments between a mentor and mentee, in contrast to formally scheduled meetings, are spontaneous interactions that occur by chance and can impart "just in time feedback" from the mentor (Turner & McCarthy, 2015, p. 1). A hallmark of a mentoring moment is the presence of stress. Learning moments, relational changes within the mentor-mentee relationship, times when significant action is required, and times of significant emotional change can be mentoring moments (deHaan, 2019).

O-zones are key mentoring moments accompanied by neuroendocrine chemical responses that occur during times of interpersonal and intrapersonal stress. *O-zones* offer mentors opportunities to develop and further the mentor-mentee relationship through support during times of stress or discouragement (Blaess et al., 2017) or praise, appreciation, and encouragement as a result of accomplishments. Understanding the neurochemical opportunities or *O-zones* as they arise in the mentor-mentee relationship may assist mentors in optimizing pair-bonding and more importantly mentee growth and development. Mentors can be educated to identify and optimize *O-zone* opportunities.

The production of specific neuropeptides, neurotransmitters, and hormones in response to stress can assist a mentor in capitalizing on opportunities for further development of trust bonding as well as facilitating mentee psychosocial and emotional intelligence. In the same way Boyatzis and Jack (2018) fortified mentoring strategies by linking neuroscience to human behavior, Blaess at al. (2017) propose that the production of oxytocin during stress is a biological link to optimizing the extensive human process of mentoring.

Capturing opportunities to foster bonding in the mentoring relationship during stressful events can be strategically productive. At such times it may be most effective to embrace the complexities and chemical overlap of the DMN/PEA and TPN/NEA mentoring strategies. Mentors need to discern stressful mentee experiences as growth opportunities and to identify the neuroendocrine window of mentee vulnerability to strengthen the mentoring bond (Blaess et al., 2017). Genuine listening and dialogue designed to explore emotional reactions, challenge assumptions and interpretations, and offer

understanding, support, and encouragement, are likely to facilitate personal as well as subsequent higher education institutional development.

11. Conclusion

Many members of the boomer generation delayed retirement and remained in their academic positions due to the financial crisis of 2007-2008. As many as 81%, however, remained in academia not for economic reasons, but rather due to their professional commitment to students and institutions (Flaherty, 2013). Even prior to COVID-19 pandemic, many higher educational institutions faced financial challenges; issues pertaining to student health, mental health, housing, and food; equitable access to technology; and, increasing public scrutiny. COVID-19 has amplified these concerns and brought others to the forefront. Among other pressing issues, the COVID-19 pandemic has magnified is the inevitable, eventual turnover of higher education leadership and faculty as well as the critical need for institutional leadership planning and preparation.

By 2021, millennials are expected to comprise 75% of the workforce (Morrison-Williams, n.d.). Millennials, particularly millennial women, are a highly educated generation. Approximately 27% of millennial females and 21% of millennial males hold college degrees. In contrast, among members of the boomer generation, only 14% of females and 17% of males earned college degrees (Morrison-Williams, n.d.). More importantly, as of 2015, women in the US earned more than 50% of all PhDs (Okahana & Shou, 2018) and represented 51.5% of assistant professors and 32% of full-professorships. Although women represent a substantial portion of the talent pool in academia, they continue to be underrepresented in tenured academic faculty and leadership positions such as department chairs, deans, and presidencies. Explicit and implicit gender biases, stereotypes, and gender-based marginalization continue to deter women's career advancement and educational institutions are not immune.

In corporate America, succession planning has been instrumental in sustaining efficient leadership transitions. Although slow to gain traction in higher education, succession preparedness and planning are critical to the development of future leaders, institutional continuity, and the achievement of an institution's long-term goals. As Davis (n.d., p. 2) points out, "Leadership preparation requires thoughtful, careful exposure of individuals to activities that … sharpen their capabilities and advances their knowledge while providing the coaching and guidance necessary for successful leadership." Millennial women seek learning and development opportunities, challenges, female role models, and mentors. Mentoring develops future leaders, fosters knowledge transfer, and contributes to the acquisition of critical organization skills. A thoughtful, well designed, and intentionally executed mentoring program may make academic careers more attractive to women and as a result fuel institutional talent, productivity, creativity, and innovation.

A mutually beneficial and productive mentoring dyad is based on a resonant relationship and bond between the mentor and mentee. The establishment of such a relationship cannot be taken for granted.

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The impact and outcomes of mentoring depend largely on the knowledge, preparation, and focus of the mentor. Effective mentoring represents a significant investment of time and energy as well as intellectual and affective labor. Faculty benefit from institution-based mentorship training, guidance, and a deliberate curriculum designed to promote mentorship excellence (Columbia University, n.d.). Neuroscience research has contributed substantial knowledge to the mentoring literature in recent years (Blaess et al., 2017; Boyatzis et al., 2018, 2019; Jack et al., 2013; Love, 2014; O'Connor & Lages, 2019). Strategically applied, the knowledge benefits not only mentor-mentee bonding, but also the impact and outcomes of the relationship.

As we and many others have noted, women in academia remain underrepresented in tenured faculty and institutional leadership roles. Mentoring programs can attract, engage, and retain talent. Mentoring in higher education contributes to overall performance including teaching effectiveness and research productivity. Mentoring improves morale, motivation, and innovation. Mentoring provides millennial women with respite from career stress and a safe place to address issues of advancement through institutional structures. Offering up-to-date, institution-based mentor training and opportunities ensures consistent mentoring quality. When deliberately executed, mentoring offers higher education institutions a host of benefits including greater, overall internal leadership; increased networking throughout a campus; support for diversity efforts; improvement of technical knowledge; and, encouragement for broader and more inclusive visioning (Orsini et al., 2019).

The throes of a seemingly unrelenting pandemic, COVID-19, rapidly disrupted higher educational institutions. Instructional delivery in most institutions quickly moved entirely online; technological upgrades and access were expanded; students moved out of dorms; services offered by libraries, cafeterias, student clubs, and recreation centers became virtual, restricted, or nonexistent; and, a majority of faculty and staff now conduct necessary, institutional business from home or remote locations through virtual means. Leaders faced and continue to face unprecedented challenges as well as fiscal, ethical, and practical decisions potentially having life-and-death consequences for students, faculty, staff, and their institutions as a whole. While much remains uncertain, what is clear is that varying responses to the pandemic and the decisions made will have far-reaching consequences and leave a lasting imprint for many years to come. The value of or need for mentoring may seem superfluous at this tumultuous time. Given more considered deliberation, however, faculty mentoring of millennials, especially women, particularly when paired with succession planning, may be essential to effective higher educational leadership, innovation, and institutional survival.

References

Abbajay, M. (2019, January). Mentoring matters: Three essential elements of success. *Forbes*. Retrieved from https://www.forbes.com/sites/maryabbajay/2019/01/20/mentoring-matters-three-essential-element-of-success/#2a42b85945a9

Akrivou, K., & Boyatzis, R. E. (2006). The ideal self as the driver of intentional change. *Journal of Management Development*, *25*(7), 624-642. https://doi.org/10.1108/02621710610678454

Ambrosetti, A. (2014). Are you ready to be a mentor? Preparing teachers for mentoring pre-service teachers. *Australian Journal of Teacher Education*, *39*(6), 3. https://doi.org/10.14221/ajte.2014v39n6.2

American Psychological Association. (2006). *Introduction to mentoring A guide for mentors and mentees*. Retrieved from https://www.apa.org/education/grad/mentoring

Anderson, E. M., & Shannon, A. L. (1988). Toward a conceptualization of mentoring. *Journal of Teacher Education*, *39*(1), 38-42. https://doi.org/10.1177/002248718803900109

Arora, R., & Rangnekar, S. (2015). Relationships between emotional stability, psychosocial mentoring support and career resilience. *Europe's Journal of Psychology*, *11*(1), 16. https://doi.org/10.5964/ejop.v11i1.835

Baik, J. H. (2013). Dopamine signaling in food addiction: Role of dopamine D2 receptors. *BMB reports*, *46*(11), 519. https://doi.org/10.5483/BMBRep.2013.46.11.207

Baliki, M. N., Mansour, A., Baria, A. T., Huang, L., Berger, S. E., Fields, H. L., & Apkarian, A. V. (2013). Parceling human accumbens into putative core and shell dissociates encoding of values for reward and pain. *Journal of Neuroscience*, *33*(41), 16383-16393. https://doi.org/10.1523/JNEUROSCI.1731-13.2013

Bartel, S. (2018, December). *Leadership barriers for women in higher education*. AACSB International. Retrieved from https://www.bized.aacsb.edu/articles/2018/12/leadership-barriers-for-women-in-higher-education

Bean, N. M., Lucas, L., & Hyers, L. L. (2014). Mentoring in higher education should be the norm to assure success: Lessons learned from the faculty mentoring program, West Chester University, 2008-2011. *Mentoring & Tutoring: Partnership in Learning*, *22*(1), 56-73. https://doi.org/10.1080/13611267.2014.882606

Beaton, C. (2016, October). This is what millennial entitlement does to the workplace. *Forbes*. Retrieved from https://www.forbes.com/sites/carolinebeaton/2016/10/13/this-is-what-millennial-entitlement-does-to-the-workplace/#1273cd9516a5

Berridge, K. C., & Robinson, T. E. (1998). What is the role of dopamine in reward: Hedonic impact, reward learning, or incentive salience? *Brain Research Reviews*, *28*(3), 309-369. https://doi.org/10.1016/S0165-0173(98)00019-8

Blaess, D., Bloom, L. K., Hollywood, K., & Santin, C. (October, 2017) Strategies, stages, and opportunities for maximizing the mentoring relationship. *Chronicle of Mentoring and Coaching*, *Special Issue 10*, 275-281.

Bolman, L. G., & Deal, T. E. (2017). *Reframing organizations: Artistry, choice, and leadership* (6th ed.). Jossey-Bass.

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Bower, G. G. (2007). Factors influencing the willingness to mentor 1st-year faculty in physical education departments. *Mentoring & Tutoring*, *15*(1), 73-85. https://doi.org/10.1080/13611260601037397

Boyatzis, R. (2008). Creating sustainable, desired change in teams through application of intentional change and complexity theories. In *Creating Sustainable Work Systems* (pp. 129-142). Routledge.

Boyatzis, R. E., & Jack, A. I. (2018). The neuroscience of coaching. *Consulting Psychology Journal: Practice and Research*, *70*(1), 11-27. https://doi.org/10.1037/cpb0000095

Boyatzis, R. E., Rochford, K., & Jack, A. I. (2014). Antagonistic neural networks underlying differentiated leadership roles. *Frontiers in Human Neuroscience*, *8*, 114. https://doi.org/10.3389/fnhum.2014.00114

Boyatzis, R., Smith, M., Van Oosten, E. (2019). *Helping people change: Coaching with compassion for lifelong learning and growth*. Harvard Business Review Press.

Cardel, M. I., Dhurandhar, E., Yarar-Fisher, C., Foster, M., Hidalgo, B., McClure, L. A., … Angelini, C. (2020). Turning chutes into ladders for women faculty: A review and roadmap for equity in America. *Journal of Women's Health*, *29*(5), 1-13. https://doi.org/10.1089/jwh.2019.8027

Columbia University, Office of the Provost. (n.d.). *Guide to best practices in faculty mentoring*.

Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., … Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, *65*(4), 564-570. https://doi.org/10.1097/01.PSY.0000077505.67574.E3

Davis, P. D. (n.d.) *Preparing leaders for the future*. American Council on Education. Retrieved from https://www.acenet.edu/Programs-Services/Pages/professional-learning/Preparing-Leaders-for-the-Future.aspx

deHaan, E. (2019). *Critical moments in executive coaching: Understanding the coaching process through research and evidence-based theory*. Routledge.

Faurer, J., Sutton, C., & Worster, L. (2014). Faculty mentoring: Shaping a program. *Contemporary Issues in Education Research*, *7(*2), 151-154. https://doi.org/10.19030/cier.v7i2.8487

Flaherty, C. (2013, June). Working way past 65. *Educause*. Retrieved from https://www.insidehighered.com/news/2013/06/17/data-suggest-baby-boomer-faculty-are-putting-retirement

Fox, M. D., Snyder, A. Z., Vincent, J. L., Corbetta, M., Van Essen, D. C., & Raichle, M. E. (2005). The human brain is intrinsically organized into dynamic, anticorrelated functional networks. *Proceedings of the National Academy of Sciences*, *102*(27), 9673-9678. https://doi.org/10.1073/pnas.0504136102

Gadbois, S. A., & Graham, E. (2012). New faculty perceptions of supervision and mentoring: The influence of graduate school experiences. *Collected Essays on Learning and Teaching*, *5*, 44-49. https://doi.org/10.22329/celt.v5i0.3416

Gardner, S. K. (2016, Summer). Mentoring the millennial faculty member. *The Department Chair: A Resource for Academic Administrators*, *27*(1), 6-8. https://doi.org/10.1002/dch.30088

Garvey, B., & Alred, G. (2003). An introduction to the symposium on mentoring: Issues and prospects. *British Journal of Guidance and Counselling*, *31*(1), 3-9. https://doi.org/10.1080/0306988031000086125

Gordon, I., Zagoory-Sharon, O., Schneiderman, I., Leckman, J. F., Weller, A., & Feldman, R. (2008). Oxytocin and cortisol in romantically unattached young adults: Associations with bonding and psychological distress. *Psychophysiology*, *45*(3), 349-352. https://doi.org/10.1111/j.1469-8986.2008.00649.x

Gwoke, P. (2019, May). Knowledge transfer: Mentoring millennials. *BridgeWorks*. Retrieved from http://www.generations.com/2019/05/30/knowledge-transfer-mentoring-millennials/

Hairston Green, D. Y., & Smith, L. S. (2015). Institutional culture impact on leading teams and mentoring. New Mexico Mentoring Institute. *New Perspectives in Mentoring: A Quest for Leadership Excellence & Innovation.* New Mexico Mentoring Institute, Albuquerque, New Mexico.

Hamilton, J. P., Farmer, M., Fogelman, P., & Gotlib, I. H. (2015). Depressive rumination, the default-mode network, and the dark matter of clinical neuroscience. *Biological Psychiatry*, *78*(4), 224-230. https://doi.org/10.1016/j.biopsych.2015.02.020

Hamilton, J. P., Furman, D. J., Chang, C., Thomason, M. E., Dennis, E., & Gotlib, I. H. (2011). Default-mode and task-positive network activity in major depressive disorder: Implications for adaptive and maladaptive rumination. *Biological Psychiatry*, *70*(4), 327-333. https://doi.org/10.1016/j.biopsych.2011.02.003

Hannibal, K. E., & Bishop, M. D. (2014). Chronic stress, cortisol dysfunction, and pain: A psychoneuroendocrine rationale for stress management in pain rehabilitation. *Physical Therapy*, *94*(12), 1816-1825. https://doi.org/10.2522/ptj.20130597

Hill, S. (2014). The default-network, task positive network, and goal-directed problem solving. *Western Undergraduate Psychology Journal*, *2*(1).

Hochschild, A. R. (2012). *The managed heart: Commercialization of human feeling* (3rd ed.). University of California Press.

Hollywood, K. G., Blaess, D. A., Santin, C., & Bloom, L. (2016). Holistic mentoring and coaching to sustain organizational change and innovation. *Creighton Journal of Interdisciplinary Leadership*, *2(*1), 32-46. https://doi.org/10.17062/cjil.v2i1.34

Houser, K. A. (2019, March). *What are the key challenges facing women in academia*? SageOcean. Retrieved from https://www.ocean.sagepub.com/blog/what-are-the-key-challenges-facing-women-in-academia

Howard, A. R. (2015). Coaching to vision versus coaching to improvement needs: A preliminary investigation on the differential impacts of fostering positive and negative emotion during real

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time executive coaching sessions. *Frontiers in Psychology*, *6*, 455. https://doi.org/10.3389/fpsyg.2015.00455

HR Daily Advisor. (2020, July). *Majority of female millennials want access to mentors, coaching to reduce stress*. Retrieved from https://www.hrdailyadvisor.blr.com/2020/07/03/majority-of-female-millennials-want-access-to-mentors-coaching-to-reduce-stress/

Huber, D., Veinante, P., & Stoop, R. (2005). Vasopressin and oxytocin excite distinct neuronal populations in the central amygdala. *Science*, *308*(5719), 245-248. https://doi.org/10.1126/science.1105636

Husband, R. L. (1985). Toward a grounded typology of organizational leadership behavior. *Quarterly Journal of Speech*, *71*(1), 103-118. https://doi.org/10.1080/00335638509383720

Ibarra, H. (2015). *Act like a leader, think like a leader*. Harvard Business Review Press.

Jack, A. I., Boyatzis, R. E., Khawaja, M. S., Passarelli, A. M., & Leckie, R. L. (2013a). Visioning in the brain: An fMRI study of inspirational coaching and mentoring. *Social Neuroscience*, *8(*4), 369-384. https://doi.org/10.1080/17470919.2013.808259

Jack, A. I., Dawson, A. J., Begany, K. L., Leckie, R. L., Barry, K. P., Ciccia, A. H., & Snyder, A. Z. (2013b). fMRI reveals reciprocal inhibition between social and physical cognitive domains. *NeuroImage*, *66*, 385-401. https://doi.org/10.1016/j.neuroimage.2012.10.061

Kelly, R. (2007, February). Now is the time to prepare for millennial faculty. *Academic Leader*, *23*(2), 1-4.

Kiken, L. G., Lundberg, K. B., & Fredrickson, B. L. (2017). Being present and enjoying it: Dispositional mindfulness and savoring the moment are distinct, interactive predictors of positive emotions and psychological health. *Mindfulness*, *8*(5), 1280-1290. https://doi.org/10.1007/s12671-017-0704-3

Livi, S., Kenny, D. A., Albright, L., & Pierro, A. (2008). A social relations analysis of leadership. *The Leadership Quarterly*, *19*(2), 235-248. https://doi.org/10.1016/j.leaqua.2008.01.003

Love, T. M. (2014). Oxytocin, motivation and the role of dopamine. *Pharmacology Biochemistry and Behavior*, *119*, 49-60. https://doi.org/10.1016/j.pbb.2013.06.011

Mayo Clinic Staff. (n.d.). *Stress symptoms: Effects on your body and behavior*. Mayo Clinic Foundation for Medical Education and Research. Retrieved from https://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress-symptoms/art-20050987

Morrison-Williams, S. (n.d.). *Millennials – Changing the face of higher education*. Pacific Institute. Retrieved from http://www.educationinitiative.thepacificinstitute.com/articles/story/millennials-changing-the-face-of-higher-education

Ms. Career Girl3190. (n.d.). *Two out of three millennial women say access to role models and mentors would increase their confidence at work*. Retrieved from https://www.mscareergirl.com/two-out-of-three-millennial-women-say-access-to-role-models-and

-mentors-at-would-increase-their-confidence-at-work/#:~:text=Tone%20Networks%2C%20a%20 digital%20executive%20coaching%20platform%20for,levels%20and%20increasing%20workplac e%20confidence%20amongst%20Millennial%20women

National Institutes of Health, Department of Human Resources. (n.d.). *Organizational benefits of mentoring*. Retrieved from https://www.hr.nih.gov/working-nih/mentoring/organizational-benefits-mentoring

Noel, C., & Arscott, C. H. (2020, July). *Be the company millennial women want to work for*. Thinkers50 Limited. https://www.thinkers50.com/blog/millennial-women/

O'Connor, J., & Lages, A. (2019). *Coaching the brain*: *Practical applications of neuroscience to coaching*. Routledge.

Okahana, H., & Shou, E. *Graduate enrollment and degrees: 2007 to 2017*. Council of Graduate Schools.

Olff, M., Frijling, J. L., Kubzansky, L. D., Bradley, B., Ellenbogen, M. A., Cardoso, C., … van Zuiden, M. (2013). The role of oxytocin in social bonding, stress regulation and mental health: An update on the moderating effects of context and interindividual differences. *Psychoneuroendocrinology*, *38*(9), 1883-1894. https://doi.org/10.1016/j.psyneuen.2013.06.019

Orsini, J. M., Benge, M. P., & Carter, H. S. (2019, April). *University of Florida, Department of Agricultural Education and Communication, UF/IFAS Extension*.

Page, M. (2015, May). *What are the benefits of mentoring*? Retrieved from https://www.michaelpage.co.in/advice/management-advice/leadership/what-are-benefits-mentoring

Phillips, S. L., Dennison, S. T., & Davenport, M. A. (2016). High retention of minority and international faculty through a formal mentoring program. *To Improve the Academy*, *35*(1), 153-179. https://doi.org/10.1002/tia2.20034

Pianin, E. (2017, May). *Data shows millennial women are dominating the current job market*. Inc. Retrieved from https://www.inc.com/the-fiscal-times/millennial-women-dominate-job-market-men-overshadowed.html

Posner, M. I., & Raichle, M. E. (1998). The neuroimaging of human brain function. *Proceedings of the National Academy of Sciences*, *95*(3), 763-764. https://doi.org/10.1073/pnas.95.3.763

Postlethwaite, B. E., & Schaffer, R. H. (2019). Creating a mentoring program that works A process for decision makers. *Graziadio Business Review*, *22*.

PricewaterhouseCoopers. (n.d.). *The female millennial A new era of talent*. PwC.

Qian, J., Lin, X., Han, Z. R., Chen, Z. X., & Hays, J. M. (2014). What matters in the relationship between mentoring and job-related stress? The moderating effects of protégés' traditionality and trust in mentor. *Journal of Management & Organization*, *20*(05), 608-623. https://doi.org/10.1017/jmo.2014.46

Ragins, B. R., & Kram, K. E. (2007). *The handbook of mentoring at work: Theory, research, and practice*. Sage.

Raichle, M. E., MacLeod, A. M., Snyder, A. Z., Powers, W. J., Gusnard, D. A., & Shulman, G. L. (2001). A default mode of brain function. *Proceedings of the National Academy of Sciences*, *98*(2), 676-682. https://doi.org/10.1073/pnas.98.2.676

Rochat, P. (2003). Five levels of self-awareness as they unfold early in life. *Consciousness and Cognition*, *12*(4), 717-731. https://doi.org/10.1016/S1053-8100(03)00081-3

Rochford, K. (n.d.). *The opposing domains of leadership: Integrating task and relationship* (Unpublished manuscript). Department of Organizational Behavior, Weatherhead School of Management, Case Western Reserve University.

Rodrigues, S. M., Saslow, L. R., Garcia, N., John, O. P., & Keltner, D. (2009). Oxytocin receptor genetic variation relates to empathy and stress reactivity in humans. *Proceedings of the National Academy of Sciences*, *106*(50), 21437-21441. https://doi.org/10.1073/pnas.0909579106

Saffold, G. (2005). *Strategic planning: Leadership through vision*. Evangel Publishing House.

Schmitz, A. (2020). *Unique obstacles millennial women face in the workplace*. UpCounsel, Inc. Retrieved from https://www.upcounsel.com/blog/telling-stories-building-culture-interview-brave-millennials-laura-youngkin

Sheldon, K. M., & Lyubomirsky, S. (2006). How to increase and sustain positive emotion: The effects of expressing gratitude and visualizing best possible selves. *The Journal of Positive Psychology*, *1*(2), 73-82. https://doi.org/10.1080/17439760500510676

Sripada, C. S., Phan, K. L., Labuschagne, I., Welsh, R., Nathan, P. J., & Wood, A. G. (2012). Oxytocin enhances resting-state connectivity between amygdala and medial frontal cortex. *International Journal of Neuropsychopharmacology*, *16*(2), 255-260. https://doi.org/10.1017/S1461145712000533

Tugade, M. M., Fredrickson, B. L., & Feldman Barrett, L. (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. *Journal of Personality*, *72*(6), 1161-1190. https://doi.org/10.1111/j.1467-6494.2004.00294.x

Turban, D. B., & Lee, F. K. (2007). The role of personality in mentoring relationships: Formation, dynamics, and outcomes. In B. R. Ragins, & K. E. Kram (Eds.), *The handbook of mentoring at work: Theory, research, and practice* (pp. 21-50). Sage.

Turner, C., & McCarthy, G. (2015). Coachable moments: Identifying factors that influence managers to take advantage of coachable moments in day-to-day management. *International Journal of Evidence Based Coaching and Mentoring*, *13*(1), 1-13.

University of California, Davis. (n.d.). *The benefits of mentoring*. Retrieved from https://www.hr.ucdavis.edu/departments/learning-dev/toolkits/mentoring/benefits

University of Nevada Medical Center, Reno. (2016). *Inspirational mentor of educators*. Retrieved from https://www.unmc.edu/academicaffairs/faculty/mentoring/mentoring-awards.html

Viviani, D., Charlet, A., van den Burg, E., Robinet, C., Hurni, N., Abatis, M., … Stoop, R. (2011). Oxytocin selectively gates fear responses through distinct outputs from the central amygdala. *Science*, *333*(6038), 104-107. https://doi.org/10.1126/science.1201043

Wanberg, C. R., Welsch, E. T., & Hezlett, S. A. (2003). Mentoring research: A review and dynamic process model. *Research in Personnel and Human Resources Management*, *22*, 39-124. https://doi.org/10.1016/S0742-7301(03)22002-8

Wang, S., Tomlinson, E. C., & Noe, R. A. (2010). The role of mentor trust and protégé internal locus of control in formal mentoring relationships. *Journal of Applied Psychology*, *95*(2), 358-367. https://doi.org/10.1037/a0017663

White, A., Brannan, J., & Wilson, C. B. (2010). A mentor-protégé program for new faculty, part I: Stories of protégés. *Journal of Nursing Education*, *49*(11), 601-607. https://doi.org/10.3928/01484834-20100630-04

Wicks, J. (2017, July 19). *Integrating millennials into higher education administration*. Inside Higher Ed. Retrieved from https://www.insidehighered.com/views/2017/07/19/how-integrate-millennials-higher-ed-administration-essay

Wise, R. A. (2004). Dopamine, learning and motivation. *Nature Reviews Neuroscience*, *5*(6), 483-494. https://doi.org/10.1038/nrn1406

World Health Organization. (2019, May). *Burn-out is an "occupational phenomenon": International Classification of Diseases*. Retrieved from https://www.who.int/mental_health/evidence/burn-out/en/

Yim, L., & Waters, L. (2013). The role of interpersonal comfort, attributional confidence, and communication quality in academic mentoring relationships. *Education Research and Perspectives*, *40*, 58.

Zachary, L. J. (2009). *The mentee's guide: Making mentoring work for you*. Jossey Bass.

Zhu, L. L., & Onaka, T. (2003). Facilitative role of prolactin-releasing peptide neurons in oxytocin cell activation after conditioned-fear stimuli. *Neuroscience*, *118*(4), 1045-1053. https://doi.org/10.1016/S0306-4522(03)00059-9

Zhu, X., Zhu, Q., Shen, H., Liao, W., & Yuan, F. (2017). Rumination and default mode network subsystems connectivity in first-episode, drug-naive young patients with major depressive disorder. *Scientific Reports*, *7*, 43105. https://doi.org/10.1038/srep43105