ALASKA PACIFIC UNIVERSITY

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This thesis is submitted as partial fulfillment for the Master of Arts at Alaska Pacific University. The work has been supervised, examined, and accepted by the thesis committee including one or more members of the Education Department Faculty.

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A META-SYNTHESIS OF MICRO FACIAL EXPRESSION LITERATURE AND THE LEGAL SYSTEM

A Thesis

Presented to the Faculty of

Alaska Pacific University

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By

Vania Iumatti-Lodewyk

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Abstract

The purpose of this meta-synthesis is to provide a critical review of lies and deception (encompassing from about 2250 B. C. to present day), gathering information from scientific, legal, and other pertinent fields to demonstrate how Micro Facial Expressions (MFEs) has impacted the judicial process through an organizational and insightful critique as forensic psychologists face the possibility of *in vivo* court testimony. The discussion provides the foundation of emotions, how they can be expressed both verbally and non verbally. This research provides the genesis of Micro Facial Expressions and its working concept, as well as postulates the problem: Would a Micro Facial Expression observer infringe upon the rights provided by the American Fourth and Fifth Amendment Constitutional Rights?

Keywords: lies, deception, non-verbal, micro facial expressions, forensic psychology, emotion, demeanor, legal system, Federal Rules of Evidence, Fourth Amendment Right, Fifth Amendment Right, U. S. Constitution

Dedication

Okay? Ok. Deep breathe in. Hold it! Exhale, ever so slowly (appreciate it, as you are doing so).

With trepidation I now present you my "baby". WOW! I cannot tell you. No, that is not true, as I am about to do just that (smirking devilishly). ***Andy***, this has got to be the longest birthing labor process that I have ever been in (I refuse to consider future work on my M.S. and Ph.Ds. at this time or I might not go forth with them).

As I sit here and ponder the enormity of this process (at which you probably laugh, as you have experienced not only for yourself, but over and over through each and every one of your students). Bless your heart: you are a *Saint*!

In a flash, it all comes back to me: The sleepless nights, hours of anguish and argumentation over inability of communication with previous mentors, difficulty writing due to formulation of grammar in duality of primary languages, the mergence of concepts so new that few individuals were ready to embrace, the forced solitude of mind, the tears, the agonizing headaches …

But …Were it not for you, my true and shining mentor, I don't think that I would have so successfully survived this process. You showed me strength, when I had none. You gave me direction, when I could not see the light. You were patient, when I was ready to lash out. You were kind, when I was misguided. You corrected me, taught me, encouraged me, and so much more.

As I can never repay you for all that you have inspired me to be, I promise you this: I will pay it forward and try to be as good a mentor to the next student to come long. Thank you.

To my Mother Zilda,

Washing machine!

Se você se lembrou do motivo por trás dessas duas palavras, eu espero, eles trouxeram um grande sorriso no seu rosto, caso contrário, lá vai uma boa piada por baixo de um ralo, e um bom começo de uma conversa...

Por quatro anos, eu tentei escrever minha dedicação em sua honra, e me acho aqui a meia-noite, no dia de prazo de entrega do meu mestrado, ainda tentando colocar em a algumas palavras o que o meu coração tem cheio de emoções indescritíveis. Como posso agradecer a pessoa que me deu a vida, me incentivado através de bons e maus momentos, é o minha pior crítica e a minha melhor amiga que uma pessoa poderia ter?

Há tanta coisa para lhe agradecer; Eu poderia fazê-lo em ordem alfabética, ou numericamente, ou em ordem cronológica e ainda minha mente fraca certamente esqueceria nove décimos dos fatos importantes que seriao preciso ser ditos. É claro que eu poderia apenas dizer, “obrigado mamãe para ... tudo o que você já fez e continua a fazer por mim”; mas iria soar trivial, um pos pensamento, sem coração. Não faria justiça à mãe super que você é.

Ser mãe significa geralmente longas horas e um monte de trabalho, e muitas vezes não há também muitos "obrigados" devolvidos. Às vezes é porque a criança não é capacidade de falar essas palavras. Às vezes é porque a vida só se torna tão ocupada que

não são os momentos para as palavras a serem ditas com sinceridade. Às vezes é porque você está sempre lá, fazendo o que você faz, e essas palavras são esquecidas.

Obrigado por trocar fraldas, mudando lensol, trocar de roupa nos armários como as estações mudam e as crianças crescem. Obrigado por encontrar meias perdidas, perdeu livros da biblioteca, perdeu sonhos e ajudar sua filha a acreditar neles novamente. Obrigado por limpando o nariz, limpando os balcoes, enxugando as lágrimas. Obrigado por aplicar curativos, dando beijos, se dando. Obrigado por amarrar sapatos. Obrigado por uniformes de lavar, lavar pratos, lavando os erros do passado e deixar as suas filhas saber que é OK para ser humano.

Obrigado por impor limites e mantê-los seguros e ajudando-os a compreender que a vida é sobre muito mais do que apenas começando "o seu caminho." Obrigado por amar a sua filha de uma maneira só você pode. Obrigado por nos dar um sentido de valor apenas por estar lá para nos, de forma incondicional, uma e outra e outra vez. Obrigado por nunca desistir nos, mesmo quando fica difícil e você está exausta. Obrigado por ter esse lugar especial em seu coração que tem sido, e sempre será, salvo para a sua filha. Não importa o que.

Obrigado pela maneira que você representa paciência, graça, amor, humildade, bondade e altruísmo. Você está ensinando essas qualidades para suas filhas, netas e netos, todos os dias sem falar uma única palavra, simplesmente através de suas ações, e muito

provavelmente nem siquer percebem que você está fazendo isso. Obrigado por trazer à vida dessas intangíveis para a sua filha a experiencia de primeira mão.

Obrigado pelo tempo, esforço, amor e cuidado que você põe em sua família. Obrigado por trabalhando contra o relógio. Obrigado por ser real. Obrigado por todas as coisas que você faz, dia após dia, que você não pensar em como "especial" ou que merece um agradecimento. Obrigado mamãe por estar sempre lá. Obrigado mamãe por me manter quente, para manter-me calma e por me manter sã. Obrigado por entender que houve momentos em que eu seria louca com você, mas sempre me perdoando no final.

Obrigado por colocar-se para mim, por me encorajar, por acreditar em mim e por me avisar que você nunca esperava mais do que o melhor que eu podia fazer. Obrigado mamãe por me ensinar a ser honesta, cortês, apreciativa e amorosa. Obrigado por tentar me ensinar a ser limpa e arrumada, mesmo que não funcionou. Obrigado por me ensinar para tentar ver o melhor nas pessoas, para ser diplomático em face do conflito, e quando eu não tinha escolha a não ser lutar, lutar justo. Obrigado pelas milhares de coceras nas costas, milhões de chamadas telefônicas. Ainda assim, ate hoje, que você continua a me dar presentes e eu sou incrivelmente grata por isso.

Obrigado por colocar milhares de fraldas, meus sabedoria de adolescência, minhas às vezes insanidades aos 20 e a montanha-russa emocional que era meus 30 anos. E apesar de tudo, obrigado por me amar, não importa o quê.

Obrigado mamãe por ser tão inteligente, tão linda, tão sábia e tão talentosa. É bom saber que tenho o potencial em algum lugar na minha genética para possivelmente ser um dia tão especial como você. Acima de tudo, obrigado por me apresentar ao mundo da psicologia. Na época, a psicologia me ajudou a entender o mundo, e agora eu espero que com o meu conhecimento adquirido vou voltar para o mundo esse favor várias vezes mais

Mãe, as palavras "eu te amo" não são suficientemente adequadas para expressar o quanto sou grata de ser sua filha, o quanto você é apreciada ou o quanto você sempre vai significar para mim, por isso vou simplesmente dizer: Obrigado por ser mãe minha super-herói, minha especialista-em-tudo, e minha melhor amiga.

Então, se não fosse por você Mamãe, eu não estaria aqui, eu não seria a mulher que eu admiro, eu não teria um futuro que tem verdadeiro potencial. Esta não é a minha vitoria, ela é nossa.

Obrigado por seu amor incondicional e Amizade

To Tom

What can I say about a man who knows how I think and still sleeps next to me with the lights off?

This thesis work is dedicated to you, my husband Tom, who has been a constant source of support and encouragement during the challenges of graduate school and life. I am truly thankful for having you in my life who have always loved me unconditionally and whose good examples have taught me to work hard for the things that I aspire to achieve. You deserve this as much as I do. Words cannot express my love and gratitude for your patience, devotion and ever-constant wisdom.

I love you

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PREFACE

In the Gestalt of the *here and now*, approaching my final six credits to complete my masters of art, thinking that the worst was over, my mentor Professor Page, gave me the most difficult task yet: to write a preface about myself. Cold shivers ran up my spine and a horrific need to scream, run and hide came to me all at once. I recognized the signs all too well. I was having a classic *flight or fight* syndrome - A panic attack. What do I do? Well, I sat in front of the computer with a blank page for a long time, almost as thought I was challenging the computer to write the essay by itself. It didn't work of course. Then I just sat there thinking why this particular task was so difficult. After all I consider myself to be, to an extreme degree, an extrovert who does not back down from a battle and will talk about anything; no topics disallowed. In meditation, the answer came to me: I just did not want to write things down. Talking is easy. People listen and likely forget (actually this is the best place to be if you are a good liar. Ironic, isn't it, that *lying* is part of the topic of my thesis). I have always believed that once I put my thoughts into writing, they become alive, real. Truth be told my past is far too upsetting be re-lived. But were it not for those past battles (lost or won), I would have not grown to be what I am today. So I make the decision to celebrate (yes, celebrate) those memories and share them with the world. I was born in Brazil in 1957. I was one of two daughters to an Engineer father and a Psychologist mother. My father, true to Latin culture, wished I were a boy, named me as one and brought me up as such. My father, in my opinion, was a controlling masochist, manipulative, cunning and emotionally punitive man. I believe that my formative years were distorted by his insistence to raise me a boy. Mother did not attend the university until late in her life. Her interest in psychology opened my life to the fascinating world of the mind. The 1960s was particularly difficult time as Brazilian government was undergoing the

bloodless coup, which in reality was anything but. My family lost many friends that were just murdered for their beliefs. The atrocities that I witnessed can easily be equated to anecdotes of full-blown wars. I still have recollections of being followed by uniformed armed men that took notes about where I stopped, whom I spoke with and the jest of the conversations. Amidst the constant societal coercion and corruption, my discontent with my native country grew exponentially and to it I justify my fascination with *right and wrong*, *criminology* and *law*.

No sooner I finished high school, I came to California and studied at California State University, Northridge, graduating with a BA in Psychology with emphasis in Criminology. I did so wanted that degree that I finished in three years. Those three years were very rewarding because I found that I had a goal in life: I found both Gestalt (the therapy, all its principles, which I highly admired) and the law. After college, came marriage and kids, my career was set-aside for about four years. When I felt encouraged enough to attempt to enter the police academy. I was denied. I was too short, too fat or not a citizen. I considered myself extremely lucky when the height minimum was lowered to five feet. Then I was not a citizen, but I gained my citizenship (A fact that I am *extremely proud* of. And at this time I will take a pause to justify why: I jokingly say that I was only born in Brazil in deference to my mother, because had I been given the choice, I would have never done so. For those readers that were lucky enough to have been born in the United States of America and have forefathers in this country of ours – you have history here. You matter. You contributed to what made this country great. I did not have such honor. So, when I was awarded my citizenship, I was one step closer to fulfill my dream: accomplishing the possibility of giving something back, contributing in my own small way, whatever that way may be *back* in return). Now it was time to re-apply to the police force. However, after childbirth I had gained a lot of weight, so I had to loose weight from nearly 230

to slim 150 pounds. I worked out everyday, several hours a day. It took me nine months to make through the qualifying obstacle course…but I did it. Finally, I had the academy date in sight … but I got disqualified because of an unknown birth defect. For years to come I was a very angry person. I could not reconcile my emotions. In the end, my life did not turn out bad, I did become a Federal Officer and satisfied my quest to contribute in making our country a little better than when I joined it. Life still threw a few twists my way. In 2004 I moved to AK under duress of personal harm (left my children in California) found a new job and bought a new home. In 2009, I lost both my new home and job. Both experiences left me with debilitating physical and psychological confronts. Now homeless and unemployed I faced new challenges. In an attempt to gain some resemblance to normalcy I decided to return to my education. I studied hard, took the required testing, and much to my surprised made into Alaska Pacific University Master's of Arts program. Now here I conclude this chapter with a grand smile on my face, with another "*I did it*".

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CHAPTER 1:

Background

The quests for extricating the truth or the lie from third parties (be that a suspect or a witness) have confounded societies for centuries if not millennia. Subjective information emanates from varied authors (such as Thorpe (1840), Lea (1892), Moore (1908), and Harper (1904) among many others) in the fields of theology, law, criminal justice and criminology regarding Western Civilization history since about 2250 B.C in Babylon when the Codes of Hammurabi (Harper, 1904) ruled - to when the Methods of Torture and Trials by Ordeal (Trovillo, 1939) were written and used as truth/lie extrication method in search for the truth and punishment. Although between 2250 B.C. and 800 A.D. there were no psychological methodologies for testing lies and deception, the general belief was that truth could be coerced through torture (Lea, 1892). In other words, a person accused of committing a crime would be expected to react emotionally and physically to the accusations. Notwithstanding evolution of humanity, technology, and science, the approach to extricate the truth or lie continued from 2250 B. C. through the ages nearly to a current present. A big discovery in the field of physiology, that in today's terms can be defined as a great jump for psychology and other studies, was Canons' (1915) inference that the body realized a chain of rapidly occurring's reactions inside helped mobilize the body resources to deal with threatening circumstance's. These conditions, now know as the *fight or flight response*, in physiology, are defined by Mosby's dictionary of medicine, nursing, & health professions (2012),

> As the reaction of the body to stress in which the sympathetic nervous system and the adrenal medulla act to increase cardiac output, dilate the pupils of the eyes, increase the

rate of the heartbeat, constrict the blood vessels of the skin, increase the levels of glucose and fatty acids in the circulation, and induce an alert, aroused mental state.

In layman's term: an aroused mental state is explained as a person's reaction to stress by either fleeing from a situation or remaining and attempting to deal with it. These stress changes in the body are target-specific to increase the survival chances in at risk situations. Looking at *Figure 1*, one should be able to discern the six major physical changes a human body undergoes during a fight or flight response.

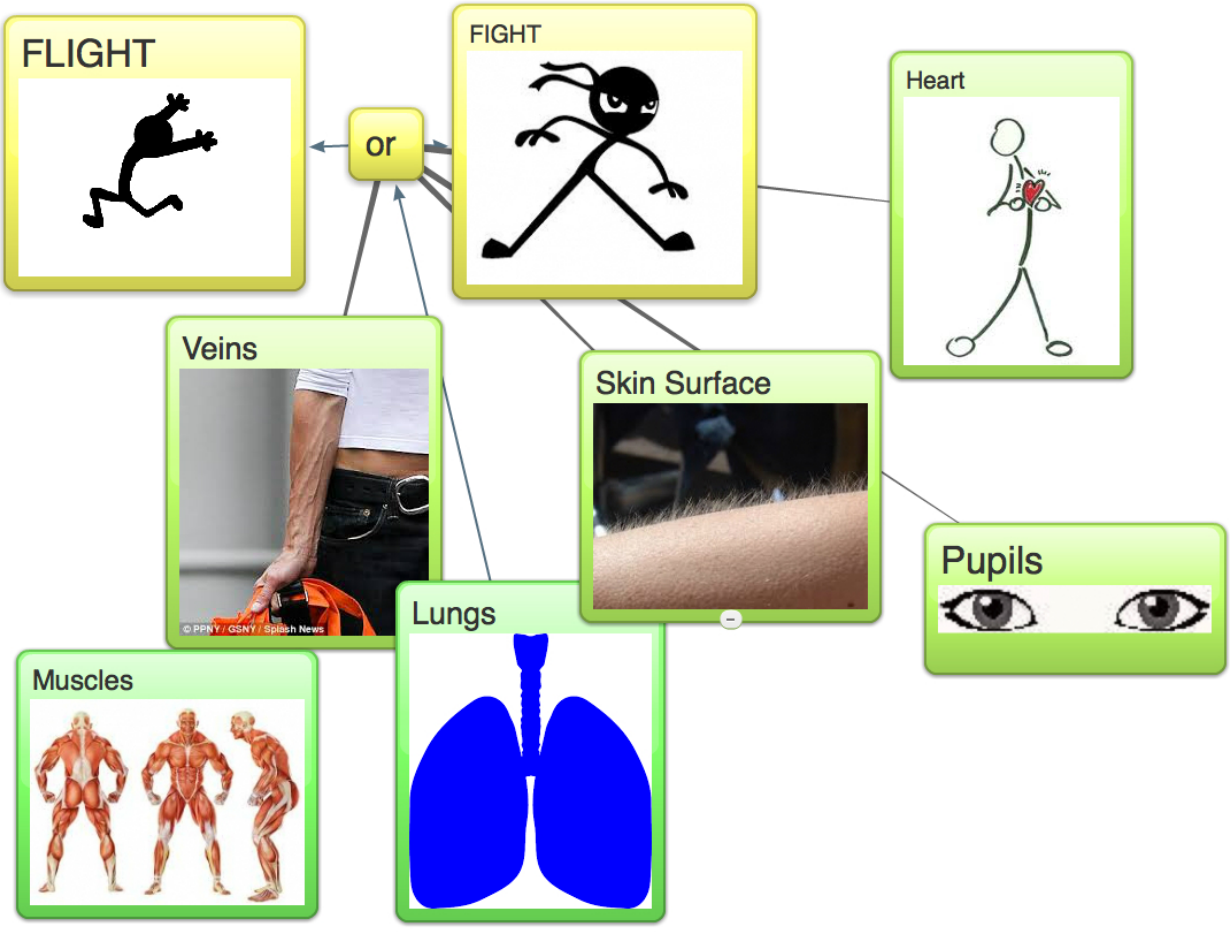


Figure 1. Fight or Flight Physical Stress Changes. © Vania Iumatti-Lodewyk, 2015.

Once your body perceives that it is at risk, before you make a conscious decision what to do next, the following physiological symptoms will happen: Your heart will beat faster in response to the potential threat. Dilation of your veins will cause you to use less heat to keep warm and your pupils to dilate as well and become more sensitive to visual cues. Your skin may detect those same cues as your large muscles relax allowing you to deep breath. Deep breathing provides you sensitivity to smells that might alert you to what the potential danger is. Your skin will be sensitized to air and electrical changes received by the hairs standing on end. Other muscles ready for the need to flee and adjust for adrenalin level changes. Main bodily functions are shut down; you will not be hungry, need to salivate, sweat, or other gastric-intestinal functions. Your body is focused on the potential threat (the big picture); now you must determine if the threat is valid and if you are going to stay and fight… or flee.

According to Layton, 2005, all of these physical responses are intended to help you survive a dangerous situation by preparing you to either run for your life or fight for your life (thus the term fight or flight). Fear -- and the fight-or-flight response in particular -- is an instinct that every animal possesses.

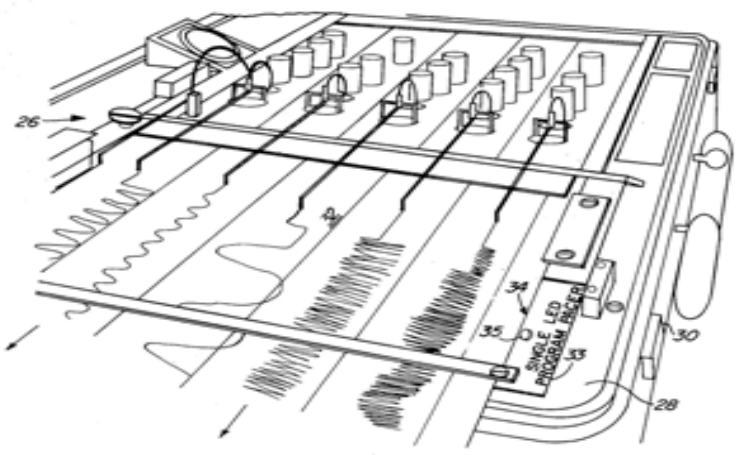


Figure 2 The Polygraph Machine

In 1921, Larson, a medical student, created the prototype of the now known the *Polygraph machine* (see *Figure 2*, a drawing of a polygraph machine) that detects involuntary physical reactions of individuals being questioned. Larson's polygraph was based on the fight or flight response. The U. S. Courts rejected the introduction of the Polygraph as evidence and have since scrutinized science and humanity's expert testimony at times with disdain and a perceived rather tough posture.

Overview of Literature

Theoretical and scientific literature prior to the early 1960s reflects a continuous interest base in the search for detection method as well as better understanding of lies and deception. One evolving concept is Micro Facial Expression; its development from a series of events will be explored herein next. The genesis of "micro momentary" expressions is attributed to Haggard and Isaacs. In their 1966 study, while examining footage of therapy sections between therapist and patient while looking for congruity of non-verbal communication. According to Ekman & Rosenberg (2005), the study of facial expression received little attention in modern psychology until the 1960s. *Table 1* consists a summation of Landis (1924) attributes this late start to MFE to the following factors:

Table 1

Attribute *to MFE's Late Start*

(1) Early research suggested that the face did not provide accurate information about emotions, and psychology in general, did not trust Ekman's findings;
(2) The spirit of the time of behaviorism and its blatant rejection of the study of *unobservables* such as emotion discouraged researchers from pursuing this path;
(3) No tool was available for measurement. (Landis, 1924)

In 1960s, Condon and Ogston established the study of relations at the film fraction of a frame-by-frame representing 1/25th of a second and recognizing reciprocal self-synchrony.

Tompkins and McCarter in 1964, presented a *Theory of Affect* that positively identified facial poses as indicative of emotions, giving headway to Ekman's empirical response listing on his book Methodological Decision: Emotion in the Human face, to Landis criticism (1972/1982). Ekman answered question such as: what are the behavioral signs of deceit? Can the facial measurements be automated (in other words computerized)? The meaning of different types of smiles and other topics. Tompkins and McCarter study however did not concentrate on facial expressions but rather body micro-rhythms movements, i.e., shoulders rising and hands rising almost at the same time between partners. Then in 1966, Haggard and Isaacs discovered micro-expressions movements happening between therapist and patient while scanning motion picture films of psychotherapy hours. It was Ekman, through a series of studies (1965a, 1965b, 1969) while attempting to find labels that linked emotional facial expressions that bore the brunt of criticism. Ekman began studying what eventually let to become MFE as noted in 1965b. In 1971, Ekman and his colleague Friesen (whom had previously successfully measured the facial behavior and expressions of American, Japanese, Argentinian, Brazilian, and Chelonian college-educated emotions) presented new research among the least cultured, or influenced by culture, peoples, Eastern or Western world. The Tribesmen of in Papua New Guinea were told simple stories and asked to identify the emotion from one of three photo images. The results were not perfect but sufficiently because they concluded facial expressions to be universal (Ekman & Friesen, 1971) (For elaboration on these findings see "Facial Expressions of Emotions: New Findings, New Questions" by Ekman, 1992). By 1978, Ekman and his associates had developed the techniques to measure facial movement and identified over 10,000 expressions. In 1979, Ekman and Friesen completed the taxonomy of every human facial expression, known as the Facial Action Coding System (FACS). FACS is a detailed technical guide, or better yet, a

manual that contains descriptions and categorization of facial behavior based on muscle (or combinations of groups of muscles) contractions or extensions that create them. FACS itself is descriptive and includes no emotion-specific descriptors. Unlike systems that use emotion labels to describe expression, FACS explicitly distinguishes between facial actions and inferences about what they mean.

Problem

As indicated before in our presentation through time in history, and still is currently, one of the major problems facing the American judicial system is humanity's inability to correctly pinpoint with veracity the determination of a lie or intention of deceit from a suspect or a witness during the interrogation and investigation of a crime. Currently there are many theories and methodologies (e.g. The Reid Nine Steps of Interrogation (Inbau, 1974), Cognitive Interviewing (Geiselman, Fisher & Associates, 1975), Accusatory Interrogations (Inbau, 1974), Structured v. Non Structured Interviews, Open-ended Questions Formulations and Closed-Ended Questions Formulations which are part of Qualitative Approaches of research (Glasser and Strauss, 1960s)) that attempt to answer those questions, but none that can measure the output or have been accepted by the courts in their entirety due to a lack of methodology, reliability and validity. Skepticism and disapproval has lingered because of the negative attitude that has been equated to and lingered towards the polygraph methodology and many believe MFE lacks credibility (Church, 2012; New, 2007; Rand, 2000; Rengifo, 2011), as it has yet to be tested in the U. S. Courts. A thorough review of the related published literature is necessary to remove the conjecture and doubt to move forwards credible, reproducible and valid research, which will clearly separate the clinical psychological researches from the pseudo testing of the polygraph.

In other words, the courts argued (Frey v. U. S., 1923) that there was no reliable peer accepted research that proved a direct correlation between emotions and detecting lies and deceit.

Purpose & Research Questions

The purpose of this meta-synthesis is to provide a critical review of the related scientific and legal research of lies and deception (encompassing from about 2250 B. C. to present day), gathering information from scientific, legal, and other pertinent fields to demonstrate how Micro Facial Expressions (MFEs) has impacted the judicial process through an organizational and insightful critique as forensic psychologists face the possibility of *in vivo* court testimony. The discussion provides the foundation of emotions, how they can be expressed both verbally and non verbally. This research discussion provides the genesis of Micro Facial Expressions and its working concept, as well as postulates the problem: Would a Micro Facial Expression observer infringe upon the rights provided by the American Fourth and Fifth Amendment Constitutional Rights?

Table 2.

Thesis Questions

1. Will MFEs violate the 4th Amendment Rights of each citizen as interpreted by the U. S. Constitution?
2. Will MFEs infringe upon the 5th Amendment Rights of each citizen as interpreted by the U. S. Constitution?

This research targets to demonstrate that MFE has been silently present in the American courtrooms, but can be constructively utilized to the betterment of all interested parties; providing real answers to demeanors of behavior and potential lies and deceit.

Communication

Communication in the English language, in particular, can be problematic to say the least. English is not a phonetic language. Sometimes words may contain different spelling but that has

similar sounds to others and can often lead to miscommunication (especially to non English speakers, like myself). Due to the nature of the works of the human brain, individuals often interpret what its being said, and put our own twist to its intent. That being said, one must take into account that the actual spoken language accounts to a minor share to actual communication. On the other hand, non-verbal communication is a combination of complex and unconscious mechanisms such as gesture, posture, facial expression, eye contact, pheromones, proxemics, haptics, and paralanguage. In 1967, Mehrabian concluded after his research that the importance of verbal and nonverbal messages in situations where there was incongruence between words and expression followed the 7%-38%-55% rule. In his own words:

> When there are inconsistencies between attitudes communicated verbally and posturally, the postural component should dominate in determining the total attitude that is inferred. (Mehrabian, 1972. *Nonverbal Communication,* p. 108)

Koneya & Barbour, authors of *Louder than words: Nonverbal communication* (1976), concur with Mehrabian. *Figure* 3 is a chart that represents Mehrabian's formula. In contention, however, Borg in 1960 believed that the non-verbal communication should be at 93%.

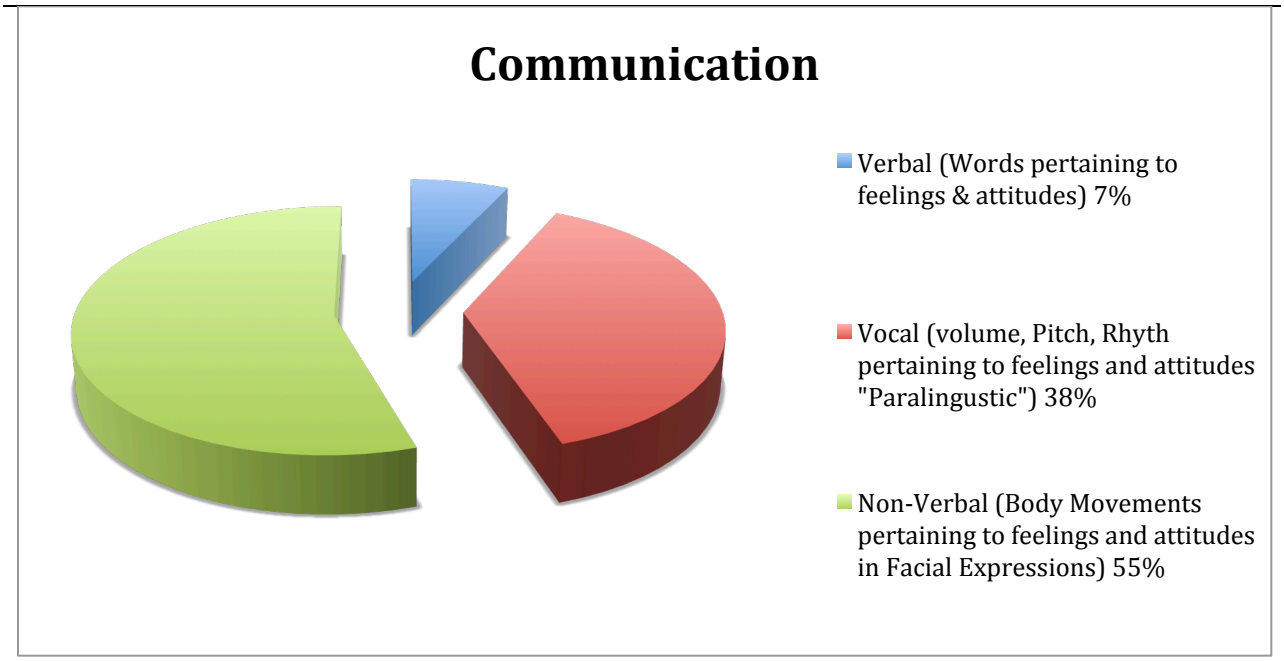


Figure 3. Communication © Vania Iumatti-Lodewyk, 2015

This graph illustrates visually how Mehrabian communication 7%-38%-55% Rule. This rule stresses that nonverbal communication is far more important to the conversation then words themselves, next the vocalization of words are considered in terms of volume and pitch in which they are used, and lastly consideration is given the words themselves, as they pertain to feelings and attitudes.

Listening

Another problem with verbal communication is that the great majority of people do not *actively listen* to conversations. One must be aware that listening and hearing do not mean the same thing. Hearing is a phase of listening; your ears receive the sound waves that are ultimately transported to your brain for identification. Listening is a complex communication process that any successful clinical psychologist will attest to be a successful one must listen, interpret the meaning of what is being said, and evaluate the message before responding to the person speaking. However in our societies, it is human nature to half listen

to a conversation, while waiting for the person to pause, so they can then interject thoughts or opinions about the subject. Almost as if in a contest that who can out do, out experience related incidents. Consequently, to a good liar, these opportunities are as good as gold to insert key concepts or deceitful incidents into the conversation that may not be recognized as lies and may not sufficiently remembered to be verifiable (DePaulo, 2010; Dimitrius, 2008).

Emotions

Emotion as defined by Kasschau ("n. d."); in an article in the American Psychological Association web site paragraph one:

> A conscious experience including a state of (physiological) arousal and a meditating interpretation; (sic) as such it is assumed to emphasize two factors: (1) some degree of arousal, and (2) an attempt by the experiencing organism to label the experience.

Emotions are the key concept to MFEs. The understanding of the related behavioral theories and the complete history of evolution of emotions are not necessary to the scope of the discussion in this paper. Issues they are pertinent to understanding of MFEs in the legal arena are discussed further in detail within Chapter (2).

Lies and Deception

Micro facial expressions open a door to several sub topics including the hot topic of lies and deceit. To say "I lie, you lie, and we all lie", is not just a presupposition anymore. According to a research study conducted at the University of Massachusetts, Feldman's research (2009) revealed that 60 percent of the subjects lied at least once during a short conversation. And in that small span of time, subjects told an average of 2.92 false things. So, is a false thing a lie or not? Ekman (p.28, 2009) re-defines "a lie as one person's intent to mislead another, deliberately without prior notification and without consent". Our societal traditions dictate the

values and standards in which people live by creating boundaries of acceptable behavior. Non-compliance to the moral and standard values set especially in the judicial system become lies. Lies become behavioral conflicts that must be administered by the laws of men. These laws are seen in black and white and are based on interpretations of previous court rulings or stare decisis, statutes and the American Constitution. This topic deserves a lot more discussion, which will be provided in Chapter 2.

MFE Definition

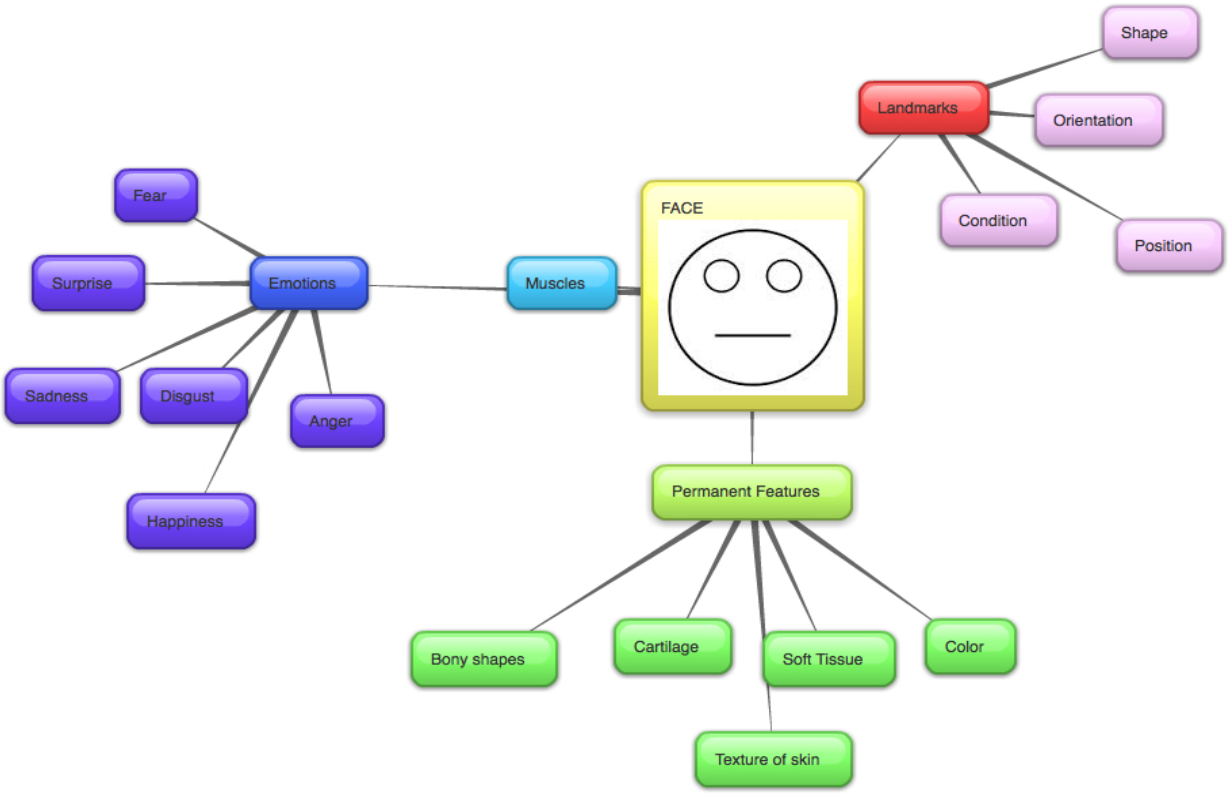
As previously stated, to communicate is not easy regardless how simple a definition process may be. Explaining the subtleties of MFE it is also not easy. There are many variables that interplay and complicate interpretation of Action Units the reader or the coder. Non-verbal emotion expressions develop on the face. Non-verbal emotions are subject to the (1) *permanent fixtures* of the face (bone shape, cartilage, soft tissue, and texture of the skin), (2) other permanent *landmarks* can also influence the expression (shape, orientation, condition and position), and (3) *muscles* manufacture the emotions (fear, surprise, sadness, happiness, anger and disgust). These attributes complete the characteristics of face that triggers our consideration as to the identity of a person, and are represented in Table 2 (Ekman and Friesen, p. 20, 2003). The totality of these expressions can differentiate one emotion from another.

So, for example, utilizing both Table 3 as our blank canvas, and *Figure* 4 as our final outcome, observable individual differences to emotion displayed can be singled out: A. Sclera (the white part) of the eyes, exposed in surprise and fear, not present in anger, happiness or disgust. But the appearances of those observables by themselves are not necessarily all inclusive. Further investigation is required. Other incongruent factors may also be important

determinants on the conclusion. The good observant will take all factors into considerations before attempting to make a final determination.

Table 3

Micro Facial Expression



The pictures below (*Figure* 4) represent frozen-in-time expressions of emotions that are easy to recognize across cultures. A more subtle variation of these emotions is likely to be leaked in the face in a small fragment of time. Here are some examples of recognizable signs one can observe in these pictures associated with their emotions (Ekman, 2003, 2009). *Sadness*: Inner corner of the eyebrows are pulled upwards, furrowing at the center of the forehead, tears may or not be present. *Disgust*: The wrinkling of the nose and raised upper lip occurring

together. *Anger*: Upper eyelids are raised, eyebrows drawn together a mid forehead and tight (puffed) upper lip.

Figure 4. Six Universal Emotions or Six Primary Emotions

Forensic Psychology

Forensic psychology is the application or the interaction of some of the practices of clinical specialties to the legal arena. Fulero & Wrightsman (pp.5-9, 2009) credit Hugo Munsterberg as the father of forensic psychology. Munsterberg was the first to claim that psychology should be applied to the law, and his work on the unreliability of memory is still echoed in the legal system. Fulero & Wrightsman also discuss that although Munsterberg's goal to push the psychological profession into the legal arena, however his standing within the legal arena was met with incredulity. Munsterberg's legacy continues to be a challange psychology and other sciences have to contend with whenever they enter the courts for expert testimony consideration. Battles of words, in and outside the court of law, have impacted this somewhat short-lived but highly regulated arena.

The Law

Understanding the historical process of the law and the adversarial posture of the American judicial system is crucial to understanding the progression, the intent and the conclusion of this paper, which we'll discuss further later in Chapter 2.

CHAPTER 2. LITERATURE REVIREW

Purpose

The purpose of this meta-synthesis is to provide a critical review of the related scientific and legal research of lies and deception (encompassing from about 2250 B. C. to present day), gathering information from scientific, legal, and other pertinent fields to demonstrate how Micro Facial Expressions (MFEs) has impacted the judicial process through an organizational and insightful critique as forensic psychologists face the possibility of *in vivo* court testimony. The discussion provides the foundation of emotions, how they can be expressed both verbally and non verbally. This research discussion provides the genesis of Micro Facial Expressions and its working concept, as well as postulates the problem: Would a Micro Facial Expression observer infringe upon the rights provided by the American Fourth and Fifth Amendment Constitutional Rights?

1. Will MFEs violate the 4th Amendment Rights of each citizen as interpreted by the U. S. Constitution?
2. Will MFEs infringe upon the 5th Amendment Rights of each citizen as interpreted by the U. S. Constitution?

This research targets to demonstrate that MFE has been silently present in the American courtrooms, but can be constructively utilized to the betterment of all interested parties; providing real answers to demeanors of behavior and potential lies and deceit.

Selection Criteria

From the beginning of this quest, the expectation was to gather a synthesis of the various literature offered in the MFE topic. This current meta-synthesis includes:

Published Articles

The study was published in a peer-reviewed journal between 1977 and 2015. As a pre-selection process, to get an idea of what is out there, incremental Internet searches were completed. It began with a simple search MFE query on Google then on Google Scholar (GS).

The first search yielded '8,070,000' hits between 1977 and 2015. Notes were kept on the yield results for each (but not the increment of time it took).

Discriptive Qualifiers

This process of hits and misses continued on the Internet, as all the 'qualifiers', including: MFE + TEST + NONVERBAL +LYING + NEUROSCIENCE + DECEPTION + JUSTICE DEPARTMENT + COURT + LAW + JURIES + JUDGES + LAWYERS + DECISIONS + FRE + CONSTITUTIONAL RIGHT + FOURTH AMENDMENT + FIFTH AMENDMENT, variations, combinations, and all of the above were tested. This process continued to build on the original search by adding additional descriptors to non-verbal behavior and other word like associations to the search as the progress progressed. The resulting table on the addendum page illustrates the varied numbers of hits found. With such an impossibly high number to visit each site was out of the question. Largely due to the distinct difference between Google and GS, as GS is more reputable for published articles (also having a smaller sample), a list was secured for the first twenty pages. From those twenty pages articles were selected based on the titles and abstracts that most closely matched the criteria of the study. Original selection totaled 100. After the first year of material gathering 2/3 of the selection was disregarded.

Sample size

Original selection limit expectation to be (>100 <30). If numbers cannot be reached from first selection, secondary selection will be drawn from references used in primary selection. Other options will be considered on a case-by-case determination.

Databases

From the Access to several databases, including but not limited to: ProQuest, Jaapl, Psypress, PsyArticles, EBSCOHost, IEEEXplore, Wiley-Blackwell, Justia, ResearchGate,

HeinOnline, arXiv, Credo SpringerLink, Reference, Eric, Google Books, Google Scholar, JSTOR, LexisNexis Academic, and WestlawNext.

Language

The study was written in English because there are studies in languages other than English. The study must be in English (this clause was added, because this author is able to speak more than three languages. When this study began and fellow researchers around the world heard about it, there was an influx of material (articles and research studies) forwarded for contention. Some of these studies may have merited a second, look others did not; however all but one was written in English. Although the English forwarded paper (was not written by the sender from Brazil), so it did not present to be a prejudicial ethical consideration because since it had been pre-selected as one of the possible original studies.

Identified Problems

Problems identified were: Age of study, Specificity of the study, Topic of the study, Language of the Study, and Topic saturation. Later in the research, as needed, at the suggestion of mentor and confederates aware of this research project and its difficulties, whomever would come across legal or technical computer programing scholastic peer reviewed research, would inform of additional possibilities for consideration. The studies were related to Micro Facial Expressions, Non-Verbal Communication, Neurosciences, Lies, Deception, Justice Department, Courts, Law, Juries, Judges, Lawyers, Decisions, U.S. Supreme Court, Federal Rules of Evidence, Demeanor, Constitutional Rights, Fourth Amendment and Fifth Amendment Rights. Since this is a meta-synthesis of Micro Facial Expression literature and the legal system there will be no human interaction participants (other than occasional telephone call interactions). Due to the time span covered in the historical content on human lie detection, the presentation follows

as ascending timeline as much as possible. 3) Time constraints limit the ability of total inclusiveness of all desired topics.

Study Topic Generalization

Topic of the study must closely relate to Micro Facial Expressions research/studies as related to: The Amendment Rights (4th and 5th), any Federal, Appeal Court, District Court, Criminal Court, Local, Civil, Tort laws /rulings /hearings /judgments /decisions /opinions /trials /fillings /attorneys/ prosecution/ defense/ demeanor/ credibility/ veracity/ guilt/ innocence /lie detection test/ /nonverbal communication /fMRI /neuroscience, and topic saturation. (Note: criteria were worded 'loosely' due to the lack of true matching on original Internet search). The information secured will be coalesced into the separate Amendment rights (4th and 5th and any remaining issues regarding the law that may be raised and can be potentially raised as a consequence to, or related to MFEs), further filter arguments by law citations rulings (secure ruling transcripts and familiarize with referenced text), map linear causal relationship of rulings-time, postulate application standards to causal relationship of demeanor- MFEs, fMRI-MFE and MFE - 4th/5th Amendments. (Note: The need for this psycho-legal *symbiotic relationship* will be further explained in Chapter 4). However, the process by which the articles were selected was difficult at best. Deliberate need for vagueness on term/topic definition was necessary as MFE have not yet been challenged into the courts. The material sought has not been in any legal case (involving MFEs in the U. S.). Next material explored were case rulings with any mention of non-verbals or derivations of the word. Results led to few possible law 'articles'/ 'theories' on demeanor and fMRI. This action gave this research new approach-basis for queries and eventually more success in final goal (with over 100 articles selected as target positive, albeit not all used).

The original intention was to present all of the selected research in one table (please refer to addendum table 2). It turned out that it was not the best idea, as it became necessary to sort it again and again into different categories when presenting other research classifications such as legal opinions, neuroscience, computing and psychology among others. Subsequently, the original table was broken down into several sub-tables, and the only surviving table hereby presented below for further discussion on the *Literature Review* section is represented on *Table 4 Legal Studies*, which is contains all the literature material in chronological order since the beginning of the presentation of this paper (note that the literature spans a period of twenty years from 1993 through 2013).

Table 4

Legal Studies

Title	Primary Author	Publication Year
The importance of non-verbal communication in the courtroom	Remland	1993
A wipe of the hands, a lick of the lips: The validity of demeanor evidence in assessing witness credibility	Blumenthal	1993
The demeanor gap: Race, lie detection and the jury (*)	Rand	2000
Nonverbal detection of deception in forensic contexts (*)	Frank	2003
Assessment of perceived guilt through facial expression analysis of attorneys (*)	Warner	2004

Title	Primary Author	Publication Year
Neuroscience-based lie detection: The urgent need for regulation.	Greely	2007
Racial blindsight and criminal justice: Othello error: Facial profiling, privacy, and the suppression of dissent	Herbert	2007
Deceiving the law	Unknown Editor	2008
The veiled truth: Can the credibility of testimony given by a Niqab-wearing witness be judged without the assistance of facial expressions?	Williams	2008
Dangerous decisions: A theoretical framework for understanding how judges assess credibility in the courtroom	Porter	2009
Confronting religion: Veiled muslin witness and the confrontation clause	Murray	2010
Neuroscience in the courtroom: An international concern	Church	2012
Will get fooled again: Emotionally intelligent people are easily duped by high-stakes deceivers	Baker	2013

(*) Reflects cases that fit more than one table sort/criteria

Seeking Credibility

The decision to present the arguments postulated on this paper in a chronological order, became a necessity after encountering quoted information with dubious unsubstantiated sources. Two research sources identified: Scalpello ("n.d.") and Trovillo (1939) anecdotal accountings of recorded methodology for detecting lies and deception by ancient Chinese rituals involving the

practice of dry rice. The anecdote recounts societal process to judge the culpability of a suspect by inserting dry rice onto the suspect's mouth. The physical response process implication expected to be akin to the now known emotion aroused by fear (or fight-or-flight response); if the rice was spat dry, the person was deemed guilty. This research was unable to verify the sources used by Scalpello and original work retrieved on Trovillo was illegible via public Google access. Please refer to *Figure 5 (Historical Timeline as Related to Lie and Deception)*, an illustration of the research process to acquire the information to link the missing data in seeking credibility.

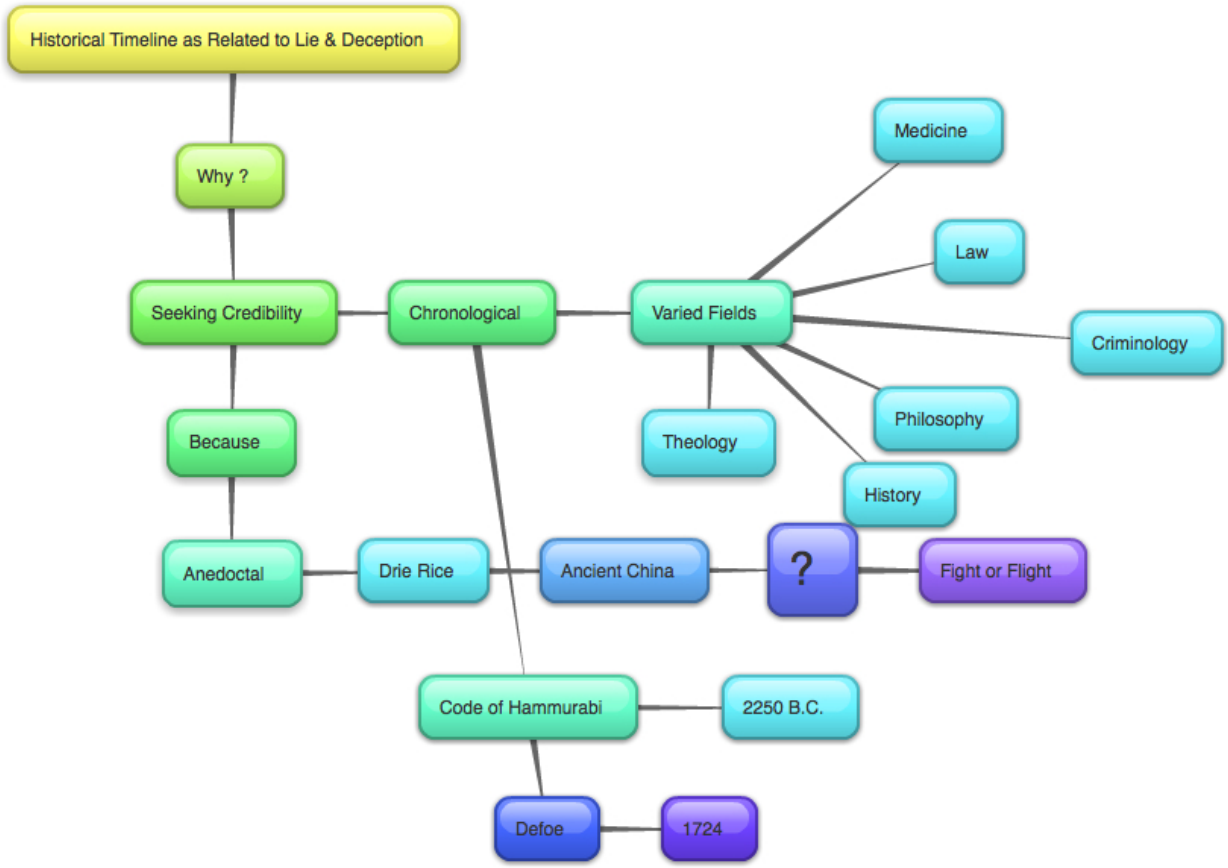


Figure 5. Historical Timeline as Related to Lie and Deception © Vania Iumatti-Lodewyk, 2015

In conclusion, the research in this synthesis combines credible information encompassing a variety of areas: law, criminology, theology, philosophy, medicine, and general history, among

others. Normal research practices dictates using information that is as contemporary as possible (10 years or less). Due to the range and scope of the concepts, a larger breadth of historical information proved necessary.

Historical Timeline

Ancient China circa 2250 B. C.

The first credibility issue in the literature encountered dealt with the usage of the terms methods of the *Ordeals and of Torture* and the anecdote of the trial of *Dried Rice* as a mean of deception detection in ancient times. Verifiable written documentation is found through the early 1700s. Author, Trovillo (edited by Inbau, 1939), quoted Lea's original work *Superstition and Force: Essays on the wager of law – the battle – the ordeal - torture* (1892).

Only a few reliable sources continued with the dried rice research there were a few reliable Internet sources that quoted Vrij (2004) allegedly stating that the Chinese condoned the physiological use of rice torture since at least 1,000 B. C. Scalpello's statement sided in a paper published in Academia.edu, "no date". (Note: this research have been unable to verify the information, retrieved as of June 17, 2014 7:21PM.) The topic of lies and deception cited as far back as the *Code of Hammurabi*, under the *American Journal of Theology*. According to Winckler (1904) in his article entitled *The Code of Hammurabi,* the code itself dates back circa 2250 B. C. This code is known as the law that the strong shall not oppress the weak. Winckler quotes Harper in his translation of False Witness:

> If a man in a case (pending judgment) bear false (threatening) witness or do not establish the testimony that has given, if that case be involving life, that man shall be put to death. If a man (in a case) bear [sic] witness for grain or money (as a bribe), he shall himself bear the penalty imposed in that case. The Mosaic Law was in similar line. Thus Deut.

> 19:16-19: If a false witness rise up against any man, o testify against him that which is one, then both the men, between whom the controversy is, shall stand before Yahweh, before the priests and the judges which shall be in those days . . . and behold, if the witness be a false witness and hath testified falsely against his brother; then shall ye do unto him as be had though to have done unto his brother. Winckler, p. 605, 1094

The Code of Hammurabi is commonly known as the *eye for an eye, a tooth for a tooth law*. The historical presentation shows the way in which the law changes and the quest for the truth and detection lies and deceit continues throughout history. Pursuing history in detail is not the goal of this paper, however fascinating. Our intention in drawing attention to it is to demonstrate that this cause is old and not without reason.

Three other recommended books that breach the same subject (pursuing history) in different times and are often quoted by those researching the history of lie detection are: *Superstition and Force* (Lea, 1866); *Ancient Laws and Institutes of England comprising Laws enacted under the Commissioners on the public records of the Kingdom appointed by his Majesty's Commission of the 12th of March 1831* (Thorpe, 1840) and *History of Lie Detection* (Trovillo, 1939). The first two books are Open-Access in public domain because they are older than 75 years and not in copy right material and available through Google. Although this author could not verify the sources beyond Lea, it is reasonable to infer that since similar accountings are found in the Code of Hammurabi time to the accountings of Lea time – that customs did not change a great deal despite the length of time. Thus in the lack of proof otherwise, this research will accept the anecdote of rice as plausible.

The next verified account to attempt to detect a lie came in form of a letter from author Defoe to his brother entitled *The Great law of subordination considered or the insolence and*

unsufferable behavior of servants in England duly required (back in *1724)* and his observations of blood pressure visible to the naked eye. In his words*:*

> Guilt carries fear always about with it; there is a tremor in the blood of thief, that, if attended to, would effectually discover him, and if charged as a suspicious fellow, on that suspicion only I would always feel his pulse, and I would recommend it to practice. The innocent man which knows himself clear and has no surprise upon him; when they cry "stop thief" he does not start; or strive to get out of the way; much less does he tremble and shake, change countenance or look pale, and less still does he run for it and endeavor escape. Defoe (1724).

Although Defoe was not educated on varied topics, Defoe excelled as a writer and in observing life. Defoe's letters cried out for the medical sciences to take a better look at the causation and prevention of criminology.

Age of Enlightenment circa 1650s through 1780s

The quest to understand criminals and criminal behavior, lies and deception included, and continued through the Age of Enlightenment. The time between the Age of Enlightenment and the Industrial Revolution brought a very important event in the Western World: On March 4, 1789, the first Judiciary Act ratified by the United States Supreme Court. The importance of this date should be obvious from a judicial point of view; as of now United States of America had the highest court of appeal and to help interpret the constitution and settle many other issues within the varied fields of law.

The presence a *gap* in the timeline does not, by any means, indicate that there were no developments, controversies, discoveries or interesting events happening throughout the world in the various disciplines. This research's quest however allows us to be somewhat selective to

issues that are related to the topics of interest or this research would lose focus of the final product. The next century will feature a shift focus from the law to the world of science.

The Nineteenth Century 1801- 1900

Shifting attention to the Italian born criminologist and physician founder of the Italian school of Positivist Criminology (1878): C. Lombroso. The Encyclopedia of World Biography (2004) calls Lombroso as the father of modern criminology, because he advocated his attention on the study of the individual offender as distinguished by the physical anomalies or Phrenology (The study of bumps on an individual's head). Lombroso's theories were refuted in Europe. The theories were embraced in the U. S. Lombroso used applied blood pressure tests to suspects while assisting actual police investigation and interrogation (Matte, 1996). *Figure* 6, The Nineteenth Century, illustrates the people and events that are important in our research timeline.

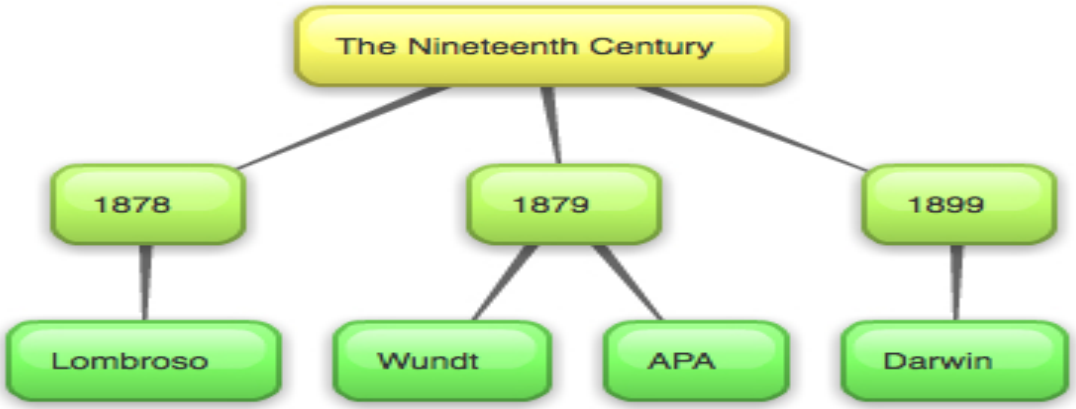


Figure 6. The Nineteenth Century 1801 – 1900 © Vania Iumatti-Lodewyk, 2015

In 1879, Wundt, a German physician, philosopher, and physiologist was one of the founding fathers to support the break away of psychology from biology and philosophy. Wundt founded the first formal laboratory for psychological research/experimental psychology. Within the same year (1879), the *American Psychological Association was organized and founded*. The importance of these events nearly defines the backbone of what will be the concept in our

discussion and will be further made clear as this research lay down our argument in the pages to come.

In 1899, Darwin became the first scientist to postulate the universality of human emotions. Darwin believed that emotions were biologically innate and a major part of his theory of evolution.

The Nineteenth Century proved to be very eventful to both the psychological and legal arenas. *Figure 6* is a graphic illustration of important events for both the psychological and legal arenas relevant to lies, deception and eventually MFEs. Researchers seeking affirmation of Darwin's postulations were unsuccessful. Early dominant posture in the field of psychology was one that facial expressions were both culture and language specific (Matsumoto and Hwang, 2011). *Figure* 7, Depicts the historical impact of the Twentieth Century was in our timeline, for both the psychological and legal arenas.

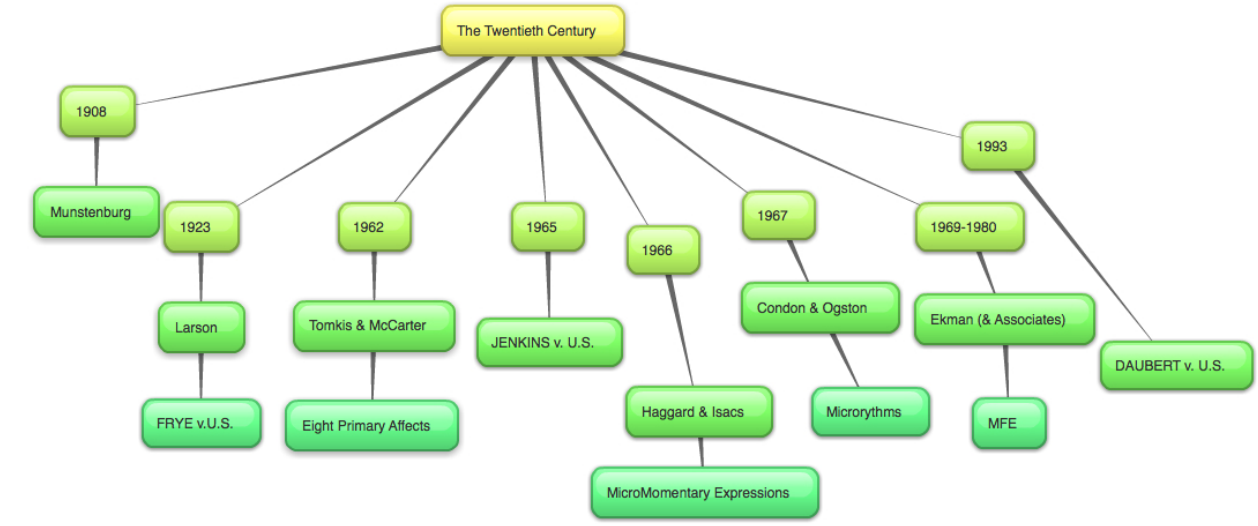


Figure 7. The Twentieth Century 1901-2000 © Vania Iumatti-Lodewyk, 2015

The Twentieth Century 1901-2000

During the first decade, Munsterberg (1908), considered (Fullero & Wrightsman, 2009) the father of forensic psychology and one of the original founders of the APA, wrote on the reliability of eyewitness testimony. Munsterberg's views were at times viewed as adversarial because of over-inflated claims for his science, and for offering his testimonial for either side of a legal case. An often strong-quoted opinion of Munsterberg is that of Moore (1908) titled *Yellow Psychology*; where Moore dismisses scientific studies and quotes Justice Grier saying "Experience has caused me to have little confidence in the opinions of experts and professors, who often have more knowledge than judgment". The courts have had a long-standing position that it views the social studies communities as adversarial. Some blame the court's adversarial stance on Munsterberg's un-solicited opinions (see Moore, 1907). Others believe the courts have dismissed or marginalized the legal relevance of social science research (see Chief Justice Rehnquist opinion on psychological studies on Lockhart vs. McCree, (1986), Redding and Dickon Reppucci (1999)). In 1917, Marston develops the first modern polygraph. In 1921, in *State v. Driver*, a North American psychologist testifies in court as an expert witness for the first time (albeit, his testimony was rejected).

Next, in 1921 Larson, a medical student introduced to the legal community the cardio-pneumo-psychogram or the polygraph for the defense on Frey's murder case as proof of Frey's innocence. The lower court denied Larson opportunity to give expert testimony. Frey appealed and the U. S. Supreme Court affirmed (Frey v. United States, 1923). In short, the Supreme Court held that the lower court had not erred in its decision to exclude the test results explaining that although the "deception test" had a scientific basis, however it was imprecise between experimental and established science.

Post Frey

The Frey case became known, as the "Frey Test" that would set precedence and influence the American judicial system for nearly seventy years. The Frey test also known as the *general acceptance test* or the *admissibility test of scientific evidence* imposed 'in vivo' limits and restrictions of the defendant's mental health expert testimonial. In other words, the Frey test required that the evidence be:

Table 5:

Frey Test

(1)	From the field from which the technique it belongs to,
(2)	That the expert is recognized by his/hers own peers
(3)	The methods are valid and reliable or in theory that the flaws in the expert's suppositions would be exposed through cross-examination

The Frey decision remained dormant among American judicial jurisprudence for nearly twenty-five years. Although the Frey decision had a negative impact on future expert testimony within the psychological community, numerous other court cases that were also important and relevant to our timeline continued to happen (General Electric Co. v. Joiner, 1997; Kumbo Tire Co. v. Carmichael, 1998; United States v Cordoba, 1993). To discuss all of them in this paper would be beyond the scope of this research, but the amicus filed with Jenkins v. United States, 1965 is pertinent to our discussion. In Jenkins, the American Psychological Association (APA) filed and *Amicus Brief* on February 1962, seeking recognition by the courts. In Jenkins, the courts recognized the following issues (yet, the restrictions on admissibility test of scientific evidence remained virtually similar):

Table 6

Jenkins v. U.S.

(1) Psychology is an established science

(2) The practice of psychology is a learned profession.
(3) A clinical psychologist is competent to express professional opinions concerning the existence or non-existence of mental disease and their causal relationship to overt behavior; and
(4) Experience is the essential legal ingredient of competence to give an expert opinion.

The American U. S. Supreme Court decided that other courts/judges could allow psychologists testimony as 'experts' in cases where a determination to the defendant's mental disorder was needed, but this was to be based on the psychologist training and expertise. In Jenkins v. United States that the courts recognized:

> Psychology as an established science, a learned profession competent to express professional opinions concerning the existence or non-existence of mental disease and their causal relationship to overt behavior, and experience is the essential legal ingredient of competence to give an expert opinion.

Thus affording psychologists the recognition needed in courts throughout the nation. Further validation of psychology as a discipline is subsequently obtained in 1954 on the Brown v. Board of Education case decision outlawing school segregation.

In Frey, this research postulates, the nexus is lost between attempts to detect lie and deceit in the American judicial arena and focus is shifted into introduction of expert testimony or scientific evidence whereas the courts have been all along utilizing demeanor of behavior as gages of deceit.

Tomkins and McCarter (1964) revived Darwin's theories (Darwin's hypothesized that emotions and their expressions were biologically innate and voluntary. Darwin's theories were found inconclusive in the early 1900s) around 1962 by conducting the first study to demonstrate that facial expressions were consistent with certain emotional states and to distinguish eight primary affects and their facial responses:

Table 7

Eight Primary Affects

Interest-Excitement: eyebrows down, eyes track, look listen
Enjoyment-Joy: Smile, lips widened up and out, smiling eyes (circular wrinkles)
Surprise-Startle: Eyebrows up, eyes blink
Distress-Anguish: Cry, Arched eyebrows, mouth down, tears, rhythmic sobbing
Fear-Terror: eyes frozen open, pale, cold, sweaty, facial trembling, with hair erect
Shame-Humiliation: eyes down, head down
Contempt-Disgust: sneer, upper lip up
Anger-Rage: Frown, clenched jaw, eyes narrowed, red face. Tomkins and McCarter (1964)

Tomkins later enlisted Ekman and Izard to conduct several studies on both literate, illiterate, and later on preliterate people, now known as the *universality studies* while seeking and attaining high cross-cultural agreement in judgments and emotions (Ekman, 1972; Ekman & Friesen, 1971; Ekman, Sorenson, & Friesen, 1969; Ekman, et al, 1969; Izard, 1971).

In 1966, Haggard and Isaacs researched non-verbal behavioral communication between therapist and client/patient that could not be observed naturally in therapy situations. Haggard and Isaacs examined hours of filmed therapy sessions and noted changes within one-eighth to one-fifth of a second frames per second (f.p.s.) that they called *Micromomentary Expression* (MME) changes.

Also in 1967, Condon & Ogston while researching interaction of couples, filmed during therapy at the fraction-of-a-second level, perceived that couples had interactive micro movements or microrhythms of only a four and a half second long film they were able to see frame by frame interaction of a wife shoulder moving as her husband's hand moved; to which Condon & Ogston attributed to be microrhythms.

In the years that follow from the late 1969s through all of the 1970s and the 1980s, Ekman and many of his associates (Friesen, Sorenson, Izard, Matsumoto) worked on several

research studies to quantify, validate and expand the concept of micro facial expressions (Matsumoto, Keltner, Shiota, Frank & O'Sullivan, 2008). Ekman worked on expanding the taxonomy of like words to define the same emotion, grouped emotions by intensity or pleasantness, positive or negative, and eventually reducing Tomkins & McCarter's eight primary affect emotions down to six (Ekman, 1998, 1999). These independently conducted cross-cultural studies suggested universality in interpreting facial expressions of emotions (Ekman, Sorenson, & Friesen, 1969; Ekman & Friesen, 1971; Izard, 1977). Matsumoto & Hwang (2011), claim that Ekman's work on MFE has increased our understanding of emotions and its evolutionarily adaptive process.

In 2002, Elfenbein & Ambady presented a meta-analysis of 168 datasets examining judgments of emotions in the face and other nonverbal stimuli indicating universal emotional recognition well above chance levels. Matsumoto (2002) questioned Elfenbein & Ambady's research study fundamental design issues and claimed the data did not support their conclusions. There have been over 75 studies that have demonstrated that these very facial expressions are produced when emotions are elicited spontaneously (Matsumoto, Keltner, Shiota, Frank & O'Sullivan, 2008.), however Elfenbein & Ambady in the 2003 final article's print, remains strong on the assertion of nature v. nurture argument.

Affective Neuroscience

Affective Neuroscience is the study of the neural mechanisms of emotions, in layman terms how the study of the human brain in health and disease. Broca first suggested that emotions were related to the center of the brain in the limbic system in 1878. There are several parts of the brain involved with the emotion process such as the main structures of the limbic system (Amygdala, Thalamus, Hypothalamus, Hippocampus) and other parts of the brain as the

Cerebellum, the Pre-Frontal Cortex and the Basal Ganglia. Each of these structures has been associated with a particular process, for example: the Amygdala is associated with negative emotions especially fear and it is activated when perceiving potential threats. The Hypothalamus synthesizes and releases neurotransmitters that can affect mood and arousal. The Insula is connected to body structures that regulate our body's autonomic functions like heart rate and breathing and it is presumed to play a role in the emotion of disgust (Blair, Morris, Frith, Perreth, & Dolan, 1998; Morris et al, 1966). Emotions cannot be empirically measured since this research cannot quantify internal experience of others. Studies of the central nervous system correlates of facial expressions also bear upon the dimensionality versus discrete issue. The study of emotions to be related to certain brain areas was not an innovative idea when Ekman got into MFEs (see Ekman & Davison: *Affective Science: A Research Agenda*, 1994). Neuroscience-based lie detection test (NBLD) were noted at the hearing of John Robert's to be Chief Justice of the U. S. Supreme Court in 2005; as the question arises on the assessment to resolve whether a person is prone toward delinquency or violent comportment (Pulice, 2010). Studies of brain function ameliorated by leaps and bounds after the development of three-dimensional images known as the Magnetic Resonance Imaging (MRI) machine patent was issued in 1974, and several hundred studies since were performed on brain system functions alone (Barrett & Wager, 2006; Kober et al. 2008; Murphy, Nimmo-Smith, & Lawrence, 2003; Phan et al. 2002; Vytal & Hamann, 2010).

Judges are starting to attend conference to and discuss the impact of NBLD and its legal ramification; defense attorneys are already in preparations to use NBLD as mitigating evidence (Pulice, 2010). Still, all this information has not satisfied the requirements of the courts or Frey. The advancement of science was fast and a new resonance imaging system was developed: the

fMRI. Functional Magnetic Resonance Imaging (fMRI) machine has ascertained that the perception of different facial expressions elicits activity in different brain regions, (Keltner & Ekman, 2000); while others believe that research is still too young to be indicative of a definitive answer. The general consensus is indicative that key brain structures are critical for the production of emotion. Brain fingerprinting, developed by Farwell in the late 1980s and specifically designed to detect criminal conduct (Rosen, 2007) is based on the theory that brain waves change when people recognize familiar things. There are three types of NBLD tests: Brain fingerprinting, The Functional Magnetic Resonance Imaging (fMRI) and The Brain Electrical Oscillations Signature test, (BEOS). In tne next section this research will focus with comparative literature of fMRI.

Functional Magnetic Resonance Imaging (fMRI)

In contrast to an MRI (spatial, high resolution, anatomical structure), the fMRI machine records blood flow of activated brain areas in response to specific input (stimuli: a base stimuli such as finger taping versus seeing a picture of a crime scene). Neuroscience-based lie detection measures the involuntary responses of the brain, while the polygraph measures the physical manifestations associated with lying (Pulice, 2010). An fMRI is considered a diagnostic/experimental tool that although more expensive (due to its soft and hardware) provides functional images and metabolic structure at high resolution with no invasive procedures. Pulice indicates that the fMRI test balances temporal and special resolution, if the subject attempts to deceive the questioner, the right orbitofrontal/inferior frontal, the right middle frontal, and the right anterior cingulated are activated. Researchers estimate they can correctly identify when subjects are being deceptive, with accuracy rate of between 86% and 93%. However, the test can only indicate there is general deception but *not* what the deception is about

(Runkle, 2011; United States v. Semrau, 2010). Keeping in mind, since the fMRI is rarely used for diagnostic procedural work, there is a lack of standardization among lab procedures and equipment. Another cautionary note is the populous used exclude the elderly and younger than 18 years old as well as people skilled at deception. Yet, for some the claim that neuroscience research has made it possible to examine the human brain - the 'seat' of consciousness, decision making, thought, memory and personality seem alluring (Aronson, 2008). The theory is that while "lying" the brain must exert extra cognitive effort. The primary areas illuminated are presumed to be involved in the decision making process. fMRIs are credited for being accurate, safe and effective and does not require highly trained personnel to read the test results (Pulice, 2010). Wolpe (2005) asserts:

> Advances in magnetic resonance imaging, electroencephalography (EEG) and other techniques, can for the first time, reliably [emphasis added] measure changes in brain activity associated with thoughts, feelings and behaviors, in principle allowing researchers to link brain activity patters directly to the cognitive or affective process or states they produce. p.39

Other researchers have more reserved opinion (Abe et al., 2007; Phan et al., 2005; Spence et al., 2001). However, fMRI cannot hone in on the individual neurons that might mitigate the actual critical function of the mental process. It is extremely difficult to find an empirical case of pure emotion because in any normal situation, emotion is inseparably intertwined with cognition. The courts, and to some extent the scientific community agree that there is a linear comparison between the polygraph and the fMRI mentality (McNamara v. Borg, 1991; New, 2008; People v. Shedrick, 1985; Water Wheel Inn v. Exchange Ins. Co., 1999; Wilson v. Corestaff, 2010; Wolpe, 2005).

Although *not* expressively stated by the United States Supreme Court, it is *not* an unreasonable conclusion that emotional measurement (of lie or deceit) is the missing link in the polygraph testing on the Frey case. It is also not an unreasonable inference that the premises behind the polygraph are based on the fight-or flight reaction, which is based on the emotion of fear? If Affective Emotion research has demonstrated that the Amygdala has correlation to fear, would then that be sufficient proof for the courts? Documenting the origination of deception or lies mapping process was closer, but still involved more than one area of the brain to conclusively equate deception = x, where x equals (one) location; rather than several in combination locations.

> From a scientific perspective, there appear to be specific sub-regions of the prefrontal cortex that are activated during deception. The development of a deceptive idea appears to be associated with the lateral prefrontal cortex while the intention associated with the deception seems to be associated with the medial prefrontal cortex. The fact that these regions have been determined is a step in the right direction for pinpointing the exact mechanism by which deception originates. (Rengifo, 2011, p. 5)

The question posed, "If Affective Emotion research has demonstrated that the Amygdala has correlation to fear, would then that be sufficient proof for the courts?" remains that are ever persisting are: Can this half answer help or harm the expert testimonial? The answer is not easy, and debatable depending on ethical considerations. The next section will examine the ethical considerations forensic experts.

Ethical Considerations

Sixth Amendment Right, confrontation clause challenges are adversarial by nature. The confrontation a forensic psychologist must face when testifying against an unethical forensic

colleague should not be adversarial for a party or a cause. The American Psychological Association's (APA) *Ethical Principles of Psychologists and Code of Conduct* (Effective date June 1, 2010 Copyright © 2010 American Psychological Association retrieved from the APA web site www: http://apa.org.com) provides a common set of principles and standards upon which psychologists build their professional and scientific work. The APA (2002) Code does not address this issue specifically, and not *all* practicing forensic psychologists are members or follow APA guidelines. In the timeline for profit-testimony has been a contention with the courts since Munsterberg and what Greely & Illes (2007) believed neuroscience promises – a prevue into what and how people think – combined with the erroneous discernment that this is legitimate *hard science*. Companies like No Lie MRI and Cephos Corporation offer fMRI services are current example of for profit testimonial industry. Their assertions are yet to be tested in a court of law. *Figure 8* is a snapshot of the advertising of the two more known for profit companies current on the market selling methods of detection and other information stored in the brain. Whether their testimonials will impact the jurors it is yet to be determined. Research by Eagly, Chaiken, & Wood, (1981) demonstrate that the use of court-appointed expert witnesses may reduce juror tendency to question the validity of the presented testimony. Jurors may develop pre-message expectations based on which side the expert is testifying for. These perceptions can lead jurors to form knowledge and/or reporting biases of the offered testimony. In turn, these expectations may affect the perceived trustworthiness of the witness. Because they are court-appointed (i.e., a friend of the court), expert witnesses and their testimony may carry a greater weight with jurors, reducing their tendency to engage in hindsight. Also, research by Cooper & Neuhaus, (2000) provides that juror views of expert testimony may be affected by source cues (i.e., credentials and compensation).

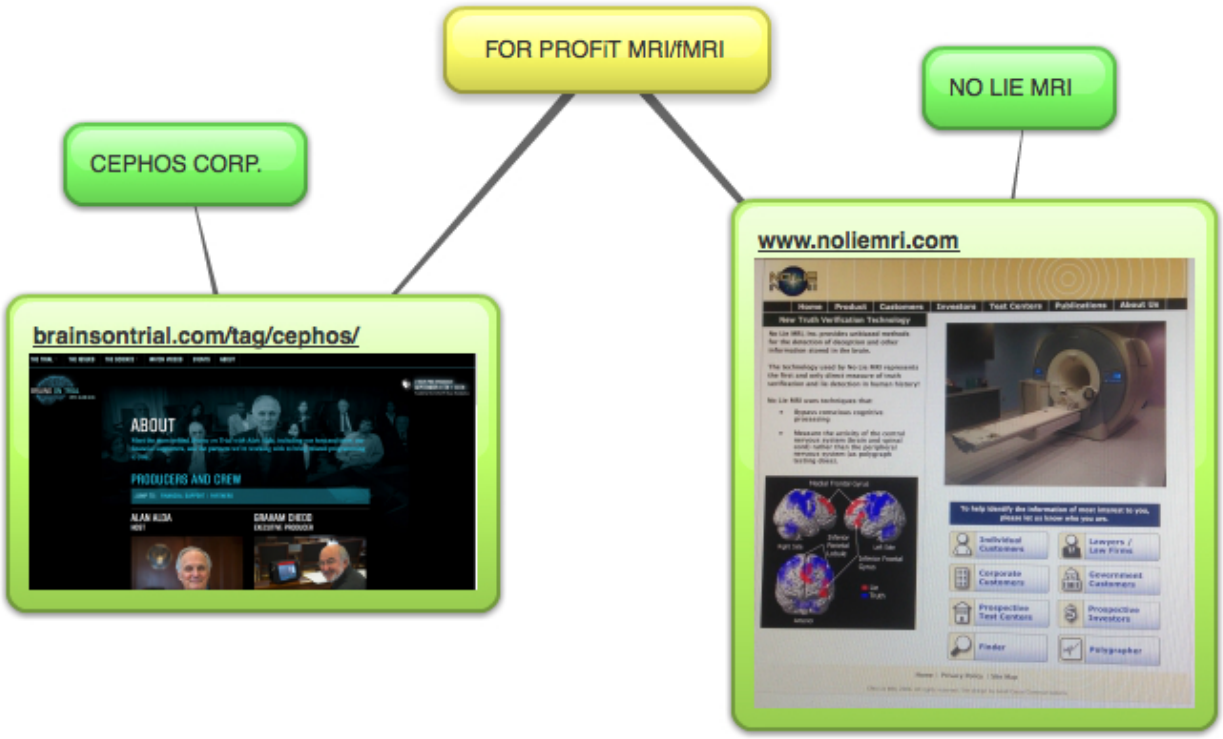


Figure 8. For Profit fMRI/MRI © Vania Iumatti-Lodewyk, 2015.

Results of their study indicate that jurors tended to view highly paid, highly credentialed experts as hired guns. The experts were less believed, less liked, and generally viewed as less effective than experts who were paid less or who had more modest credentials. Wagner, provided an insightful review of *Can neurosciences identify [sic] lies?* In the Judge's Guide to Neuroscience: A Concise Introduction (2010). Wagner believes that fMRI is capable of resisting counter measures, however researchers are yet to produce proper studies with any unambiguous relevant published data whether fMRI-based neuroscience methods can detect lies at the individual-subject level, design limitation. In *United States v. Semrau,* 1976, the Tennessee court judge ruled excluding on the Daubert (will discuss Daubert a little later in this chapter) evidentiary hearing submitted by Cepho's president Stephen Laken on the reliability of fMRI evidence that the defendant had not defrauded the government. Mr. Laken's evidence submitted to the courts

lacked verifiable proof of its scientific reliability. Judge Pham anticipated fMRI might someday gain acceptance in the scientific community. With more than one variable, the results of fMRI and its probative value of neuroscientific evidence in the courtroom, things are still very much under heavy consideration. Studies on fMRI (brain scans/fingerprinting) evidence reveal potentially high success rates for truth-telling detection, as well as for determining specific memories of events and people. According to Thompson (2005:1602, 1609-11), fMRI has been used in counterterrorism efforts, particularly those at the Pennsylvania's Institute for Strategic Analysis and Response (ISTAR). Thompson believes that this evidence will significantly decrease the torture involved in obtaining information from terrorists.

Church, in 2007, on the other hand, discusses a case that is a very recent example of a neuroscience test used to convict a suspect occurred in India. The use of a brain scan as evidence has aroused international attention and concern. An Indian court, in 2008, based on experimental knowledge from evidence of an Electroencephalogram (EEG) test result, convicted a woman (Aditi Sharma) of murder. Although the India trial had a higher level of significance due to the murder charge, it was not the first time that the use of neuroscience information was used in a court of law to influence the final outcome. After Sharma's conviction, India used the same testing to convict two more criminal defendants on *conclusive* experimental knowledge. Church also stated that in May 2009, Italy's court of appeal was the first European court to reduce a murder sentence based on findings that the defendant had a proven genetic brain evidence indicator for propensity towards violence. Since, both the countries of Israel and Singapore have started to research possible uses of neuroscientific evidence.

Meanwhile, in our own courts, juries heard and/or considered testimony of expert witness on cases where evidence was presented based on *neuroscientific* data. Some famous examples

are: (1) The John Hinckley's trial in 1981for the attempted assassination of President Ronald Reagan. The courts admitted Hinckley's CT scans as evidence of schizophrenia and his actions were a direct result of his brain abnormalities. Hinckley was convicted by reason of insanity. (2) The Braunstein's trial in 2007 for kidnapping, sexual abuse and robbery. MRI evidence was provided linking schizophrenia to Braunstein's lack of ability to control his sexual impulses. (3) In Weinstein's defense in 1992 a brain cyst was attributed to his client's killings. (4) Harrington v. Iowa (2003). Farwell analyzed Harrington's brain fingerprinting and concluded that Harrington's brain did not contain information about the murder. The evidence was utilized in a post-conviction motion for relief, but it was not considered. (5) Slaughter v. State (2005). In a post-conviction discovery motion with new evidence from a brain fingerprinting measurement, Farewell determined that Slaughter lacked knowledge of the crime. The court concluded that the evidence could not survive the Daubert standard of admissibility because any corroborating evidence did not support it. (Note: Pulice argues that in cases 4 and 5, the tests only determines the *knowledge* exists in the brain and must establish to what extent (everything); a subject can be *consciously prepared* (therefore counter-measuring); subject matter is not yet fully accepted in the field of its domain.) (6) In the U. S. v. Semrau, (2010), the Tennessee Court Judge excluded the evidence under Daubert test on several prongs: reliability (error rates), not accepted by peers as a lie detection tool, and prosecution did not have knowledge of the testing and expert could not identify exactly which questions the defendant answered truthfully or deceptively therefore the expert testimony would not be beneficial to the triers of fact.

Church brings forth the argument that fMRI technology could bring the end to *mental privacy*, or more clearly put a loss to human rights under the Fourth Amendment Rights. However Church cautions all along that should the dawn of evidentiary disputes be mollified, the

likelihood statutory concerns do not pose a substantial risk to permissibility. This discussion will be tabled for a later more appropriate venue.

A Misguided Assumption

An early research methodology was considered to compare statistical data from fMRI to MFE lie detection research. It seemed plausible. After all, both researches dealt with lies detection, brain, non-verbals, and judicial implications, however, fMRIs moved faster through the judicial processes. But what kind of historical data could be compared? Church (2012) quoted peer publication based on fMRI research numbers to exceeded 8,700 by 2007 and exceeded 504,000 by Internet in Google Scholar in 0.05 seconds on 02/04/2015. In comparison, an Internet Google Scholar search on MFE yielded about 112,000 results in 0.11 seconds (same date and time as above). Articles included a range in cases from science, to computer vision, psychiatry, artificial intelligence, nature and others. Since the number of published papers dates ranging from 1954 through present date, average about three times the number fMRI had been. Perhaps it might be possible to extrapolate conclusions? Confirmation of ever growing dissemination popularity on the MFE topic is not disputed; and evident in every day news headline such as this week's New York Daily News (Wednesday, February 4, 2015 @ 1:10 PM by Alehandro Alba). Alba reports that in Amsterdam a creative agency created a book that contains a facial recognition program and will not open its cover unless the reader presents him/herself in a neutral state. Social popularity (publication at nearly seven times the ratio fMRI-MFE) context does not represent scientific acceptance, as clearly one cannot compare oranges to apples. This is even more so justifiable by the conclusions of Vul, Harris, and Winkielman & Pashler's *Voodoo fMRI, (2009).* A troubling research demonstrating that a rather "large, and quite prominent, segment of social neuroscience research is using seriously defective

research methods and producing a profusion of numbers (impossibly high) that should not be believed" (p. 22). Lacking quantitative and qualitative validity, this argument in this research is considered moot. But is it really? Keep this afterthought in mind for just a little while longer…

Daubert v. Merrell Pharmaceuticals

Returning to our chronological timeline, on June 28, 1993 the United States Supreme Court announced its decision in the case Daubert v. Merrell Pharmaceuticals (1993). The original case filed by the families of Daubert and Schuller both of who were born with serious birth defects and whose families claimed that the drug Bendectin, produced by Merrell Dow, a subsidiary of Dow Pharmaceutical, caused their birth defects. Although the case was filed in a California court, Merrell Dow removed the case to a federal court and moved for a summary judgment, as their experts possessed documentation showing that no published study suggested a correlation between Bendectin and birth defects. Although Daubert and Schuller submitted expert evidence of their own suggesting otherwise, their expert evidence was based on in vitro and in vivo animal studies. The methodology used in these studies had not gain sufficient acceptance with the scientific community. The District Court granted Merrill Dow summary judgment. Daubert and Schuller appealed to the Ninth Circuit court. The Ninth District Court affirmed the lower court's decision. The Plaintiffs then asked the United States Supreme Court to review the case.

Post Daubert

The Daubert U.S. Supreme Court decision must be mentioned as its rulings changed the standard of admissibility of scientific evidence and expert testimony in the federal courts. Under the auspices of the U.S. Supreme Court Daubert decision the Advisory Committee on Proposed Rules extended, amended (the 'General Acceptance test'), and codified its rules in 2000. Now

the requirements of the Federal Rules of Evidence 702 (the admissibility of expert testimony in federal courts) states:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case. Federal Rules of Evidence: Testimony by Expert Witness – Federal Evidence Review (2014).

The Executive Council of the American Psychology-Law Society (AP-LS), filed a petition to the APA for the recognition of forensic psychology as a subspecialty (AP-LS, 2000). The petition defined, as cited by the John Jay College of Criminal Justice, Department of Psychology's web site (second paragraph):

> The professional practice by psychologists within the areas of clinical psychology, counseling psychology, neuropsychology, and school psychology, when they are engaged regularly as experts and represent themselves as such, in an activity primarily intended to provide professional psychological expertise to the judicial system. (Crossman, "n.d.").

In Daubert, the standard for determining the admissibility of expert testimony, the U.S. Supreme Court relied on Rule 702 providing that the witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise:

> (a) The expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue,
>
> (b) The testimony is based on sufficient facts or data,

(c) The testimony is the product of reliable principles and methods, and

(d) The expert has reliably applied the principles and methods to the facts of the case.

There are further explanations and clarifications, case citing's as well as individual interpretations of the Daubert standard available for easy understanding besides the factual Daubert ruling and the Rule 702 (suggested reading: the Handbook of Forensic Psychology: Resource for Mental Health and Legal Professionals (2003), under the heading of *Admissibility of Scientific Evidence*).

> Although Daubert has been codified, not all courts within the United States use it. Some state courts still use the Frye test when dealing with scientific evidence such as California (People v. Leahy, 1994), Florida (Marsh v. Valyou, 2007); Illinois (People v. McKown, 2007)… among others and must act as the 'gatekeepers'. As a gatekeeper, the judge hears testimony without the presence of the jury, as not to prejudice their decision making process. Some states, such as Georgia, have not specifically implemented Rule 702, but rather look to Daubert in establishing their own standards regarding expert testimony. Georgia courts adhered to the test set forth in Harper v. State, (1982), under which expert scientific testimony was admissible if the procedure or technique on which the expert relied had "reached a scientific stage of verifiable certainty" or "rest[ed] upon the laws of nature." However, in February 2005, Georgia's legislature intervened passing Senate Bill 3 which mandates that Daubert be followed in civil cases and encourages the Georgia courts to draw on federal 'Daubert' precedents. The legislation supplies a different test in criminal cases, in which "the opinions of experts on any question of science, skill, trade, or like questions shall always be admissible."

Defining Forensic Psychology becomes somewhat complicated as one looks at the definition from the psychological and the legal side. For that reason a deeper look needed. First and foremost, one must repudiate a misunderstanding of forensic psychology. The most common misnomer about forensic psychology is that it is related to the science of fact finding crime scene related to physical evidence or Crime Scene Investigation (C.S.I) where seminal fluids, blood, prints and the like, are used to create a psychological profile of the *unsub* (unknown subject). Second, although officially the two arenas are to see each other in the same context, the truth is far from reality. As discussed under 'Ethical Considerations' there are contentions of unethical behavior amongst peer forensic psychology professionals. The American Psychological Association has defined forensic psychology as,

The professional practice by any psychologist working within any subdiscipline of psychology (e.g., clinical, developmental, social, cognitive) when applying the scientific, technical, or specialized knowledge of psychology to the law to assist in addressing legal, contractual, and administrative matters (APA, Specialty Guidelines for Forensic Psychology, p. 7).

However, Small (1992-1993) in his opinion published Legal psychology and therapeutic jurisprudence, clearly illustrates that there is descent among the legal arena, prevailing:

> In civil law, forensic clinical psychologists are now routinely called upon to testify in cases of child custody, workmen's compensation, and negligence suits alleging psychological trauma and pain. In criminal law, forensic clinical psychologists are called upon to testify about a variety of issues including defendants' competency to stand trial, defendants' mental status at the time of the offense, as well as providing recommendations for sentencing.

Forensic clinical psychology has met with criticisms from experts both outside and from within the field. Initially, forensic psychologists were embraced by those outside the field as an important ally to legal decision makers. However, legal scholars have since criticized psychologists for delivering little of what was initially promised. Additionally, legal scholars have criticized forensic clinical psychologists for usurping the role of the legal decision maker.

The case made here is that there is a notable disagreement in what is expected of forensic psychologists, and no solution to this problem is offered. Although it is not this research's quest to answer the question of the correct definition of forensic psychology, but for the reader who might be interested in pursuing further enlightment in this topic, suggested reading are the articles by Hall, J. (1956) *The Psychiatry and Criminal Responsibility,* Tanford, J.A. (1990-1991) *The Limits of a scientific jurisprudence: The Supreme Court and psychology and* Carnegie Commission on Science, Technology and Government: *Science and technology in judicial decision making creating opportunities and meeting challenges (1993).*

Because this was not a primary concern in this research paper, however interesting the topic, the issue will not be pursued. Nonetheless, a marked impression remained along with concerns and implications post Daubert, which must be subjugated to another time, another research project, otherwise this project would be never ending.

However, if considering what has been learned by the attempts made by neuroscience vis a vie the fMRI technology, and applying the knowledge gained through the years of legal explanations and interpretations of Daubert; a 'legal theory' can be developed for consideration by legal experts. To do develop this research methodology procedure a selection criteria was created.

The presentation of the literature review is offered, as in most of the information discerned herein has been in chronological order. However, you might take notice in some occasions, the integrity of this structure of will not be followed, so that the flow of topics take precedence. Another excusatory pause is hereby noted that albeit it might not be relevant at this stage, while researching the literature herein, any and all sources cited by the author in question was also thoroughly researched for understanding his original work. Not included as part of this literature review are the computer studies and theoretical psychological researches (though included in the reference section, as required by the APA manual, chapter 6, p. 169-192). The next section will review the selected articles used as base for the preparation of the legal argument theory to be presented.

Neuroscientific Research & Legal Case Decisions

Remland, according to his bio at the West Chester University Internet site, is a professor of Communications Studies, specializing in the study of nonverbal communication, with particular interest in power, status, and cross-cultural differences. Remland presented his paper titled *The Importance of nonverbal communication in the courtroom* to the Annual Meeting of the Eastern Communication Association in 1993 (84th, New Haven, Ct, April 29-May 2). Remland's article, although twenty years old, refers to studies older than that his own by at least ten years. These articles will be explored, as the need arises, in the flow of this literature review. According to Remland, all parties involved in a courtroom process are influenced by a *continuous exchange of nonverbal signals*, yet little has been done to combine what is known about the influence of nonverbal communication in the courtrooms. This is a rather old report that explores recommendations on varied studies including utilization of speech rate, voice intonation, positional location in relationship to jurors and eyewitnesses to practicing attorneys.

Remland specifically cites the works of: Barge, Schlueter & Pritchard (1989) Attempts were made to secure more information on this and other researches without success. Successful retrivals will be summarized immediately after the author's name. Burgoon, Buller & Woodall (1989), generally speaking this research discusses the delivery of an attorney's speech is likely to be more effective if the speech is kept at moderately fast rate. The attorney keeps a strong eye contact, and avoids contradictions between of words and facial expressions and/or voice and body movements. Burgoon, Birk, and Pfau (1990) analyzed the nonverbal behavior of undergraduate students who were assigned to deliver in-class persuasive speeches. They discovered, in part, that speakers were judged as more persuasive when they exhibited greater vocal pleasantness (e.g., pitch variety and fluency), kinesic/proxemics immediacy (i.e., eye contact, body lean, orientation), facial expressiveness, and kinesic relaxation (i.e., tension-free random movement). LeVan (1984): LeVan, at the time she authored this article, was a student at the Alabama School of Law. *Nonverbal communication in the courtroom: Attorney beware.* The article proceeds to define several commonly used terminologies such as *the Rosenthal Effect* (the occurrence when an individual is placed in an unfamiliar situation in which the individual does not know how to behave. The individual tends to seek out the most experienced person, watch how that person reacts, and then modify the individual's own behavior to agree with the experienced person's behavior). Harlfield, Cacioppo and Rapson (1994): *Similar posturing*. Findings suggest that rapport may be associated with interactant's adopting similar postures (mirroring), speech styles, facial expressions, and patterns of coordinates. Building rapport includes the use of non-verbal behaviors (close distance, eye contact, smiles, and soft vocal tones) and avoidance of antagonistic cues (sarcastic tones, turning away and intimidating gestures). Matlon (1988) recommends attorneys (during voire dire) to stand 3-6 feet from the

individual being questioned, avoid interruptions, and avoid angry tone of voice and staring. Remland & Jones (1989) *focuses on body orientation*. Interviewees speak significantly longer in response to personal question when interviewer used a direct body orientation, vocal backchannels, head nods and eye contact. Rieke & Stutman (1990): on *Nonverbal communications*. Research found aggressive prosecuting attorneys (fast rate of speech, a lot of eye contact, emotional gestures, hostile vocal inflections, and high volume) were more viewed as more effective and more likely to obtain guilty verdicts than passive attorneys. Hodgson & Pryor (1984): on *Gender bias*. Researched gender biases and found that women evaluated female attorneys less favorably (less intelligent, less friendly, less expert, less experienced) then their male counterparts. McPeek & Edwards (1975): on *Expectancy violations*. The study summary states that the expectancy violation study was conducted to test the hypothesis that sources delivering unexpected communications (specifically long-haired males arguing against marijuana usage and seminarians arguing in its favor) would be more persuasive than communicators of expected messages (pro-marijuana hippies and anti-marijuana seminarians). [The study is based on other studies by Koeske & Crano (1968) that found that statements attributed to incongruous or unexpected sources were boosted in credibility (p. 194). And Walster, Aronson, & Abrahams (1966), demonstrated the enhanced credibility and persuasiveness of sources who make unexpected (i.e., apparently self-defeating) statements (p. 194).] It appears that when expectancy disconfirmation involves incongruity between expected and actual messages, the source and the message are accorded greater credibility and have greater influence. Greater attitude change for unexpected sources was found only when the message was anti-marijuana. Unexpected communicators also were rated as more sincere and honest than expected sources. Possible reasons for failure of the expectancy effect to hold for

pro-marijuana communications were suggested, and the results were discussed in terms of a variety of social-psychological theories. Deitz & Byrnes (1981), Efran (1974), Hartfield & Sprecher (1986), Kulka & Kessler (1978), Thornton (1977), Solomon & Schopler (1978), Jacobson (1981), on *Physical attractiveness*. Reportedly Efran back in 1974 was the first researcher on this causal effect, however, this research was unable to retrieve any confirming documentation (not that there is doubt to its existence). Waltman (1984) Recommends that Police officers that are testifying in court should dress conservatively when in civilian clothes, for example in suit and ties, no flashy colors, eye glasses, use of jewelry or chewing gums. Should the officer choose to wear his uniform, then it must be neatly pressed and uncluttered with police gear. Forgas, O'Connor & Morris (1983), in *physical attractiveness* "what is beautiful is good" hypothesis, which is people are likely to assign positive attributes to good-looking individuals. Subsequently, more attractive defendants are less likely to be convicted of a crime or less guilty than an ugly counterpart. This is also known as the "*Halo Effect*". Savitsky & Sim (1974): examined the biasing effect of a defendant's facial expressions and have discovered that it does influence perceptions of guilt, seriousness of the crime, and severity of punishment. Varied facial expressions of a defendant giving testimony as either angry, happy, sad or neutral; results showed that the crime (petty theft and vandalism) was viewed as less serious, the defendant was seen as less likely to commit another crime, and the defendant received less punishment with a sad or neutral expression than with a happy or angry face. The angry facial expression elicited the most unfavorable reaction. Rieke & Stutman (1990): on *Facial disfigurements*. Hemsley & Doob (1978): on *Gaze aversion*. Pryor and Buchman (1984): on *Anxiety level*. Ekman (1991): Deception detection. Dorch & Fontain (1978), Hart (1971), Blanck, et al (1985): on *Judge's gaze patterns* and *other nonverbal signals*. In their research,

Blanck et al investigate how trial judges' expectations for trial outcome might predict both the judge's unintended verbal and nonverbal behavior, and the verdicts returned by the juries (or in other words an *interpersonal expectancy effect*). The repercussion being that this impacts the processes of a fair and impartial trial (*Due process*: requires the absence of actual bias by the trial judge toward the defendant. But not only are trial judges required to be fair and impartial, Blanck et al must also satisfy the appearance of justice invoked by the Sixth Amendment of the U.S. Constitution). The article goes on to cite several (fifteen plus) criminal court misconduct cases (citations omitted) that casted doubt on defense witness's credibility on a variety of situations. The researcher's arguments presentation is established by example behavior from the bench where judges' interference in additional questioning of witnesses and/or subject for clarification is considered prejudicial for the prosecution. In other instances, judicial nonverbal interference is present, however not made part of court records, therefore not available for consideration under appellate review. Judges' expectations for trial outcome tended to relate to prosecution and defense lawyers' perceptions of the trial process. The relationship between judges' expectations for trial outcome and lawyers' perceptions of the trial process varied for prosecution and defense lawyers. When the judge expected a guilty verdict, the prosecution tended to perceive the judge as holding more order during the trial, as being more interested in the case, and as believing that the prosecution should win the case. When the judge believed the verdict would be guilty, defense counsel tended to perceive the judge to have relatively less respect for all the trial participants, especially for the second count. Defense counsel also tended to perceive the judge to speak less clearly throughout the trial, and less clearly in his or her delivery of the final jury instructions in particular, when the judge believed the verdict should be guilty. Finally, when the judge believed the verdict would be guilty, defense counsel tended to

perceive that the judge thought the prosecution should prevail, especially for the first count. Overall, the prosecution and defense lawyers' opinions of judges seem to relate in predictable ways to their perceptions of judges' expectations for trial outcome. Conclusion: The behaviors of the trial judge can sometimes influence jury verdicts so as to deny a defendant's constitutionally protect right to a fair and impartial trial. Blanck et al's study proposed and empirically employed a general model for the study of predicting juries' verdicts from judges' verbal and nonverbal behavior. The variables in the model included: (A) the background variables of the trial participants, (B) the expectancy variable of the trial judge, (C) the verbal and nonverbal transmission of the judge's expectancy, and (D) the trial outcome. Blanck et al found that judges' expectations for trial outcome predict judges' verbal and nonverbal behavior and that this behavior also relates to the verdicts returned by juries. The findings have implications for understanding whether judges' beliefs for trial outcome 'leak' to juries and, if so, how. Blanck et al's study may also aid in the development of standards of appellate review that would enable courts to evaluate more systematically the permissible limits of judicial behavior and to give guidance for the future study of trial judges, jurors, and trial counsel with respect to the effects of communicative behavior in the courtroom.

Remland believes that in spite of the obvious impact on nonverbal communication in the courtrooms, the empirical research is not definitive. He cautions the validity of some of his recommendations is based on anecdotal evidence therefore should be considered with considered with considerable caution and ecological validity.

Before leaving the discussion on Remland altogether, it is important to tie in what is behind all this rhetoric that Remland tried so hard to make in his argumentation. Remland asserted two main points in his discussion: (1) The Credibility of Demeanor and (2) Perception

of Facial Expressions. Now the literature review will continue to the next research article: A Wipe of the hands, a lick of the lips: The Validity of demeanor evidence, in assessing witness credibility by Blumenthal (1993). His contribution in this research is important because he addresses both the law and the social sciences as equal contender's, unbiased and fair.

Blumenthal explores *demeanor evidence* assessment from both scientific and legal point of views. Case law in the U. S. has endowed demeanor evidence concept in both case law and in the Federal Rules of Evidence. According to Austin's research (*Why jurors don't heed the trial,* 1985*),* when there is discordance among on witnesses, jurors tend to make their determinations based on witnesses' demeanor, rather than on the substance of the witness testimony. Empirical research has been conducted on the *act of deception* and its *perception* and *detection by observers*. More specifically, research design is to answer whether it is possible for subjects to detect in a speaker's behavior indicia to empirical trial the validity of the *demeanor evidence*. (Suggested further reading material on this subject: Gordon D. Hemsley & Anthony N. Doob, The Effect of Looking Behavior on Perceptions of a Communicator's Credibility (1978); Gerald R. Miller & Judee K. Burgoon, Factors Affecting Assessments of Witness Credibility, in the Psychology of the courtroom (1978); Gerald R. Miller & Norman E. Fontes: The effects of videotaped court materials on juror response (1978). Experimentation in the law: Report of the Federal Judicial Center Advisory Committee on Experimentation in the law (1981); Ebbe B. Ebbessen & Vladimir J. Konecni, On the External Validity of Decision-Making Research-What Do We Know About Decisions in the Real World, (1980). Case law focuses on the use of demeanor assessing the *credibility* and the *reliability* of a witness's evidence, in other words whether or not that individual is *worthy of belief* on a per case basis. Social science on the other hand, has produced empirical evidence refuting people's ability to identify that an individual is

lying when the witness is actually is being deceptive (Bond, (1978); Murphy, (1987); Bok, (1978); (DePaulo, (1980); Ekman & Wallace, (1969)).

Blumenthal considers, quite extensively, the knowledge-use-justification of proven incontrovertible psychological concepts by the legal arena. Likewise, one must equally consider is it the purpose of the law to protect society from individuals' prejudiced moralities? Whereas the social sciences theories are helpful in determining the appropriate clinical treatment for the populous, social sciences should not be given a free reign to subvert viable legitimate ethical laws. Just as the law is not qualified nor expected to determine the clinical mental state of an individual. But this is not a matter that this research is seeking to answer, although in some perspective it does weigh in the overall scheme previously mentioned of 'stances' between the legal and psychological arenas.

Blumenthal asserts and establishes empirical research evidence that when conflict exists among witnesses/jurors tends to base their determination on credibility on demeanor rather than the substance of the witness testimony (Zuckerman, 1981). Subsequently, disbelievers would contend that as long as it is measured, rational resemblance between signs of tangible and observed deception, the strength of the legal idea is sensible. Blumenthal argues albeit there may be some correlation between *perceived* and *actual deception*; it is indisputable and imperfect correlation and one cannot argue with "this is good enough" for trial practice. Blumenthal clarifies that only one (DePaulo's, 1982) research obtained a statistical correlation between a list of indicia of perceived deception and a list of actual deception of indicia. Blumenthal also considers the implications of such conflict upon the Sixth Amendment Right (the Confrontation Clause).

Blumenthal provides an insightful analyses of the current (as of 1993) research on verbal

and nonverbal studies through a legal perspective, at times using psychological and social sciences statistical data and other times legal precedents to juxtapose his arguments. Blumenthal addresses the nonverbal behavioral research categorized into various actions into different channels: face, body and voice (Ekman, Wallace, & Friesen, (1969). These channels are differentially controllable. As he explains, a non-controllable channel can send a great deal of information; and it can hide just as much. In situational-discourse, channels exhibit difficulty in controlling informational flow one from another and exhibit leakages. In general, the channel, which is most informative when the communicator is truthful, is most misleading when the communicator is deceptive (Zuckerman, 1981). Blumenthal analyses that the telltale indicators axiom put to empirical testing involved the presentation to subjects of videotapes of speakers both lying and telling the truth, and subjects must then judge the speaker's veracity (Ekman & O'Sullivan, 1991). He argues that an obvious problem in generalizing from an empirical study to the courtroom is that the witness are not presented in videotapes, as well as the typical witness stand hides most of the witness's body language from the jury. Blumenthal did note that Ekman & Friesen (1969) had predicted that the facial expressions alone would not be sufficient to detect lies without the vocal channel, and later literature reviews by DePaulo (1982) and Zuckerman (1981) confirmed facial, body or vocal cues with actual deception. So, according to Blumenthal,

> As it might be expected from the Ekman-Friesen model, not one of the accepted visual cues – Frank's grimaces or smiles, Rains's 'Furtive glances' and shifty gaze. Or nervous blinking, - was observed at significant level when speakers lied, and in almost all other behaviors there was an actual decrease during deception. (pp.1192)

The important conclusion from Blumenthal's findings was that all the populace believed behavior manifested by a deceiver are qualitatively and quantitatively different than those which

are actually being observed during deception. In his conclusion, Blumenthal reconciles that:

> It is unforgivable that the legal system deliberately ignores demonstrated, relevant findings about demeanor evidence and willfully adheres to an ineffectual traditional approach. Blumenthal suggests that simple changes in evidentiary instructions or ways in which constitutional rights are interpreted and applied can prevent mistakes to legal assumptions about demeanor evidence and willfully ignores demonstrated, relevant findings about demeanor evidence and willfully adheres to an ineffectual traditional approach. (pp.1204)

While Blumenthal explicates the legal meaning of demeanor evidence, Rand (the next in line author to be discussed in this literature review), discusses his own coined termed *demeanor gap* in a more court-specific context, with emphasis on the African-American race. Rand further proposes that demeanor gaps provides justification for proposing juror competence, specifically that white jurors who are unable to accurately performed the core jury responsibility of evaluation the demeanor of African-American witnesses are not competent to serve. Rand wrote this theory article titled: *The Demeanor Gap: Race, Lie Detection, and the Jury,* in 2000.

Rand (2000) argues there exists a 'demeanor gap' of cross-racial demeanor of evaluation in credibility determinations by jurors. Rand uses the *Black's Law Dictionary* definition of demeanor, which states: "Demeanor is itself an indication of how jurors and lawmakers misunderstand how to evaluate demeanor evidence, since it focuses the observer's attention on mannerisms that are highly manipulable"(p.2, Black Law Dictionary 430 [6th ed 1990]). Rand quickly makes the point that the Supreme Court's decision in United States v. Scheffer (1998) upheld that it was part of the jury's core function to make credibility determinations in jury trials as well as that it was a fundamental premise of the criminal trial system of the jury to be the lie

detector. Rand explains that it is within the trial that the jury observes the demeanor of the witness and hears testimony. Trial transcripts, however, reflect neither observation nor actual jury deliberation consequently deprivative of Appeals Court's ability to deliberate on certain motions such as witness's veracity.

Using articles written by Blumenthal (1993) and Wellborn (1991), Rand juxtaposes the diminishing reliance on credibility determination based on demeanor, considering that the courtroom is not evaluative conducive due to its architectural design and attorney pre-trial witness preparation. Rand makes explications that "the demeanor gap goes to the mechanics of fairness, by positing that a juror of one race might be legally and functionally incompetent to judge the demeanor of a witness of another race, necessitating some racial balance on the jury" (p. 5). According to Rand, the traditional evaluation of demeanor is based on three fallacies: (1) a liar will betray himself through the stereotypical correlates of deception, in other words, like fidgeting or not being able to maintain fixed eyesight with the listener. Rand cites Ekman as the source of his personal theoretical understanding and explanatory information of his (Ekman's) body of work. Rand affirms that after thirty years of research, it is a proven fact that liars do not give off these cultural stereotypical cues because they are controllable and the phenomenon is called *differential controllability*. In other words, under this high risk situation stress, the liar or sender can betray his emotion/deception leakage that he is attempting to suppress (that the message is insincere). (2) Observer fallacy happens when the observer pays attention to the right cues the liar wants, but not the correct one it should, citing the works of DePaulo (1985), Zuckerman (1981), and Hemsley & Doob (1978). And, (3) Observers are generally accurate in making credibility determinations based on demeanor and can perform at better than chance levels. Quoting the results from DePaulo (1985) Hockings (1979) and Littlepage & Pineault

(1978) that members from our culture are not very good at detecting lying strangers and overall accuracy result was .540 for factual content judgments, indicating that accuracy of truth detection was only slightly above chance. Rand believes/states that "behavioral science research [he] reviewed demonstrates [his assumption] that the average juror deciding issues of *credibility* based on *demeanor evidence* is unlikely to do much better than chance at detecting deception in witness testimony". He further asserts that *virtually all* the research that has been conducted on deception were *mono-cultural* and *mono-racial*. Rand makes a plea to the disconnect of systematic unfairness of African-American witness, and makes claim that the only study ever published on cross-cultural lie-detection study was by Bond (1990) with American and Jordanian students, supporting that deception cues are not universal. Armed with the results of Bond's research and the confirmation support from the study of Chao (1987) that first generation Chinese-American deception cues are distinctive from mainstream American deception cues, Rand believes it reinforces the concept that deception based cues are not universal and therefore can be extended to cross-race. Rand goes on to explicate the (A) *familiarity bias* (cultural assimilation of various display rules and contextual overlays of emotions) and how it might impact credibility determinations: (1) learning effect – ascertains a person of one culture might have trouble in evaluating demeanor of a dissimilar race by lack of awareness of those type of faces, and (2) persons of dissimilar cultures might have special set of deception indications, thus look for other movements. (B) *Skepticism bias* or the *benefit of the doubt* bias where most observers give the senders the benefit of the doubt and are therefore more likely to believe the sender even if they [the observer] know the sender may be deceiving them. Rand stresses that even the best well-meaning juror would come into the judicial process with cognitive conditioning biases that would compel to be skeptical about the witness DePaulo (1985),

Zuckerman (1982), Krieger (1966), McMorris (1999), and Pennington & Hastie (1991). Rand justifies three ways that whites could develop patters of understanding about African-American witness through negative stereotypes: (1) less intelligent than whites, (2) not trust worthy and honest and (3) violent. It is "this skepticism bias that implies some jurors might be simply unfit to serve not because of bias, but because of an unconscious unwillingness to extend the benefit of the doubt" (p. 47). (C) *Motivation Bias*. Truthful speakers akin to deceptive ones are motivated to present effectively portray sincerity giving a cohesive, planned story to the detriment of control over nonverbal cues and may cause impressions of nervousness (DePaulo, 1987). In the end Rand closes with two main conclusions the first that: "At the very least, jurors should specifically be instructed that some of the folklore regarding lie-detection is inaccurate and misleading" (p. 71). And the second that:

> Demeanor Gap changes the way that race is used as a basis for justifying representation on the jury: it is not only that whites do not understand, it is that they are arguably incapable of fulfilling one of the primary requirements of jury service. That cuts directly against the fairness and integrity of the system in a way that simply arguing for more empathetic jurors does not. If whites are incapable of making accurate credibility assessments, they are arguably incompetent to serve in the same way that those who do not understand or cannot fulfill their duties would be incompetent to serve. (p. 61)

The literature review that follows continues the courtroom discussion related to the importance of facial expressions, examining the weight given to nonverbal expressions in jury instructions, the appellate courts, jurors' disqualification, and judge biases. Williams' perspective draws attention to the case of a Niqab-wearing witness in a Michigan trial.

Williams's article (2008) titled: *The veiled truth: Can the credibility of testimony given*

by a Niqab-wearing witness be judged without the assistance of facial expressions discusses many issues related to the dismissal of a devout Detroit Muslim Ginnah Muhammad's case in Michigan's District Court. Ms. Muhammad goes to court donning her Niqab, a scarf and a veil covering her entire head except for her eyes. Ms. Muhammad was contesting the rental car company charges allegedly caused by thieves. Her testimonial did not occur because the judge gave Ms. Muhammad the choice to remove her Niqab or have her law suit dismissed; Ms. Muhammad choose the latter. The judge, reasoning that without the ability of seeing Ms. Mohammad's face he could not make a determination as to the veracity to her testimony, dismissed the case. Williams, after setting up the article begins to establish the fact that nonverbal communication (facial expressions, gestures, and body movements among others) plays a common role in every day ordinary conversation and that the same skills (enable individuals to interpret conversation) are true inside the courtroom, albeit with some modifications (LeVan, 1984). Williams, notes (1) The Bench Book for the United States District Judges references to assessing the credibility of witnesses … "Their manner and demeanor in testifying before you", and (2) The Bench Book for the United States District Judges states… "Consider each witness's … appearance and manner while on the witness stand" (Davitt et al. 2005), because (i) *the focus by the courts on facial expressions can be seen in various arenas throughout the trials and appellate process*. (3) Model Jury instructions. (ii) *Juror disqualification can be indicative of the significance of facial expressions at a trial*. The earliest case cited was Rhodes v. State when a criminal conviction was overturned after a juror gave an affidavit indicating that his eyesight was so defective that he could not see the faces of the witnesses including the defendant. In Texas, Black v. Continental Casualty Co (1928), the Appellate court overturned a jury verdict after it found that one of its twelve jurors was unable to

hear the testimony of the witnesses. In New York, People v. Pagan (1999), the Appellate court recognized the role that sight plays in determining the credibility of a witness through perception (despite of her blindness) and using a case by case rather than disqualification of a juror. (4) Action and reactions of judges constituting prejudice against one of the parties, (Judicial Bias). In particular, Williams mentions the Fifth Circuit reversal of the Travelers Insurance Co. v. Ryan (1969) ruling, that exemplifies so well what is known as the *Rosenthal Effect* or the tendency of individuals in unfamiliar situations to look at the most experienced person in the room for guidance (LeVan, 1980). In this case, between the judge, attorneys, witness, defendant, jurors will likely observe and mirror the behavior of the judge. According to Williams, cases of judicial bias whether leading to a reversal on appeal or not, illustrate the commitment of the higher court's consideration to this matter because the importance of facial expressions in the courtroom is seen in so many levels. William also looks into two special circumstances where facial expressions cannot be considered by the courts (the right of the fact finding): testimonial of child victims (right of the victim) of sexual abuse (the right of confrontation by the Sixth Amendment right) and the use of antipsychotic drugs (demeanor modifier) to a defendant during trial (violating his Sixth and Fourteenth Amendment rights). In the case of sexual abuse, two cases are decisive in this matter: Coy. v. Iowa and Maryland v. Craig. In the former, Justice O'Conner noted that the right to confrontation *was not absolute* and on the latter that the Constitution did not guarantee an *absolute right to a face-to-face confrontation*. It seemed, to Williams, that the importance of viewing facial expressions of a witness as part of the Sixth Amendment's right, helped decide the ruling on Riggins v. Nevada and the involuntary administration of drugs. Still, Williams questions, however aside from a court's balancing of state and individual interests, what is the role of facial expressions in determining credibility?

He answers: (a) expressing our identify; (b) communicating our attitudes and feelings; (c) creating first impressions of ourselves and stereotyping others; (d) structuring and facilitating the flow of an interaction; (e) influencing others; (f) assisting in the production and comprehension of speech; and (g) allowing us to engage in deception and to send "mixed messages" (Remland, 1993). So, if a witness on the stand, under the scrutiny of the judge and jury, revealing more through fidgeting with his clothes and shifting his body than he does through his testimony (LeVan, 1980) what level of importance should be placed on nonverbal communication (Remland, 1993)? Mehrabian studies (1971) say individuals attempting to deceive were more pleasant and often accompanied by smiles more often than truthful communicators. Zuckerman's study is (1979) contrary to Mehrabian's study. Williams enumerated Ekman's 1991study results the percentage of each group, sorted by occupation, by how they performed in lie detection test (not provided here) as a signifier why judges do not make good credibility determinators. Concluding that the inability to determine untruthfulness, like determined by Ekman and O'Sullivan, lies in perception. Then, since the Niqab obscures the entire face of Ms. Muhammad, the ordinary manner of identification of a witness becomes problematic. The solution to this problem is a practice instituted by the Florida Department of Highway Safety and Motor Vehicles procedure (Oren, 2005) where officials allowed veiled women to have their photograph taken in a private room by a female employee. Thus the problem of exposure of hair and face is minimizing to another female and to a very short duration. Continuing on the question of the judge's consideration of the witness wearing the Niqab and being unable to make the determination of her credibility: According to Ekman & O'Sullivan (1991) weighing credibility based on body movements and self-touching are not only more prolonged acts than micro facials, but also easier to perceive. A court faced with similar situation could change its

focus from facial expressions exhibited by the witness to body movements and voice, along with conveyance to the jury through instructions similar to those, which that are instructed to take into account facial expressions. Next in this literature review, continuing the discussion on veiled witness and the confrontation clause, Murray will discuss the Ms. Muhammad's case in light of the First and the Sixth Amendment Rights.

Murray presents Ms. Muhammad's case in more factual descriptive terms then the previous accounting from Williams, giving a better perspective into this case. From understanding the rationale of the legal framework of the Constitution conflicts and how to decide which takes more precedence to the next and eventually how credence to eyewitness testimony is evaluated. The Notre Dame Law Library Assistant Director of Patron Services Dwight Kim was essential in retrieving the transcripts of small claims court Hearing at 1, in the case of Ginnah Muhammad v. Enterprise Rent-A-Car, No. 06-41896 (Mich. Dist. Ct. Oct. 11, 2006), which are attached to the addendum for easy of perusal. What is revealed about Ms. Muhammad's case is that the judge, prior to the beginning of the testifying, asked Ms. Muhammad to remove her veil so that he could assess her reliability and credibility. Ms. Muhammad refused on religious grounds and her suit was ultimately dismissed. Murray, using Ms. Muhammad's case as base for his theoretical framework as the bases for the discussion of a case in a criminal court. Where the she immediately cites that removing her veil is a burden of her religious practice, offensive to her dignity, and an infringement of her rights *Free Exercise under the First Amendment*. And the defendant counsel cites the Sixth Amendment quoting that the accused (Enterprise) has a right … *to be confronted with the witness against him* (U. S. Constitution Amendment VI). With two Constitutional rights in conflict, the question that remains is, which of the two takes precedence onto the other?

According to Murray, the following things are important to remember: (1) Criminal trials resolve around the issue of the guilt or the innocence of the defendant. (2) The trial will determine the liberty that the defendant enjoys as a normal citizen will cease to exist in the future. (3) The very potential of that loss of freedom of liberty warrants granting the individual a right to defend themselves (Lemos, 2006; First Amendment; Religious Beliefs; Sixth Amendment Right; Fair trail & Confrontational Right).

Other Human Rights

The problems that Muslim-Americans face in the American judicial system is not new and can be demonstrated in the number of academic articles written in the matter (Orenm 2005; McCusket, 2007; U.S. v. Scheffer, 1998; Nussbaum, 2009). Test of the First Amendment, numerous Supreme Court decisions describing the nature of burdens and granting exemptions, and a comprehensive history and tradition of religious accommodation in the United States provide strong legal justification for taking the Muslin position very seriously (Nussabaum, 2008). In Lee v. Illinois (1986) … "The central mission of the Confrontations Clause … is to advance a practical concern for the accuracy of the truth-determining process in criminal trials by assuring that the trier of fact [has] a satisfactory basis for evaluating the truth of the [testimony]. And in Mattox v. United States (1895) (Blackmun, J., dissenting) (third alteration in original) (quoting Dutton v. Evans, 1970) … The Supreme Court highlighted the central concerns of the Confrontation Clause: Fairness and the reliability of testimony (finding that the Confrontation Clause's primary function is to ensure the reliability of evidence presented at criminal trials through adversarial testing). This left the *door open* to *exceptions for public reasons and necessities of particular cases.*

Nearly one century after Mattox, in Iowa v. Mattox, the General Clause, the Supreme

Court held that the Clause *guaranteed a literal* right to confrontation (by giving child victims of sexual abuse to testify behind a screen in order to avoid eye contact with its accused/defendant). Writing for the majority, Justice O'Connor acknowledged that protecting child abuse victims from fear and trauma could amount to a significant public policy interest, as determined by legislature, to overcome the preferential right (then in Maryland v. Craig, 1990; it held that a preference only reflected for face-to-face confrontation at trial and must be case-specific).

Free Exercise Clause

In as much as the Free Exercise Clause requiring religious exemptions, American constitutional history is not clear-cut. Each state constitution allows for liberty of conscience provided that it does not interfere with good and peaceable order (McConnell, 1990; Hamburger, 1992). The Confrontation Clause is a neutral and does not discriminate against or target religious practice. The Supreme Court acknowledges in Smith (1990) that the state might need to justify refusing to extend exemptions to religious believers if it grants other exemptions to the law in question. Consequently, because there was an exemption to the law for child abuse victims, the state must present compelling reason for denying similar exemption to the Muslim woman wearing the veil. A governmental interest underlying a law if it is stronger than the interest connected to the religious exemption and granting the exemption will undermine the efficacy of the law (*Fraternal Order of Police v. City of Newark, 1999*). Thus, the veiled witness needs to show that the policy behind the Confrontation Clause, namely reliability, fails to outweigh her individual liberty interest and granting a religious exemption would not seriously undermine the efficacy of the provision (United States v. Lee, 1982).

The Court recognizes trustworthiness and impartiality as the fulcrum of the confrontation right. All parties consider demeanor evidence, in the judicial arena, essential in determining the

credibility and fairness of a criminal procedure. Murray goes as far as quoting Williams in the fallibility of the weight given to nonverbal expressions in jury instructions, the present situation of juror disqualifications and judge's inappropriate prejudice biases. Murray presents several statements: Scientific research indicates that verbal and nonverbal communication deserves equal consideration (Blumenthal, 1993; Remland, 1993; Wellborn, 1991 and LeVan, 1984). Scientific research tells us that facial expressions and other nonverbal expressions do not always follow verbal representations (Remland, 1993). Scientific research casts doubt on the proposition that individuals can determine when they are being lied to through nonverbal expressions (Ekman & O'Sullivan, 1991). Judges only detected untruthfulness approximately fifty-seven percent of the time (Ekman & O'Sullivan, 1991).

Murray asks: With all the uncertainty the fact finder is presented to ascertain deceit through nonverbal communication and with a slightly better than average percentage performance expectancy, how compelling is the court's interest in requiring a witness to remove her veil, especially when the only nonverbal cues inhibited by the Niqab are facial expressions? According to Swerling (1999), strict observation is unnecessary to uncover doubt, hesitation, lack of confidence, and even lies; this information is the product of verbal responses as well. Murray concludes his article by commenting that cross-examination via confrontation was a significant component of the accusatorial criminal justice system because it enabled the discovery of the truth.

Next, this literature review will look into the work of Wellborn titled Demeanor. First published in the Cornell Law Review in 1991, then again in 2014. Since, this topic is well within the parameters of this discussion, it merits consideration. Wellborn seems rather old fashioned in his traditional views, and most of the research used is rather old (thirteen plus

years). However, giving plausible consideration to his arguments and the lack of response to his expressed opinions (or this research's lack of evidence of rebuttal) makes his opinion deserving to be heard.

Wellborn asserts that there is great value in the premise that ordinary untrained people in detecting deception generally will make significantly more accurate judgments of credibility if they are given the opportunity to view the demeanor of a witness than if they do not. Such clues are by no means impeccable guides, but are often immensely helpful (Frank, 1950). Wellborn also quotes Wigmore, saying that a witness's demeanor "without any definite rules as to its significance, is always assumed to be in evidence (1937, p. 1076)", and further states that the assumption that demeanor provides highly useful information plays an important role in other procedural doctrines.

Wellborn believes that the empirical investigation of the utility of nonverbal behavior in detection of deception or inaccuracy of a witness might bear upon the witness credibility in two ways: (1) the willingness of the witness to tell the truth, and (2) as evidence of the quality of the witness's perceptions and memory (capacity to know the truth). Wellborn proceeds to discuss material that has been reviewed over and again in this lit review about the three main categories of nonverbal channels, thus this part of the material will be skipped, unless essential to the argument. According to Wellborn, the psychology of deception and deception detection in the courtroom is particularly flexible to experimental analysis. Courtrooms have more in common with laboratory studies than laboratory studies conditions sufficiently relate to *real life (Zuckerman, DePaulo, & Rosenthal, 1981).* For example, the interview respondent and the courtroom witness are alike in that: their responses are nonspontaneous, highly structured, self-conscious, and public. They are all strangers, assigned to task-oriented roles and to fact-finders.

Where they differ: In context (a witness responds substantially to evidence in the case, v. an experiment elicits respondents 'stories from experiment), in format (none of the experiment elicits cross-examination by adversarial representative), Fact Finders (Jurors deliberate in groups/consensus v. while in experiments it is done individually), and finally in trial (witnesses prepare or rehearse before testifying v. respondents do not). Wellborn questions, isn't then more likely that the presentation of witnesses in adversary format only makes it more difficult for the trier to process any nonverbal information? (Cooper, 1971) McCormick (1984) seconds Wellborn sentiments wondering as well "whether it is not the honest but weak or timid witness, rather than the rogue, who most often goes down under the fire of a cross-examination (pp.1080)". Psychological evidence supporting McCormick hypothesis (that when respondents are questioned by suspicious interviewers, subjects tend to view their responses as deceptive even when they are honest significantly increases detection errors) in two distinct phenomena's: (1) suspicious interrogation distorts observer's perception, and (2) interrogation causes stress for the respondent, which in turn induces behavior likely to be interpreted as deceptive aka the Othello error (Ekman, 1985; Toris & DePaulo, 1984). Again, Wellborn questions, if the average individual observer cannot effectively interpret nonverbal indicia to detect falsehood, it is unlikely that a deliberative group of observers can do better. Psychological research on the relationship between respondent rehearsal and deception detection is inconclusive (Miller, deTurck & Kalbfleisch, 1983). Maier and Thurber's 1968 study, for example, indicated that nonverbal information actually diminishes the accuracy of deception detection (albeit the subjects were role-playing). Littlepage and Pineault 1978 study concluded that the facial information is not effectively used as an important cues to the perception of the truth, and consistent with the findings of Maier and Thurber's 1968 study. Littlepage and Pineault also

concluded that facial information is not effectively used as an important cue to the perception of truth. However, since Ekman, Friesen and & Scherer (1976) had discerned paralinguistic differences between truthful and deceptive messages, Littlepage and Pineault surmised that it was possible that although paralinguistic cues are available, subjects are not proficient at decoding paralinguistic cues (p. 463). Wellborn looked yet into another study by Hocking, Bauchner, Kaminski & Miller (1979) where the relative accuracy of observers in detecting deception under various conditions was compared and analyzed, separating the factual and emotional interview segments. Researchers inquired what behaviors subjects looked for in determining nonverbal lying cues. The results do not support the notion that people can detect deception based upon the culturally accepted body cues cited by the subjects, and parallel the results obtained by Maier & Thurber (1968) and Littlepage & Pineault (1978). That is, they indicate that nonverbal information was not useful to the subjects in detecting deception, whereas verbal content did provide a basis for significantly better-than chance judgments. Wellborn argues

> The factual-emotional and head-body dichotomies of the Hocking study were designed in part to address the thesis of Ekman and Firesen's 1974 article, that observers can more accurately discern body cues than facial cues to deception.

In Ekman and Friesen's test respondents were instructed to tell the truth about their feeling after watching a feel-good movie and to lie after watching a disturbing film (of burn victims). Hockings contemplates that the body cues being detected are but a reflection of the stress experienced from watching a disturbing film, and not deception. Hockings' study used similar visual stimuli and replicated Ekman & Friesen's body-face results. But the factual segment without the stressful stimuli, failed to disclose any reliable body clues. In fact the results, based

on body-only shots (without audio) were consistently worse than chance, indicating that subjects read body cues indicating stress not deception. The final study mentioned was the 1981 Zuckerman, DePaulo & Rosenthal meta-analysis. It indicated in its combined analysis that the face did not seem to give away deception cues and may even have provided misleading information. Of all channels and channel combinations, only the facial channel failed to produce accuracy significantly greater than chance. And in contrast to the face, the availability of body cues increased deception detection accuracy. Wellborn cautions that this conclusion was based upon four studies including Ekman and Friesen's 1974 article that were duplicated by Hocking's study, thus casting serious doubt upon the Ekman & Friesen's body-cues thesis. Wellborn concludes that taken as a whole, the experimental evidence indicates that ordinary observers do not benefit from the opportunity to observe nonverbal behavior in judging whether someone is lying.

Wellborn then shifts his attention to demeanor and the detection of witness errors when using verbal content of cross-examination. In a study by Wells, Lindsay and Ferguson (1979) the confidence of the witness, rather than accuracy, was the major determinant of juror belief. Results found that jurors are unable to do better than chance in distinguishing between accurate and inaccurate eyewitness identification and that the jurors accord inappropriate weight to witness confidence. Wellborn concludes,

> Conceivably, the problem of judging the accuracy of identification testimony is somehow categorically different from the evaluation of a witness's perception and memory in other contexts. Even so, however, it is not plausible that such differences significantly affect the utility of demeanor. If one supposes that witness demeanor is generally useful to triers in judging the reliability of a witness's perception and memory, one would hardly

> expect that identification cases would be an exception to the rule. Identifications of strangers challenge most people's faculties of perception and memory. If demeanor generally provided clues to the soundness of a person's perceptions and memory, one would expect that demeanor information would be relatively powerful in this context. Since demeanor information proves useless in judging identifications, such information is probably not valuable in appraising witness perceptions and memory. (p. 1091)

Wellborn considers as an implication for the law, the abandonment of live testimonial in favor of deposition transcripts, as it would negate the distracting, misleading and unreliable nonverbal data and enhancement of reliable data (verbal content). However, the confrontation clause mandates the live testimony in a criminal case with the caveat that there is always the potential determent effect of live testimony may have on dishonest witnesses. The assumption that demeanor may be a reliable guide to credibility plays a small role in the hearsay rule. The theory of the hearsay rule is to employ a person's belief in a matter of evidence imposes certain dangers (errors in perception or memory, accidental miscommunication and insincerity), and that these dangers be exposed or reduced by the ideal conditions of testimony. Dispute resolution techniques (such as summary jury trial) do not employ live testimony (which brings about the concern of the absence of demeanor information). Demeanor value is central to two doctrinal controversies: (1) can the trier of fact reject the uncontradicted, unimpeached testimony of a disinterested witness, and (2) whether the trier of fact may find a fact on the basis of disbelief of testimony denying the fact. Appellate judges based on empirical research determinations of credibility of oral testimony (Fed. R. Civ. P. 52(a)) have assumed that they lacking the opportunity to observe the demeanor of the witness, simply could not make the credibility determinations as accurately as trial courts. A *de novo* review of facts is a bad idea, and

appellate court rejection of trial court findings should continue to be limited to instances of clear error (Wright & Miller, 1991). When the testimony taken in a deposition (or another proceeding) is admissible in lieu of live testimony, two conditions must be met: Either the witness is unavailable or the party against whom the evidence is offered had the opportunity and similar motive to examine the witness at the deposition or previous proceeding (Fed. R. Evid. 804(b)(1)). In other words, the testimony is usually of inferior quality to present testimony, it will offer something beyond the declarant's trial testimony could provide. Wellborn states that in civil and criminal cases with respect to defense evidence abolition of the unavailability requirement is both constitutionally permissible and desirable in light of the psychological research on demeanor. Social science evidence indicates that the absence of demeanor evidence alone probably does not weaken the Alternative Dispute Resolution (ADR) techniques (Brunet, 1987), albeit a more serious issue would be the effect of summarization, because the same social science evidence indicates that close examination of verbal content is useful to the one evaluating credibility. Wellborn finally addresses in plain words that "all courts have refused to permit findings based solely on disbelief of testimony to the contrary – juries can not believe uncontradicted, unimpeached, disinterested testimony" (Posner, 1986; Cooper, 1971). Wellborn continues and concludes:

> The majority position disallowing demeanor-based rejection of uncontradicted, disinterested the empirical evidence supports testimony that demeanor is not a reliable guide to credibility … This suggests the following treatment: If demeanor is the only possible basis for rejection of a disinterested witness's testimony, the testimony must be accepted; if, however, the content of the testimony provides a reasonable basis to reject it, the jury may do so" . . ."The extent of permissible inferences drawn from the presentation

> of particular false testimony is analogous to the weight given to a party's extrajudicial fabrication, suppression, spoliation, or subornation of evidence. In appropriate circumstances, inferences from such "admissions by conduct" are permitted to support particular findings (United States v. Philatelic Leasing, 1985). The presentation of false testimony at trial should be treated similarly, where the judgment of falsity reasonably derives not from demeanor, but from the testimonial content or other record evidence. To this extent, the doctrine that disbelief of testimony can never alone support a finding of fact should be qualified."

An Empirical Study to Create Framework of Judge's Credibility

The next section of this literature review diverges from the previous material, as it is an empirical psychological study of the theoretical framework for understanding a judge's assessment of credibility in the courtroom. This is a Canadian corroboration by Porter and ten Brinke published in 2009 by the British Psychological Society. The decision to include Porter & ten Brine's article in the literature review was easy. This literature review has been relying heavily on the legal point of view thus far and it will be objective to at least provide the psychological basis on at least two of the main issues thus far discussed here: credibility and the processes of judges assessments. It bears noting the marked differences in courtroom and at times legal procedures in text, as the authors are from Canada and their references do not translate verbatim into American legal system.

Porter & ten Brinke (2009) posit question judges and juries ability to accurately evaluate the credibility of witnesses in light of the number of wrongful convictions (presumably in Canada and the United States). Together they speculate that the jurors and judge alike, based upon first (strong and rapid) impressions (intuition) of the defendant's face will carry on a lasting

interpretation to justify subjective irrational (often biased) assimilation of mistaken evaluation of guilt or innocence. Porter and ten Brinke express doubt to the validity that the legal community makes fair and accurate decisions concerning guilt and innocence. They give three reasons, first that it is not possible to empirically assess a trial outcome, second that akin to science, the courts do not have a self-expectation of infallibility in their decisions, and third, in numerous contexts human decision-making is highly irrational. Porter & ten Brinke argue that psychological science relies on *acceptable error rate* (5%), the courts maintain the *beyond a reasonable doubt* criterion (per case rule). The imprecision of this definition, Porter & ten Brinke claim, not only acknowledges that doubt is permissible, but to the extent that it would be unreasonable to conclude otherwise.

According to Porter & ten Brinke, a key role of judges and jurors during a trial is to assess the credibility of a witness. In a Canadian ruling R. v. Morrissey (1995), credibility was pointed out to specify it was not synonymous with reliability by noting:

> When one is concerned with a witness's testimony, one speaks of the witness's credibility. When one is concerned with the accuracy of a witness's testimony, one speaks of the reliability of that testimony. Obviously, a witness whose evidence on a point is not credible cannot give reliable evidence on that point. The evidence of a credible, that is honest witness, may, however, still be unreliable. (p. 205)

Porter & ten Brinke question how does a judge or a juror know whether a witness is providing an honest version of events? And asserts further: this is not a trivial issue; due to the nature of the adversarial system most trials feature contradictory testimony by witnesses. In many cases, there is little or no evidence other than conflicting stories told by the complainant and defendant, and decision-making is guided almost entirely by credibility assessments. In, R. v. Marquard (1993),

the Canadian Supreme Court concluded that 'Credibility is a matter with the competence of laypeople. Ordinary people draw conclusions about whether someone is lying or telling the truth on a daily basis (p. 248)'. And, continuing the same line of thought … R. v. Francois (1994), Justice McLahlin stated: 'In the end, the jury must decide whether it believes the witness's story in whole or in part. That determination turns… on the demeanor (sic) of the witness and the common sense of the jury'. (pp.122) Porter & ten Brinke warn that the 'common sense' as argued by the Canadian's highest court is incompatible with the empirical based conclusion that credibility assessment is highly complex, often unreliable task with errors occurring about 45% of the time (Bond & DePaulo, 2006; Vrij, 2000) should be interpreted as the first sign of danger in the context of dangerous decisions about credibility (according to Ekman and O'Sullivan, 1991, other known groups that perform around the same percentage error level are police officers and judges). So, the question remains, how does the judiciary assess credibility?

Intrapersonal Biases

While it is recognized that human decision-making is subjective to many predispositions (Kahneman & Tversky, 1982), judges and jurors are not immune from such biases. Empirical research (Greenberg & Ruback, 1982; Konecni & Ebbesen, 1982) on sentencing indicate that judges are heavily prejudiced by their respective past, and vulnerable to critical errors and reliance on false stereotypes (Granhag & Stromwall, 2004; Vrij, 2000, 2004; Vrij & Mann, 2004). Four theories attempt to address the nature of judicial and jury decision-making. (1) A single prevailing piece of evidence is over-evaluated and all others are discounted. This scenario is more likely to happen in expeditious trials such as bail hearings. (Dhami & Ayton, 2001; Gigerenzer, Todd, & ABC Research Group, 1999). (2) Triers of fact construct stories of the case in question based on information (real or not) provided by the attorneys, sorted by coherence and

accommodated by the evidence to determine the degree of validity of narrative (Pennington & Hastie, 1992). (3) Similar to the previous construct of stories, however stories must be secured by good judgment impressions about the world (Wagenaar, Van Koppen, and Crombag, 1993). (4) Triers of fact through cautious estimate of evidence and related opinions, or secondarily and less validly, through erroneous features such as witness appeal (Petty and Cacioppo, 1986). With as many theories as there are questions, it is not surprising that the decision makers may still be completely unaware of the power of their biases in the courtroom. Therefore, it remains to be an important objective to assess the information that is influencing judicial credibility assessment decisions. In other words, what specific types of information do triers of fact rely on in their credibility decisions?

Based on court transcripts, the Supreme Court of Canada (in R. v. B. (K.G.) (1993) (sic) concluded that the judges and juries must be able to view a witness clearly to 'adequately evaluate *body language*, *facial expressions* [italics emphasis] and other indicators of credibility that are not apparent from a written transcript'. Author notes observation reliance on the wrong body cues lacking validity could compromise credibility in the courtroom. Laypersons as so do some judges (see Laurenide Motels v. Beauport, 1989); generally associate lying with nervous behaviors such as speech disturbances, longer pauses, gaze aversion, and body movement/shifting, whereas research indicates an opposite behavioral pattern (Vrij, 2000, 2008). In R. v. Jaharianha (2001) [note: unable to verify source] the judge stated that 'Each [the defendants] exhibited classic signs of discomfort when challenged' … 'each was evasive at times or his eyes shifted around. Thus in certain points of the story displayed signs of untruthfulness'. Another case mentioned was the U. S. Second Circuit Court of Appeals, Morales v. Artuz. The defendant appealed his conviction of the case based on the fact that the

key witness testified while wearing dark sunglasses (Confrontation Clause). The original judge response that 'I don't believe and it does not provide the defendant with adequate opportunity to examine you and it does not provide the jurors with the opportunity to evaluate your credibility, if they can't see your eyes', ultimately permitting the witness to wear the sunglasses. In reviewing the precedents, the Appeal Courts noted that the Supreme Court's 'established law' of confrontation was intended to ensure an opportunity to see the defendant and for jurors to see the witness's eyes in order to assess credibility. The Court further noted that 'seeing a witness's eye has sometimes been explicitly mentioned as of value in assessing credibility.' The article author's states that there is not way of knowing how often judges rely on heuristics in practice but do not report them in their judgment. The final example provided of witness credibility assessment was the consideration if the testimony 'has a ring of truth' (R. v. Mervyn, 2003; and R. v. S (R. D.), 1997) or better said the judges use their *intuition* or *gut instinct* to assess the credibility of testimony. Contrary to the justices' intuition, research by Porter, Woodworth & Birt (2000) found that a self-reported reliance on intuition and accuracy in detecting deception were inversely related.

In another unrelated self-reporting data-gathering study (Porter, 2006) to evaluate credibility (at the-right-time and at the-right-place deal) gathered some interesting statistical information …

> The judges exhibited a biased in their perceptions of the relative honesty of complainants and defendants, and they considered complainants to be more deceptive in their testimony. The results suggest that the judges hold no consistent strategies for assessing credibility, and exhibit individual biases that must influence their perceptions of specific

individuals. Further, the lack of agreement and bias exhibited suggest that the evaluation of a common set of evidence by different judges could be highly variable.

Results were supportive of those of Stromwall and Granhag (2003) such as the notion that lying is associated with gaze aversion and fidgeting. Police officers, social workers, and teachers regarding the deceptive behavior of adults and children hold similar beliefs (Vrij, Akehurst, & Knight, 2006). These beliefs conform to the false stereotypes found among laypersons all over the world (Akehurst, Ko'hnken, Vrij, & Bull, 1996; Bond & Atoum, 2000; Global Deception Research Team, 2006). Reliance on these beliefs (false stereotypes of deceptive behavior) may introduce bias in decision-making pertaining to certain cultural groups, as consistent with literature found in social science that it is more difficult to detect lies when the liar and observer do not share the same ethic or cultural background (Vrij, 2000).

Intrapersonal Biases supporting evidence

Porter & ten Brinke describe the foundation of decision-making evolutionary past and ending up with nonverbal behavioral manipulation to deceive by altering or inhibition of facial expressions accompanying an emotion (Ekman, 1992; Leach, Talwar, Lee, Bala, & Lindsay, 2004). As the Canadian Supreme Court pointed out in R. v. B. (K.G.) (1993) facial expressions and the analysis of emotions play a critical role in the assessment of credibility in the courtroom, as it can be viewed as a rich source of relevant information. The authors offer that in the *Dangerous Decisions Theory* (DDT) the intrapersonal decisions of credibility by the triers of fact occur quickly upon seeing the witness's face. The process of estimating another person's credibility is connected with increased activity in the primitive areas of the brain (especially the amygdala), alerting the presence of a threat in the situation (Adolphs, 2002). Facial features associated with perceived honesty included: babyfacedness, symmetry, and attractive-ness (Bull,

2006, Bull & Vine, 2003; Zebrowitz, Voinescu, & Collins, 1996). Research also shows people consistently labeled particular faces as good guys (clergyman, medical doctor) or bad guys (murderer, robber) (Goldstein, Chance & Gilbert, 1984; Yarmey, 1993). Further, defendant is more likely to be convicted if crime if face is congruent with offence, than if face is incongruent with offence (Macrae & Shepherd, 1989; Shoemaker, South & Lowe, 1973). A more recent work by Dumas & Teste (2006) confirmed this effect occurs regardless of the prosecution's evidence. The DD Theory's initial impression the trier of fact has, of a defendant's credibility in the courtroom, an enduring subconscious influence on the way the new information (the trier of fact) assimilates information is irrational (Kahneman & Tversky, 1982). Those initial evaluations will also be influenced by the trier of facts experiences and personal schemas about deceptive behavior and heuristics for detecting lies. Consequently, there will be conflict among triers of fact and judgments will be unreliable. Resulting implications will be irrational but rationalized by members of the jury and judge about dishonest behavior; usually generating *tunnel vision* assimilation of potentially ambiguous or contradictory evidence concerning the defendant. Support for this assimilation ambiguity or contradictory evidence was given another name in 'asymmetrical skepticism' in a study by Ask & Granhag (2007), the tendency to be more skeptical about evidence that runs counter to one's prior belief than evidence consistent with the belief.

Disagreement of the minds

A brief description of Ekman's work is provided with definitions (Ekman, 1992, 2006; Frank & Ekman, 1997). Despite their (MFE) popularity in the news media (Henig, 2006), and scientific community (Schubert, 2003), authors question the empirical research to support the utility of MFE as a reliable deception detection tool. In 2008, authors' conducted their first

thorough investigation of facial expressions associated with genuine and falsified emotions. The results supported the hypothesis that leakage occurs during emotional falsification, but it happened rarely so briefly to be called micro expressions and questioned their usefulness as a cue to deception in the forensic field as questionable. While attention to the face could reveal information about the subject inner emotional state, the examination may also be contaminated by a verification bias when viewed in light of predetermined ideas. Lying is also associated with both verbal and nonverbal cues other than facial expressions (DePaulo, 2003; Vrij, 2000).

The authors conclude that although a reduction in tunnel vision decision-making would go a long way in improving credibility assessments in the courtroom, having the triers of fact think more critically about the process, their awareness of intuitive influences, and encouraging the use of empirical cues could reduce the strength of biases present in the assimilation of evidence stage of the DDT framework; The other way is through the expert testimony on credibility assessment. The next section of this synthesis of literature examines several issues relating to deception but Herbert's strongest argument is against TSA is the use of FACS technology as reasonable privacy violation of the 4th Amendment right.

Herbert's article (2008): Othello Error: Facial profiling, privacy, and the suppression of descent, ties in on the topic of when an observer discounts cues of truthfulness given the observer's need to conform his/her observations of suspicions of deception. Herbert is currently a Howard School of Law professor. In this article, Herbert challenges the U. S. Transportation Administration's (TSA) use of FACS to identify potential terrorists in American airports violates reasonable expectations of privacy under the Fourth Amendment.

Herbert presents an article challenging the constitutionality of the Department of Home land Security and its independent Transportation Security Administration (TSA) use of the

Screening Passengers by Observation Technique (SPOT) by its Behavior Detection Officers (BDOs) based on the Facial Action Coding System (FACS) under the Fourth Amendment. As an introductory crash course, Herbert sets up her audience by giving the facts on SPOT: It was a post 9/11 decision implemented in June 2003. Characterized as behavior-pattern training that monitors conveyed emotions through via subconscious gestures and facial expressions in a non-intrusive recognition methods (but not technologically based or automated) of identifying potentially high-risk individuals by watching itinerants. SPOT is based on FACS created and published by Ekman and Friesen (1978). FACS is a comprehensive manual or catalog of thousands of facial muscle anatomically based combinations system for measuring all visually discernible facial movements. According to Herbert, Ekman & Friesen determined those humans' share seven universal basic emotions, one positive and six negative, and the face manifest the emotions irrespective of race, ethnicity or gender. Herbert also notes that despite the fact of its inception in 2003, to date SPOT has yet to nab a single terrorist but it is accredited to arrests of common criminals, drug smuggling, possession of false documents and other crimes. Herbert is critical of TSA's plan on expanding its SPOT operation nationwide and possible TSA oversight of racial bias, specifically noting the well documented state and federal bigotry and racism against Asian Pacific Islanders (Hwang, 2006). Herbert asserts:

> "TSA's use of SPOT under the auspices of protecting national security in a post-September 11 nation will unfairly punish political dissent by travelers, not thwart terror. SPOT is destined to disproportionately target race, ethnicity, and color, not to detect terrorist activity ... This article asserts that use of SPOT in American airports by governmental officials violates travelers' Fourth Amendment right in support of constitutional protection of public privacy (pp.1)".

Herbert says:

> It catches terrorists. There are no empirical studies to prove it does. Besides it imposes on personal liberty. Also, system is designed to identify not to catch. Therefore there is no crosschecking system implemented, any calibration, and non-reviewable discretion for the free play of subconscious biases.
>
> Why? *Subconscious racial biases* are particularly likely to occur to skew results because FACS permits theracial profiling so soundly condemned in other areas.
>
> Why? *Origins* of Ekman & Friesen's work on micro facial expression (2007), such as his research on the Mary's film (40 year old who attempted suicide and lied about her emotions); real-time in face visibility capacity; facial expressions are full, subtle (partial [evident in one area but not across the entire face], slight [weak or diminished] and micro [the most brief in the face]) and combined. The explanation continues into FACS, and how it is considered both a seminal and the most comprehensive method of coding facial display to date. It distinguishes forty face based *action units* visible muscle movements at four levels of intensity (Heller & Haynal, 2005). Observers after extensive training and education can expect to achieve acceptable levels of inter-observer reliability at a range of 45-60% (Vrij, 2000). However, the observer differences in coding skills or scoring methodologies may have an impact on interpreting or translating FACS, subjective measurement is absolutely possible (Banninger-Huber, 2005). Pressing on the residual bias issue, Herbert quotes Frank (who helped Ekman devise the FACS catalogue and will be featured in this herein literature review later) being pharaphrased here, that despite objectively codifying facial measurement, it is still crucial that the interpretation is also objective and not subjective to observer's inferential judgment of what may be

present upon the scrutinized face. Frank also adds that there is no amount of training to provide an observer with the knowledge or understanding of the origin or source of the micro expression. Because of FACS advocates comments, such variation time in people's ability, intensity, and duration to process emotion and return to base line level (as compared to the polygraph) (Freshman, 2006; Vrij, 2000; Eggen & Vedantam, 2006) have generated criticism for idolizing the veracity and reliability of the coding system (Azar, 2000). Criticism is also found with regards to the misrepresentation that FACS is not comprehensive, limiting within its confinements and lacking of "empirical information regarding potentially determinative nonverbal phenomena results (pp.90)" (Heller & Haynal, 2005; Banninger-Huber, 2005).

Herbert then poses several questions: why the facial phenomenon occurs? Is there any triggering sources identification? Why does FACS not provide observers with the ability to discern the nature of the deception? Can micro facials be observed absent conversations? Does a relationship exist between a coder and a sender if more than one session is observed? Is FACS fail-proof (background noise free, i.e.: language, tone of voice, secondary MFE, temperature anything that can obfuscate a MFE)? Giving the fact, for example psychopaths, sociopaths and some schizophrenics (for further resding on this topic a highly suggested book is the Sociopath Next Door) that excellent liar may succeed in not exhibiting emotions and providing substantive informative response difficult to verify, what purpose then would it be to track/detain a traveller with SPOT? Why does FACS not include cosmetic treatments such as Botox or Restylane facial injections?

Almost everyone correctly reads some overt macro facial expression (Rosenberg, E. 2005), but few coders realize that thy routinely may make mistakes albeit FACS feedback and

correction are essential elements of its proper use (Ekman, 2007) and Herbert accuses Ekman of being aware of officers' likely inability to 'come clean' considering the influence of law enforcement training as well as 'expertise' in detecting deception. Herbert says that comparatively speaking to the polygraph, SPOT fills a detection void that looms since 9/11 and promises to detect accurately terrorist threats but there should be legitimate skepticism that airport personnel or even police can successfully and correctly detect terrorist via SPOT when studies indicate human ability to detect lies is at 56.6% (Karp & Meckler, 2006). The heavily discredited polygraph test, given the inaccuracy and unreliability of test results, experts continue to object to its use as substantive evidence in courts of law (Vrij, 2000). Before moving on completely into arguments of law, Herbert makes one more pass at the danger of racial and ethnic biases. All factors being equal (that under FACS neither skin color nor facial features communicate emotion messages, but that may affect your impression, Ekman, 2007), observers rely on Afrocentric facial features to infer negative character traits that are stereotypic of African Americans (Banks et al, 2006; Eberhardt, Davies, Purdie-Vaughns & Johnson, 2006; Pizzi, Blair & Judd, 2005). Subconscious race-based bias is a problem some scholars believe why racial profiling on the base of race, ethnicity or nationality is ineffective means by which to assess a criminal threat because the number do not compute (Davies, 2003; Maclin, 1998). In a war of words (not numbers) elucidation is represented that common held belief is opposite to reality: contrabands higher for whites, drugs same as whites. As further proof, Herbert submits as testimonial evidence that judges are historically and culturally influenced (Andrews, 2003; Siegel, 2000), allowing implicit stereotypes to be the mechanism through which observers process insights and make judgments, albeit, these beliefs can be identified (Kaliouby & Robison, 2004; Barrett & Niedenthal, 2004). One testimonial is from a test available on-line

called the Black-White Implicit Association Test (available at: https://implicit.harvard.edu/implicit/demo/selectatest.html), which examines hidden race-based biases and stereotypes by focusing on black and white faces. Results of the test revealed a number of automatic associations as to operate without awareness, intention or control. The more an observer perceives a face as Afrocentric, the more the observer sees crime and criminality (Pizzi, Blair, & Judd, 2005). The more association of bad equals Back crime and criminality, the more the observer inflicts hash punishment, and the cycle continues. The second testimonial comes from the same research group in a different testing procedure where subjects were required to match photos (faces) to words (descriptive language). As in their first study, the results of the second study demonstrated that irrespective of their actual race, faces possessing stronger Afrocentric features were given higher probability ratings in descriptions that were stereotypic of African Americans. Similar results were obtained from a third study with mixed photographs, where the observant could rely on the subject's race as a basis upon which to make a stereotypic judgment. Herbert (2008) goes as in so far as to use Rand's theoretical argument paper (2001) as "sobering proof" that race and visible ethnicity affect nearly everything, including lie detection (in) accuracy, what constitute deception cues and credibility assessment. Herbert concludes this part of its commentaries by presenting one final argument in the words coined by Stumpf (2006), *the conflation crimmigration,* requires those who are deemed to *look* or *appear* as if they are in the United States illegally to be criminally regarded until proven otherwise.

Legal Arguments

Herbert now turns the arguments to the legal arena in as much as how FACS poses a real threat to the Fourth Amendment. Herbert considers privacy in public as considered by the

Federal Courts an oxymoronic. Herbert concludes, under currently conceived and administered opinions, FACS is unconstitutional. The following are Herbert's reasoning. (1) Privacy under Katz– Appeals filled subjective to information obtained from a conversation by (an electronic hearing and recording device) from the outside a public telephone booth. The court concluded that the government's activity in listening and recording Katz's words constituted a Fourth Amendment 'search' and that the "Fourth Amendment protects people, not places" … "What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection (pp.110)" (Katz v. United States, 1967). Further, in his concurring opinion Justice Harlan elucidated the governmental rules under the Fourth Amendment for searches and seizures …

> The rule that has emerged from prior decisions is that there is a two fold requirement, first that a person have exhibited an actual (subjective) expectation of privacy and, second, that the expectation be one that society is prepared to recognize as *reasonable*.

This decision was questioned as it left the ultimate decision of surveillance by the police to go unregulated (thus citizen's freedom diminished) by constitutional restraints (Amsterdam, 1974; LaFave, 1983; Allen, 1975). The Supreme Court however made two rulings in United States v. White (1971) and United States v. Miller (1976) that redefined the justifiable, reasonable and protected area under the Fourth. In White, the Court determined although White likely had a subjective expectation of privacy of conversation with his cohort in crime Jackson (albeit misplaced as there is always a risk of double crossing) could likely be reported to the police, subsequently, that Mr. White's expectations were unreasonable. In Miller, the Court upheld that a bank depositor had no legitimate expectation of privacy in voluntary financial information disclosed to the bank during the course of ordinary business. The defendant sought but failed to

suppress "all fruits derived from the pen register' on the ground that the police had failed to secure a warrant prior to its installation. The Courts argued that even if the defendants could have a claim under reasonable subjective expectation, society was not prepared to recognize it as reasonable.

Per Katz, the government is not banded from surveying areas one knowingly leaves open for public view, nor are governmental agents required to ignore items in plain view when the officer is lawfully present and able to observe (Horton v. California), use vision aids (U. S. v. Lee; U. S. v. Dunn) or change their position to get a better view, so long as they do not invade a protected interest in doing so (Arizona v. Hicks), traveling on public thoroughfares (U. S. v. Knotts), car occupants being asked to get out of their car after traffic stop (Pennsylvania v. Mimms; Hiibel v. Sixth Judicial Dist. Court of Nev.), open fields (Hester v. United States; Oliver v. United States), and aerial Observations (California v. Ciraolo; Florida v. Riley).

Herbert explains, that the Fourth Amendment plain view observations are not considered searches (Soldal v. Cook County), and cases that address Fourth Amendment challenges regarding the privacy of attributes and features such as the voice, handwriting (U. S. v. Dionisio), hands (U. S. v. Richardson) and eyes (State v. Shearer) typically fail Katz's prong number one and never get to prong number two. In United States v. Dionisio, the Court considered whether an individual possesses a reasonable expectation in the privacy of his voice. In its ruling the Court stated that the "rare recluse who chooses to live his life in complete solitude" may possess a right to privacy but "no person can have a reasonable expectation that others will not know the sound of his voice, any more than he can expect that his face will be a mystery to the world". To Herbert, the Court's bottom line that any member of the public (including the face) cannot be private and this position cannot be justified. In her defense,

Herbert argues that Americans are a polite society, staring goes against our mores. America needs a definition of privacy that not only contemplates but respects "social boundaries" that protect us from being simplified and objectified and judged out of context (Rosen, 2000). Citing Bond v. United States as a primal example of limited disclosures of privacy and that without privacy there can be no individuality. Domination (by police and government) is what gave rise to the Fourth Amendment. To say that police and government comportment that restricts individual's liberty (body integrity) or right to exclude others from what is yours be subject to judicial control is desirable, but that is not what is happening post Katz. The governmental need to protect against terrorists may be high, but the burden of the governmental invasion of privacy (invasive and stigmatizing) liberty interests is higher.

Herbert asserts that the use of Ekman's SPOT and FACS techniques by TSA violates individual's civil rights. Governmental violations should not be condoned because evidence of criminality is discovered. Singling out individuals can create other significant harm, such as: (1) Individual's privacy. (2) Injury suffered from being publicly singled out by police and treated like a criminal suspect. (3) Suffering of police violence and abuse. (4) Discrimination. (5) Contact woes. Most of the arguments on the above questions have been addressed already in the previous discussions presented, the remaining ones are addressed now. Reasonableness of FACS: Reasonableness is determined by a process of categorical balancing (Taslitz, 2007), and Herbert admits that there is no doubt that FACS observation, if subjected to the strictures of the Fourth Amendment, would fit into the category of "administrative searches" (then later on claims to have already successfully argued that FACS is unreasonable) therefore should be declared constitutionally dead.

Moving right along, the next literate review is a dissertation by Warner (2005) on the Assessment of perceived guilt through facial expression analysis of attorneys.
Warner hypothesized that the attorney would leak information to the trier of fact about his client's perceived guilt (or innocence), and the trier of facts would be more likely to decide the guilty (or innocence) verdict based on the attorney's beliefs.

Warner's research examined the relationship between the attorney facial expressions and jury verdict. The hypothesis is that the attorney would 'leak' the information about his client perceived guilt to the trier of fact. Warner provides the usual introductory and literature review for a dissertation thesis, unexpectedly; much of the introduction/literature review was refreshing as it was educational on the topic (as she provides the basic divergent opinions between Ekman and Vrij). However, since most of the information discussed on her thesis has been addressed within the previous authors featured in this literature review herein, only new sources of relevant information will therefore be mentioned.

In a forensic perspective what Warner is trying to accomplish is to determine to what extent the attorneys are leaking their expectancy variable influence the trier of facts' deliberations or decisions. Research studies on expectancy variables (Blanck, Rosenthal & Hazard, 1985) and several case rulings (State v. Larmond, 1976; U. S. v. Hill, 1975; Cantor v. State, 1976; Sholes v. Meager, 2003) were used as evidentiary proof that emotions can leak out through nonverbal behavior and may affect the jury's verdict, albeit little research has been conducted regarding 'attorneys' and how they present themselves and the effects on jury verdicts.

Warner states that her research yielded significant results for the measure of nonverbal emotions elicited by facial expressions and its effect on jury verdict. Attorneys are more likely

to have displayed nonverbal expressions of emotion on their faces to the jury that affected the verdict. Results suggest that attorneys need to better monitor nonverbal expressions of emotions when defending their clients. Juries could be able to pick up nonverbal cues when considering verdicts and will rely on nonverbal cues when evidence and details are withheld. These results support Finkel (1995) theory that trier of fact relies on participative point of view rather than on subjective evidence. Also supports Walker-Andrews (1977) theory reflecting vulnerability of human judgment in as much that individuals rely on nonverbal social cues when making judgments to relieve own ambiguity. Further, absent verbal responses, one will infer their recognition of emotional expressions and render a judgment that is more negative.

Warner notes several limitations to the study, but these are the most relevant: Participants were mainly college students (in administration, not psychology) therefore not representative of a main stream juror pool, and gender, control of age, race and ethnicity of participants.

The next in line research to be reviewed in this literature review is the chapter 26 of the Handbook of Forensic Psychology: Resource of Mental Health and Legal Professionals, titled Nonverbal detection of deception in the forensic context authored by Frank and Ekman (2004). Although Frank & Ekman collaborated in this article, for the ease of reference, all future references will be addressed as Frank.

In this article Frank discusses the lie process in the deliberate presentation of information that a witness hopes will mislead. Lies are defined in three separate possible courtroom scenarios. In the courtroom lying is synonymous with the established legal definition of perjury. Lies can occur from outright fabrication, denial, distortion, evasion, and concealment, to even "telling the truth falsely". Although the explanations are rather lengthy, the concepts are simple, and at least some of us are rather not conditioned to consider it for lack of savvy. For example, if

one is asked a question with a verb in the past tense (did you have?) and the answer is given in the present tense (I do not have); thus denying a causal present existence/relationship, never acknowledging a previous old relationship (a lie by omission), but a true statement. Evidence, (Park, Levine, McCornack, Morrison & Ferrar, 2002) indicates in day-to-day life most lies are betrayed by circumstances surrounding the lie and not by conduct.

Frank discusses how to spot behavioral signs such as *thinking clues* and *feeling clues*. The liar must create facts, descriptions of things that didn't happen or that he did not witness, this process, and this misinformation leaves behavioral signs. These signs range from hesitation in speech or a misplaced word or contradictory statement to vary vague accounts with less logical structure (DePaulo, Lindsey, Malone, Muhlenbruck, Charlton & Cooper, 2003). On the spot thinking, often manifest itself in many speech hesitations, speech disfluencies and errors, often fewer of the hand or often with fewer of the hand or facial gestures that typically illustrate speech (DePaulo, Stone & Lassiter, 1985; Ekman, Friesen, & Scherer, 1976).

When emotions are aroused, changes are unbidden and occur automatically (further explaining MFE's). These changes are considered fundamental features of an emotional response (Ekman, 1984; Frijda, 1986). Frank quotes Ekman (1984) in stating that three emotions involved in deception are: (1) Deceit-fear (of being caught in a lie). These are low levels of fear; they keep you alert and likely help you get away with the deception, however can produce signs to a skilled lie catcher's detection. (2) Deception-fear (guilt about lying). This refers to feeling guilty about lying to someone not about whether someone is guilty or innocent in court; but rather trying to exculpate a friend from a wrong done onto them (i.e., testifying that they were home when they were not). And (3) Deception-delight (guilt in having someone duped). In this

case lying can produce a positive as well as a negative emotion, as the lie may be viewed as a proud accomplishment.

This article is a great resource for understanding the mechanics of MFEs for the forensic psychologist and legal professional in court. Insightful implications, cautions, hindering, helping factors, and conclusions are a must read for those in need to understand current psychology-legal arena issues. Of particular interest, it is so noted, the comments on the "*implications"* sections the explications of 'Behavioral Sciences' "There is no single behavior that, across all people or in all situations, guarantee that a person is lying"… "However, there is evidence in the face and voice that someone is lying, particularly in high-stake lies in which the liar faces benefit for successful lying and punishments for unsuccessful lying" (DePaulo et al., 2003; Ekman, 2002). "Behavioral science often relies upon probalistic evidence, that is, evidence that can tell you what are the odds that anyone draw from a given population might shown a pattern of behavior or a certain characteristic"… "In contrast, the law, is dependent upon particular evidence, that is, evidence concerning the ability or characteristics of this specific person on the stand"… "Researchers can predict the proportion of eyewitnesses who may succumb to a memory distortion technique in the laboratory but cannot identify in a courtroom whether a particular who has testified has actually succumbed (e.g., Loftus, 1979)". Two types of mistakes are commonly made in judging deception: (1) Othello Error (Ekman, 2009). The lie detector disbelieve truthful witness may appear anxious and fearful and appear deceptive, and (2) Idiosyncrasy Error (Ekman, 2009), in the failure to observe a person's typical style of behavior (DePaulo et Al., 1985; Zuckerman, DePaulo, & Rosenthal, 1981).

The overall value of this article is in its informative approach and not its argumentative style. The information is provided for you to digest and use as you see fit. The next three

literary reviews are from the neuroscientific arenas. This perspective is approached from both an ecological value and the legal perspective, as it has been brought to through more attention of the legal community as a theoretical and actual topic of relevance. Since all the articles are from 2007, the reviews will follow in alphabetical order and commence with Church's work titled Neuroscience in the courtroom: An international Concern.

Church brings into this circle of discussion a new and most interesting topic: Neuroscience. One would not really think that it would have much to do with either law or lie detection, and one would be wrong in both counts. As Church cites in the introduction of the article a true (drama) life story of an Indian defendant woman (Aditi Sharma) who stood accused of murder of her fiancé based on evidence retrieved via an electroencephalogram (EEG) from her memory (or 'experimental knowledge') of the killing in question. Sharma was convicted, and India became the first country to convict a criminal defendant on the basis of a brain scan or neuroscience. As to be expected, Sharma is appealing, the scientific and legal backlash noise has since been growing briskly. Concerning questions surged about the technology's reliability; it's truth-telling capacity; it's credibility; the utility of this evidence in the courtroom; its ethicality; and Fourth Amendment Rights (search; invasiveness; privacy). Even more disturbing to the scientific community at large is the fact that India (Sharma's) was not the first and only case; it happed again and again. The propensity of interest in neuroscience experimentation by countries in Europe, Asia and the Middle East is an indication how acceptance of the field is widespread with certain allure (Khoshbin & Khoshbin, 2007). In 2009, Italy became the first European court to use genetic information (brain imaging scans) to reduce a criminal defendant's murder sentence. Of course, in every battle of opinion, there are pro and con views. New (2008) contends assuming neurosciences eventual scientific reliability; significant evidentiary and

constitutional issues are at stake in using this evidence in either civil or criminal proceedings. While, Bird & Illes (2006) believes that a greater understanding of potential legal uses of neuroscientific evidence, in conjunction with a sound regulatory scheme, would prove beneficial to the legal arena. The point is, whichever side one chooses to stand, the technology that is able to detect what a person is thinking, could represent the end of 'mental privacy'; especially it such testing, Church speculates, becomes mandatory and subconscious thoughts would no longer be our own.

In a bit of historical background, Church provides theoretical evidence to the legal posturing against social science's knowledge (Jones & Goldsmith, 2005) and the subsequent reality harm it brings upon consumption and application of knowledge among disciplines. Then Church goes on to explain neuroscience of lie detection. There are two primary forms of neuroscientific evidence: (1) Langleben's funcional Magnetic Imaging (fMRI), and (2) Farwell's brain fingerprinting. fMRI information is disseminated as: potentially high rated successful for truth-telling detection; determination of specific memory of events and people; ascertain how people feel about one another; essentially read minds within fifty years (Thompson, 2005). Two competing American companies; No Lie fMRI and Cephos are attempting to perfect fMRI technology. Brain fingerprinting, on the other hand, searches for specific information in a person's memory based on electrical brain activity, albeit more intrusive Farwell's website does not promises the test to prove one's guilt or innocence (it does promise, however, of providing information if the individual has stored memory of the crime in question). Brain fingerprinting is possible via the P300 wave that is activated when an individual recognized someone or something that is part of his specific memory (New, 2008). Church elucidates that neuroscience is relatively a new field, but its expanding knowledge base is quick and growing as implicated by

the reliance of the courts in both civil and criminal matters in the past two decades as well as the number of peer published articles. Renowned case rulings cited (involving neuroscience) are: U.S. v. Hinckley, Jr. (1982); the 2007 Peter Braunstein's New York journalist's convicted of kidnapping, sexual abuse and robbery case; People v. Weinstein (1992); McNamara v. Borg (1991). Church claims that due to the belief that neuroscience can potentially cause evidentiary and constitutional problems to admissibility, the U. S. Courts have shown reluctance to admit cognitive neuroscience evidence for the purposes of lie detection and memory exploration (Moreno, 2009) and to date only considered two cases (and dismissed both during pretrial hearing on different grounds): U. S. v. Semrau, 2010 and Wilson v. Corestaff Services L.P, 2010. On Semrau, the judge ruled that the evidence did not satisfy Daubert by proving that the science lacked scientific reliability and the error rates are currently unknown. On Wilson, the judge ruled that the plaintiff failed to meet Frye's standard of veracity of a witness, which is "within the ken of the jury".

Assuming that neuroscience gains general acceptance in the scientific community, scholars still want the courts to address the constitutional concerns where the implicates the Fourth and the Fifth Amendments and the international community (dependent upon their standards of admissibility (Wolpe, 2005). Previously coined term 'cognitive liberty' to denote the right that neuroscience seems poised to invade (Rosen, 2007), pertains to the privacy of one's mental freedom and consciousness of thought (Wolpe, 2005). In Terry v. Ohio (1968), the Courts enunciated what was a principle of governmental invasion of a person's privacy under the Fourth's Search and Seizure Clause. Then under U. S. v. Kincade (2004) the Courts explained the 'reasonableness' of a search for the promotion of legitimate governmental interests. As of the publishing of Church's article in 2012, the U. S. Code provides that the Attorney General

may "collect DNA samples from individuals who are arrested, facing charges, or convicted or from non-United States (42 U. S. C. § 14135a(a)(1)(A)). Genetic identifiers have become normative and commonplace. Courts typically view procedures such as obtaining a blood sample or a fingerprint as minimally physically invasive and pursuant to the purpose of establishing identity (Jones v. Murray, 1989). Paraphrasing New (2008), the lingering question remains, if the legal system were to mandate government's interest in the sought-after neuroscience mental information, it would cast doubt on the understanding of communication, as without mental intent to communicate, there can be no communicative behavior.

Church makes some additional points as this matter relates to international concern, however, this will not be addressed further here, thus concluding, Church's literature review. New, the next in line literature to be reviewed, was quoted a couple of times already by previous authors. New's article also addresses the neuroscience topic with its repercussion on the Fourth and Fifth Amendments, however, New's biological science base knowledge gives his article a more biology-science balanced background.

New understands and explains that technologies, especially any attempting to introduce new evidence (such as fMRI) relating to deception detection will likely face an uphill battle due to most populous known failure under admissibility of the polygraph in the early Twentieth-Century to date. As New elucidates, the fMRI measures the differential oxygen blood level flows into different parts of the brain. Per the Functional MRI Research Center (Columbia University, http://fmri.org), when brain areas are activated, the demand of blood flow is in the magnetic properties changes from neutral to increase levels can be measured. The fMRI testing advantages are considered to be non-invasive, does not require administration of radioactive substances, and can make large number or measurements over time without significant risk to

patient, can be used as a research tool (as opposed to diagnostic). Theoretically, deception involves multiple cognitive processes: The liar must do two things at the same time (1) Withhold the truth (what New calls *suppression veri*) and (2) creating dependable new information (suggestion falsi) that is assuming that the listener knows and grasps the correct information. Consequently, the baseline activity of telling the truth is what a truth teller will tell, or what a liar may tell if distracted (fatigued, anesthetized or inebriated). This model presupposes that engaging in deception requires additional cognitive processing that will involve centers in the brain controlling executive functions such as problem solving, planning and the conscious manipulation of information in working memory (involving the centers in a way base line activities should not).

The technique created by Farewell is known as 'Brain Fingerprinting'. Brain fingerprinting has been systematically studied since the 1920s and it is also known as the next generation of scientifically based lie detection. It's technique is based on a neural wave of electrical brain activity known as P300 lasting as long as several milliseconds, that is evoked in response to presented stimuli that suggest, depict, or recall information stored in the memory of the test subject (Patel & Azzam, 2005). Brain Fingerprinting measures what Farwell refers to as a "memory encoding related multifaceted electroencephalographic response" (MERMER) (Farwell & Smith, 2001). A MERMER includes the P300 wave as part of a larger EEG response that is elicited when a subject is presented with a stimulus recognized by the subject but willfully withholds that knowledge. Farwell claims the Brain Fingerprinting process records EEG activity on at least three locations on the skull as the subject is presented with a series of stimuli such as objects, words, or photographs. The 'stimuli' falls into three broad categories: (1) probes – relevant information a guilty person would know by deny knowing. (2) Targets – similar in

nature to probes, but known to the subject because they were exposed to it prior to the trial. And, (3) irrelevant – are unknown to the subject and irrelevant to the question at hand. Farwell claims MERMERs will be elicited only in response to targets in an innocent subject (to whom the probes are irrelevant) and in response to both targets and probes in subjects with guilty knowledge, or recognition, or the crime-related probe stimulus. Although Farwell's claims the test is highly reliable, his studies have not been replicated. Also, variables such as knowledge from any news reporting media could present a confounding factor in the results, but data available does not seem to address the issue. Brain Fingerprinting has not yet been admitted as scientific evidence in an American court.

After providing the background on both the fMRI and Brain Fingerprinting, New explores the admissibility of neurological evidence through a legal perspective topic. In the post-Daubert world, the admissibility of evidence (Brain Fingerprinting) came up twice. In Harrington v. Iowa (2003), the Iowa Supreme Court granted defendant's motion for post-conviction relief but expressly denied to consider Brain Fingerprinting evidence as it was used as a pre-trial motion outside the presence of the jury and carries little precedential value. And, in Slaughter v. Oklahoma (2005) in his second post-conviction motion for relief presented the courts with Farwell's Brain Fingerprinting analysis of the defendant. Farwell also testified, with promises to provide the documentation of his comprehensive report, but Farwell never did and the motion to admit the analysis was ruled not to have met Daubert. Though these preceding explanatory arguments have been made previously, the analysis as to why they failed is of most importance as New continues … Unlike P300 waves, that have been widely studied and accepted by the scientific community as an event-related potential, Brain Fingerprinting has not been subjected to significant amount of peer review or repetitive testing by experts in

encephalography (Moenssens, 2002). Proprietorship issues discourage researches during life of the patent. Farwell's claims of the P300 wave method exceed the generally known literature. If the method exceeds generally known procedures, then its techniques might not be readily available for other scientist to test the procedure, thus passing the second prong of Daubert is questionable. As to the third Daubert prong, the requirement of an error rate determination, the report is based on a single peer-reviewed analysis publication. As such, the article does not provide great detail pertaining the statistical algorithms in obtaining confidence values for the results in a quantitative data; thus it is difficult to determine the methods to determine error. Altogether, says New, methodology must be tested and repeated, and even then admissibility will remain problematic under Daubert.

New questions the constitutionality of mining mental information from defendants and witnesses in a criminal trial under untested Fifth Amendment issues. At first, New says, classifying the data from brain activity as 'physical' evidence may be alluring; as the expert witness would present the evidence in bright colored charts of wave activity or even some video re-play of memory recollection. Thus, mental information could be declared 'tangible' in that it is a physical measurement of a concrete tangible phenomenon (such as fingerprints, hair and blood sample or genetic evidence in form of DNA) if it can be established that thoughts exist independent of nervous system activity and can be preserved after death (when all neural activity ceases). Otherwise that privilege could not be viewed as tangible as an individual electing not to communicate in response to an interrogation to withhold that information (the spirit of the constitutional privilege against self-incrimination, Miranda v. Arizona, 1996).

Can, however, the extraction of knowledge or memories be considered reasonable under the Fourth Amendment searches? New answers this question in piece-meal style. Partially

quoting the Fourth Amendment: "The rights of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures shall not be violated, and no Warrants shall issue, but upon probable cause"… by quoting Skinner v. Railway Labor Executives' Assoc., (1989) ruling in part … "guarantees the privacy, dignity and security of persons against certain arbitrary and invasive acts by officers of the government of those acting at their direction." Quoting Jacobsen (U. S. v. Jacobsen, 1984) on expectation of privacy … "A search occurs when an expectation of privacy that society considers reasonable is infringed". Privacy concerning your own body (Ferguson v. City of Charleston, 2001) …"Any bodily intrusions, such as tests to obtain blood or urine, undoubtedly constitute a search". Also noted by the Supreme Court (Schmerber, 1966) … "Search warrants ordinarily required for searches of dwellings, and absent an emergency, no less could be required where intrusions into the human body are concerned … the importance of informed, detached and deliberate determinations of the issue whether or not to invade another's body in search of evidence of guilt is indisputable and great." Search and seizures must be reasonable (City of Indianapolis v. Edmond, 2000), and whether a search or seizure is reasonable is a fact-specific determination (U. S. v. Montoya de Hernandez, 1985).

New concludes that barring first having probable cause to suspect the individual was guilty of wrongdoing, a search and seizure under the Fourth Amendment would be prevented because: under Schmerber it might not only involve pain and trauma to the subject, but also intrude upon the dignitary interests of the individual's personal privacy and bodily integrity (Winston v. Lee, 1985). The Fifth Amendment might offer protection might apply to a defendant seeking to avoid self-incrimination (whereas a witness to a crime who was innocent of wrongdoing would not). "Brain Fingerprinting represents another method by which recorded

knowledge resulting from measurements of neural activity may be on the verge of wider legal acceptance and admissibility, particularly in the more flexible post-Daubert era of evidentiary standards."

The last literature review is on authors Greely & Illes. Their article is also on the subject of neuroscience-based lie detection. Greely specializes in the ethical, legal and social implications of new biomedical technologies. Illes shares interests in Neuroethics, brain research, and stem cell research. Although they have co-authored this article, for brevity, it will be referred to as Greely. Also, where the nature of the article may be repetitive, information will be skipped, unless otherwise necessary to convey a point.

Greely & Illes, together see the problems to be encountered by new neuroscience based-lie detection technologies in legal issues are huge and that they should implicate at a minimum the Fourth and the Fifth Amendment, but in reality it should be at a minimum of five Amendments, the Fourth and the Fifth inclusive. Those were the reasons, which this article was selected, based on the search match and abstract contents. However, after further reading and analysis of the article, no further pertinent useful information was acquired and the article was not included in this research. Thus concluding this section of the literary review.

CHAPTER 3. MFE META-SYNTHESIS DATA COLLECTION

Purpose

The purpose of this meta-synthesis is to provide a critical review of the related scientific and legal research of lies and deception (encompassing from about 2250 B. C. to present day), gathering information from scientific, legal, and other pertinent fields to demonstrate how Micro Facial Expressions (MFEs) has impacted the judicial process through an organizational and insightful critique as forensic psychologists face the possibility of *in vivo* court testimony. The discussion provides the foundation of emotions, how they can be expressed both verbally and non verbally. This research discussion provides the genesis of Micro Facial Expressions and its working concept, as well as postulates the problem: Would a Micro Facial Expression observer infringe upon the rights provided by the American Fourth and Fifth Amendment Constitutional Rights?

1. Will MFEs violate the 4th Amendment Rights of each citizen as interpreted by the U. S. Constitution?
2. Will MFEs infringe upon the 5th Amendment Rights of each citizen as interpreted by the U. S. Constitution?

This research targets to demonstrate that MFE has been silently present in the American courtrooms, but can be constructively utilized to the betterment of all interested parties; providing real answers to demeanors of behavior and potential lies and deceit.

Research Design

The research design is a Meta-Synthesis, however, it is not human oriented, in as much as no experimentations will be performed. There are no expectations of human contacts other than occasional phone calls, as needed for verification or assistance needs.

Research Selection

The selection process in this research was very problematic. Its idea was complicated; how can comparison be made in two (or more) distinct and opposite subjects be accomplished? On one hand, psychology is the coessential master of empirical research and on the other hand, legal studies are philosophical and more case-specific, based on rulings of torts. Basic statistical probabilities are not regarded or accepted by mainstream legal thought, therein the constant stance of distrust and non-acceptance of psychological knowhow. Basic rules do not apply. Faced with the reality that the best approach was no approach; accommodation to both arenas is the best solution for the time.

Selection Criteria

Time to think of the next problem: How to research, how to define the search? That proved to be just as troublesome. Research proposal was not well defined in the beginning, and ideas were sought as explained in Chapter two. After coherent analysis of gathered material, basic guidelines were evident in numbers of hits. The parameters of our research were defined by all procedures within the confinement of the judicial arena, as the only psychology theme used was MFE. Even more defined, within the confinements of the Fourth, Fifth and Sixth Amendment Rights. Put it all together, our interests lies in the conceptual theoretical infringement that Micro Facial Expressions may pose to violate an individual personal right to unreasonable search under the Fourth Amendment Right; The potential unsolicited disclosure (not by his 'own mouth') to incriminate himself against his Constitutional Right to remain silent by the Fifth Amendment.

Consideration was given here in two lines of thoughts. First, using empirical psychological studies that the legal arena used to both credit and discredited social sciences would benefit this research in arguing that the legal arena cannot vacillate its position when it

suits them. Second, to gain knowledge why this is such a point of controversy. Understanding of this matter can only be beneficial to future implications. Consequently, these research parameters were defined to be (short definition is provided):

- 4th Amendment Right
- 5th Amendment Right
- 6th Amendment Right
- Federal Appeal Court
- District Court
- Criminal Court
- Local Court
- Tort Laws
- Rulings
- Hearings
- Judgments
- Decision
- Opinions
- Trials
- Fillings
- Attorneys
- Prosecution
- Defense
- Demeanor
- Credibility
- Veracity
- Guilty
- Innocence
- Lie Detection test
- Non Verbal Communication
- fMRI
- Neuroscience

Micro Facial Expression

CHAPTER 4: FINDINGS

PURPOSE

The purpose of this meta-synthesis is to provide a critical review of the related scientific and legal research of lies and deception (encompassing from about 2250 B. C. to present day), gathering information from scientific, legal, and other pertinent fields to demonstrate how Micro Facial Expressions (MFEs) has impacted the judicial process through an organizational and insightful critique as forensic psychologists face the possibility of *in vivo* court testimony. The discussion provides the foundation of emotions, how they can be expressed both verbally and non verbally. This discussion provides the genesis of Micro Facial Expressions and its working concept, as well as postulates the problem: Would a Micro Facial Expression observer infringe upon the rights provided by the American Fourth and Fifth Amendment Constitutional Rights?

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This research targets to demonstrate that MFE has been silently present in the American courtrooms, but can be constructively utilized to the betterment of all interested parties; providing real answers to demeanors of behavior and potential lies and deceit.

Symbiotic Relationship: An explanation

The quest is to explore the implication of Micro Facial Expression possible violations of the Fourth, infringements of the Fifth Amendment Rights. It is not among the intentions of this meta-synthesis to test, defend and/or duplicate research, or validates micro facial expressions studies and psychological theories.

(a) Accreditation: this researcher needed to understand the theory behind the MFE psychological process. To demonstrate critical 'hands on' ability as a coder, the author became a certified METT advanced level (Certificate received: March, 2003), and to

demonstrate knowledge on subject matter, material referenced in the reference section (see Ekman, 1957, 1965a,b, 1970, 1972, 1984, 1992, 1998, 1999, 2006, 2007; 2011, Ekman & Friesen, 1696a,b, 1971, 1974, 2003; Ekman, Friesen, & Ellsworth, 1982; Ekman, Friesen & Hager, 2002; Ekman, Levenson, & Friesen, 1983; Ekman, O'Sullivan, Friesen, & Scherer, 1991; Ekman, Friesen & Scherer, 1969, 1976; Ekman & O'Sullivan, 1991; Ekman & Rosenberg, 2005; Ekman, Sorenson & Friesen, 1969) were duteously studied.

(b) Internet Search: Since, original exploration of the Internet did not yield any leads on the parameters needed for continued searches. Eventual results led to psychological studies, but not to the much-needed legal research. Non-verbal communication eventually led to demeanor, neuroscience, fMRI studies and legal procedures involving the 4th, 5th and the 6th Amendments nearly simultaneously. After reading, researching and processing the material, this conclusion was reached: *Although a symbiotic relationship exists between psychological-legal professionalism, there is no relationship between the two when comparing published research articles*.

(c) This *symbiotic relationship* problem is two-fold: (1) Methodological design or procedure (research procedures) and (2) Professionalism Bias. Methodological design – Whereas in social sciences, the research and reporting procedures, is to design a laboratory experiment with structured set guidelines; and in all fairness to the legal side, no guidelines were found (maybe guidelines were not so easily accessible in Internet queries to this researcher…). Reporting must include… identifying the research problem, clearly stated and justification of selection (particularly in relation to any valid alternative designs that could have been used); clearly and explicitly specify hypotheses central to

the research problem, expletively describe the data which will be necessary for an adequate testing of the hypotheses and describe the methods of analysis to be applied to the data. The legal side, on the other hand, from all the articles read conclusions reached appeared to only require that a 'story' or a 'thesis' be constructed upon the rulings of law (be that the majority or descending views) to argument a position on how the next trier of fact may or not adjudicate the next case based on the facts-of-the-case-at-hand rather than based on empirical facts. The logical conclusion, therefore is that there are a lot of "ifs" or conjunctions to be dealt with and no more of a "flip of the coin" and "at-chance-level" than any other case anyone would consider to start with from 'scratch' with or contender from the get go. Reinforcing the issue that these two types of *literatures are not comparable.*

(d) *First Implication:* The research reviewed in this study utilized a wide berth of design approaches (Action, Case study, Causal, Cohort, Exploratory, Historical, Meta-Analysis, Observational, and Sequential), although all of the designs are psychology appropriate, in the future, ideal court trials case specific designs studies would be: *Case Studies and Descriptive designs*. Case Studies are in-depth studies of a particular research problem rather than a sweeping statistical comprehensive investigation. Its approach to understanding a complex issue through detailed appropriate analysis of limited conditions and their relationships. However, due to its intense exposure to the case study, there is a higher likelihood of researcher's interpretation bias. Descriptive studies help provide answers to questions of who, what, where and how of the research question, but never the why. Case studies are valuable to the judicial system, as it deals with the facts of the case in question (the target or person in question is being observed in a natural and unchanged

setting and results in massive amounts of data) that combined with other designs might be productive in other meaningful ways (not even Freud can argue with that!). The data, however, cannot be duplicated.

(e) The other matter to be discussed, *professionalism bias*, how it is referred at this time, it may be construed as giving priority to a study referred by a *known individual* (the other kind of professionalism bias was addressed by Herbert (2008) aka *subconscious bias* or *Othello error bias)*. The former professionalism bias occurred in more than one situation during this research study. From its inception, and as the research continued its progression, most of the articles involving the computer design, computer interfacing, computer imaging …. came from outside sources. However, it is duly noted that said studies were included in this research for statistical purposes (number of studies and publication year), they were reviewed for literature contents. It was this research's intention to demonstrate that there is a current movement to facilitate encoding FACS to a mobile (transportable) unit that can allow the user *automated discrete and observable in vivo identification or classification of MFE in a courtroom*.

Research Result Analysis

The *Figure* 9 below represents the number of research-accepted articles reviewed separated by field areas and year published. The total numbers of articles reviewed were 107. Beyond the articles that made into the table, there were those that were not selected totaling 384, and there are other articles that were selected for reading material prior to commencement of this study (which were not elected acceptable so not to influence as biased) and treated as educational materials.

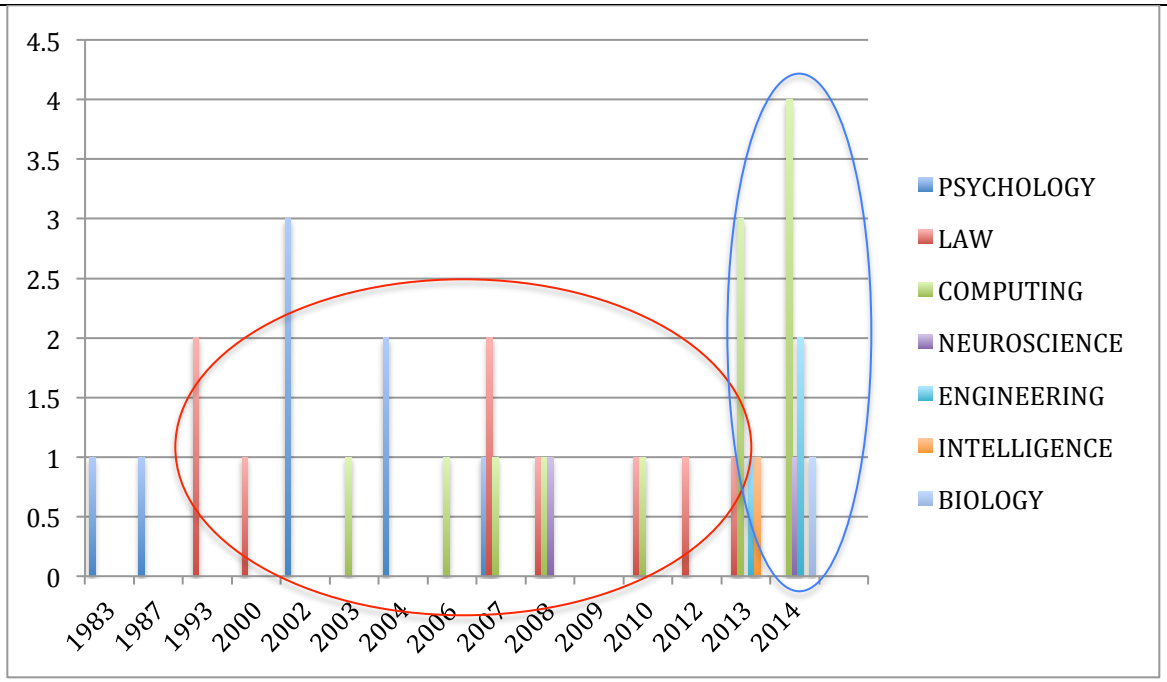

Figure 9. Statistical Overview © Vania Iumatti-Lodewyk, 2015

This research seeks to demonstrate that facial expressions have been silently present in the American courtrooms, and that MFE can be beneficially utilized to the betterment of all interested parties; providing real answers to demeanors of behavior and potential lies and deceit be constructively mitigated.

A couple of patterns were noted on *Figure* 9:

1. During the first decade, upon the emergence of MFE, as expected, the field of psychology mostly explored the topic.
2. The first legal article (related to non-verbal) published was in 1993, but the majority of articles happened between 2008 and 2012. The significance to the timeline follows the emergence of the MRI/fMRI technology in the late 1980s (not the emergence of MFEs).
3. Last and most interesting cluster/spike, is the emergence of the computing (which includes Intelligence, Information Analysis and Engineering) in the late 2013-2014.

This time period coincides to a movement to answer the need to produce a stable portable automated system to identify AUs in the face. The table 7 Imaging & Computing Studies, on Chapter two, identifies all of the selected studies for review on this matter.

Knowledge gained

From the standards that this research required to be observant as psychological researches do, and from the standards of as the facts that pertain to this-case-matter in law advocates, commonalities or lack thereof were noted, arguments were sorted, relevant case laws followed, dates prioritized, if noted biases (self included) annotated, and commentary-contrast analysis follows. Note that all legal arguments will be considered and discussed separately.

Things they share:

Use of empirical statistical data

Remland (defending several studies on jury and attorney communication, p. 58-64 in lit. rev.); Blumenthal (defends legal flexibility to the utility of empirical psychological research of deception detection in the courtroom because of its real life parallels, p. 64-67 in lit. review); Rand (defends the theory of white individuals incompetence to serve as jurors in an Afro-American defendant trial, p. 67-71); Williams (placing importance on non verbal communication, p. 71-74); Herbert (argues subconscious racial biases, p. 91-99); Warner (argues attorneys would leak perceived guilt to trier of fact, p. 99-101); Frank & Ekman (discuss probalistic evidence, p. 101-103); Church (discussed legal validity of fMRI, p. 103-107); New (discusses legal implications of fMRI, p. 107-111); Wellborn (questions the utility of experimental evidence, p. 78-84); Porter & ten Brinke (argue that courts maintain the beyond a reasonable doubt criterion while psychological sciences relies on acceptable error rate, p. 84-91);

and Murray (Casting doubt on the need to see facial expressions since other channels are more likely to expose the truth, pp. 74-77).

Psychological empirical data is not definitive.

While Remland and Wellborn were decisive about this matter, Blumenthal's opinion was not far behind. Blumenthal expressed that psychologists were not qualified in law, just as lawyers were not qualified in psychology. This attitude elucidates well the posturing that was reflective in articles reviewed (see Moore, 1907 re: Munsterberg, p. 129; Chief Justice Rehnquist Opinion, 1999, p. 129; see Church; Jones & Goldsmith, 2005 p. 104) and what was addressed under 'ethical considerations' in Chapter two (p. 42). Evidence of the court's ever growing discontent within psychology community adversarial position is reflective by the for hire expert testimony forensic psychologists. Expert forensic psychologists will cite appropriate empirical studies to fit the case they are hired often contradicted by the hired expert by the opposing counsel. When judges are left to adjudicate on the bases of which study has more merit, and science cannot provide anything more than generalization or speculation … judges will turn to the law as a matter of fact and guidance. Potter & ten Brinke, Williams and Rand don't view it in the same context.

Age of Primary and Secondary Information Source

Both primary and secondary source of information followed a similar pattern grouping: Micro Facial Expressions, non verbals, and credibility of witnesses or demeanor presented with the oldest range of empirical studies (ranging from 1976-2009), whereas articles on fMRI or neurosciences presented the newest range empirical studies (ranging from (2001-2009). All articles that presented legal rulings, rarely offered rulings that were not previously already explored, known or available to this research. Only in one occasion, the Warner (2004) article,

presented the assertion that no prior research had ever been done on the expectancy of attorney leaking perceived guilt information to the trier of fact (jury), and this research found conflicting evidence. These facts were documented with empirical researches described and cited by Remland (1993) throughout his article, for example: Blank, Rosenthal & Cordell 1985; Burgoon, Buller & Woodall, 1989; Hart, 1991 and Hartfield, Cacioppo & Rapson, 1994 to name a few. The dichotomy of researching your sources a little deeper is such that you may find old information…. however it may still prove to be invaluable. So far, the impact of the legal research has not been addressed because it uniquely different than all the other variants. However, in as much as primary and secondary sources, it fits this discussion. A Federal Court ruling is based on precedents of law, consequently, all cited cases are secondary sources.

Lie Detection v. fMRI: The big leap

When coding the selected research studies, one of the reasons that led this research to the possibility of the fMRI research was the *keyword* description of *lie detection* study. The five main researches reviewed were Greely (later dropped from the lit. review), Williams (2008), Murray (2009), Church (2011), and New (2008). Williams and Murray share their mutual interest over fMRI ethical concerns. Church and New's commonality was the quantitative analysis of the fMRI testing procedure and their assessment of the legal possible (perceived and factual) violations of the Fourth Amendment Rights and implications of the Fifth and Sixth Amendment Rights. Different legal theories share same goal in mind. Legal arguments will be discussed at a different venue.

Non-verbal communication v. Demeanor

Non-verbal communication and demeanor were two other keyword search descriptors. Blumenthal (1993), Remland (1993) and Wellborn (1990) were sub grouped under non-verbals

and Baker (2013), Murray (2009), Potter & ten Brinke (2008), and Williams (2008) under demeanor. The matter of non-verbal communication was addressed by Blumenthal, and supported by Remland, as he discussed all attorneys comports at trial maximized to his advantage. It comports are also utilized by defense attorneys to maximize jury sympathy impact towards the defendant's character. Remland also discusses the role of the adjudicating trier of fact and how they can influence their perceptions upon the jury's outcome, evidence however and should be considered with caution and ecological validity (citing studies by Blanck et al., 1992; LeVan, 1984; and Blanck, Rosenthal & Cordell, 1985). In agreement as to the ecological validity, Blumenthal and Remland argue that studies using college students as jurors, unrealistic stimulus materials, and unreal consequences make it difficult to generalize to courtroom environment. Wellborn in a reversal of sorts compares some aspects of laboratory experiments to actual courtroom 'real life' behavior, and evidence strictly regarding accuracy credibility judgments indicates that legal procedures could be improved by abandoning live trial testimonial in favor of presentation of deposition transcripts. That consideration however is as unrealistic as it is illogical. The Supreme Court's position on the right of confrontation is of essentiality in due process (in civil proceedings) and as "a political matter no American lawyers (and non lawyers alike) would tolerate such curtailment of an institution so deeply imbedded in our legal tradition".

Facial Expressions (in general, MFE included) and Probabilistic Statistics

Dissention among the ranks is always to be found, this research is not to be the exception. In the articles written by Porter & ten Brinke, Herbert and Rand that is their commonality. These authors express their unique favor to a different thought seeking a deeper reasoning beyond a micro facial expression; but the causal reason that leads to the triggering of the MFE. Porter &

ten Brinke (2008) presented some argumentation with involving Canadian legal justifications, which made at times hard to follow (especially when material was not available through Internet media). Their article left this researcher with more questions than answers by its conclusion, as it could not be determined if Canadian courts considered same U.S. rulings or not? Potter & ten Brinke joined by Rand and Herbert raises the question of judges' intrapersonal decisions of credibility subconsciously influencing assertion of credibility and subsequently deeming them unreliable. This concept is based on the theories by the work of Vrij (2000); although not necessarily divergent from Ekman's work, but it is rather a parallel thought process that explains the source of where the MFE thought process begins. Herbert's article differs in that it specifically challenges the constitutionality of the FACS, and Rand's article challenges the white juror's competence to serve in an African-American defendant trial (for lack of cognizance of intrapersonal decisions). Warner's article was included in this section because it dealt directly with MFEs, in particular with guilt and the assumption that attorneys leak information of perceived guilt to the triers of fact. Warner results support research by Finkel (1995) to rely on participative point of view rather than on subjective evidence and Walker-Andrews (1977) in that individuals rely on non-verbal cues to relieve own ambiguity. Frank & Ekman's article served as explanatory for defining courtroom lie and perjury differences and probalistic statistics. Probalistic statistic is a definition that cannot be explained often enough as it is crucial in arguments in law. In probalistic statistic it is said that within the population there is a 5% chance that X will display this kind of behavior; the law says this does not represent that the suspect falls within these 5%. The law wants a case specific representation therefore empirical science is refuted.

Legal Arguments

This is where the substance of this research lays, yet while attempts to explicate the necessity for assumptions (theories or stories) have been made throughout this quest; it is hereby reworded.

In matters of legal procedures, Micro Facial Expressions has yet been introduced to the judicial system as a challenge to its constitutionality. Consequently, any discussions as to MFE's constitutionality challenges are theoretical in nature, albeit based on factual challenges presently faced by fMRI and polygraph testing (and other true life events). Stories or theories are legal manners by which legal scholarly articles are published. Stories or Theories invoke rules or court decisions previously ruled by adjudication in torts, legislation, decisions in local, district, and appellate and federal courts.

Because of the intrinsic value given to the credibility or demeanor of an individual under scrutiny in a court of law (as noted by directions given by the judges to the triers of fact, in every court in the judicial system); its definition has been elucidated many times over scholastically (Remland, Blumenthal, Williams, Porter, Murray, Wellborn) and judicially (The Bench Book for the United States District Judges, Federal Jury Practice and Instructions, Indiana Supreme Court in Rhodes v. State, Riggins v. Nevada…etc.) and will continue to be debated. Part of the essence of what defines us, is also part of the question in what makes us lie and how (neither of which are to be debated or explored here). However, when people chose to lie in the courtroom and your own body can expose those lies, is it then a constitutionally protected act under reasonable searches by the Fourth Amendment? That is the first question, this research is proposing to explore.

The Fourth Amendment of the U. S. Constitution ensures

> The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

Public Space and Knowledge

The Fourth Amendment, however, only protects the rights of an individual against searches and seizures conducted by the government (i.e. federal or state agents, local police…); and the individual must *first aver* that they had a reasonable expectation of privacy. Our argument, on this vein of thought is: If the suspect or person (under interrogation), the individual is already *detained,* his/her constitutional rights were already *given* to them, (whose right's) were either *waived* or (individual is) *in the presence* of their attorney, no rights to privacy have been asserted (to officers) in an interrogation room or at a police station. Therefore, *there are likely no violations to the Fourth, if the subject is, monitored, for leaked, signs of incongruity of truth cues*.

First, the Courts established what: (a) constituted a search: In Katz v. United States, 1967, the U. S. Supreme Court in a two fold requirement concluded that the government's activity (in listening and recording Katz's words) constituted a Fourth Amendment 'search' and that the "Fourth Amendment protects people, not places". In Terry v. Ohio (1968), the Courts enunciated what was a principle of governmental invasion of a person's privacy under the Fourth's Search and Seizure Clause. Subsequently, the Supreme Court ruled on two decisions further by defining *justifiable, reasonable and protected* areas under the Forth. (b) First, in U. S. v. White, 1971, that a person must have *exhibited* an actual (subjective) expectation of privacy

and, second, in U. S. v. Miller, 1976 that the expectation is one that society is prepared to recognize as "*reasonable*". (c) If the individual is observed in a *public space*, the Supreme Court explained under (Katz v. United States, 1967) that what "*a person knowingly exposes to the public*, even in his own home or office, is not a subject of Fourth Amendment protection … " [emphasis in *knowing*]. (d) When the officer (government), that "is lawfully present and able to observe" (Horton v. California, 1990) [emphasis on lawfully]; (e) "Travelling on public thoroughfares" (U. S. v. Knotts, 1983) [emphasis on public]; (f) Car occupants being asked "to get out of their car after a traffic stop" (Pennsylvania v. Mimms, 1977; Hiibel v. Sixth Judicial Dist. Court of Nev., 2004); (g) "open fields" (Hester v. United States, 1924; Oliver v. United States, 1984), and (h) "aerial Observations" (California v. Ciraolo, 1986; Florida v. Riley, 1989) are not violations of the Fourth Amendment. Therefore, it is again this research's position that an observer utilizing MFE techniques under any of the above mentioned conditions, would violate the person under observation be able to successfully claim that their Fourth Amendment Right's were violated.

Personal Characteristics

Individuals "do not possess an *expectation of privacy* in their personal characteristics" under the Fourth Amendment Rights.

In 1973, The Courts ruled in U. S. v. Dionisio that a voice exemplar before a grand jury did not violate a person's Forth or Fifth Amendment constitutional rights. Similarly in 1985, the Courts ruled in U. S. v. Richardson, that providing *handwriting sample was not a violation* of a person's Forth and Fifth Amendment constitutional rights. In 1991, the Supreme Court ruled on Soldal v. Cook County that under The Fourth Amendment *plain view observations are not*

considered searches. In its ruling the Court stated that the "rare recluse who chooses to live his life in complete solitude" may possess a right to privacy but "*no person can have a reasonable expectation* that others will not know the sound of his voice, any all boundaries" that protect us from being simplified and objectified and judged out of context (Rosen, 2000).

Body integrity

Genetic Identifiers

The U. S. Code provides that the Attorney General may "collect DNA samples from individuals who are arrested, facing charges, or convicted or from non-United States (42 U.S.C. § 14135a(a)(1)(A)). *Genetic identifiers* have become normative and commonplace. Courts typically view procedures such as obtaining a blood sample or a fingerprint as minimally physically invasive and pursuant to the purpose of establishing identity (Jones v. Murray, 1989). Under Katz v. U. S., 1967, the courts considered fMRI might be a violation of the Fourth Amendment. If the Courts consider MFEs to be an invasive procedure, when the brain is shielded and well insulated from view inside layers of skin, bones and other matter; as annunciated in Schmerber v. California, 1966 … "The integrity of an individual's person is a cherished value in our society, searches that invade bodily integrity cannot be executed as mere fishing expeditions to acquire useful evidence: The interests in human dignity and privacy which the Fourth Amendment protects forbid any such intrusions on the mere chance that desired evidence might be obtained." Furthermore, in United States v. Knights, the Supreme Court found that the reasonableness of a search: The degree of intrusion into an individual's privacy compared to the need "for the promotion of legitimate governmental interests" *depends on the totality of the circumstances*. United States v. Knights, 2001. However, this research argues that

the observation of an individual being deposed under oath in a public courtroom cannot be equated to a diagnostic sterile fMRI testing conditions. Anyone of the gallery courtroom audience equipped with a suitcase sized fitted laptop computer and camera can gather the necessary information without awareness, pain infliction or bodily integrity invasion cherished by society and expressed by the courts. Consequently, any challenges to expert testimonial derived from MFEs from open exposure observation (does seem to not fit the protected Fourth Amendment confinements) would have ultimately be heard during a suppression hearing and decided by the courts.

Reasonableness

Then under U. S. v. Kincade (2004) the Courts explained the 'reasonableness' of a search for the promotion of legitimate governmental interests. As of the publishing of Church's article in 2012, the U. S. Code provides that the Attorney General may "collect DNA samples from individuals who are arrested, facing charges, or convicted or from non-United States (42 U. S. C. § 14135a(a)(1)(A)). Genetic identifiers have become normative and commonplace. Courts typically view procedures such as obtaining a blood sample or a fingerprint as minimally physically invasive and pursuant to the purpose of establishing identity (Jones v. Murray, 1989). Paraphrasing New (2008), the lingering question remains, if the legal system were to mandate government's interest in the sought-after neuroscience mental information, it would cast doubt on the understanding of communication, as without mental intent to communicate, there can be no communicative behavior.

It is arguable, paraphrasing Freud, that there is communication between the subconscious and the conscious self. This Freudian concept/theory is long accepted by the members of

psychiatric and psychological communities. If such basic communication(s) is occurring and leaking; obvious for all to see, even if (only those who have training, may actually notice), not by word of mouth, not compelled by torture, but voluntarily. Albeit likely against the individuals conscious consent, but probably out of his sense of integrity or honesty. An individual's own body is betraying his election not to communicate verbally yet doing so expressively. Consequently, the findings of this research lead you to the conclusion that there is no infraction of either the Fourth or the Fifth Amendments.

Fifth Amendment

The Fifth Amendment of the U. S. Constitution provides,

> "No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service in time of war or public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation".

The Fifth Amendment addresses:

> Only a relatively narrow scope of inquiries." It only applies to testimony "that will subject its giver to criminal liability (III, next to last paragraph) Garner v. United States, 1976.

The United States Supreme Court has limited the scope of the Fifth Amendment privilege to answers that would support a criminal conviction or which would furnish a link in the chain of evidence needed to prosecute the witness. Historically, the common-law rule, underlining the concept of a voluntary confession of guilt person was the most convincing evidentiary effectual proofs in law. However, due to the nature of evidence (when at earlier times people could have been brought to testify in feudal or territorial issues) are now subjected to scrutiny and caution. The assumption that an innocent person would endanger (his) own life by perjuring themselves in lieu of someone else (due to their statutes, friendship or other unknown reason), now ceases when confession appears in consequence of inducements of a temporal nature (due to coercion) in reference to the charge, deprives freedom of will or self-control essential to confession voluntary within the meaning of the law. Subsequent cases followed essentially the same line of thought. Then, in Bram v. United States (1897), the Court assimilated the common-law rule thus mentioned as a command of the Fifth Amendment and indicated that henceforth a broader standard for judging admissibility was to be applied. The most important Supreme Court ruling impacting the Fifth Amendment was the landmark Miranda v. Arizona (1966) case. In it, the U.S. Supreme Court comprehensively expanded the constitutional amendment protections to include any situations outside the courtroom that might restrict personal liberty. When in a trial, the criminal defendant has the Constitutional right not to testify. There have been many cases brought before the Supreme Court that challenge particular infringement under the Fifth Amendment, each with specific circumstances that have helped define it even more. With each new ruling as well as with each new scientific development, more trials and more debates are brought forth with even more legal, moral and ethical dilemmas.

Testimonial, Tangible Evidence or Not?

The prospect of retrieving cognitive (mental) information from suspects (defendants) and/or eyewitnesses as either physical (tangible) or actual (oral) testimonial is a real current concern. The question of mining the mind (fMRIs) has yet to be heard, but if the vacillation presented to the court as the question of self incrimination is indicative how problematic this conundrum will be, researchers have a long time to wait to find out if MFE will ever be able to pass muster. Thus far, the Courts have ruled in favor of tangible evidence such as blood, fingerprints, photographs, gestures, voice and hair sample collections are not violations of the Fifth Amendment (See: Schmerber v. California, 1966; Boyd v. U. S., 1886; Pennsylvania v. Muniz, 1990; and U. S. v. Dionisio, 1973). The Supreme Court has held the privilege extends only to communicative evidence, and Blood, testimonial. Legal references cite cases Curcio v. U. S., 1957; Estell v. Smith, 1980; U. S. v. Campbell, 1961 and U. S. v. Matos, 1990, as proof positive of the Fifth Amendment disclosure prohibitions. They are. However, none of them are intrinsically linked to any neuroscientific or MFE testing/testimonial. The Courts stated …

> "Although we agree that this distinction is a helpful framework for analysis, we are not to be understood to agree with past applications in all instances. There will be many cases in which such a distinction is not readily drawn. Some tests seemingly directed to obtain 'physical evidence', for example, lie detector tests measuring changes in body function during interrogation, may actually be directed to eliciting responses which are essentially testimonial. To compel a person to submit to testing in which an effort will be made to determine his guilt or innocence on the basis of physiological responses, whether willed or not, is to evoke the spirit and history of the Fifth Amendment. Such situations call to mind the principle that the protection of the privilege 'is as broad as the mischief against which it seeks to guard' (Counselman v. Hitchcock, 1892)".

This ruling is very descriptive and confining to most lie detection technology testing currently out in the field. New, agrees. This research position is opposite. Strong arguments were made already demonstrating that MFE observations can be overt, do not require intrusions of body or mind, there are no risk potentials to the witness or defendant. However, it may be considered as testimonial but not of his own words or mouth [emphasis on 'own words or mouth'], even though no words might be spoken (Miranda v. Arizona, 1966; Rochin v. California, 1952). This is a rather a far-reaching theory that would have to be decided by the courts. It is nonetheless a tangible theory in that unlike charts, tables or photographs, properly explained by a forensic expert (granted new evidential procedures would still have to be introduced into courts and survive the Frey and Daubert tests) to the triers of facts, the individual palpable and reproducible muscle movements associable with action units (AU) of expressive emotions.

Summary Statement

In these past pages, this research's quest was to present arguments that would provide a review of the historical lies and deceit literature and its impact on the judicial system. Also, to discuss the impact the possibility of a forensic psychologist (or another MFE observer) in vivo testimony being alleged with violation or infringement the rights provided by the American Fourth and Fifth Amendment Constitutional Rights. This research targets to demonstrates that Micro Facial Expression has been silently present in the American courtrooms, but that it can be constructively utilized to the betterment of all interested parties; providing real answers to demeanors of behavior and potential lies and deceit can be constructively agreed to.

This research has documented that the legal arena's disdain to psychological sciences empirical knowledge contribution in human behavior, academically dates back, as early as Munsterberg in the 1900s and more recently in Small's opinion published in 1993. This disdain can also be demonstrated through legal court rulings in U.S. v. Frey (the polygraph) in the 1923 and more recently in Lockhart v. McCree 1986.

The court system in the United States have consistently argued (since Frey) that there is no reliable research to prove direct correlation between emotions and lie and deceit. This is the junction where the necessity to research far back into history became a must. Time spent to verify these facts were well worth it, as lots of information were discovered albeit not all relevant to this research (but learning is learning!). Anecdotal ancient Chinese myth teaches that the principals of the fight or flight response existed as far back as 2250 B.C. This principal was not scientifically explained until 1915 by Cannon. The fight or flight response are changes in the body that are target-specific to increase the survival chances in at risk situations. Consequently, in a linear timeline from 1915 to 1923 science did not have sufficiently knowledge developed to conclusively answer the "how, what, where and why" for the court at the time.

Since the early 1920s, the sciences have demonstrably grown in research achievements concerning emotions. A general 'consensus' on the definition of emotion has been established. Several proposed definitions of what a 'lie' constitutes are available depending on the basis of theoretical approaches. Presuming the courts does not dispute the concept that emotions exit, this research is therefore not compelled the necessity to argument its existence. Nonetheless, Broca (1878) first suggested that emotions were related to the center of the brain in the limbic system, and that affective neuroscience is the study of the neural mechanisms of emotions. Emotions, however, cannot be empirically measured since experts cannot quantify internal experience of

others. Although not expressively stated by the Supreme Court in the Frye case, it is not an unreasonable conclusion that emotional measurement (of lie or deceit) is the missing link in the polygraph testing on the (Frey) case. It is also not an unreasonable inference that the premises behind the polygraph are based on the fight-or flight reaction, which is based on the emotion of fear. Lie detection efforts were not halted but hindered after Frey. Two distinguished fronts are focused here: Neuroscience's MRI and Psychology's MFE.

Neuroscience, through the assistance of the Magnetic Resonance Imaging testing (patented in 1974) has established that the amygdala is associated with negative emotions. This is especially true for fear and when someone is perceiving potential threats. With the betterment of the MRI technology, a newer prototype became available that was more responsive, less intrusive, and noninvasive with high resolution functional images that could identify when subjects are being deceptive: the fMRI. Within the scientific and the legal community, there is agreement that there is a linear comparison between the polygraph and the fMRI mentality (Wolpe, 2005; New, 2008; Wilson v. Corestaff, 2010; McNamara v. Borg, 1991; People v. Shedrick, 1985) and speculation that as is it might suffer the same fate of failing the Frey and Daubert tests.

On the other hand, MFEs observations do not attempt to present the courts with an origination source of the emotion of the lie, rather it provides the muscle movement that is measurable and visible to the naked eye when the person been observed is incongruent in thoughts and expressions. The measurements were created and catalogued by Ekman & Friesen (1978), are called Action Units (individually), collectively put together as a catalog of thousands of facial muscle in anatomically based combination system called FACS Spell out acronym. To

date, MFEs have not been challenged in court as to its constitutionality, nor has it been presented as a new scientific evidence-methodology; its fate it is still to be decided in the legal arena.

This research's legal theoretical argument presented was based on current and past legal decisions related to the infringements upon the Fourth and violations of the Fifth Amendment Rights.

A. Based on the wording of the amendment itself, if a subject is under arrest and his liberties are already curtained by or waived under Miranda Rights (with or without counsel); that the suspect is within the walls of a police station [a public location = no searches and privacy could be arguable depending if interview room door is closed], a MFE observer could meet both the spirit and the intent of the law.
B. Protects people not places; Public Space; What a person knowingly exposes to the public (Katz v. U.S., 1967)
C. Clarification of principle of government invasion of a person's privacy (Terry v. Ohio, 1968)
D. Definition of justifiable (U.S. v. White, 1971)
E. Explanation of Reasonable (U.S. v. Miller, 1976; U.S. v. Kincade, 2004)
F. When the officer is "lawfully present and able to observe" (Horton v. California, 1990)
G. Travelling on public thoroughfares (U.S. v. Knotts, 1983)
H. Getting out of their car after a traffic stop (Pennsylvania v. Mimms, 1977)
I. Open fields (Hester v. U.S., 1924)
J. Aerial observations (California v. Ciraolo, 1986)
K. Plain view (Soldal v. Cook County, 1991)
L. Voice sampler (U.S. v. Dionisio, 1973)

M. Handwriting sample (U.S. v. Richardson, 1985)

N. Genetic Identifiers (42 U.S.C. § 14135a(a)(1)(A) ; Jones v. Murray, 1989)

O. Depends on totality of circumstance (United States v. Knights, 2001)

P. Tangible Information privilege (Schmerber v. California, 1966; Boyd v. U.S., 1886; Pennsylvania v. Muniz, 1990 and U.S. v. Dionisio, 1973)

Q. Disclosure Prohibitions (Curcio v. U.S., 1957; Estell v. Smith, 1980; U.S. v. Campbell, 1961 and U.S. v. Matos, 1990)

The two main arguments against MFEs are:

1. As New (2008) said (pertaining to brain mining), it would cast doubt on the understanding of communication, as without mental intent to communicate, there can be no communicative behavior. We contend that empirical studies from areas such as communication – Mehrabian's (1967) conclusion on non verbal communication being the single most powerful form of communication at 55% over verbal (pertaining to feelings and attitudes) and bodily movements (volume, pitch, rhythm...). Koneya & Barbour (1976) support Mehrabian's conclusion and Borg (1960) believe it should be more on a higher range of 93%. This research stated before and affirms that Freud in his wise and expert opinion loosely stated that there is communication between the subconscious and the conscious self. This Freudian concept/theory is long accepted by the members of psychiatric and psychological communities. If such basic communication(s) is occurring and leaking; obvious for all to see, even if (only those who have training, may actually notice), not by word of mouth, not compelled by torture, but voluntarily. Albeit

likely against the individuals conscious consent, but probably out of his sense of integrity or honesty. His own body is betraying his election not to communicate verbally yet doing so expressively.

2. "Some tests seemingly directed to obtain 'physical evidence', for example, lie detector tests measuring changes in body function during interrogation, may actually be directed to eliciting responses which are essentially testimonial. To compel a person to submit to testing in which an effort will be made to determine his guilt or innocence on the basis of physiological responses, whether willed or not, is to evoke the spirit and history of the Fifth Amendment. Such situations call to mind the principle that the protection of the privilege 'is as broad as the mischief against which it seeks to guard' (Counselman v. Hitchcock, 1892)". This research argues that the spirit of this ruling may have sought to protect inclusive MFE, if it is seen only as testimonial. However, should the courts determine that MFE can be deemed a tangible test, then MFE still has a chance to be accepted under the guidelines of the Fourth Amendment. Either way, it is still up to the courts to decide.

One question remains… Why, one wonders and considers (after all the legal research in the past four years) do humans need to manipulate the law, pushing envelops of constitutionality, trying a way to find discourse to subvert moral society through lies of character only to be caught by his own lying leaking face?

This project began with a pool of 384 articles to deliver a meta-synthesis of 107 selected articles, 13 legal opinions, and 67 court rulings designed to provide insight into the issues

surrounding MFE. The aggregation of these findings and court decisions will help us more forward, more well informed, and better equipped to make critical decisions.

Implications

The merits of argument on the reasonableness MFE observations to be non-invasive, at no risk, voluntary, measurable and tangible are backed both empirical evidence and court rulings. When judicial approval is considered, and if obtained, then Forensic Psychologists will be able to safely address to both arenas requirements equally. Judicial approval would likely incentivize the policing departments to consider the use of MFE as a proactive method of recognition or defensive approach to high-risk calls and efforts to mitigate danger to its officers.

Limitations

- Sample size: Regardless of the fact that this is a meta-synthesis over one hundred articles were pulled and one third were reviewed, the pool sample is still too small. Considering that the legal arena has many sub specialization catagories, this research barely scratched the surface.
- Reliable data: The availability of data is problematic as it is mostly outdated. Whether current interest has shifted or cooperation is minimal, for the latter the root cause is demonstrative.

CHAPTER 5: CONCLUSION

SUMMARY OF FINDINGS

This research sought to demonstrate that MFE has been silently present in the American courtrooms. This was accomplished by the court case rulings cited where credibility were issues of interest. This research further demonstrated how conscious the courts are when credibility of their own judges is at issue. Arguments were supported not only by court rulings, but also by legal opinions and empirical evidence. This research found validity in Micro Facial Expression and not a violation of the Fourth and Fifth Amendments to the U. S. Constitutions. A theoretical legal argument was presented and defended to the strengths of Micro Facial Expression surviving a challenge to a charge of violation of the Fourth Amendment Right and infrigment of the Fifth Amendment Right. Although MFE Technology is still its embryolic stages; its future potential as lie detection technique is unique and can be constructively utilized to the betterment of all interested parties.

Recommendations

The most important message derived from this quest is that although very difficult, and not often recommended, a meta-synthesis can be the best fit when attempting to analyze two completely divergent methodological approaches.

To gain better cooperation from the legal arena, this recommendation is made: rather than trying to find methods to analyze the inner motives of attorneys and judges from a third party perspective alone, include the attorneys and judges to self evaluate pre and post each day during a trial (as one would with the jurors).

Future Research

Future research is recommended on case studies of judges and attorneys and their decision-making processes. Understanding the process provides parameters for empirical studies that can be then inferred into a larger populace. Cooperation is key, and to gain it trust must be first deserved. Hummanities academia as a whole has proved lacking to the legal arena. Psychologists are at their best when listening and as a group have failed to hear so far; it is about time to start.

An uptade

Since the finalization of this paper, the news headlines at MSN on the Internet read: "ACLU sues feds over airport acreedings", by Keith Laing (provided by the Hill).

> "The ACLU claims that TSA's Behavior Detection and Analysis program (formaly known as SPOT (Screening Passengers by Observation Techniques), lacks a scientific basis, is wholly innefective, and has given rise to allegation of racial profiling."

This is a perfect way to recommend inquiring minds and potencial researchers who might want to pursue the undiscussed topic of admissibility of new scientific techquinic under Frey and Daubert. This will be undoubletly a worthy challenge, but one that can be conquerable.

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Addendum

Attachment 1. Google Search

GOOGLE		GOOGLE SCHOOLAR
MFE	0	53,000
Micro Facial Expression	432,000	48,400
Micro Facial Expression + Test	250,000	37,600
Micro Facial Expression + Non-Verbal	193,000	852
Micro Facial Expression + Lying	92,000	3,290
Micro Facial Expression + Neuroscience	1,160,000	1,670
Micro Facial Expression + Deception	1,840,000	728
Micro Facial Expression + Justice Department	2,880,000	1,380
Micro Facial Expression + Court	2,730,000	3,580
Micro Facial Expression + Law	371,000	12,100
Micro Facial Expression + Jury	109,000	126
Micro Facial Expression + Judges	316,000	3,590
Micro Facial Expression + Lawyers	1,580,000	545
Micro Facial Expression + Decisions	5,620,000	5,110
Micro Facial Expression + U.S. Supreme Court	171,000	765
Micro Facial Expression + Federal Rules of Evidence	3,130,000	1,120
Micro Facial Expression + Constitutional Rights	3,160,000	1,040
Micro Facial Expression + fourth Amendment Right	750,000	844

Micro Facial Expression + Fifth Amendment Right	2,020.000	667
Micro Facial Expression + Sixth Amendment Right	1,690,000	421
Micro Facial Expression + (all of the above variables)	7	0

Attachment 2. Study Characteristics of all articles included in analysis (arranged chronologically)

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Autonomic nervous system activity distinguishes among emotions	Ekman	1983	American Association for the Advancement of Science	
The role of facial response in the experience of emotion: More methodological problems and a meta-analysis	Matsumoto	1987	Personality and Social Psychology	A rebuttal opinion on Laird (1984) response to published research results by Tourangeau and Elleswoth (1979) study of self-report measures
A wipe of the hands, a lick of the lips: The validity of demeanor evidence in assessing witness credibility	Blumenthal	1993	Nebraska Law Review	A persuasive argument on the validity of demeanor evidence
The importance of non-verbal communication in the courtroom	Remland	1993	Information Analysis	Reviews the empirical research on nonverbal communication in the courtroom arena based on evidence and insufficient studies

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
The Demeanor gap: Race, lie detection and the jury	Rand	2000	Connecticut Law Review	Proposes that a demeanor gap exists in the legal arena relating to the African – Caucasian population and such disparity should be addressed in the legal system.
Universals and cultural differences in recognizing emotions	Elfenbein	2002	American Psychological Society	A meta-analysis examining the universality and culture specificity of emotion recognition
Methodological requirements to test a possible in-group advantage in judging emotions across cultures: Comment on Elfenbein and Ambady (2002) and evidence	Matsumoto	2002	Psychological Bulletin	Rebuttal discussion on Elfenbein's meta-analysis. Methodological requirements for studies to test adequately the in-group advantage hypothesis and additional requirement in reviewing multiple judgment studies and examining variance in judgment effects across those studies.

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
The influence of judge, target, and stimulus characteristics on accuracy of detecting deceit	Porter	2002	Canadian Journal of Behavioural Science	Identify contributing factors related to the ability to detect deceit, including characteristics of the credibility assessor, characteristics of the target and the modality of the report
Facial expression recognition from video sequences: Temporal and static modeling	Cohen	2003	Computer Vision and Image Understanding	Classification of facial expression recognition using Bayesian network in the case of Naïve-Bayes classifiers the use of Cauchy distribution assumption
Non verbal detection of deception in forensic contexts	Frank	2003	Forensic Psychology	Resource for mental health and Legal professionals
Ekman, emotional expression, and the art of empirical epiphany	Keltner	2004	Research in Personality	Individual differences in emotion and the shaping of the life context

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Assessment of perceived guilt through facial expression analysis of attorneys	Warner	2004	Alliant International University	The data from this study supported the hypothesis that nonverbal expression o f emotion can be read by others in a way that might affect jury verdict.
Dynamic of facial expression extracted automatically from video	Littlewort	2006	Image and Vision Computing	A systematic comparison of machine learning methods applied to the problem of fully automatic recognition of facial expressions.
Neuroscience-based lie detection: The urgent need for regulation.	Greely	2007	American Journal of Law & Medicine	Argument of non-research use of neuroscience technology is premature at this time

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Racial blindsight and criminal justice: Othello error: Facial profiling, privacy, and the suppression of dissent	Herbert	2007	Ohio State Journal of Criminal law	Asserts that invasive visual examination of travelers' faces and facial expressions for law enforcement purposes under the auspices of protective administrative searches ineffectively protects national and airport security and violates reasonable expectations of privacy.
Emotion judgments do not differ as a function of perceived nationality	Matsumoto	2007	International Journal of Psychology	Reports on three studies concerning the relationship between emotion judgments and perceived nationality of the expressors being judged

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Authentic facial expression analysis	Sebe	2007	Image and Vision Computing	Create the first authentic facial expression database where the test subjects are showing the showing the natural facial expressions based on their emotional state and evaluate current promising machine learning algorithms for emotion detection.
Deceiving the law	Unknown Editor	2008	Nature Neuroscience	Editorial
The veiled truth: Can the credibility of testimony given by a Niqab-wearing witness be judged without the assistance of facial expressions?	Williams	2008	University of Detroit Mercy School of Law Review	Assessment of current standing of facial expression in courtroom arena

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Dangerous decisions: A theoretical framework for understanding how judges assess credibility in the courtroom	Porter	2009	Legal and Criminological Psychology	Dangerous decisions theory (DDT) offers a theoretical framework to build our understanding of the decision-making process that can culminate in such injustices
Spontaneous facial expression in unscripted social interaction can be measured automatically	Girard	2010	Behavior Research Methods	Seeks to address the need for valid, efficient and reproducible measurement.
Confronting religion: Veiled muslin witness and the confrontation clause	Murray	2010	Notre Dame Law Review	Arguments on the confrontation clause
Neuroscience in the courtroom: An international concern	Church	2012	William & Mary Law Review	Article review of potential use of fMRI and other neuroscience testing in the courtroom

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Facial expression recognition system by using AFERS system	Saisudheer	2013	International Journal of Computer Engineering Science (IJCES)	Introduces an Automated Facial Expression Recognition System (AFERS): A near real time, next generation interrogation tool that has the ability to automate the Facial Action Coding System (FACS) process for the purposes of expression recognition.
An effective approach for facial expression recognition with local binary pattern and support vector machine	Nhan	2013	Research Notes in Information Science	The proposed approach based on local binary features and support vector machine is simple, fast and significant for real time applications
Will get fooled again: Emotionally intelligent people are easily duped by high-stakes deceivers	Porter	2013	Legal and Criminological Psychology	Results found that Emotionally Intelligent people are less likely to be able to detect deceit

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Differences between individuals with and without experience with assault in identifying facial signs of imminent aggression	Matsumoto	2013	Intelligence and Security Informatics	Study replicated and expanded results of previous study that provided evidence that certain facial expression may be reliably associated with imminent assault.
Complete local binary pattern for representation of facial expression based on Curvelet transform	Nagaraja	2013	Multimedia Processing, Communication & Information Technology	Proposes a technique for facial expression representation based on combination of Curvelet transform and CLBP.
Meta-analysis of the first facial expression recognition challenge by using embedded systems	Siva Rao	2013	International Journal of engineering research & Technology	Reports several methods currently identified as meeting the first facial expression challenge
FPGA Implementation of a novel robust facial expression recognition algorithm	Piparsaniyan	2014	Electronics and Communication Engineering	FPGA implementation of the extended Bayesian classifier using CORDIC unit has obtained 96.73 emotion recognition

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Facial expression recognition using local Garbor Binary Pattern (LGBP) and Principal Component Analysis (PCA)	Grupta	2014	Engineering and Technology	Integration of LBP and PCA with JAFFE database with a 87.5% high recognition rate
Dynamic Facial Expressions of Emotion Transmit an Evolving Hierarchy of Signals Over Time	Jack	2014	Biology	Supportive that perceptual expectation models show "basic" facial expression signals are perceptually segmented across time and follow a "biologically basic to socially specific" hierarchical signal evolution.
Facial expression Recognition using texture description of displacement image	Raie	2014	Journal of Information Systems & Telecommunication	Support vector machine is used to classify the extracted feature vectors. The proposed method is evaluated on standard databases and the results show a significant accuracy improvement compared to DLBPHS

Title	Primary Author	Publication Year	Research Field Area	Outcome Measure
Discriminative regions selection for facial expression recognition	Mliki	2014	International Journal of Computer Sciences	Presents a low-computational approach for facial expression recognition based on automatic selection of descriptive emotion regions
The cognitive neuroscience of deception: Advances in neuroscience, criminal law application and ethics	Rengifo	2014	Neurogenesis Journal	Review article of fMRI, PET, P300 and CIT testing in criminal law and ethical implications.
Affective facial expression processing via simulation: A probabilistic model	Vitale	2014	University of Technology, Sydney - Australia	Proposes a probabilistic computational theory for the detection of emotion states based on facial expressions.
BP4D-Spontaneous: a high-resolution spontaneous 3D dynamic facial expression database	Zhang	2014	Image and Vision Computing	Reports developmental and scientific research processes for creation of a 3D facial expression database

Attachment (Table) 2 was created to show the researches selected for review to demonstrate continued interest in the MFE research through date. Analysis of the data is beyond the scope of this study, therefore not pursued.

Attachment 3. Theoretical MFE Studies

Title	Primary Author	Publication Year
Autonomic Nervous System Activity Distinguishes Among Emotions	Ekman	1983
The role of facial response in the experience of emotion: More methodological problems and a meta-analysis	Matsumoto	1987
Methodological requirements to test a possible in-group advantage in judging emotions across cultures: Comment on Elfenbein and Ambady (2002) and evidence	Matsumoto	2002
The influence of judge, target, and stimulus characteristics on accuracy of detecting deceit	Porter	2002
Universals and cultural differences in recognizing emotions	Elfenbein	2002
Nonverbal detection of deception in forensic contexts (*)	Frank	2003
Assessment of perceived guilt through facial expression analysis of attorneys (*)	Warner	2004
Ekman, emotional expression, and the art of empirical epiphany	Keltner	2004
Emotion judgments do not differ as a function of perceived nationality	Matsumoto	2007
Deceiving the law (*)	Unknown Editor	2008

Title	Primary Author	Publication Year
Differences between individuals with and without experience with assault in identifying facial signs of imminent aggression	Matsumoto	2013
Facial expression recognition system by using AFERS system	Saisudheer	2013
Will get fooled again: Emotionally intelligent people are easily duped by high-stakes deceivers	Baker	2013

(*) Reflects cases that fit more than one table sort/criteria

Attachment 4. Imaging and Computing Studies

Title	Primary Author	Publication Year	Outcome Measure
Facial expression recognition from video sequences: Temporal and static modeling	Cohen	2003	Wanted determine the best method to capture MFE system for classification from continuous video input. Results need further research to include multiple modalities such as voice analysis…
Dynamic of facial expression extracted automatically from video	Littlewort	2006	A systematic comparison of machine learning methods applied to the problem of fully automatic recognition of facial expressions.
Authentic facial expression analysis	Sebe	2007	Create the first authentic facial expression database where the test subjects are showing the showing the natural facial expressions based on their emotional state and evaluate current promising machine learning algorithms for emotion detection.
Complete local binary pattern for representation of facial expression based on Curvelet transform	Nagaraja	2013	Proposes a technique for facial expression representation based on combination of Curvelet transform and CLBP.
An effective approach for facial expression recognition with local binary pattern and support vector machine	Nhan	2013	The proposed approach based on local binary features and support vector machine is simple, fast and significant for real time applications
Facial expression recognition system by using AFERS system	Saisudheer	2013	Development of a portable, near real-time system to detect the seven universal expressions of emotions, including full video support, snapshot generation and case management utilities to enable users to re-evaluate interviews in detail at later time.
Meta-analysis of the first facial expression recognition challenge by using embedded systems	Siva Rao	2013	Reports several methods currently identified as meeting the first facial expression challenge

Title	Primary Author	Publication Year	Outcome Measure
Spontaneous facial expression in unscripted social interaction can be measured automatically	Girard	2014	Reports a major advance in automated coding of spontaneous facial actions during unscripted social interaction. Findings suggest automated FACS coding has progressed sufficiently to be applied to observational research in emotion and related areas of study
Discriminative regions selection for facial expression recognition	Mliki	2014	Presents a low-computational approach for facial expression recognition based on automatic selection of descriptive emotion regions
Facial expression recognition using Local Gabor Binary Pattern (LGBP) and Principle Component Analysis (PCA)	Gupta	2014	The 'effective' impact of the proposed approach has been illustrated through experimental results and analysis. There is an option to deal with paralyses facial expressions recognition, which may provide a helpful direction in the case of medical science and neurology.
FPGA implementation of a novel robust facial expression recognition algorithm	Piparsaniyan	2014	Proposes to implement a method for facial emotion recognition based on Gabor wavelet based feature and extended Bayesian classifier for multi class classification. Reported accuracy of 96.73% for JAFFE database…
Facial expression Recognition using texture description of displacement image	Raie	2014	Support vector machine is used to classify the extracted feature vectors. The proposed method is evaluated on standard databases and the results show a significant accuracy improvement compared to DLBPHS
Affective facial expression processing via simulation: A probabilistic model	Vitale	2014	Proposes a probabilistic computational theory for the detection of emotion states based on facial expressions.

Title	Primary Author	Publication Year	Outcome Measure
BP4D-Spontaneous: a high-resolution spontaneous 3D dynamic facial expression database	Zhang	2014	Reports developmental and scientific research processes for creation of a 3D facial expression database

Attachment (Table) 4 Imaging & Computing Studies was created to illustrate the increasing number of researches in the MFE subject to date. In recent years a lot of research have been attempted to improve upon the rigorous studies pertaining to communication of nonverbal expression. The focus on MFE was increased by the criticism that instruments that measured facial expressions (slow motion viewing) were bulky, cumbersome and do not assess emotion (in the face) by an average observer in real-time. Although this is not our area of expertise, all articles were read. Analysis of the data is beyond the scope of this study, therefore not pursued.

Attachment 5. Neurological Studies

Author	Year of Publication	Journal	Outcome Measure
Unknown Editor	2008	Nature Neuroscience	Editorial (*)
Rengifo	2014	Neurogenesis Journal	Review article of fMRI, PET, P300 and CIT testing in criminal law and ethical implications (*)

(*) Reflects cases that fit more than one table sort/criteria

Attachment 6. E-mail to Purdue (OWL) Engllish Department

E-mail to: Purdue English Department (OWL) On Line Writing Lab

Re: [Contact Form] Message to the OWL Mail Tutors - APA Citation

PURDUE x

Purdue English Dept. - Online Writing Lab

<owlmail@purdue.edu>

to me

Hello Vania,

It looks like this document is made of sections written by the individual contributors. If you a
two particular sections, you might cite each with its own title and author as a work in an edit
the Acknowledgements, it looks like Andrew S. Mansfield was the collection's editor. So if y
cite the entire document, citing it as an edited collection seems to make sense. We have pa
examples on the OWL website that explain both of these citation styles.

Best wishes,

OWL Mail
1872

----- Original Message -----
From: "Vania Iumatti-Lodewyk" <iumattilodewykv@gmail.com>

To: "OWL Mail Tutors" <owlmail@purdue.edu>
Sent: Sunday, November 30, 2014 9:37:57 PM
Subject: [Contact Form] Message to the OWL Mail Tutors - APA Citation

Message Sent From: 72.35.101.152

Browser used:

Name: Vania Iumatti-Lodewyk

Location: Alaska Pacific University

Subject: [Contact Form] Message to the OWL Mail Tutors - APA Citation

I am at a loss how to cite this one reference: \r\nA Judge\'s guide to neuroscience: A concis \r\nIt lists several \"contributors\" that are listed alphabetically and no instructions how to ref copyrighted (2010) to the University of California, Santa Barbara. Here is the link if it helpshttp://www.sagecenter.ucsb.edu/sites/staging.sagecenter.ucsb.edu/files/file-and-multimedia/A_Judges_Guide_to_Neuroscience%5Bsample%5D.pdf\r\nI have looked at you and I am still at a loss. Can you help?\r\nThanks

Attachment 7. Sample Meta-Analysis Reporting Standards Form

Meta-Analysis Reporting Standards (MARS)
Information Recommended for inclusion in Manuscripts Reporting Meta-Analyses

Table 4
Meta-Analysis Reporting Standard (MARS): Information Recommended for Inclusion in Manuscripts Reporting Meta-Analyses

Paper Section and topic	**Description**
**Title:	Neuroscience-based lie detection: The urgent need for regulation
Author	Greely & Illes
**Year	2007
Abstract	The problems to be encountered by new neuroscience based-lie detection technologies in legal issues are huge and that they should implicate at a minimum the Fourth and the Fifth Amendment, but in reality it should be at a minimum of five Amendments, the Fourth and the Fifth inclusive
Introduction	Review of this study revealed an in depth analysis of the fMRI testing. The authors expressed concerns for the community at large lack of regulation for potential knowhow exploitation and offer suggestions for guidance. However failing to explore the legal side of the discussion…
Method Inclusion and Exclusion Criteria	Original qualifier: 1. Google □Google Scholar search☑ 2. APU databases☑ 3. Selection Criteria: Study between 1977 and 2015☑ 4. English ☑ per case determination□ 5. Ethical violations□ no violations☑ 6. MFE related□ Nonverbal ☑ 7. Legal implications: 4th□ 5th□6th□Demeanor□fMRI☑ other □ 8. Failure to meet any of the above = Exclusion

Moderator and mediator Analyses	Good article, very explanative of the fMRI process. Quantitative and qualitative significant relevant to fMRI studies. Not significant to legal processes.
Search Strategies	Must meet qualification stages 1 – 8 (cannot be skipped) any fails = disqualification
Coding Procedures	
Statistical Methods	Meta-Synthesis
Results	Upon secondary review, this research failed to meet the legal implications needed to remain in this study and was therefore excluded
Discussion	

From "Reporting Standards for Research in Psychology: Why Do We Need Them? What Might They Be?" by APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008, American Psychologist, 63, pp. 848-849. Copyright by the American Psychological Association.

**NOTE: Author's name and publication Year were added by this researcher to the form.

Attachment 8. METT – Certificate of Training