



An Analysis of a Conflict Between the Theories of Creationism and Science in the Experience of a Pre-service Physics Teacher

Michael Paul Lukie

Volume 9, Number 1-2, August–December 2021

URI: <https://id.erudit.org/iderudit/1091472ar>

DOI: <https://doi.org/10.7202/1091472ar>

[See table of contents](#)

Publisher(s)

International Centre for Innovation in Education/Lost Prizes International

ISSN

2291-7179 (print)

2563-6871 (digital)

[Explore this journal](#)

Cite this article

Lukie, M. (2021). An Analysis of a Conflict Between the Theories of Creationism and Science in the Experience of a Pre-service Physics Teacher. *International Journal for Talent Development and Creativity*, 9(1-2), 81–98.
<https://doi.org/10.7202/1091472ar>

Article abstract

This paper explores a conflict a pre-service physics teacher experienced while completing a teaching practicum at a religious high school that supported creationism. As a result of the conflict, the pre-service teacher was scapegoated by the staff and students at the school. An analysis of the projective dynamics involved in this conflict are explored including scapegoating, psychic inflation, fanaticism for science, and what was constellated in the pre-service teacher's personal, familial, and cultural unconscious. In examining the pre-service teacher's unconscious, it will be suggested that religion is part of the pre-service teacher's repressed shadow and the cooperating/mentor teacher's religious projections helped to constellate this shadow element. By examining the conflicts that arise between pre-service teachers and their cooperating teachers as a result of psychodynamics and differing worldviews, educators can begin to understand how analytical psychology may be applied so that such conflicts may be depotentiated in the future.

An Analysis of a Conflict Between the Theories of Creationism and Science in the Experience of a Pre-service Physics Teacher

Michael Paul Lukie

University of Winnipeg, Faculty of Education, Winnipeg, Manitoba, Canada

Abstract

This paper explores a conflict a pre-service physics teacher experienced while completing a teaching practicum at a religious high school that supported creationism. As a result of the conflict, the pre-service teacher was scapegoated by the staff and students at the school. An analysis of the projective dynamics involved in this conflict are explored including scapegoating, psychic inflation, fanaticism for science, and what was constellated in the pre-service teacher's personal, familial, and cultural unconscious. In examining the pre-service teacher's unconscious, it will be suggested that religion is part of the pre-service teacher's repressed shadow and the cooperating/mentor teacher's religious projections helped to constellate this shadow element. By examining the conflicts that arise between pre-service teachers and their cooperating teachers as a result of psychodynamics and differing worldviews, educators can begin to understand how analytical psychology may be applied so that such conflicts may be depotentiated in the future.

Keywords: Analytical psychology; complexes; shadow; projection; psychological types; cultural unconscious; personal unconscious; familial unconscious; scapegoating; archetypal reflectivity; physics education; teacher education.

Introduction

The conflict central to this psychodynamic analysis centers upon my pre-service teaching practicum where my scientific view that the age of the Earth was very old was challenged by my cooperating teacher who believed that the age of the Earth was very young. By analyzing this conflict through the lens of analytical psychology, I am now better able to understand the ways my shadow and my complexes contributed to the problem. I wondered what "fragment of involuntary psychic activity" (Jung, 1960/2014j, p. 282) the conflict revealed about my unconscious and how the analysis of this conflict may reveal insights into myself that may not otherwise have been possible. This paper provides a creative application of Carl Jung's analytical psychology to education and may potentially provide educators with the opportunity to enrich their talent development through understanding the psychodynamics of teaching and learning. Using a Jungian lens to interpret and analyze the psychodynamics of teaching and learning introduces creative new ideas that may enrich the understanding of complex teaching and learning processes.

In sharing this conflict, my hope is to highlight its significance, more precisely Jung's theories of complexes and psychological types, and the role of archetypal reflectivity (Mayes, 1999, 2003, 2005, 2007; Dobson, 2008, 2009; Moore, 1991; Moore & Gillette, 1992) to teacher education so that they might inform pre-service teacher education programs. Fidyk (2016a, 2016b, 2017a, 2017b) makes the case for the significance of studying the unconscious dynamics at play in the classroom and Dobson (2008) suggests that the dominant approaches to educational psychology have long overlooked the unconscious dimensions of the mind. Indeed, Fidyk (2017a) stresses that it is unlikely that teachers will turn to analytical psychology as a way to understand their pupils or themselves, so it is important that teacher education programs include Jung, Jungian, and post-Jungian scholars in their education programs. By examining such conflicts through the particularities of this one case, other

pre-service teachers may begin to understand the psychodynamics of such conflicts and the ways they may be depotentiated in the future thereby transforming their pedagogy. Since some readers may not be familiar with some of the terminology presented in this paper, a glossary of terms has been provided.



Vasudhara Mandala dated to 1777 (Samvat 897) - Metropolitan Museum of Art
https://commons.wikimedia.org/wiki/File:Vasudhara_Mandala_MET_DP-17356-001.jpg

To investigate the art of Carl Jung, see: <https://speakingofjung.com/blog/?offset=1549112445076>

The conflict

The conflict I had with my physics cooperating teacher was about the age of the Earth, I contended that the Earth was very old while my cooperating teacher contended it was very young. In Winnipeg, Manitoba, Canada, as part of Bachelor of Education programs, pre-service teachers are assigned to a particular high school and teach a six-week practicum under the guidance and supervision of a cooperating teacher. For my practicum, I was assigned to teach grade twelve physics at a religious high school² where students took Bible study courses and time was allotted for daily prayer.

The conflict arose at the end of one of my physics lessons when I discussed paleoclimatology, the study of Earth's ancient climate (Bradley, 1999). The discussion about paleoclimatology provided the physics class with a real-world context about how physicists use ice cores to study the Earth's ancient climate. By studying ice cores obtained from Antarctica, I explained that physicists were able to obtain detailed information about the Earth's ancient air temperature and CO₂ levels going back many hundreds of thousands of years (Lüthi et al., 2008; Barnola et al., 1987; Petit et al., 1999).

I explained to my students that oxygen has two isotopes, oxygen 16 and oxygen 18, and that by comparing the ratios of these two isotopes in ice cores, physicists could determine changes in the Earth's ancient climate (Jouzel et al., 1994). Despite my excitement about paleoclimatology, I was not able to elicit any discussion from my physics students about an ancient Earth climate, and I felt concerned that none of the students seemed willing to engage in a conversation with me. The discussion that I attempted to have with my students only lasted about five minutes, and I remember attributing their trepidation in talking with me to the fact that it was the last class of the day. After the students had left, my cooperating teacher invited me to discuss my physics lesson, but I could already sense that he seemed agitated. The N (intuition) of my personality typology (INFJ)³, which identifies my type of personality or my type of consciousness, was already at work.

My cooperating teacher, in good pedagogical form, began with constructive criticism about my physics lesson and then said he had some words of caution for me. He said that I should not have suggested an ancient age of the Earth. He tried to explain in a very diplomatic way that teachers and students at the school believe in creationism and a young age of the Earth. He further explained that many faculty and students at the religious school take the Bible literally, placing the Earth's age after the time of Noah and the great flood or 6000 years old. By my suggesting that the Earth was older than 6000 years, I was promoting an antagonistic point of view, contrary to the views of the students, teachers, and the school. I was told by my cooperating teacher that students who attend the school hold the view that the Earth is 6000 years old, and I should not engage in discussions that challenge their views. I was instructed to strictly follow the curriculum and not to engage in any more improvised discussions with the students without first discussing these topics with him before my physics lessons.

I found my cooperating teacher's point of view and advice highly disturbing. I asked my cooperating teacher if he believed the Earth was 6000 years old, and he answered that he believed in the literal word of the Bible. I was mystified as to how someone who was teaching physics could hold such a view, and I could not comprehend his answer. I argued with him suggesting that scientists have

² According to the Manitoba Education and Advanced Learning website:
http://www.edu.gov.mb.ca/k12/schools/ind/non_fund_ind.html

In Manitoba, there are two kinds of independent schools: Funded Independent Schools and Non-Funded Independent Schools. Funded Independent Schools implement provincially mandated curriculum, hire Manitoba certified teachers, and meet other provincial requirements. Non-Funded Independent Schools are not required to meet these conditions (Manitoba Education and Advanced Learning, 2015).

³ INFJ: Introverted Intuitive Feeling Judging. According to Jung's theory of psychological types, INFJs direct their energy inward, and decisions are made with feeling. INFJs are independent, highly intuitive deep thinkers, empathetic, warm, and caring.

discovered trees that are much older than 6000 years. It has been reported by Öberg and Kullman (2011) that the world's oldest recorded tree is a 9550 year old spruce in the Dalarna province of Sweden "dating back to the early Holocene (9500 cal. yr BP)" (p. 183).

I debated with my cooperating teacher about the light year or the time it takes light to travel in one year. I explained that the speed of light is well known to physicists, where the speed of light in a vacuum equals "299 792 458 ms⁻¹" (Mohr & Taylor, 2005, p. 7), and that astronomers have discovered planetary objects whose light has taken more than 6000 light years to reach Earth (van den Heuvel, 2016). In fact, I further argued that based upon the speed of light, scientists have discovered galaxies billions of light years away from the Earth, and that the universe is approximately 13.8 billion years old (Jarosik et al., 2011). The National Aeronautics and Space Administration (NASA) launched a satellite called **The Wilkinson Microwave Anisotropy Probe (WMAP)** in June 2001, which was designed to map the cosmic microwave background (CMB) radiation over the entire sky in five frequency bands (Jarosik et al., 2011). The data obtained from the WMAP revealed that the age of the universe is approximately "13.75±0.13 Gyr" (Jarosik et al., 2011, p. 14) or 13.75 billion years old.

I remember finally giving up on my attempt with scientific reasoning. I stated to my cooperating teacher that I would stick to 'the plan' and would not deviate from the prescribed lessons we agreed upon. In this way, I was being directed by my cooperating teacher to teach the 'curriculum-as-plan' (Aoki, 2005) rather than

teaching from the indwelling between zone with 'curriculum-as-lived' (Aoki, 2005) that unfolds in the moment among the particularities of students and place in relation to the planned lesson. Aoki (2005) suggests that teaching in the 'Zone of Between' is "an extraordinarily unique and precious place, a hopeful place, a trustful place, a careful place" (p. 164) that leads to an authentic curriculum and new curricular possibilities. To that point, I had been seeking to balance curriculum-as-plan with curriculum-as-lived.

The conflict finally ended when I asked my cooperating teacher if I should apologize for stating views contrary to the status quo, but he said the students understood well 'my kind of position' and an apology would not be necessary. I immediately felt marginalized and, for the rest of my teaching practicum, was worried that I may be transferred to another school based upon this incident. The remaining classes of my practicum went well, but I constantly felt that I was being closely monitored and that I was being subjected to a form of censorship. I had never encountered a group in education with such a radically different worldview than mine. I came to my views about the world based upon critical thinking and a reasoned scientific analysis, whereas the students and cooperating teacher came to their views about the world based upon faith in the literal translation of the Bible.

Complexes

Singer (2014) suggests that differentiating complexes can become an immensely liberating and deeply meaningful psychological task. The conflict with my cooperating teacher activated several complexes striking through the levels of my personal, familial, and cultural unconscious. Jung (1960/2014h) describes a complex as "the image of a certain psychic situation which is strongly accentuated emotionally and is, moreover, incompatible with the habitual attitude of consciousness" (p. 96). In the classroom, Fidyk (2017a) suggests that complexes thrive, as the relationships among teachers and students are often patterned upon parent/guardian-child dynamics. In addition, teachers' complexes can be activated when acting out of their splinter psyches due to a lack of ego strength, due to a lack of a differentiated consciousness, and through stress, fatigue, or overwhelm (Fidyk, 2017a).

In differentiating my personal complexes, I can share that my mother and father were both Ukrainian Catholic and raised me as Ukrainian Catholic. However, religion was not so strongly emphasized in the household as to censor scientific knowledge. Since my father was a science teacher and my mother was a resource teacher, what was emphasized in my household was critical thinking. I was an altar boy throughout my childhood and when I was 13, our Ukrainian Catholic family priest asked me if I would ever consider becoming a priest. Therefore, in my conflict with the cooperating teacher, religion was part of my shadow.

My shadow contents contained my reservation for religion, and its adherence to doctrine and lack of scientific reasoning. Since I was raised to cautiously think about the role of religion in terms of science, I was troubled by what religion appeared to be doing to my young students. My students were not being educated to think critically but were being educated to follow religious doctrine and its condoned truths. Recall that I was asked to become a priest, and I rejected this option. This rejection lay dormant; in other words, my shadow priest was repressed in my unconscious and I projected my doubt about priesthood, faith in literal readings of the Bible, and religious indoctrination upon the cooperating teacher. By extension, the way in which the cooperating teacher expressed his belief in creationism suggests that he carried part of my shadow contents that I had long repressed for religion. Jung (1935/2014b) writes that “the general psychological reason for projection is always an activated unconscious that seeks expression” (p. 152). Therefore, my unconscious repressed religious shadow was activated and sought expression precisely by my cooperating teacher for whom I was expressing his shadow contents, those contents that included a validation of the scientific method and critical thinking. Jung (1960/2014i) aptly writes, “we always see our own unavowed mistakes in our opponent...[and] an excellent example of this are to be found in personal quarrels” (p. 264-265). At the time of the conflict, I was not “possessed with an unusual degree of self-awareness” (Jung, 1960/2014i, p. 265); therefore, I could not see through the projection but succumbed to it. The hook in the conflict, or the ‘object’ for me was religion and as Jung explains “the object offers a hook to the projection, and even lures it out” (Jung, 1960/2014i, p. 273).

In differentiating my familial complexes, many of my maternal and paternal relatives became teachers while some became priests. Since both of my parents became teachers, my career choice of becoming a priest was repressed into my unconscious shadow. In my conflict with the cooperating teacher, my shadow contents were constellated by his religious creationist views because I was projecting the contents of my shadow that repressed the priest as a career choice. The cooperating teacher projected a pious or priest-like character and this projection stuck to me. Since the cooperating teacher’s projections were part of my repressed shadow, they helped to constellate my complex for religion. In analyzing this conflict, it appears that religion became the perfect hook for us to gain consciousness of our respective shadows.

In differentiating my cultural complexes, it is important to identify that contemporary Canadian culture seems to emphasize scientism or what Bonnett (2013) refers to as the belief that the natural sciences should be employed in investigating all aspects of human behaviour and condition. Canadians seem to have a deference to the authority of science when seeking the solution to a problem, and there is little reliance on religion⁴ to solve our collective problems. Historically, there is a clear differentiation between government, education, and religion. Therefore, the contemporary Canadian cultural unconscious includes the repressed view that religion can solve humanity’s problems. Scientism may be one reason why Canadians continue to engage in consumerist habits with little ecological consideration because we assume science will solve problems such as global warming, and we can therefore continue consuming and polluting the environment. In my conflict with the cooperating teacher, I was projecting the shadow elements of my cultural upbringing, shadow elements that might employ religion to address our social and cultural problems.

Contemporary Canadian culture views science and technology as the means to solutions regarding global warming and ecological degradation wherein scientists continue to propose many technologically based solutions (Jacobson, 2009; Jacobson & Delucchi, 2009). When the cooperating teacher criticized me for engaging in a discussion about the ways physicists can learn about the Earth’s ancient climate, he might have been expressing in his religious affirmations the contents of my

⁴ Although there is little reliance on religion to solve Canadian collective problems, Canadian culture does have a tolerance and respect for religion as our taxes pay for Catholic and non-religious public schooling that is unique to Canadian culture (Zinga, 2008; Treff & Ort, 2013).

culturally repressed religious shadow. I may have repressed and denied any possibility that religion can help solve critical issues such as global warming because of my familial structure and habits, as well as belonging to a culture that has promoted science and technology as providing solutions to such problems.

Gordon (2009) writes that the ultimate goal of a teacher is to help students with their own individuation in such a way that examines “deep issues while refraining from imposing their values onto young people who need to develop their own belief systems” (p. 40). If I am supposed to offer educational curricula from multiple perspectives so that students can develop their own points of view, then how can I do this in an environment where religion has already pre-determined the framework by which other views are considered by imposing a dogmatic belief system upon them?

The imposition of a dogmatic belief system is a form of fundamentalism and Riedel (2009) suggests that the fundamentalist’s attitude is intolerant and kills soulfulness and interiority. However, I was not yet able to see that my very approach might also have been considered dogmatic because I was caught in a rigid binary position. Both the cooperating teacher and I held fundamentalist positions, and we similarly defended our truth claims: “every fundamentalist system claims to have dug down to the roots, to a theoretical beginning, which it then holds to be absolute” (Riedel, 2009, p. 464). Even though I sensed that it was futile to try and persuade the students to consider a scientific worldview, since they were already predisposed towards a religious worldview that they appeared to hold absolutely, I tried. At that time, I too held my scientific views absolutely.

The constellated conflict

During the conflict, I knew that I was constellated because the “active complex puts us momentarily under a state of duress, of compulsive thinking and acting” (Jung, 1960/2014h, p. 96), although I did not have the language or theory for it. I was immediately distressed and disturbed by my cooperating teacher’s assertion that the Earth is 6000 years old. As soon as the cooperating teacher asserted his creationist view, I immediately became compulsive in my thoughts and actions and my conscious thought processes became very rigid.

As Riedel (2009) suggests, my fundamentalist complex composed of personal, cultural, and archetypal layers was activated. When this happens, the complex eradicates the capacity for both imagination and curiosity (Riedel, 2009). I was therefore intolerant of other points of view, especially the cooperating teacher’s religious point of view. I compulsively attempted to refute the cooperating teacher’s claim by stating a number of scientific arguments. I can recall feeling that the cooperating teacher’s claim was irrational and that my rational claim required a vigorous defense. I did not yet understand that these ‘rational’ attempts were indeed an intellectual defense that defended against shadow projection. Furthermore, as an INFJ personality type, I slipped into a shadow function of ‘thinking’ rather than using my more dominant ‘feeling’ function because I was constellated.

As the conflict progressed, my physiological characteristics changed as my heart rate increased, and I could not consciously respond to the cooperating teacher as I had normally been accustomed to. Jung explains that “every constellation of a complex postulates a disturbed state of consciousness” (Jung, 1960/2014h, p. 96). My complex was a “feeling-toned complex...strongly accentuated emotionally” (Jung, 1960/2014h, p. 96), and my actions were incompatible with the habitual attitude of consciousness. I typically would not have challenged another person about their views, but because the conflict constellated my complexes, I was acting in a manner well out of my habitual conscious character. I usually would have been able to hold the other person’s view in my consciousness; however, because creationism was antithetical to what I perceived to be the truth, I ‘had to take’ a stand with the cooperating teacher.

It is interesting that after the lesson, when the cooperating teacher asked to speak to me, I immediately had a feeling that something was wrong, but I did not know what it could be – again my intuition and feeling function were working to bring me to greater consciousness, but I had not yet

learned to track or identify such hunches and physiological changes. Until the cooperating teacher indicated that the problem with my conversation with the students was my claim for an old age of the Earth, did I realize that what I had said may have gone against my students' religious views.

I realize that my constellation took time to be fully activated, and again much more time and learning to understand it. My constellation intensified when I realized the cooperating teacher's disapproval with the conversation I had with my students, as well as his acceptance for only creationist views. The constellation of the complex was not an instant reaction, but I recall it taking some time to reach a pinnacle. When it was fully activated, I did not feel like myself. Jung's (1960/2014k) description fits well here: "complexes interfere with the intentions of the will and disturb the conscious performance: they produce disturbances of memory and blockages in the flow of associations" (p. 121).

Looking back at the conflict, I now realize that I did not address the complex well. I did not think through the consequences of my actions, nor could I because complexes are autonomous and "behave like independent beings" (Jung, 1960/2014k, p. 121). In hindsight, it was impossible to consciously reflect on the ramifications of my actions as when a complex 'has you,' it "can temporarily obsess consciousness, or influence speech and action in an unconscious way" (Jung, 1960/2014k, p. 121). Rather than accepting the cooperating teacher's view for a young age of the Earth, I ironically took it upon myself to try to convert him using what scientific evidence I had at my disposal. I simply could not accept an opposing view that was diametrically opposed to my own nor could I hold both views in my conscious mind because I had not yet developed adequate ego strength to hold the tension of two opposing yet complimentary views. Jung (1959/2014g) offers:

To confront a person with his shadow is to show him his own light. Once one has experienced a few times what it is like to stand judgmentally between the opposites, one begins to understand what is meant by the self. Anyone who perceives his shadow and his light simultaneously sees himself from two sides and thus gets in the middle (p. 463).

Until the conflict with the cooperating teacher occurred, I had not been in a conflict where I was faced with confronting my religious shadow; indeed, I was not yet even conscious of this shadow! In addition, I had not yet developed the capacity to hold the middle ground 'between' two opposing views nor had I acquired the analytic psychological tools to see myself from two different points of view.

Scapegoating

Montero & Colman (1995) refer to scapegoating as one of the major ways that groups remove unworkable and dissident parts (the scapegoat). Colman (1995) differentiates the scapegoat from the individual shadow because it is a matter of case (one). Scapegoating within families, schools, and cultures is a case of many individuals' negative projections onto an 'other' (singular or plural case) that then becomes the scapegoat and are identified with the ills or problems of the collective.

The basis of the scapegoat myth contends that in the process of scapegoating or rejecting the part that does not fit with the unity of the group, the group is not to blame for its problems, its bad feelings, its pains, or its defeats (Colman, 1995; Perera, 1986). The responsibility for the problem, the scapegoat, "is perceived as being fundamentally different from the rest of the group and must be excluded or sacrificed in order for the group to survive and remain whole" (Colman, 1995, p. 81). Colman (1995) contends that scapegoating is used by the group to detoxify and reject negative elements from its consciousness, adding that there is no group development without facing the problem of the group's scapegoats.

I initially became aware that I was being scapegoated when none of the physics students would engage in a conversation about paleoclimatology with me. Shaker (1982) writes that "student's behaviour could be better understood, and their erratic inclinations harnessed to educational aims if their behavioural excesses could be read for meaning rather than scorned" (p. 247). I was seeing the students' behaviour as disinterest towards the topic rather than understanding that their behaviour was

the result of a differing worldview from mine and maybe even a lack of respect or tolerance for my different point of view. The students may not have wanted to respond to me because my claim that scientists could determine the Earth's climate going back hundreds of thousands of years by using paleoclimatology was contrary to their worldview for a young age of the Earth. The students might have interpreted my view as a threat to their belief in a young age of the Earth and they understandably did not want to engage in any conversation that could have been deemed confrontational. Even if one of the students had wanted to discuss paleoclimatology, none of them would admit to this in front of their teacher because the teacher represented the religious establishment/authority and they felt obligated to remain part of that group. By extension, any student(s) who had engaged with me about paleoclimatology would have been infected with my 'contagion' (Girard, 1989), as a heretic, and no student(s) were willing to risk the scorn of their peers and especially their teacher.

I was scapegoated through the process of negative shadow projection by the students and the cooperating teacher. The projected material held their fanaticized doubt (Alschuler, 2009) about their faith-based views, and were thereby focused and projected upon me. As Colman (1995) suggests, the group of students scapegoated me because my scientific views were perceived as fundamentally different than, even heretical to their own, and by not engaging with me they excluded my ideas for an old age of the Earth. The students were able to immediately reject the negative elements from their psyche, for example, any doubt or questioning about their faith-based views, in order to remain members of the school community, thus they remained whole with no challenge to their views.

When I teach physics, I try to bring in the concept of multiple realities because these additional realities grant curriculum its fullest dimensionality (Shaker, 1982). In discussing paleoclimatology with my physics students, I sought to demonstrate that physicists study a wide range of scientific topics and not just the narrow view of topics as presented in their school's curriculum. The problem with teaching

at the religious high school was that I was not allowed to bring in multiple realities, and any additional information I sought to discuss with students had to be first censored to determine if it conformed to the one religious reality of the school. In this way, I consciously and unconsciously viewed myself as different from the other teachers, which held me apart from the school community, the students, and my cooperating teacher, and thus contributed to my position as scapegoat.

In the exploration of a curricular event, Shaker (1982) writes that in order to provide full dimensionality within the lesson, "historical meaning, disciplinary meaning, personal meaning, utilitarian application, and associations with fantasy" (p. 248) should all have status in the lesson. Paleoclimatology provided a potential discussion topic about history, the utilitarian function of physics; it provided an avenue to discuss the age of the Earth; it provided a context for some of the physics topics students were studying; and, it could have provided a fantasy component where creation myths about the origins about the Earth could have been further explored.

Fanaticism & psychic inflation

Alschuler (2009) writes that Jung associates fanaticism with repressed doubt and that extreme beliefs, strongly held and defended, characterize fanaticism. In the conflict, the cooperating teacher and I each held fanatical views. He held strong views about creationism, while I held strong views about science. Since I defended my views about science during the conflict by compulsively bombarding the cooperating teacher with 'facts' that claimed to disprove a young age of the Earth, I must have been harboring some repressed doubt about my scientific views. I possessed some 'truth' about the age of the Earth and because I strongly identified with this view, I fell victim to psychic inflation (Alschuler, 2009). This psychic inflation resulted in the puffing up of my ego and the dissociation (splitting off) and repression of any thought that was incompatible with my view. The thought that was incompatible with my view was that there may be some validity to the cooperating teacher's faith-based claim and that science may not have all the answers.

I could not understand how someone could base his truth on ‘faith in religion’ rather than basing it on scientific reasoning and critical thinking – which I now understand as ‘faith in science’ – an equal and opposite position. Nevertheless, it was still a split off binary position and did not reflect Aoki’s (2005) urge to dwell in the zone in between where *both* positions *and* another may hold veracity. My ego held some repressed doubt about the scientific method, and I was harboring hidden doubt about science within my psyche, and it was this doubt that became dissociated from my ego. My ego became one-sided, and the resulting one-sidedness of my inflated ego activated a compensatory counteraction. Alschuler (2009) explains, that “the unconscious attempts to moderate the ego’s one-sidedness by confronting it with an opposite image, a doubt (disbelief)” (p. 46).

In the conflict, I expressed my repressed doubts with a projection onto a non-believer and with a deep conviction that I had to convert my cooperating teacher in order to confirm my view for an old age of the Earth. Unknowingly, I was trapped in a vicious circle in which my fanaticism about the scientific truth for the age of the Earth continued as my repressed doubt was projected each time I provided an example disproving the cooperating teacher’s creationist views. Alschuler (2009) contends that the vicious circle can be broken through a compensatory process where the extreme one-sidedness of the fanatic reaches a limit and it converts into its opposite, or an enantiodromia. As I engaged in the conflict, I can clearly recall wanting my cooperating teacher to show unquestioning

adherence to science and convert to my worldview.

Upon reflection of the conflict, I can understand how the cooperating teacher’s psyche also held splinter parts as he must have been projecting his repressed doubt about the validity of his faith-based creationist views. Since the cooperating teacher is a physics and science teacher, I suspect that it must have been difficult for him to constantly repress his hidden doubt about his faith – if it was at all conscious. However, I suspect that the degree of difficulty the cooperating teacher found in repressing science is directly proportional to his inculcation into religious dogma that he received from his family and community when growing up.

When the cooperating teacher studied science when training to be a physics teacher, he must have been bombarded with scientific facts that were contrary to his worldview. The cooperating teacher may have found it easier to repress his doubts about faith-based truths in the environment of the religious school since everyone at the school seemed to possess a split psyche that repressed their scientific worldview. I wonder how often we do this in argument rather than really hearing the other and holding that view as a possibility? Especially in the context of education, how often does this kind of dynamic take hold between cooperating teachers and pre-service teachers or between students and their teachers? The examination of the conflict may well serve to inform teacher education programs and further, the insights gained argue for the importance of bringing a depth psychological perspective to teacher education.

Archetypal reflectivity

Building upon Clifford Mayes’ (1999, 2003, 2005, 2007) important work in depth psychology and teacher education, Dobson (2009) extends the theme of archetypal reflectivity through classroom application and states that teacher “reflectivity involves a meta-cognitive process through which educators increase their awareness of the implicit attitudes, beliefs, and knowledge that inform their practice-in order to transform their practice” (p. 149). Mayes (2005) rightly states that the student-teacher relationship is archetypal and a key component of teacher development is their reflectivity.

In examining the conflict with the cooperating teacher using archetypal reflectivity, I sought to understand the deeper layers of my teaching practice in psychological terms and to determine any unresolved prejudices and issues that may have stood in my way. In doing so, I contribute to my own psychological and pedagogical growth, and I offer it here as an example for others who share similar educational concerns. As Jung wisely explains, “the teacher should watch his own psychic condition, so that he can spot the source of trouble when anything goes wrong with the children entrusted to his care” (Jung, 1954/2014d, p. 120). Within the context of the conflict with the cooperating teacher, the

source of the trouble was our differing worldviews and our fanaticism and fundamentalism for these views – a common occurrence in teacher education and education in a larger context.

Four images of maturity outlined by Moore (1991) are applied and described by Dobson (2009) in the context of education: the Royal, Warrior, Magician, and Lover, and they may be used to inspire self-reflection on a teacher's practice, see Table 1. Each of the four images of maturity in Table 1 is possessed by a bi-polar immature shadow and is characterized by either an active or a passive stance (Dobson, 2009).

Table 1: Archetypal reflectivity and the images of maturity, (Dobson, 2009)

Royal		Warrior		Magician		Lover	
Bi-Polar Immature Shadow							
Active	Passive	Active	Passive	Active	Passive	Active	Passive
Tyrant	Weakling	Sadist	Masochist	Manipulator	Denying Innocent One	Addicted Lover	Absent Lover

For the 'Royal' the bi-polar shadow consists of the 'tyrant' and 'weakling', for the 'Warrior' the shadow consists of the 'sadist' and 'masochist', for the 'Magician' the shadow consists of the 'master of denial' and the 'trickster,' and for the 'Lover', the shadow consists of the 'addicted lover' and 'absent lover' (Dobson, 2009). Each of the maturity archetypes and their corresponding shadows, both active and passive, have specific characteristics when viewed within the context of teaching-and-learning.

First, the mature 'Royal' provides a fertile environment for student growth, while the immature active 'tyrant' is not authentically interested in students and the immature passive 'weakling' defers to the will of administration. Second, the mature 'Warrior' integrates social issues into the classroom, while the immature active 'sadist' does not deviate from school rules and the immature passive 'masochist' makes curriculum decisions based primarily on what is popular or easy with the students (Dobson, 2009). Third, the mature 'Magician' strives to put that content and methodological knowledge in service to the fullest possible individual and social development of the students in every lesson (Dobson, 2009).

On the other hand, the immature active 'master of denial' is focused on teaching to the test, while the immature passive 'trickster' does not effectively plan lessons and projects the blame for any unsatisfactory classroom experiences onto the students (Dobson, 2009). Finally, the mature 'Lover' values the emotional and spiritual realms of the educational experience, while the immature active 'addicted lover' desires student adoration and the immature passive 'absent lover' lacks interest, enthusiasm, and vitality (Dobson, 2009).

As a new pre-service teacher with little teaching experience, I had an idealized

conception about the kind of teacher I wanted to be, and this conception included many of the positive maturity characteristics for the Royal, Warrior, Magician, and Lover archetypes. However, after the conflict with the cooperating teacher and because I had not yet developed adequate ego strength, my teaching characteristics unconsciously adopted many of the shadow characteristics for each of these archetypes.

For example, I initially valued the characteristics of the mature 'Lover' archetype, characteristics that included creativity, intuition, and emotion. However, after the conflict I found myself exhibiting the passive shadow characteristics of the 'Lover' archetype, characteristics such as a lack of enthusiasm and interest for both my students and the content of the course. I was overwhelmed by this passive shadow after the conflict because I felt increasingly alienated from others and I felt depressed. I was a teacher who was only 'going through the motions' of teaching the curriculum because I was afraid to deviate from the curriculum in creative and spontaneous ways (drawing upon my intuition).

Prior to the conflict, my teaching was characterized by the mature 'Magician' archetype since I tried to integrate the physics content into its fullest possible development in

every lesson. However, after the conflict, I adopted the passive shadow of the 'Magician' archetype because I did not effectively plan or organize my physics lessons to facilitate the fullest possible learning. The mature 'Magician' archetype attends to transformative learning, but after the conflict, I unknowingly and unconsciously adopted its shadow manipulator characteristics. These characteristics included conforming to the repressive structures of the school, which served to perpetuate a view for a young age of the Earth.

Dobson (2009) indicates that the 'Warrior' archetype is characterized by an alert presence of mind, uses strength and power, and defends social justice issues. Since I lacked the ego strength to negotiate consciously a position in-between the conflict, I felt that I could not hold my view with any strength or power. Instead, I adopted the active shadow of the 'Warrior' archetype, and I kept students 'in their place' by not deviating from school rules or classroom procedures and taught a narrowly prescribed curriculum.

Finally, the 'Royal' archetype is characterized by a teacher who provides a fertile environment for student growth (Dobson, 2009). The 'Royal' archetype has an active shadow, the 'tyrant', characterized by a teacher who is reluctant to disrupt hierarchy and a passive shadow, the 'weakling', who consistently defers to the will of the school administration. Thus, after the conflict, I unconsciously adopted the shadow aspects of the 'Warrior' archetype wherein I deferred to the will of the

administration by not discussing an ancient age of the Earth.

Through an examination of the maturity archetypes, teachers can each learn to be scholars of their own consciousness (Diamond & Mullen, 1999) because an ego will oscillate between the poles of a given archetype's shadow unless the ego properly accesses an archetype (Moore & Gillette, 1992). Rather than oscillating between the poles of the shadow for a given maturity archetype in the conflict, I unconsciously adopted the shadow aspects of the archetype's poles. Prior to the conflict with the cooperating teacher, I drew upon maturity archetypes that were not yet fully formed and the conflict may have detrimentally affected my teaching development by pushing it into the shadow aspects for each of the archetypes.

In attempting to be a scholar of my own consciousness, I now recognize that my pre-service teaching assignment at the religious school provided me with the opportunity to develop my ego strength as a teacher. In addition, my pedagogical practice has been enhanced through the insights that I have gained through relevant Jungian psychological theories and my occasions for on-going reflection via such theoretical understanding.

The religious hook in this conflict is but one example that may inspire other pre-service teachers to examine their shadows and develop their own ego strength and psychological insight. It was important to recognize that I was not an innocent bystander in this conflict, but rather, I equally participated in the events that transpired.

Significance to education

Faculties of Education would be well served by integrating insights gleaned from Jungian psychology particularly regarding shadow projection, complexes, and archetypal influence, as well as making special topic courses available in their programs. Students returning to Faculties of Education seeking a second degree or teachers who return to graduate studies come with a greater capacity to reflect upon their practice and might be psychologically more ready to consider an inner life.

The conflict herein analyzed illustrates that pre-service teachers will be confronted by students, parents, and teachers who may not share their worldview, and to successfully navigate conflicts, pre-service teachers need the requisite tools that analytical psychology provides for addressing the complicated interpersonal and interpsychic interactions they will encounter when engaged with a diverse community of learners. As Shaker (1982) argues, analytical psychology supports the unconscious process throughout the teaching and learning process.

By including course work about analytical psychology in teacher education programs, education students may begin to understand the significance of the unconscious processes of learning and not just the conscious ones. For example, pre-service teachers could be provided an Interpsychic

Image, see Figure 1, where they can identify all of the interpsychic terms and processes that manifest themselves when two people have a conversation that may or may not lead to a conflict.

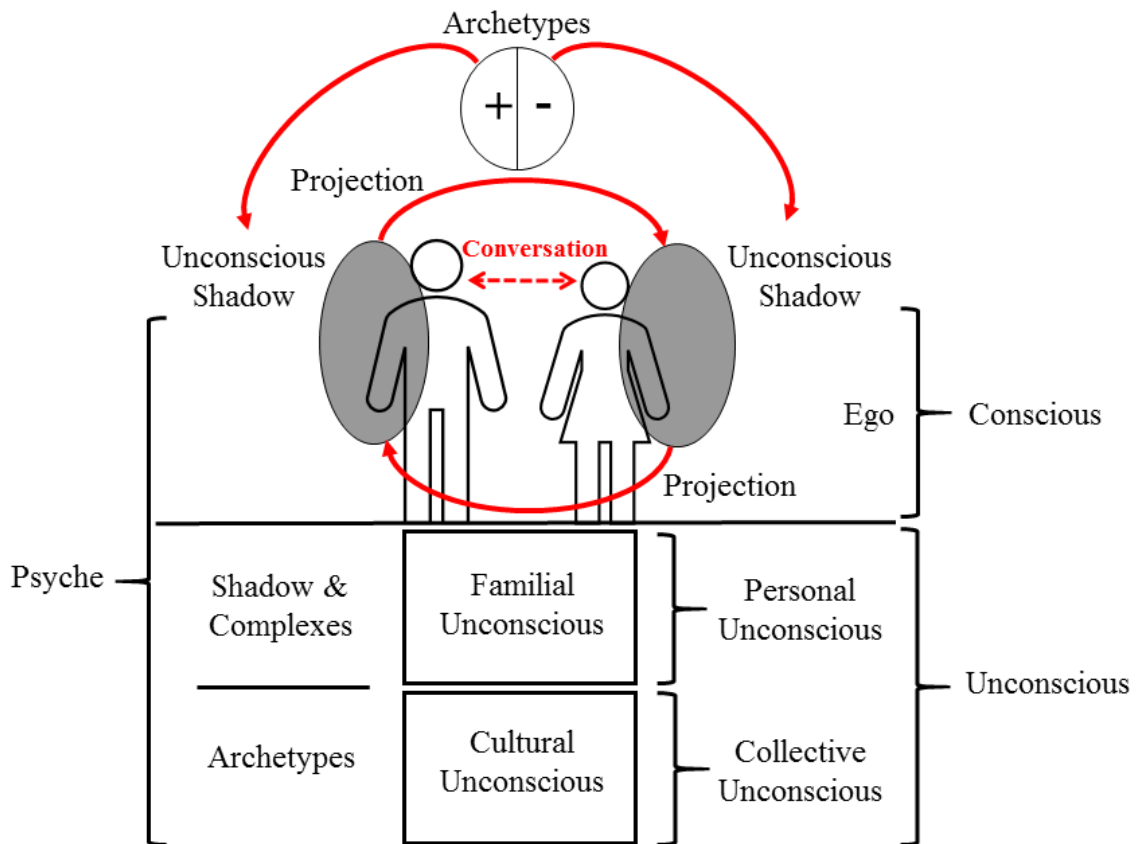


Figure 1: Interpsychic image.

Figure 1 illustrates a conversation between two people. When the people meet, both their conscious and unconscious are in communication with each other. The conscious consists of the ego, the unconscious consists of the personal unconscious and collective unconscious, while the psyche consists of both the unconscious and conscious elements of each person. The personal unconscious consists of the familial unconscious, complexes, and shadow elements, while the collective unconscious consists of the cultural unconscious, and contains archetypes or universal affect laden images that both people may be influenced by. Each of the people have complexes and repressed shadow elements that may be projected onto the other person if and when they become constellated during a conflict. Each person is influenced by archetypes and they manifest themselves in either a positive or negative way depending on the nature of what is in each person’s collective unconscious.

As Dobson (2009) suggests, Jungian-based perspectives study the totality of psychic processes, both conscious and unconscious, and this holistic approach to the psyche would complement the educational psychology as well as curriculum theory presently being taught in current education programs. In addition, “without awareness of complexes, their underlying dynamics, and ways to depotentiate them, there is little opportunity for educators to unhook” (Fidyk, 2017a, p. 83) from similar conflicts when they find themselves caught. In fact, educators will continue to see the problem as one of other (scapegoating) rather than one where she/he is personally implicated.

Teacher education programs would also benefit from the inclusion of Jung’s theory of psychological types (Jung, 1921/2014a) and the Myers-Briggs (Myers, 1962) personality types since these typologies provide a tool for better understanding learners and for communicating with them as

individuals (Shaker, 1982). Psychological typologies, while only briefly mentioned here, may provide educators with a different perspective on their pedagogy, their strengths, and limitations. In addition, teachers may be able to more deeply understand their students' behaviour if this behaviour is considered through the knowledge of their students' personality typologies.

Teacher education programs would also benefit from the inclusion of archetypal imagery since when teachers draw upon it, as demonstrated, teaching practice is enriched. The inclusion of Dobson's (2009) archetypes (Royal, Warrior, Magician, Lover) within a teacher education program may be used to inspire teacher self-reflection about their teaching practices and knowledge. This self-reflection may further assist new teachers in working through unsatisfactory pedagogy and allow them the opportunity to delve into their ontological commitments and constructs regarding their professional practice and knowledge. Something as simple as having pre-service teachers read and discuss Dobson's (2009) article, "*Royal, warrior, magician, lover: Archetypal reflectivity and the construction of professional knowledge*," and invite them to reflect upon their archetypes of maturity so as to identify their dominant teacher archetype, may be extremely valuable.

Conclusion

Through an examination of my personal experience as a pre-service physics teacher, this paper explored how I gained increasing critical understanding of a conflict that arose due to interpersonal and intrapsychic relations as well as differing worldviews within an educational setting. By examining such conflicts through the particularities of this one case, other pre-service teachers may begin to understand the psychodynamics of such conflicts and the ways they may be depotentiated in the future thereby transforming their pedagogy.

It is important for Faculties of Education to consider the placement of pre-service teachers in educational settings with dramatically differing worldviews than their cooperating teachers. It is also important that pre-service teachers understand archetypal reflectivity so that their teaching practice is not possessed by the immature bi-polar shadow of any of the four archetypes of maturity. Just as I was oppressed by my cooperating teacher into silence and conformity, pre-service teachers ought to be made aware that during their teaching practice, they may inadvertently oppress students in similar ways – and even do so with their mentors. Additionally, teachers are highly unlikely to be aware of their unconscious shadows and the ways transference and countertransference may affect the teacher-student relationship, including their assessment during their teaching practicum and daily teaching.

More inclusive teacher education programs would be wise to include insights gleaned from analytical psychology and integrate them into approaches to classroom management, curriculum theory, and professional development. The inclusion of analytical psychology within teacher education programs, in addition to the work of Mayes (1999, 2003, 2005, 2007), Dobson (2008, 2009), Moore (1991), and Moore and Gillette (1992) on archetypal reflectivity may invite education students to reflect on the totality of the psyche, both unconscious and conscious, further informing their professional knowledge and practice.

Glossary of analytical psychology terms

Analytical psychology Psychotherapy in the tradition of C. G. Jung. [See Psychoanalysis]

Archetype Primordial, structural elements of the human psyche. Primordial mental image inherited by all, such as recurrent symbols and motifs. "Another well-known expression of the archetype is myth and fairy tale...The term 'archetype' thus applies only indirectly to the 'representations collectives', since it designates only those psychic contents which have not yet been submitted to conscious elaboration and are therefore an immediate datum of psychic experience" (Jung, 1959/2014f, p. 5).

Collective unconscious	A structural layer of the human psyche containing inherited elements, distinct from the personal unconscious. “The collective unconscious contains the whole spiritual heritage of mankind’s evolution, born anew in the brain structure of every individual” (Jung, 1960/2014l, p. 158). “I have chosen the term ‘collective’ because this part of the unconscious is not individual but universal” (Jung, 1959/2014f, p. 3).
Complex	An emotionally charged group of related ideas or images that are usually repressed and cause an abnormal behaviour or mental state. “It is the image of a certain psychic situation which is strongly accentuated emotionally and is, moreover, incompatible with the habitual attitude of consciousness” (Jung, 1960/2014h, p. 96).
Cultural complex	An emotionally charged aggregate of ideas and images that tend to cluster around an archetypal core and is shared by individuals within an identified collective (Kaplinsky & Singer, 2010).
Constellate	To activate, usually used with reference to a complex and an accompanying pattern of emotional reactions (Sharp, 20210). “This term simply expresses the fact that the outward situation releases a psychic process in which certain contents gather together and prepare for action. When we say that a person is ‘constellated’ we mean that he has taken up a position from which he can be expected to react in a quite definite way... the constellated contents are definite complexes possessing their own specific energy” (Jung, 1960/2014h, p. 94).
Dobson’s archetypes	Royal, Warrior, Magician and Lover. Each of these archetypes contain positive and negative shadow elements (Dobson, 2009).
Ego strength	Strength of that part of the mind that reacts to reality and has a sense of individuality or self esteem.
Enantiodromia	When things get to their extreme, they turn into their opposite. The emergence of the unconscious opposite in the course of time. “A conversion of something into its opposite” (Jung, 1956/2014e, p. 375).
Fanaticism	Represents a repressed doubt where extreme beliefs are strongly held and defended (Alschuler, 2009).
Personal unconscious	The personal layer of the unconscious, distinct from the collective unconscious (Sharp, 2010). “The personal unconscious contains lost memories, painful ideas that are repressed (i.e., forgotten on purpose), subliminal perceptions, by which are meant sense-perceptions that were not strong enough to reach consciousness, and finally, contents that are not yet ripe for consciousness” (Jung, 1953/2014c, p. 66). “The personal psyche, it has contents and modes of behaviour that are more or less the same everywhere and in all individuals” (Jung, 1959/2014f, p. 4).
Projection	An automatic process whereby contents of one’s own unconscious are perceived to be in others (Sharp, 2010).
Psychic inflation	The “puffing up of the ego, often resulting in the dissociation (splitting off) and repression of any thought” (Alschuler, 2009, p. 64) that is incompatible with one’s beliefs.

Psychoanalysis	Therapeutic method investigating the interaction between conscious and unconscious elements in the mind and bringing the latter into consciousness.
Reflectivity	To reflect, to go back in thought, meditate or consult with oneself (on or upon something); remind oneself or consider, as in archetypal reflectivity.
Repression	The unconscious suppression of psychic contents that are incompatible with the attitude of consciousness (Sharp, 2010). To actively exclude unpleasant or unwanted thoughts from conscious awareness.
Scapegoat	A person bearing blame that should fall onto others (Perera, 1986). The scapegoat is a person, subgroup, collective, idea, object, etc. made to bear the anxious blame for others in their place (Colman, 2012).
Shadow	Hidden or unconscious aspects of oneself, both good and bad, which the ego has either repressed or never recognized (Sharp, 2010).
Unconscious	The totality of all psychic phenomena that lack the quality of consciousness (Sharp, 2010). Includes the personal, familial, collective, and cultural unconscious.

References

- Alschuler, L. R. (2009). Fanaticism: A psychopolitical analysis. *A Journal of Archetype and Culture*, 81, 59-83.
- Aoki, T. (2005). Teaching as indwelling between two curriculum worlds. In W.F. Pinar & R.L. Irwin (Eds.), *Curriculum in a new key: The collected works of Ted T. Aoki* (pp. 159-165). Routledge.
- Barnola, J. M., Raynaud, D., Korotkevich, Y. S. & Lorius, C. (1987). Vostok ice core provides 160,000-year record of atmospheric CO₂. *Nature*, 329, 408-414. <https://doi.org/10.1038/329408a0>
- Bonnett, M. (2013). Normalizing catastrophe: Sustainability and scientism. *Environmental Education Research*, 19(2), 187-197. <http://dx.doi.org/10.1080/13504622.2012.753414>
- Bradley, R. (1999). *Paleoclimatology*. Academic Press, Harcourt Brace and Company.
- Colman, A. D. (1995). *Up from scapegoating: Awakening consciousness in groups*. Chiron Books.
- Colman, A. D. (2012). *Beyond scapegoating*. Talk presented at TEDx, Prince Albert, South Africa. From: https://www.youtube.com/watch?v=cjBBhYCpLk0&ab_channel=TEDxTalks
- Diamond, C. T. P., & Mullen, C. A. (Eds.). (1999). *The postmodern educator: Arts-based inquiries and teacher development*. Peter Lang Publishing.
- Dobson, D. S. (2008). *Transformative teaching: Promoting transformation through literature, the arts, and Jungian psychology*. Sense Publishers.
- Dobson, D. (2009). Royal, warrior, magician, lover: Archetypal reflectivity and the construction of professional knowledge. *Teacher Education Quarterly*, 36(3), 149-165. From: <https://www.jstor.org/stable/23479194>
- Fidyk, A. L. (2016a). Unconscious ties that bind—attending to complexes in the classroom: Part 1. *International Journal of Jungian Studies*, 8(3), 181-194. <https://doi.org/10.1080/19409052.2016.1195425>
- Fidyk, A. L. (2016b). Unconscious ties that bind—attending to complexes in the classroom: Part 2. *International Journal of Jungian Studies*, 8(3), 195-210. From: <https://doi.org/10.1080/19409052.2016.1195426>
- Fidyk, A. L. (2017a). The influence of cultural and familial complexes in the classroom: A Post-Jungian view. In j. jagodzinski (Ed.). *The precarious future of education: Risk and uncertainty in ecology, curriculum, learning, and technology* (pp. 71-97). Palgrave Macmillan. https://doi.org/10.1057/978-1-137-48691-2_4
- Fidyk, A. (2017b). The influence of cultural and familial complexes in the classroom: A Post-Jungian view. In j. jagodzinski (Ed.), *The precarious future of education. Education, psychoanalysis, and social transformation* (pp. 71-108). Palgrave Macmillan. https://doi.org/10.1057/978-1-137-48691-2_4
- Girard, R. (1989). *The scapegoat*. JHU Press.
- Gordon, R. (2009). Finding the philosopher's stone. In D. P., Slattery & J. L. Selig (Eds.), *Reimagining education: Essays on reviving the soul of learning* (pp. 39 - 50). Spring Journal Books.
- Jacobson, M.Z. (2009). Review of solutions to global warming, air pollution, and energy security. *Energy & Environmental Science*, 2(2), 148-173. From: <https://doi.org/10.1039/B809990C>
- Jacobson, M. Z., & Delucchi, M. A. (2009). A path to sustainable energy by 2030. *Scientific American*, 301(5), 58-65. From: <https://www.jstor.org/stable/26001592>
- Jarosik, N., Bennett, C.L., Dunkley, J., Gold, B., Greason, M.R., Halpern, M., Hill, R. S., Hinshaw, G., Kogut, A., Komatsu, E., Larson, D., Limon, M., Meyer, S. S., Nolte, M. R., Odegard, N., Page, L. Smith, K. M., Spergel, D. N., Tucker, G. S., Weiland, J. L., Wollack, E., & Wright, E. L. (2011). Seven-year Wilkinson Microwave Anisotropy Probe (WMAP) observations: Sky maps, systematic errors, and basic results. *The Astrophysical Journal Supplement Series*, 192(2), 1-15. From: <http://dx.doi.org/10.1088/0067-0049/192/2/14>
- Jouzel, J., Koster, R.D., Suozzo, R.J., & Russell, G.L. (1994). Stable water isotope behavior during the last glacial maximum: A general circulation model analysis. *Journal of Geophysical Research: Atmospheres* (1984–2012), 99(D12), 791-801. From: <https://doi.org/10.1029/94JD01819>
- Jung, C.G. (1921/2014a). General description of types (R.F.C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C. G. Jung: Complete digital edition* (Vol. 6, pp. 330-407). Princeton University Press.
- Jung, C.G. (1935/2014b). Tavistock lectures (R.F.C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 18, pp. 5-182). Princeton University Press.
- Jung, C.G. (1953/2014c). The personal and the collective (or transpersonal) unconscious (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 7, pp. 64-79). Princeton University Press.
- Jung, C.G. (1954/2014d). Analytical psychology and education (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 17, pp. 65-132). Princeton University Press.
- Jung, C.G. (1956/2014e). The dual mother (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C. G. Jung: Complete digital edition* (Vol. 5, pp. 306-393). Princeton University Press.

- Jung, C.G. (1959/2014f). Archetypes of the collective unconscious (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 9.1, pp. 3-41). Princeton University Press.
- Jung, C.G. (1959/2014g). Good and evil in analytical psychology (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 10, pp. 456-468). Princeton University Press.
- Jung, C.G. (1960/2014h). A review of complex theory (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 8, pp. 92- 104). Princeton University Press.
- Jung, C.G. (1960/2014i). General aspects of dream psychology (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 8, pp. 237-280). Princeton University Press.
- Jung, C.G. (1960/2014j). On the nature of dreams (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 8, pp. 281-297). Princeton University Press.
- Jung, C.G. (1960/2014k). Physiological factors in human behaviour (R.F.C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 8, pp. 114-125). Princeton University Press.
- Jung, C.G. (1960/2014l). The structure of the psyche (R.F.C. Hull, Trans.). In H. Read et al. (Eds.), *The collected works of C.G. Jung: Complete digital edition* (Vol. 8, pp. 139-158). Princeton University Press.
- Kaplinsky, C., & Singer, T. (2010). *The cultural complex. Jungian Psychoanalysis: Working in the Spirit of Carl Jung*. Routledge.
- Lüthi, D., Le Floch, M., Bereiter, B., Blunier, T., Barnola, J.M., Siegenthaler, U., & Stocker, T.F. (2008). High-resolution carbon dioxide concentration record 650,000–800,000 years before present. *Nature*, 453(7193), p. 379-382. From: <https://doi.org/10.1038/nature06949>
- Manitoba Education and Advanced Learning (2015). *Schools in Manitoba, non-funded independent schools*. Government of Manitoba. From: http://www.edu.gov.mb.ca/k12/schools/ind/non_fund_ind.html
- Mayes, C. (1999). Reflecting on the archetypes of teaching. *Teaching Education*, 10(2), 3-16. From: <http://dx.doi.org/10.1080/1047621990100202>
- Mayes, C. (2003) Foundations of an archetypal pedagogy, *Psychological Perspectives*, 46(1), 104-117. From: <http://dx.doi.org/10.1080/00332920308405775>
- Mayes, C. (2005). *Jung and education: Elements of an archetypal pedagogy*. Rowan & Littlefield Education.
- Mayes, C. (2007). *Inside education: Depth psychology in teaching and learning*. Atwood Publications.
- Mohr, P. J. & Taylor, B. N. (2005). CODATA Recommended values of the fundamental physical constants: 2002. *Review of Modern Physics*, 77(1). From: <https://doi.org/10.1103/RevModPhys.77.1>
- Montero, P. & Colman, A.D. (2000). Collective consciousness and the psychology of human interconnectedness. *Group*, 24(2), 203-219. From: <https://doi.org/10.1023/A:1007540101096>
- Moore, R. (1991). *King, warrior, magician, lover: Rediscovering the archetypes of the mature masculine*. Harper Collins.
- Moore, R., & Gillette, D. (1992). *The king within: Accessing the king in the male psyche*. William Morrow and Company.
- Myers, I. B. (1962). *The Myers-Briggs type indicator: Manual*. Consulting Psychologists Press. From: <http://dx.doi.org/10.1037/14404-000>
- Öberg, L., & Kullman, L. (2011). Ancient subalpine clonal spruces (*Picea abies*): Sources of postglacial vegetation history in the Swedish Scandes. *Arctic*, 64(2), 183-196. From: <https://www.jstor.org/stable/23025692>
- Perera, S. (1986). *The scapegoat complex: Toward a mythology of shadow and guilt*. Inner City Books.
- Petit J.R., Jouzel J., Raynaud D., Barkov N. I., Barnola J. M., et al. (1999). Climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica, *Nature*, 399, 429-436. From: <https://doi.org/10.1038/20859>
- Riedel, E. (2009). Fundamentalism and the quest for the Grail: The Parzival myth as a postmodern redemption story. *Psychological Perspectives*, 52(4), 456-481. From: <https://doi.org/10.1080/00332920903304838>
- Shaker, P. (1982). The application of Jung's analytical psychology to education. *Journal of Curriculum Studies*, 14(3), 241-250. From: <https://doi.org/10.1080/0022027820140303>
- Sharp, D. (2010). *Jung Lexicon: A primer of terms & concepts*. From: <http://www.psychceu.com/Jung/sharplexicon.html>
- Singer, T. (2014). Psyche and society: Some personal reflections on the development of the cultural complex theory. *Journal of Jungian Scholarly Studies*, 9(1), 1-14. From: <http://jungiansociety.org/images/e-journal/Volume-9/JSSSvol9-2014.pdf>

-
- Treff, K., & Ort, D. (2013). *Finances of the nation 2102. A review of expenditures and revenues of the federal, provincial, and local governments of Canada*. Canadian Tax Foundation.
- van den Heuvel E. (2016). *The amazing unity of the universe*. Springer. From:
https://doi.org/10.1007/978-3-319-23543-1_6
- Zinga, D. (2008). Ontario's challenge: Denominational rights in public education. *Canadian Journal of Educational Administration and Policy*, 80, 1-44. From:
<https://cjc-rcc.ucalgary.ca/index.php/cjeap/article/view/42761>
-

About the Author

Michael Paul Lukie is an Assistant Professor in the Faculty of Education at the University of Winnipeg where he teaches secondary education courses in physics, science, and mathematics. His research interests include phenomenography, physics and science education, student understanding and engagement, analytical psychology, and metacognition.

Address

Dr. Michael Paul Lukie;
Faculty of Education; The University of Winnipeg;
515 Portage Avenue;
Winnipeg, Manitoba; R3B 2E9, Canada.

e-Mail: m.lukie@uwinnipeg.ca