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Preface

This continuing series presents original research results on the leading edge of psychology. Each article has been carefully selected in an attempt to present substantial results across a broad spectrum. This book reviews research on understanding food consumption in romantic relations by examining the past and the future; cognitive issues in idiopathic epilepsy; athlete performance, coping and anxiety; family stress and psychological adjustments among welfare and non-welfare immigrants; teacher and teaching schemas as cognitively constructed by candidates in training.

Chapter 1 - The present study examined the cognitive journey of teacher candidates as evidenced by their cognitively constructed schemas of the teacher role and the challenges of teaching at two developmental junctures; prior and subsequent to their first education course, which incorporated forty hours of observation/fieldwork.

Notably, both the semantic nature and endurance of teacher and teaching schemas have been sources of debate throughout the teacher development literature.

Findings of the present research, which included multiple, varied, complex, and overlapping cognitive pathways with respect to perceived teaching challenges and teacher portrait characterizations, paved with realism and idealism, respectively, are interpreted via an ecological perspective. Such a perspective denotes a cognitive map of understanding that identifies the developmental origins and foundations of candidates’ constructed pathways, namely, prior socialization experience and the dynamics of changing individual and contextual variables in this regard.

The ability of candidates to stay on course, with respect to the fortitude of their initial teacher and teaching schemas, is also examined in light of its
impact on post-fieldwork schemas and developmental considerations are also discussed with respect to the overall impact of such cognitively constructed routes on probable future schemas and/or behavior in the classroom.

Chapter 2 - Before romantic relationships are even formed, individuals make decisions about eating out. Although this is a common everyday decision, it is also complex in nature requiring one to consider many factors such as time, money, and healthy food choices. Past research has identified many factors that increase the likelihood of dining out. These include a desire to avoid cooking, economic reasons for those living alone, and shortage of time to prepare meals at home.

When individuals form couples in romantic relationships, decisions involving food consumption continue to occur daily. However routine this occurrence is, it is nevertheless a critical component of romantic relationships beginning during the courtship stage and extending later into marriage. Typically, in the early stage of a relationship, individuals merge independent food systems to create a joint food system. This transition is crucial as it relates to marital conflict and daily interactions.

Research has identified numerous strategies that couples employ when making decisions about eating out. Genre and familiarity of the restaurant are two important attributes that are related to the decision strategy employed. This line of research has also discovered that the stage of the relationship, dating versus married, is important in many ways. For example, the stage of the relationship influences the number and type of strategies utilized and who in the couple is more influential in making the decisions.

This commentary will elaborate on the topics presented above (i.e., the social experience of eating and decision-making strategies of couples when eating out). Additionally, current research endeavors will be presented on romantic relationships in relation to satisfaction, eating regulation, and behavioral habits of eating out. Although past and current research has greatly advanced the understanding of the importance of eating in romantic relationships, this line of research is not without limitations and specific challenges that need to be discussed. One facet that remains virtually untapped is investigating how couples make decisions regarding the decision to eat at fast food restaurants. This commentary will conclude by exploring why researchers should focus on decisions of couples related to the fast food industry.

Chapter 3 - This study examined the MMPI-2 clinical presentation of a sample of 80 Gulf War veterans seen in an outpatient clinic who were divided into PTSD or non-PTSD groups. Results indicated that MMPI-2 profiles
differed significantly, with the PTSD group scoring higher on each of the clinical scales, with the exception of scale 5. The groups were best differentiated by effect size differences among scales F, K, 2, 7, 8, and PK. The PTSD group yielded a mean 8-1 MMPI-2 code type, whereas the non-PTSD group yielded a mean 1-3 MMPI-2 code type. The findings are generally consistent with the previous literature examining the clinical presentation of Gulf veterans.

Chapter 4 - Epilepsy is a common medical problem. Several studies suggest that idiopathic generalized or focal epilepsies can adversely affect mental development, cognition and behavior. Epileptic patients may experience reduced intelligence, attention, problems in memory, language and frontal executive functions. The exact mechanisms of epilepsy-related cognitive dysfunction are poorly understood. Cognitive deficits with epilepsy may be transient, persistent or progressive. Transient disruption of cognitive encoding processes may occur with paroxysmal focal or generalized epileptic discharges while epileptogenesis-related neuronal plasticity, reorganization, sprouting and impairment of cellular metabolism are fundamental determinants for progressive cognitive deterioration. Also antiepileptic drugs (AEDs) have differential, reversible and sometimes cumulative cognitive adverse consequences. AEDs not only reduce neuronal irritability but also may impair neuronal excitability, neurotransmitter release, enzymes and factors critical for information processing and memory. The present article serves as an overview of recent studies in cognition in adult and children patients with epilepsy. In this review, we will also discuss the known adverse mechanisms of epilepsy and AEDs on cognition.

Chapter 5 - Performance, coping and anxiety are critical ingredients for the consultant in working with athletes at all levels. Consultation in sport requires competency and specificity. The greater the specificity of the service in terms of offering information and training that will assure athletes can adapt to both the known and unknown factors that will operate to pose threats to their career should be the primary goal. In consultation with agents or coaches, appealing to individual athletes who could benefit from any aspect of sports consultation requires each having an empirical basis to the consultation services. New recruits whether to a college or pro team will confront a number of issues within the purview of the sports consultant when signing a contract. As a consultant, it is essential to emphasize to agents and others within college or professional organizations why it is imperative that an extensive psychometric study be utilized for the benefit of both athlete and coaching staff. Individual assessment helps to diagnose potential problems and will be
instructive for the organization in understanding enhancing the individual’s probability of making and completing effectively in the athletic arena.

Chapter 6 - The present study explored the psychological adaptation of immigrants to Israel, while comparing between two populations – immigrants treated by the Department of Social Services welfare system, and immigrants non treated by the welfare system.

Research findings show that the psychological adaptation of immigrants is predicted by the resources in the immigrant's possession, indicating that the psychological adaptation of population with special difficulties, such as – the elderly, single mothers, psychiatric patients etc., is more problematic. These findings were refuted by the current study, according to which, unexpectedly immigrants treated by the welfare system reported higher satisfaction from their integration in Israel, from their process of Alyia and from their life condition in Israel, compared to non-welfare immigrants)

It was found that married subjects reported more familial and economic difficulties, compared to non-married, and also related these difficulties more to negative psychological responses. The present research' findings point to differences between the studied groups regarding the experience of the immigration crisis, apparently the stresses of immigration act differently according to 'the experienced level of balance' former to immigration. Finally, the present study has practical implications, by which an absorbing state should differentiate its treatment and policy of immigration, according to immigrants' position prior to immigration. Moreover, the 'resilience' hypothesis which is apparently supported by the present study, should be further examined empirically.

Versions of these chapters were also published in *International Journal of Psychology Research*, Volume 6, Numbers 1-3, edited by Frank Columbus, published by Nova Science Publishers, Inc. They were submitted for appropriate modifications in an effort to encourage wider dissemination of research.
Chapter 1

AN ECOLOGICAL INTERPRETATION OF TEACHER AND TEACHING SCHEMAS AS COGNITIVELY CONSTRUCTED BY CANDIDATES IN TRAINING

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ABSTRACT

The present study examined the cognitive journey of teacher candidates as evidenced by their cognitively constructed schemas of the teacher role and the challenges of teaching at two developmental junctures; prior and subsequent to their first education course, which incorporated forty hours of observation/fieldwork.

Notably, both the semantic nature and endurance of teacher and teaching schemas have been sources of debate throughout the teacher development literature.

Findings of the present research, which included multiple, varied, complex, and overlapping cognitive pathways with respect to perceived teaching challenges and teacher portrait characterizations, paved with realism and idealism, respectively, are interpreted via an ecological perspective. Such a perspective denotes a cognitive map of understanding that identifies the developmental origins and foundations of candidates’

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constructed pathways, namely, prior socialization experience and the
dynamics of changing individual and contextual variables in this regard.

The ability of candidates to stay on course, with respect to the
fortitude of their initial teacher and teaching schemas, is also examined in
light of its impact on post-fieldwork schemas and developmental
considerations are also discussed with respect to the overall impact of
such cognitively constructed routes on probable future schemas and/or
behavior in the classroom.

**INTRODUCTION**

The focus of the present research was to examine teacher cognition using
an ecological framework that incorporates both personal and contextual
variables in this regard. More specifically, an ecological systems perspective
(Bronfenbrenner, 2000; 2004; Bronfenbrenner and Morris, 2006) emphasizes
the importance of both the developing individual as well as the changing
environment in which said development takes place.

Although researchers have acknowledged/made note of the complexity of
teacher development (Freese, 2006; Kunzman, 2003-change and add cites
here), its ecological underpinnings, which delineate the dynamics of the
teacher role as it influences and is influenced by the context in which it
develops, have yet to be fully appreciated in the teacher development
literature. This lack of appreciation stems, in part, from unilinear approaches
to teacher development, such as the process-product approach of the 1980’s
whereby researchers attempted to minimize “good/successful” teaching to a
series of decontextualized, concrete behaviors that needed to be mastered by
all candidates in training (Korthagen, 2004; Virta, 2002). From an ecological
standpoint (Bronfenbrenner, 1986), it comes as no revelation, of course, that
such a one-dimensional approach to teaching was inevitably bound for failure.

Teachers themselves attest to the fact that there is no universal, quick fix
method to teaching, much to the shock and disappointment of teaching
candidates in training, whose initial teaching beliefs are quite naïve and
idealistic in this regard (Kagan, 1992). Given the ecology of teaching, namely,
its person specific and context specific nature, which changes as it both acts
and reacts with respect to environmental demands of each specific classroom
and society at large, it comes as no surprise that researchers, to date, have yet
to reach a consensus with respect to what comprises “good teaching” and/or
how to “teach good teaching” (Buchman, 1986; Murphy, Delli, and Edwards,
Albeit the teacher role has expanded, incorporating the context in which it exists, researchers have contended that the ability to chronicle its evolution has been difficult, and have advocated for the need of a theoretical assist (Korthagen, 2004; Schulz and Mandzuk, 2005). Bronfenbrenner’s (2000; 2004) ecological theory represents an inclusive model of support, in this regard, for a number of reasons. First and foremost, it depicts teacher development as a dynamic endeavor that incorporates individual-environmental interacts along a developmental continuum of five unified, interconnected contextual systems. These systems include the role of the teacher in the classroom (microsystem) which impacts and is impacted by how the teacher role is delineated by one’s society and/or culture (macrosystem) as well as how the role of a teacher has changed over time (chronosystem). Further intersystemic teacher role influences include home-school relations (mesosystem) as well as parent-student-teacher relations (exosystem). Secondly, the developmental dynamics of such intrasystemic and intersystemic teacher role influences are further fueled by the specific environmental demands placed upon the teacher by each respective system yielding potential teacher role conflict. For example, subsequent to 9-11 (chronosystemic influence) societal viewpoints (macrosystemic influence) of teaching have become synonymous with student learning and, thus, teachers have been subjected to increased accountability, with their performance being assessed solely by their students’ passing test scores (microsystemic influence) (Cochran Smith, 2003; Virta, 2002). In addition, recent legislation in New York City (October, 2007) has been passed which provides teachers with monetary incentives (macrosystem) if and only if their students show actual significant achievement test gains. All of the aforementioned teacher demands are further compounded by specific classroom (microsystem) demands that include disruptive student behavior, diverse student cognitive abilities and social/emotional needs, little time, and overcrowded classes (macrosystem and microsystem). Given that such demands, in their totality, are at odds with one another, teachers often experience role conflict as they attempt to overcome such challenges all at once, which is quite unrealistic, often resulting in feelings of anxiety, frustration, and helplessness (Byrne, 1999; Lens and DeJesus, 1999; Woods, 1999).

A third reason that demonstrates the value of the ecological model is its ability to address the degree to which a given teacher can handle and ultimately conquer such inter and intra-systemic challenges by emphasizing the importance of prior socialization experiences. These experiences, which, again, include micro, meso, exo, macro, and chronosystemic influences,
incorporate an individual’s prior knowledge and beliefs of teachers and teaching accrued from such experiences. Therefore, the ecological model recognizes differential behavioral responses to environmental demands as an outcome of varied prior socialization history, which may explain why some teachers remain in the profession and others abscond within the first few years of their career. In fact, the alarmingly high degree (60%) of teacher attrition in New York City (Zeichner, 2005) together with the increased need for two million teachers by 2010 (Korthagen, 2004) demonstrates the need to more closely examine these cognitive and/or behavioral differences in an endeavor to support teachers and retain them in the profession.

Although researchers have guided us down several domain specific pathways toward teacher development, such as teacher behavior, and more recently, teacher cognition, what appears to be missing from the teaching literature is a comprehensive ecological map of development (Bronfenbrenner and Morris, 2006) which would identify a variety of alternate routes, due to differences in prior socialization experience, as well as potential interdomain developmental intersections, where routes may meet and/or overlap. One such intersect, for example, involves the teacher cognition-behavior dynamic, as it takes place in the context of the classroom, which has not been adequately addressed in the teacher development literature. This is not surprising given that candidates’ cognitive beliefs, in some respects, represent uncharted territory, since they are not always conscious, and thus not easily articulated (Wideen, Mayer-Smith and Moon, 1998) or mapped out, so to speak. In addition, the high-speed nature of the teaching process itself often hinders one’s capacity to decouple one’s cognitions from one’s actions, as evidenced by reports (Kunzman, 2003; Uhlenbeck et al., 2002) of teacher candidates experiencing great difficulty with respect to explicating the motives underlying their behavior in the classroom.

If one considers, then, the ecology of development (Bronfenbrenner and Morris, 2006) and its various probable intricate routes, due to diverse prior experience, it is to be expected that even among studies that have focused solely on the path of teacher cognition, a consensus has yet to be attained with respect to first, the character and endurance of candidates’ teacher role depictions and second, the nature and developmental timeline of candidates’ perceived teacher challenges, each of which are focal points of interest in the present research. That is, candidates have reported an assortment of teacher portraits, ranging from mother-like child nurturers (Weinstein, 1990) to monotonous robot-like individuals responsible for the mechanical transfer of information (Hollingsworth, 1989), and have debated over the importance of
personality versus pedagogy in this regard (Virta, 2002). Furthermore, the
degree to which such prior beliefs are context resistant to change has yet to be
resolved among researchers (Grossman, 1992; Kagan, 1992; Widen et al.,
1998). Secondly, the actual destination and arrival time, with respect to
perceived teaching challenges among candidates, has also been a source of
storm and stress among researchers. Some researchers (Fuller, 1969; Kagan,
1992) have suggested that concerns emerge in specific designated stages, (e.g.,
survival needs, teaching concerns, and pupil concerns, respectively) while
others have claimed that these challenges arise simultaneously (Calderhead,
1989) or in a context specific manner (Ghaith and Shaaban, 1999).

The aforementioned lack of uniformity across teacher cognition studies
illustrates the necessity of examining cognition in context, using an ecological
framework that maps out and thus acknowledges a variety of possible
developmental paths constructed as a result of individual-contextual interacts.
It follows that the choice and/or ability to continue along any given path or
choose another path, at a particular developmental juncture in time, depends
upon one’s prior experiences, individual needs, and current environmental
conditions. Congruent with such an ecological design, the lack of agreement
over the teacher role is a reflection of varied pathways of prior experience as a
student/learner at the microlevel as well as societal climate of changing
viewpoints of the teacher role at the macrolevel. Teaching challenges are also
countext specific, the environmental conditions of which often vary from one
classroom (microlevel) experience to another, contingent upon other societal
forces, such as the school, and/or district (macrolevel). Candidates are
defenseless in this regard, since field placements can not be forecasted in
advance. In fact, to the contrary, they are quite unpredictable, given that they
are organized by availability and/or convenience and not specific, individual
candidate needs. It follows that candidates often perceive these challenges
very differently, depending upon their prior teaching beliefs, via an
interpretive process that researchers have conceded is rather vague and unclear
and warrants additional study (Uhlenbeck et al., 2002; Wideen et al., 1998).

The importance of charting and understanding the varied nature of
individual-contextual experiential interacts via past socialization, as mapped
out by Brofenbrenner’s (2000) ecological model of development, is further
corroborated by recent claims (Korthagen, 2004) that candidates’ initial
perceptions and predispositions with respect to teaching are influenced by an
unconscious body of wishes, values, images, feelings, role models, and
behavioral tendencies, evoked from previous school related experiences.
Since candidates are said to be unaware of such influences on their teaching beliefs, it appears vital that they be given the opportunity to cognitively reflect on them. It follows that the availability of such an ecological map of experiential understanding would also be beneficial to teacher educators with respect to helping their pupils choose the most optimal/manageable pathways towards development, given their prior beliefs, personal needs, and current environmental conditions, all in an effort to keep them fueled on a steady path to development and avoid getting lost and or stagnating in the process.

The uncertain and individual nature of prior teacher/teaching beliefs united with the context specific nature of environmental demands makes it hard to determine the differential, short and long-term impact that such beliefs may have on candidates’ perceptions of encountered teaching challenges, much less candidates’ subsequent development and/or behavior in the classroom. These developmental dynamics further substantiate the need of identifying candidate beliefs concerning the teacher role and teaching challenges as early as possible, namely, before the inception of any student teaching and/or practicum experience.

Therefore, the aim of the present study was to explore such beliefs among teacher candidates at the onset of their careers, during their first education course, that is, an adolescent development course that included a forty-hour, observation/fieldwork experience. Candidate beliefs were examined in the beginning and at the end of the semester. Ironically, while researchers have advocated the need for early candidate reflection (Flores, 2006; Schulz and Mandzuk, 2005), likening it with teaching (Dinkelman, 2003; Zeichner, 2003), they have conceded that such reflection has not been well charted (Braun and Crumpler, 2004), since teacher education programs, in general, do not adequately assess candidates’ prior beliefs with respect to teachers and teaching (Hammerness, 2003; 2006). One cited reason, in this regard, is that observation and reflection are both developmentally intertwined within the teaching process, often preventing candidates from extricating themselves, including their cognitions, actions, and student interactions, from what they see and, in turn, obstructing their objectivity (Bos, Terwel, Verloop. and Wardekker, 2002; Korthagen, 2004). This developmental barrier was thwarted in the present study, since candidates were passive, third party observers, as opposed to active participants, with respect to their field experiences. That is, participants were only observing teachers in the classroom and not physically or cognitively participating in any part of the teaching process itself.
A key factor of candidate reflection that has not been given due consideration in the teaching literature is the role of the ecology of memory, which includes its origins, development, and subsequent organization. That is, from an ecological standpoint (Bronfenbrenner, 2000), the impact of prior individual-contextual experiential interacts on teacher/teaching beliefs is contingent upon what candidates remember from such past experiences and how they remember such experiences. Memories are said to consist of knowledge structures and beliefs initially constructed from one’s daily interactions in the world which usually take place in the form of some activity or event, such as going to school, and are organized via schemas (Kuhn, 2000; Nelson, 1985; 1996). The term schema, which is common in a variety of cognitive/developmental theories, refers to an organized pattern of thought that includes knowledge and beliefs about a given concept or stimulus, including its attributes and relations among such attributes (Bem, 1981; 1983; Fiske and Taylor, 1991; Piaget, 1952; 1954). Individuals are said to organize their schemas in person specific and context specific ways, based on what is meaningful to them (Nelson, 2007; Schank and Abelson, 1977). It follows that the degree to which subsequent world interacts/experiences and thus schemas will be evaluated as meaningful and thus remembered is dependent upon what is relevant to the individual, given their prior experiences and schemas as well as their personal needs, interests and contextual goals at any given point in time.

Notably, schemas can refer to events, individuals (person schemas), and even social groupings or role schemas, such as a teacher/teaching schema. Event schemas consist of mental scripts that include sets of possible alternative actors, actions, and objects that fulfill the same function on different occasions (Abelson, 1981; Nelson, 1985; Schank and Abelson, 1977). Although event schemas originate in a context specific manner (e.g., first day of school), they become more generalized (e.g., going to school) as individuals engage in subsequent repeated episodes of the same type of event. It follows that individuals’ knowledge and beliefs continue to develop and strengthen as they engage in additional world interacts and their subsequent schemas are integrated into their existing schemas.
Although knowledge has been characterized as the cognitive outcome of thought, based on facts and hard evidence, and beliefs have been characterized as the affective outcome of thought, based on judgment and evaluation (Ernest, 1989; Richardson 1996), researchers have agreed that both constructs are intertwined (For in depth review, see Pajares, 1992). More specifically, knowledge is said to also include a belief component (Nisbett and Ross, 1980) and beliefs are also said to incorporate a cognitive, knowledge component, in addition to an emotional component and a behavioral component (Rokeach, 1968). These dynamics are illustrated in the three innermost circles of Figure 1. The affective and evaluative nature of beliefs, which are thought to be true without the necessity of evidence, make them a filter, through which subsequent knowledge is processed, screened, organized, reshaped, and redefined (Abelson, 1979; Goodman, 1988; Nespor, 1987; Posner, Strike, Hewson, and Gertzog, 1982). Therefore, beliefs play a critical role with respect to understanding the world, memory, and guiding behavior (Bandura 1986; Rokeach, 1968; Tabacknick and Zeichner, 1984).
Consistent with the ecological developmental framework (Bronfenbrenner, 1986; 2000), it is important to note that schemas, which include both knowledge and beliefs, are not isolated representations; they are cognitively constructed in a social, cultural environmental context, which includes, microsystemic, mesosystemic, exosystemic, macrosystemic, and chromosystemic influences. In addition, a schema is personally and meaningfully organized around individual goals, needs, and interests (Schank and Abelson), and is part of a larger overall knowledge base that is said to include the individual’s other world experiences, incorporating memories, schemas, constructs, skills, and cultural and social values and beliefs (Fivush and Slackman, 1986; Nelson, 2007; Woolfolk- Hoy and Murphy, 2001)( Refer to the two outermost circles of Figure I). Therefore, it is the totality of this knowledge structure, which is embedded in the socio-cultural environment in which it is acquired and constructed, that is said to influence human perception (Nelson, 2007; Nisbett and Ross, 1980; Pajares, 1992).

For present study candidate participants, referred to as apprentices of observation (Lortie, 1975; Zeichner and Gore, 1990) that have engaged in years of elementary and secondary school experiences, it was of interest to examine teaching and teacher knowledge and beliefs, accrued from such experiences, i.e. candidates’ teaching and teacher schemas. It was also of interest to ascertain whether or not such schemas would change subsequent to participants’ engagement in a semester of classroom observation fieldwork experience. To put it more succinctly, would candidates’ pre-fieldwork teaching and teacher schemas be consistent with their post-fieldwork schemas? Notably, since candidates were not initially told that they would be asked to reflect upon their teaching and role beliefs for a second time, subsequent to the fieldwork experience, it was important to examine what they remembered and reported from their classroom observation experiences and how they remembered such experiences as well as the role of prior beliefs in this regard. That is, would candidates’ post-fieldwork teaching and teacher schemas incorporate memories from the field that would justify their initial pre-fieldwork schemas? or would candidates report memories of their classroom observations that were not consistent with their pre-fieldwork teaching and teacher schemas?, causing them to question their prior teaching and role beliefs and, as a result, modify their initial schemas.

Even though the fieldwork experience has been accredited as a vital component with respect to candidate development, by both researchers as well as teacher candidates (Zeichner, 1983; 1986), it is unclear how it contributes to the actual process of learning to teach (Doyle, 1997; Johnston 1994). Fieldw-
ork has been acknowledged (Daniels and Shumow, 2003; Hammerness, 2003; Richardson, 1996) as a conduit through which candidates can further develop their reflective thinking skills, becoming more aware of their teacher/teaching beliefs and confronting their beliefs, submitting them to challenge, when they conflict with or contradict what candidates experience in the actual classroom. Teacher cognition studies, in general, have been inconclusive with respect to the endurance of candidates’ prior beliefs (Kagan, 1992; Wideen et al., 1998; Virta, 1992), with research specifically examining the impact of fieldwork also yielding mixed results in this regard (Doyle, 1997; Kane, Sandretto and Heath, 2002; Murphy, Delli, and Edwards, 2004). Notably, much of the latter research stands in contrast to the present study since it has been based on methodologies where participants have played an active role in their field experiences at some level (i.e., student practicum, student teaching, and/or first year teaching). It is also questionable as to whether candidates will be reflecting upon their observed classroom interactions through the eyes of the teachers they are observing or the actual students, being, of course, students themselves.

**METHODS**

Present study participants consisted of forty-four high school teacher candidates, ages 25-45, enrolled in their first graduate education (adolescent development) course, in a New York City School of Education. All participants were apprentices in that they had no prior education courses and no teaching experience.

**Procedure**

Candidate participants were asked to complete an assignment, in a written format, in which they would reflect on two issues; the challenges of teaching in a New York City urban high school and the role of a teacher. This assignment was conducted in the beginning of the semester, before the onset of any education coursework, and at the end of the semester, upon completion of a forty-hour fieldwork/classroom observation experience. Participants were not initially told that they would be requested to reflect upon the same two issues again, subsequent to the fieldwork experience.
Qualitative and quantitative analyses were conducted on all candidate participant responses. Qualitative research procedures were rooted in content analyses of responses and comparison analyses (Bogdan and Bilken, 1992) for emerging patterns. The constant comparative method is anchored in ground theory research processes that give rise to elaborate descriptions, categories, and concepts for theories (Glaser and Strauss, 1967). Conceptual categories surface from the systematic analyses of data and consequently develop into descriptive knowledge used to generate theory and predictive and explanatory knowledge.

Congruent with the constant comparative method, participant responses were read as whole text, with the research questions in mind. Notes were made in the margins and specific information with respect to each question was written on individual index cards (see Merriam, 1998). Data were constantly compared and contrasted to generate categories and triangulated until categories and relationships among them were exhausted and the characteristics pertaining to each question were comprehensively understood. Coding was conducted by the present researcher and by a research assistant in order to check on coding reliability.

In order to establish an individual profile of perceived teaching challenges, quantitative analyses were conducted for each participant’s response to the first research question. This profile was comprised of the total number of reported teaching challenges, the number of category concerns that had emerged, and the number of reported challenges from each respective category of concerns. These individual profiles were subsequently compared across participants. Each reported teaching challenge was recorded, tabulated, cross-tabulated, and compared and contrasted across all participants.

Quantitative and qualitative analyses of responses to the second question were necessary to determine the number and semantic nature/type(s) of teacher role beliefs, for each candidate participant, and to compare individual beliefs across participants. Each teacher role belief was analyzed, recorded, tabulated, cross-tabulated, and compared and contrasted across all participants.

RESULTS

Problems Associated with Teaching

Candidate responses to the initial question posed were in the form of narrative and/or lists succinctly stating the problems they perceived were
associated with teaching. Quantitative and qualitative analyses of responses were conducted to construct individual profiles of teaching concerns, for each participant, as well as an overall profile of perceived teaching problems among all candidates. These profiles were comprised of the number and percentage of reported teaching problems and the semantic nature of problems reported by participants.

Results revealed that each participant described and/or listed anywhere from eight to twenty-four teaching problems, varying in nature. More specifically, content analyses of responses revealed the emergence of three categories, namely, concerns about pupils, survival concerns, and teaching situation concerns. These categories are congruent with the developmental stages of concerns illustrated by researchers (Ghaith and Shaaban, 1999) and initially identified by Fuller and Bown (1975).

**Overall Profile of Reported Teaching Challenges**

Overall results were comprised from individual responses that were tabulated across participants and converted into mean percentages. An overall profile of teacher challenges was comprised of the number and percentage of teaching challenges reported from each category. Mean percentages were calculated by dividing the number of challenges reported from a category by the total number of reported challenges. This overall profile revealed that the majority (68%) of teaching problems reported by candidates entailed pupil concerns. More specifically, candidates reported twice as many concerns about pupils versus survival and teaching situation concerns combined (369 versus 177). Teaching situation concerns, at 14%, were the least frequently reported teaching problem. In fact, pupil concerns outnumbered teaching situation concerns by a margin of more than 4 to 1 (369 versus 79), and outnumbered survival issues, at 18%, by a margin of more than 3 to 1 (369 versus 98).

**Individual Profiles of Reported Teaching Challenges**

Individual profiles of candidate perceived teaching problems were determined via individual analyses of candidate participant responses and consisted of the number and category type(s) of reported teaching problems (See Table I). These profiles were subsequently compared across candidate participants. Results revealed that the majority of overall total candidates
(89%) reported teaching problems from more than one category. More specifically, 73% of total participants reported teaching problems from all three categories of concerns, while 16% of total participants reported problems from at least two categories, namely, 9% reported problems concerning pupils and the teaching situation, 5% reported survival issues and pupil concerns, and 2% reported survival issues and teaching situation concerns.

The remaining 11% of participants reported problems from one category, namely, pupil concerns. Notably, no candidate participant was found to report only survival issues or only teaching situation concerns. Individual profiles also revealed that when candidates did report concerns from more than one category, one of which consisted of pupil concerns, such concerns were never equally balanced. Reported pupil concerns always outnumbered reported teaching situation and/or survival issues.

The majority of problems described by participants were pupil concerns that reflected cognitive, social/emotional, and behavioral developmental domains. Candidates identified and described fourteen such problems. These are illustrated in Table IIa.

Cognitive concerns included varying learning ability levels, motivating students, keeping students interested, enhancing student learning, and making the curriculum relevant and realistic. Social/emotional concerns entailed low parental involvement, establishing a good student-teacher relationship, and helping students with emotional problems. Cognitive/Social issues encompassed meeting students’ social and cognitive needs, student apathy, language/culture barriers, and meeting students’ special needs/disabilities. Behavioral concerns included disruptive classroom behavior and violent students.

Participants identified and described five survival issues and five teaching situation problems. The former included lack of support from colleagues and administration, no respect from society, classroom management, bureaucracy, and low pay. Teaching situation concerns included too little time, overcrowded classes, teaching the standards, teaching effectively, and lack of supplies (Refer to Table IIb).

The Teacher Role

Participant responses to the second question were in the form of lists or short narratives identifying and/or describing what they perceived to be the role of a teacher.
Table I. Emergence of Perceived Teaching Challenges

<table>
<thead>
<tr>
<th>Challenge(s)</th>
<th>Type &amp; # ( ) of Category</th>
<th>% (and #) of Candidates that reported the challenge(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pupil Concerns, Survival Issues, and Teaching Situation Concerns</td>
<td>(3)</td>
<td>73% (32)</td>
</tr>
<tr>
<td>Pupil Concerns and Teaching Situation Concerns</td>
<td>(2)</td>
<td>9% (4)</td>
</tr>
<tr>
<td>Pupil Concerns and Survival Issues</td>
<td>(2)</td>
<td>5% (2)</td>
</tr>
<tr>
<td>Teaching Situation Concerns and Survival Issues</td>
<td>(2)</td>
<td>2% (1)</td>
</tr>
<tr>
<td>Pupil Concerns</td>
<td>(1)</td>
<td>11% (5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100% (44)</strong></td>
</tr>
</tbody>
</table>

Content analyses revealed that participants identified and described 6-17 different roles, addressing cognitive and social/emotional domains of development. Roles were recorded and compared across candidates and are illustrated in Table III, along with the percentage of candidates that reported each role. Notably, 95% of candidates reported that the major role of a teacher was to overcome all teaching problems.

Cognitive teacher roles included that of learning facilitator, motivator, educator, and someone who develops students’ critical thinking skills. Social teacher roles consisted of surrogate parent, mentor, someone who teaches students right from wrong, and someone who helps students with their emotions. Behavioral teacher roles included being a disciplinarian and a behavioral role model.

Qualitative and quantitative analyses determined the number of teacher roles reported from each respective domain (cognitive and social), relative to the total number of reported teacher roles, for each individual participant. Once this proportion was determined for each domain, for each participant, these proportions were then averaged across participants. It was determined that 46% of teacher roles cited by participants were social in nature (S), 41% of reported roles were cognitive (C), and 13% of teacher roles were both social and cognitive (S/C).
### Table IIa. Perceived Teaching Challenges

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Sample Narrative</th>
<th>% of Candidates that reported challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pupil Concerns</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cognitive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varying learning ability levels</td>
<td>it is hard to teach when each student is at a different level-cognitively</td>
<td>95%</td>
</tr>
<tr>
<td>Student motivation</td>
<td>you need to motivate kids so they want to be in your class &amp; participate</td>
<td>95%</td>
</tr>
<tr>
<td>Keeping students interested</td>
<td>you need to keep the kids interested all the time-so they don’t disengage</td>
<td>82%</td>
</tr>
<tr>
<td>Enhancing student learning</td>
<td>one challenge is making learning</td>
<td>55%</td>
</tr>
<tr>
<td>Making curriculum relevant &amp; realistic</td>
<td>one problem is making what you teach realistic- it has to make sense to them</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Social/Emotional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low parental involvement</td>
<td>one of hardest challenges is making parents part of the learning process</td>
<td>91%</td>
</tr>
<tr>
<td><strong>Pupil Concerns</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishing a good</td>
<td>it is hard to socially connect with your students</td>
<td>64%</td>
</tr>
<tr>
<td>student-teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helping students with emotional</td>
<td>dealing with all the emotional stress of teens is problematic</td>
<td>27%</td>
</tr>
<tr>
<td>problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cognitive/Social</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting kids’ cognitive and social needs</td>
<td>it is hard because you need to reach kids on a cognitive &amp; emotional level</td>
<td>95%</td>
</tr>
<tr>
<td>Student apathy</td>
<td>the apathy is hard to break through</td>
<td>45%</td>
</tr>
<tr>
<td>Language/culture barriers</td>
<td>ESL kids are really challenging</td>
<td>43%</td>
</tr>
<tr>
<td>Meeting students’ special needs &amp; disabilities</td>
<td>it’s hard when each kid has his/her own special needs</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Behavioral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disruptive behavior</td>
<td>behavior issues can overpower learning</td>
<td>66%</td>
</tr>
<tr>
<td>Violent students</td>
<td>violent kids can make teaching</td>
<td>25%</td>
</tr>
</tbody>
</table>
Table IIb. Perceived Teaching Challenges

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Sample Narrative</th>
<th>% of Candidates that reported challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survival Issues</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of support from peers and administration</td>
<td>teaching is really challenging—especially without the support of your peers</td>
<td>73%</td>
</tr>
<tr>
<td>No respect from society</td>
<td>teaching is hard enough—lack of respect from society makes it worse</td>
<td>68%</td>
</tr>
<tr>
<td>Bureaucracy</td>
<td>all the politics of bureaucracy is ridiculous</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Classroom Management</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlling/Managing class</td>
<td>controlling/managing class is quite challenging</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Low pay</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a big challenge is the ridiculously low wages</td>
<td>23%</td>
</tr>
<tr>
<td><strong>Teaching Situation Concerns</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too little time</td>
<td>well there is never enough hours in a day—much less minutes in a period</td>
<td>50%</td>
</tr>
<tr>
<td>Overcrowded classes</td>
<td>class sizes are out of control— and a health hazard</td>
<td>43%</td>
</tr>
<tr>
<td>Teaching the standards</td>
<td>teaching to those standards is hectic</td>
<td>36%</td>
</tr>
<tr>
<td>Teaching effectively</td>
<td>you need to be effective when you teach</td>
<td>27%</td>
</tr>
<tr>
<td>Lack of supplies</td>
<td>not having basic supplies, like paper, is a problem</td>
<td>23%</td>
</tr>
</tbody>
</table>

Comparative analyses of participant responses to both questions revealed a dynamic relationship that entailed parallels between challenges of teaching and the teacher role. These are listed in Table IV. For example, from a cognitive standpoint, motivation, interest, and student learning were seen as both elements that constituted the role of a teacher as well as key challenges of the teaching process. From a social vantage point, while participants identified low parental involvement and student emotional problems as challenges of teaching, they also characterized teachers as surrogate parents and individuals that had to help students with emotional issues. Furthermore disruptive behavior, a reported teacher challenge, was also perceived as the role of a teacher, i.e., to be a behavior role model and disciplinarian.
An Ecological Interpretation of Teacher and Teaching Schemas…

Table III. Teacher Candidate Perceptions of the Teacher Role

<table>
<thead>
<tr>
<th>Perceived teacher role</th>
<th>% of candidates that reported role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overcome all teaching problems</td>
<td>95</td>
</tr>
<tr>
<td>Cognitive:</td>
<td></td>
</tr>
<tr>
<td>Learning Facilitator</td>
<td>91</td>
</tr>
<tr>
<td>Motivator</td>
<td>89</td>
</tr>
<tr>
<td>Being Interesting</td>
<td>82</td>
</tr>
<tr>
<td>Develop students’ critical thinking skills</td>
<td>82</td>
</tr>
<tr>
<td>Educator</td>
<td>80</td>
</tr>
<tr>
<td>Teach real-world transfer of knowledge</td>
<td>77</td>
</tr>
<tr>
<td>Social/Emotional</td>
<td></td>
</tr>
<tr>
<td>Surrogate parent</td>
<td>91</td>
</tr>
<tr>
<td>Teach right versus wrong</td>
<td>82</td>
</tr>
<tr>
<td>Helping students with emotions</td>
<td>75</td>
</tr>
<tr>
<td>Build a safe/trusting environment</td>
<td>68</td>
</tr>
<tr>
<td>Mentor</td>
<td>68</td>
</tr>
<tr>
<td>Establish good teacher-student relationship</td>
<td>41</td>
</tr>
<tr>
<td>Cognitive/Social</td>
<td></td>
</tr>
<tr>
<td>Develop students’ cognitive &amp; social skills</td>
<td>91</td>
</tr>
<tr>
<td>Cater to students’ cognitive &amp; social needs</td>
<td>89</td>
</tr>
<tr>
<td>Social/Behavioral</td>
<td></td>
</tr>
<tr>
<td>Behavioral role model</td>
<td>89</td>
</tr>
<tr>
<td>Disciplinarian</td>
<td>25%</td>
</tr>
</tbody>
</table>

Pre-Fieldwork versus Post-Fieldwork Responses

Candidate perceptions of teaching problems and the teacher role remained consistent, in terms of number and semantic type, upon completion of their fieldwork.
**Table IV. Teaching Challenges and Analogous Teacher Roles as cognitively constructed by teacher candidates**

<table>
<thead>
<tr>
<th>Teaching Challenge</th>
<th>Teacher Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social/Emotional</strong></td>
<td><strong>Social/Emotional</strong></td>
</tr>
<tr>
<td>Low parental involvement</td>
<td>Establish good student-teacher relationship</td>
</tr>
<tr>
<td>Help students with their emotional problems</td>
<td>Surrogate Parent Establish good student-teacher relationship</td>
</tr>
<tr>
<td>Help students with their emotions</td>
<td></td>
</tr>
<tr>
<td><strong>Cognitive</strong></td>
<td><strong>Cognitive</strong></td>
</tr>
<tr>
<td>Student Motivation</td>
<td>Keeping kids interested</td>
</tr>
<tr>
<td>Enhancing student learning</td>
<td></td>
</tr>
<tr>
<td>Making curriculum relevant &amp; realistic</td>
<td>Motivator Being interesting</td>
</tr>
<tr>
<td></td>
<td>Learning facilitator Teach</td>
</tr>
<tr>
<td></td>
<td>real-world transf of knowledge</td>
</tr>
<tr>
<td><strong>Cognitive/Social</strong></td>
<td><strong>Cognitive/Social</strong></td>
</tr>
<tr>
<td>Meeting kids’ cognitive &amp; social needs</td>
<td>Cater to kids’ cognitive &amp; social needs</td>
</tr>
<tr>
<td><strong>Social/Behavioral</strong></td>
<td><strong>Social/Behavioral</strong></td>
</tr>
<tr>
<td>Disruptive behavior</td>
<td>Behavior role model &amp; disciplinarian</td>
</tr>
</tbody>
</table>

However, participants’ post-fieldwork responses did include additional knowledge constructs with respect to teaching challenges and the teacher role. More specifically, all participants stated that pupil concerns were dynamic, changing daily, and were based upon the physical, cognitive, and social classroom environment created by the teacher. In addition, candidate responses also indicated that the teacher role was an evolving process, whereby teachers reflected on their methods and adapted to individual student needs to help promote their self-esteem.

**DISCUSSION**

**An Ecological Understanding of Perceived Teacher Challenges and the Teacher Role**

The cognitive pathway set forth by candidate participant perceptions of teaching challenges and the teacher role was found to digress, in terms of scope and trajectory, from what has been reported in the literature thus far on
these issues, illustrating the inadequacy/ineffectiveness of narrow, one-way, unidimensional, and unilinear approaches to teacher development. The first digression, with respect to reported teaching challenges, stems from both the semantic nature and timeline of concerns. That is, the simultaneous emergence of teaching situation, survival, and pupil concerns, among present study candidate participants, with a key emphasis on the latter, is at odds with reports that such concerns develop time apart (Kagan, 1992), and more specifically, that primary, pre-teaching concerns are either focused on the teaching situation (Moore, 2003) or actual survival matters (Fuller, 1969; Fuller and Bown, 1975). Some researchers (Lundeen, 2004; Watske, 2003), in fact, have even gone so far to proclaim that candidates’ early spotlight on classroom management eclipses any concerns linked to the actual instruction and/or nurturing of pupils. Notably, in the present study, no participant reported only teaching situation concerns or survival issues. Quite the contrary, the majority of reported concerns were detailed issues pertaining to meeting the cognitive and emotional needs of pupils (Refer to Table IIa). These included helping students with emotional problems, varying cognitive ability and learning levels, student apathy, low parental involvement, student motivation and/or disinterest, addressing student disabilities and special needs, language barriers, and fostering strong student-teacher relationships. In fact, if one were to use the stage theory of candidate concerns as a guide to understanding present study findings, one would, in effect be lost, since the pathway paved by student needs has not yet been constructed, due to the fact that it is said to develop during the second or third year of teaching, once candidates have progressed through two earlier stages (Fuller, 1969). These stages have been identified as either concerns over classroom control and concern over the enhancement of teaching skills, respectively (Burden, 1981; Carter, 1990; Kagan, 1992) or concern for self-survival in the classroom and concern over the teaching situation, respectively, (Fuller and Bown, 1975). Stage progression is not a given in that it is contingent upon the successful resolution of perceived concerns, which are said to arise in context, via one’s daily teaching experiences, at each respective stage (Fuller, 1969; Ghaith and Shaaban, 1999).

Notably, since present study candidate participants have not yet traveled down the road of actual teaching, it is not surprising that the nature and developmental ontology of their concerns did not mirror the aforementioned stage template of development, demonstrating the need for guidance via an ecological systems framework that acknowledges diverse developmental pathways, due to variability in prior socialization experience. This is further
Calliope Haritos

substantiated by the present research finding that the number of and type(s) of participant concerns remained consistent, subsequent to their field experience, where they were able to witness the actual classroom context where teaching takes place. It is more plausible that the simultaneous emergence of concerns from all three aforementioned stages, with a particular emphasis on addressing pupil needs, among candidate participants, is an ecological-developmental reflection of their own prior experiences as students, a factor which will be discussed in more detail later. It appears evident that participants were not merely driving down the self-survival lane of being a prospective teacher but rather were more focused on a chartered course of pupil concerns, which included physical, cognitive, and social/emotional pathways of student needs.

A second digression from the current teaching literature, with respect to candidate perceptions of the teacher role, entailed a more intricate, multidimensional teacher portrait, illustrating the dynamics among micro, meso, exo, and macrosystemic influences, depicted in the ecological systems model (Bronfenbrenner, 2000), in this regard. Such a portrait supersedes the existing, simplistic, dichotomous portrait of teaching as either a cognitive act of knowledge transfer or a social/emotional practice of nurturing students (Doyle, 1997; Weinstein, 1989; 1990) and also stands in contrast to claims that candidates’ initial teacher role characterizations are exclusively based on personality and void of pedagogy and the promotion of student learning (Virta, 2002).

Candidates in the present study depicted teachers in a variety of roles (Refer to Table III) that facilitated students’ cognitive, social/emotional, moral, and behavioral development both in and beyond the classroom. That is, the teacher role was not limited to that of classroom (microsystem) educator but incorporated such tasks as teaching students right from wrong, helping students with emotional problems, social skills, and behavior problems and even being a surrogate parent, all of which illustrate the importance of mesosystemic (school-home relations) and exosystemic (parent-student relations) influences. In fact, ninety-five percent of participants reported that the role of a teacher was to overcome all the problems of teaching. Notably, these problems were not restricted to the promotion of student learning but also incorporated such pupil concerns as low parental involvement and student apathy (e.g., influence of mesosystem and exosystem, respectively), as well as survival issues, such as bureaucracy, and lack of societal and administrative support (macrosystem) and teaching situation problems, including lack of time, lack of supplies, teaching the standards, and overcrowded classes, (e.g., impact of society/macrosystem).
The Ecology of Prior Experience

From an ecological standpoint (Bronfenbrenner and Morris, 2006) the aforementioned digressions are not an anomaly but rather are normative in that they are illustrative of the variable, complex, and multidimensional nature of development due to variance in prior individual-environmental experiential interacts. Such complexity was further evidenced by the apparent mixture of both realism and idealism in present study participants’ cognitive perceptions of teaching and the teacher role. In fact, candidate responses revealed a paradox in that while their overall perceptions of teaching challenges were quite realistic, incorporating classroom (microlevel) and societal (macrolevel) constraints, their role beliefs were somewhat unrealistic, proclaiming that the major teacher role was to overcome all encountered teaching challenges, in addition to being able to fulfill all other stated teacher roles. (This is illustrated in the two innermost circles of Figure 2).

In some cases, candidate perceptions of the teacher role were parallel to that of their perceived teaching concerns, as earlier noted (See Table IV). Consistent with a systems perspective, since participants had no prior teaching experience it is feasible that their teaching and teacher role beliefs arose from their prior classroom experiences as students. In fact, qualitative analyses revealed that 86% of participant responses were found to make some reference to prior classroom experiences with teachers.

![Figure 2. The Ecology of Perceptions of Teaching Challenges and the Teacher Role.](image-url)
It follows that these microlevel-systemic experiences influence and are influenced by other contextual systems, including familial and societal viewpoints towards teaching and teachers. The latter include both small scale cultural influences, such as society in general, the media, and/or the department of education (macro-system) as well as large scale historic events (chronosystem) that can subsequently impact viewpoints towards teaching on a grander scheme, such as the tragedy of 9/11 in New York City (See Figure 2). Notably, in the present study, 82% of participant responses indicated societal/contextual influences in this regard. This is also consistent with the teacher education literature, where candidates have been reported to reveal detailed memories of their past teachers and even of the media, which are said to help develop their initial teaching/teacher beliefs and serve as templates for future teaching practice (Goodman, 1988; Nespor, 1987). Consider the following candidate excerpts of teacher role perceptions:

Teachers don’t just dish out knowledge to students, they have to handle a boat-load of problems- like rowdy students, overcrowded classes (microsystem and macrosystem influences) and parents who don’t care (meso and/or exosystem influence)- I remember this one great teacher I had who would actually call all the parents who missed parent-teacher conferences (prior classroom/microsystem experience).

Teachers are like surrogate parents-since most of their students come from broken homes (mesosystem influence). My parents got divorced when I was little and I remember this one teacher was like a dad to me (prior microsystem experience).

Teachers need to do more these days than just teach kids and help them learn. They have to make kids feel safe in the classroom- lord knows some kids don’t even feel safe in their own neighborhoods (mesosystem influence). Safety was never an issue for me at my school when I was growing up (prior classroom experience).

The Ecology of Experiential Memory; The Role of Schemas

The role of memory and the interpretive role of schemas were evidenced in the present study through participants’ pre-fieldwork and post-fieldwork responses. For example, the fact that participants evoked their past teacher/teaching memory schemes and incorporated contextual influences, without
being specifically instructed to do so, to justify and/or elaborate on their present, pre-fieldwork teaching and teacher role schemas is indicative of the ecological model (Bronfenbrenner, 2000) and schema dynamics in this regard. That is, consistent with ecological theory, such behavior was not surprising given that an individual’s schemas are constructed from and thus under the influence of a larger knowledge base that includes prior experiences and memory schemes, all of which are impacted by micro, meso, exo, and chrono systemic, environmental forces. The dynamics of memory scheme dynamics were also especially apparent in post-fieldwork responses, where candidates cited examples from their classroom observations to validate their teacher schemas. Given the fact that candidates were not initially told that they would be asked to reflect on their teacher/teaching schemes for a second time, subsequent to the completion of their fieldwork experience, from a memory standpoint, the justification of initial, pre-fieldwork teaching and teacher schemas, by participants, entailed both the capacity to remember such schemas as well as the ability to remember classroom observation experiences that were consistent with initial schemas. The majority (75%) of participants successfully incorporated remembered knowledge accrued from their classroom observation experiences to justify their subsequent post-fieldwork teaching and teacher schemas, which, notably, were consistent with their initial pre-fieldwork schemas as illustrated in the following narrative:

My fieldwork observations just reaffirmed by beliefs about teachers.. as I said earlier teachers have to motivate their kids, keep them interested, and make the material relevant.... in one class I saw the teacher was using the same dull monotone for the entire class and kept reading Shakespeare from the original text, without explaining anything...I was just as bored as the students..in fact some of them even fell asleep..

Well, I still believe teachers need to achieve a balance between being disciplinarians and nurturers. They have to let kids know what the rules are and why they exist, so they can show them they actually care about them. None of the teachers I saw could do this...there were some who wanted to be their students’ friends… but that did not work.. the kids took advantage of them… and then there were the really strict ones- they yelled a lot and punished a lot .. but the kids never listened and sometimes yelled back ..you could tell they did not have any respect for the teacher.. no learning.. but a lot of yelling and punishing.
Although the overall consistency of pre-fieldwork and post-fieldwork teaching/teacher schemas revealed in the present study is supported by the teacher development literature, the cognitive impetus of such stability has not been adequately addressed. Notably, it has been reported that candidates still consider fieldwork as the most important part of their teacher education (Zeichner, 1983), even though the fieldwork experience has not been found to significantly change candidates’ preexisting teacher/teaching beliefs subsequent to an introduction to an education course (Bird, Anderson, Sullivan, and Swidler, 1992; Tizzi and Cross 1997; Virta, 2002), subsequent to an upper levels methods course, where candidates engaged in teaching twice a week (Doyle, 1997), and even upon completion of student teaching (Brookhart and Freeman, 1992; McDiarmid, 1990; Tabacknick et al., 1984), making it unclear what role fieldwork actually plays with respect to teacher development (Doyle, 1997; Johnston, 1994). Given the fact that fieldwork is an essential component of candidates’ educational and experiential careers, as evidenced by the significant increase (e.g., 100 hours) in the number of pre-student teaching fieldwork experience hours in New York City, for example, it appears vital to examine the potential cognitive reasons underlying the aforementioned null effect of the fieldwork experience on candidates’ prior teacher/teaching beliefs.

In the present research, the cognitive behavior exhibited by participants with respect to the fieldwork experience, namely, remembering and citing evidence from their classroom observations to justify and not question or modify their initial teaching and role schemas, is best explained/understood under the umbrella of memory and schema ecology, the latter of which includes schema origins, organization, and development. As earlier discussed, schemas are the building blocks of memory experiences, organized in person specific and context specific ways. According to cognitive psychologists, schemas help individuals understand and make sense of their world, and, therefore, serve as vital, comprehensive vehicles, with respect to understanding human perception and memory (See Brewer and Nakamura 1984; Fiske and Taylor, 1991, for reviews). More specifically, numerous research studies have shown that schemas aid individuals in encoding, processing, organizing, and recalling information (Brewer and Nakamura; Nelson, 2007; Taylor and Crocker, 1981). For instance, when individuals, encounter a familiar situation, such as the school classroom experience, for present study participants, a prior germane (e.g., teaching/teacher) schema is activated and serves as a guide for making suppositions about what is happening during the situation, what will happen next, and what the appropriate actions of those
involved, such as observed teachers, should entail. It follows that if such an event is subsequently not well remembered by an individual, his/her prior relevant schema may serve as a guide to fill in the gaps, and, thus, facilitate memory. Well developed schemas, such as those constructed from early childhood experiences, are more resistant to change and therefore have much more interpretive and guiding power than newer, poorly developed schemas (Chinn and Brewer, 1993; Crocker, Fiske, and Taylor, 1984; Chaiken and Yates, 1985). Consistent with such claims, it stands to reason that present study participants’ prior, initial teaching and teacher schemas, said to develop from early childhood and a lifetime apprenticeship of classroom observations (Lortie, 1975), would not change subsequent to the fieldwork experience and further, that initial schemas would guide participants through their classroom observations and help them remember knowledge from such experiences that validated and reinforced their initial teaching and teacher schemas.

The Ecology of Memory Scheme Dynamics; Seeing is Believing and Believing is Seeing

Continuing with memory and schema ecology, an important consideration with respect to the interpretive power of schemas stems from its constituents, namely knowledge and beliefs, and their existing and ongoing developmental interdynamics, discussed earlier (Nisbett and Ross, 1980; Pajares, 1992; Rokeach, 1968) (Refer to Figure 1). The nature of these dynamics was put to the test in the present research in that participants were asked to re-reflect upon their initial teacher/teaching knowledge and beliefs, i.e., schemas, subsequent to their fieldwork experience. It was of particular interest to examine the extent to which knowledge encompassed belief and could influence belief, and/or the extent to which belief encompassed and influenced knowledge, begging the question was seeing believing or was believing seeing?, respectively, and further, how such relations would impact memory?

Memory aside, much of the teacher development literature has often treated the two options of the initial aforementioned question as mutually exclusive, often stressing the latter, namely, that believing is seeing. Although it is not surprising that research emphasis has been placed on the dominant status of beliefs, given the claims that have been made with respect to beliefs, it is important to note that these claims are also characteristic of schema development, which is to be expected since the latter envelops the former. For example, candidates’ teacher/teaching beliefs are said to be acquired via
lifelong prior classroom experiences (Abelson, 1979; Nisbett and Ross, 1980); the earlier the acquisition, the more central and/or well developed the belief, relative to subsequently acquired beliefs, and the more resistant the belief is to change (Posner, et al., 1982; Rokeach, 1968). This is also true of schema development. Likewise, beliefs are said to play a critical role in processing, organizing, and retrieving knowledge and information (Abelson, 1979; Bandura, 1986; Nespor, 1987), comparable to the interpretive role of schemas, and further, can strongly influence and even distort subsequent thinking and information processing by allowing in knowledge that is compatible with existing beliefs and filtering out knowledge that is incompatible (Abelson, 1979; Nespor, 1987; Nisbett and Ross, 1980; Rokeach, 1968). Notably, an over-reliance on a particular schema has also been reported to result in false or distorted memories (Bower et al., 1979; Schank and Abelson, 1977; Nakamura, Graesser, Zimmerman, and Rhea, 1985). Therefore, it would be negligent to suggest that the interpretive power of a schema derives itself solely from beliefs since schemas represent the interdynamics between both knowledge and beliefs (See Figure 1).

In fact, results of the present research suggest that both options, i.e., seeing is believing and believing is seeing, are probable, illustrating an interdependence between these two constructs that is further contingent upon memory ecology and a variety of individual and contextual variables, as delineated in Bronfenbrenner’s (2000) model (Refer to Figure 1). More specifically, one factor that must be considered with respect to the above mentioned question, in the present study, is the accuracy of participants’ memories. That is, to the extent that candidates remembered and cited truthful knowledge from their field observation experiences to justify their initial schemas, seeing was believing, since what candidates saw in the classroom verified their prior beliefs and, as a result, reinforced their original teacher/teaching schemas. However, to the extent that candidates’ initial schemas distorted information processing and/or memory by disregarding knowledge that was inconsistent with their initial beliefs, believing was seeing, in that candidate beliefs led them to see what they wanted to see, namely, evidence from classroom observations that was consistent with and corroborated their prior teacher/teaching schemes. Notably, since participants were reflecting upon their schemas and classroom observation experiences from memory and were not asked to submit any fieldwork notes, it is uncertain as to whether or not their reported memories were true, complete, and/or intact, in this regard. It follows that the complexity of such cognitive behavior is further magnified by the fact that a schema is personally and meaningfully organized via
individual goals, needs, and interests and is part of a larger knowledge base of experiences, memories, schemas, values, and beliefs (Nelson, 2007; Woolfolk-Hoy and Murphy, 2001) that is constructed and/or acquired within one’s social-cultural environment, which is comprised of chrono, macro, exo, meso, and microsystemic influences (Bronfenbrenner, 2000). It follows that consideration must be given to the totality of such a intricate knowledge structure, in context, with respect to its potential impact on perception, information processing, and memory (Fivush and Slackman, 1986; Nelson, 2007; Nisbett and Ross, 1980; Pajares, 1992).

**Post-Fieldwork Teacher/Teaching Schemes**

The fact that candidates’ overall teacher and teaching schemas were found to remain stable, subsequent to the fieldwork experience, from a belief standpoint, but did advance and grow, somewhat, from a knowledge standpoint, illustrates the importance of contemplating both knowledge and beliefs, when assessing schemas. More specifically, while candidate responses pertaining to teaching problems and teacher role beliefs remained consistent, in terms of number and semantic type, post-fieldwork perceptions did include additional knowledge constructs that revealed a dynamic relationship between teachers and teaching that was consistent with several key tenets of ecological systems theory (Bronfenbrenner, 2000), which, in fact, was taught to participants in their adolescent development course. Although candidates maintained their idealized belief that the main role of a teacher was to overcome all the challenges associated with teaching, these challenges and the teacher role were subsequently characterized as more dynamic, non-static, constructs. For example, pupil concerns were depicted as continuously evolving and developing in accordance with the classroom environment created by the teacher and the teacher role was delineated as a reflexive, adaptive, and evolving process, contingent upon the daily physical, cognitive, and social needs of one’s students.

These findings mirror three main constructs of the ecological model, namely, that development is a product of both the developing individual, i.e., the teacher, as well as the changing environment (e.g., the classroom) in which said development takes place, that development is further impacted by reciprocal, bi-directional relationships that exist within each system, which in this instance would be the teacher-student relationship as it develops in the context of the classroom or microsystem, and third, that individuals both
influence and are influenced by their environment, i.e., individuals are producers and products of their environment. Therefore, teachers play an active role in constructing their classroom environment, catering to student needs, and, in turn, the teacher role develops and evolves through the daily demands of the classroom (microsystem), the latter of which includes pupil needs/concerns.

Such findings are also consistent with researcher claims that individuals’ knowledge evolves as new experiences, which for present study participants included both their fieldwork and adolescent development coursework, are interpreted and integrated into existing schemas (Nisbett and Ross, 1980).

The Ecology of Cognitive Conflict

An important consideration with respect to schema dynamics and development, which incorporates the integration of new schemas into existing schemas, is the fact that it is ecologically embedded within a complex, ongoing socialization matrix, fueled by changing personal and contextual variables, as illustrated in Bronfenbrenner’s (2000) theory, resulting in potential cognitive conflict. Developmental theories vary with respect to their ability to address the parameters of such conflict, with some theories, such as Piaget’s (1954), focusing on its inevitable, universal cognitive nature, and others, such as Bronfenbrenner’s, maintaining its individual, i.e., person and context specific, nature. For Piaget (1952), the biological, inevitability of cognitive conflict stems from its role as the driving force behind the innate developmental process of adaptation. More specifically, new environmental interact experiences and the knowledge accrued from such experiences serve to disrupt individuals’ existing organized schemas (e.g., patterns of thinking) creating cognitive conflict/dissonance, which, in turn, yields subsequent schema reorganization and modification, i.e., accommodation, and ultimately results in a new schema that is more developmentally advanced than its incumbent. Notably, while some dissonance is necessary for the subsequent advancement of cognitive functions (Watske, 2003), excessive cognitive conflict, which may occur when new experiential knowledge diverges significantly from prior experiential knowledge, may deter development, due to the inhibition of the adaptation process and thus the inability to readily assimilate new experiential knowledge into existing cognitive schemes (Piaget, 1952; 1954). Piaget’s emphasis on cognitive universals, however, fails to adequately address individual variability with respect to the actual degree of
cognitive conflict experienced, which for Bronfenbrenner (2000) is dependent upon both the developing individual as well as the environment. That is, in accordance with a systems perspective (Bronfenbrenner and Morris, 2006), the inevitability of conflict, its severity, and its developmental outcome is contingent upon the specific individual’s physical, cognitive, social, and behavioral profile, i.e., prior socialization history, as well as the specific environment in which the development of the individual is taking place at any given point in time.

For Bronfenbrenner, the ecological parameters of cognitive conflict/dissonance are delineated as products of intrasystemic and intersystemic breakdowns, that is, breakdowns within and between environmental systems (e.g., micro, meso, exo, macro, and chrono). The cognitive impetus of such breakdowns stems from incongruities among and/or between individual and contextual variables. For example, one such incongruity entails the lack of compatibility between an individual’s personal beliefs and goals and environmental demands placed upon that individual. Teaching candidates are especially vulnerable in this regard since they have no control over the classroom environment(s) in which they are placed, given that field placements are often based on convenience and/or availability and not individual candidate needs or preferences. In fact, it has been reported throughout the teacher development literature (Byrne, 1999; Hammerness, 2003; Veenman, 1984; Wideen et al., 1998) that too much conflict at a given point in time, due to a lack of fit between a given candidate’s needs, goals, desires, and beliefs and contextual demands placed on that candidate, has resulted in negative developmental consequences such as ambivalence, guilt, diminished spirit, shock, frustration, alienation, and low self-esteem. Incongruities across systems may also produce cognitive conflict, such as when the department of education (macrosystem) postulates that passing student test scores are the responsibility of the teacher alone, whereas classroom (microsystem) constraints, such as overcrowded classes, disruptive students, and lack of parental and administrative support (impact of mesosystem and exosystem) in this regard, make such a task virtually impossible.

If one considers the aforesaid discussion of cognitive conflict, it is not surprising that present study participants’ initial cognitive schemes, pertaining to teaching challenges and the teacher role, remained constant subsequent to the completion of their fieldwork experience, and further, that participants used knowledge accrued from classroom observations, to justify and reinforce their prior schemas and not challenge or modify them. That is, consistent with Piaget’s (1952) theory, it is conceivable, although not certain given the earlier
discussed methodological limitations of findings, that candidates may have blocked out any new experiential knowledge that deviated significantly from their prior experiential knowledge because it could not be readily assimilated into their existing schemas. As a result of such a cognitive impetus, participants sought to maintain their prior teaching and teacher schemas, perhaps in an effort to consciously or unconsciously avoid excessive cognitive conflict, using them as a an interpretive guide through which subsequent classroom observations were perceived and remembered. Notably, such cognitive behavior corroborates researcher (Abelson, 1979; Bower et al., 1979; Brewer and Nakamara, 1984; Chinn and Brewer, 1993; Nakamara et al., 1985; Nelson, 2007; Nespor, 1987) claims of the existence of such an interpretive process and is consistent with the notion that individuals’ initial teaching perceptions are strongly influenced and maintained by an unconscious Gestalt of images, feelings, needs, and values linked to past school-related experiences (Korthagen, 2004). Furthermore, such behavior is also consistent with reports of the endurance and resistant to change nature of candidates’ initial schemas, comprised of teaching beliefs, (Hollingsworth, 1989; Kagan, 1992; Lortie, 1975; Pajares, 1992; Weinstein, 1990) and illustrates the importance of the ecological systems perspective emphasis on the role of past socialization history, in this regard (Bronfenbrenner, 2000).

It is of noted interest that the aforementioned behavior also reinforces earlier discussions on the importance of schema ecology, namely, that a comprehensive understanding of the role of any given schema, with respect to its potential impact on perception, information processing, and memory, necessitates consideration of the larger social, cultural, and cognitive context from which it is derived. More specifically, schemas, which are comprised of dynamic knowledge-belief interrelations, do not exist, nor are they constructed in isolation (Fivush and Slackman, 1986). They are personally and meaningfully organized around individual’s needs, goals, and interests (Abelson, 1979; Nelson, 2007) and are components of a larger network of knowledge that incorporates prior experiences, memories, schemas, and cultural values and beliefs (Murphy et al, 2004; Woolfolk-Hoy and Murphy, 2001) that have been acquired and/or constructed from an individual’s social-cultural environment, comprised of chrono, macro, exo, meso, and microsy-stemic influences (Bronfenbrenner, 2000) (Refer to figure 1). It follows that the dynamics of such an ecological-developmental, matrix or lens of experience continues to grow and evolve, as individuals engage in subsequent experiential world interacts, along with the developing individual and the changing environment in which she/he is socialized.
Developmental and Educational Considerations

Albeit the cognitive journey embarked upon by present study participants is in its early stages of deliberation, findings do indicate some noteworthy developmental implications. For example, to the extent that candidates continue along the same cognitive path, fueled by consistent prior teaching and teacher role beliefs, as reported in the teaching development literature (Bandura, 1986; Kagan, 1992; Lortie, 1975; Nespor, 1987; Posner et al., 1982; Weinstein, 1990), and given their lack of control over subsequently encountered obstacles or demands associated with cooperating teachers/fieldwork, it is feasible that they may experience a cognitive and developmental impasse, due to a lack of fit between their own personal teaching goals and beliefs and perceived classroom constraints. This, in fact, has been noted in studies linking idealistic candidate beliefs to subsequent classroom reality shock and disillusionment (Byrne, 1999; Hammerness, 2003; Virta, 2002). It follows that such a individual-contextual mismatch or gridlock can place candidates at risk for such stressors as work overload, lack of control and helplessness in the classroom, and role conflict (i.e. having to cater to individual student needs in an oversized classroom), all of which can influence candidates’ social and emotional development negatively, via stress, doubt, guilt, anxiety, exhaustion, and reduced personal accomplishment (Byrne, 1999; Hammerness, 2003; 2006). These developmental outcomes are further corroborated by models of teacher burnout (Lens and DeJesus, 1999) that have equated the simultaneous emergence of teaching concerns among candidates, exhibited by present study participants, with the aforementioned stressors, which, in turn, may ultimately cause candidates to leave the teaching profession.

On a positive note, it appears that candidates did cognitively construct some cognitive inroads with respect to knowledge expansion of their initial teacher/teaching schemas, as evidenced by their post-fieldwork characterizations of the teacher role and challenges such as pupil concerns as evolving constructs as well as their awareness of the dynamics between teachers and teaching, however it is unclear whether such a disruption or detour in initial thinking will be successfully integrated into more complex future cognitive schema pathways, including behavior exhibited in the classroom. Any future developmental outcome, in this regard, will be contingent upon both the strength of candidates’ existing teacher/teaching schema pathway(s) and the nature of obstacles encountered in future coursework and accompanying fieldwork/classroom experiences.
For example, in the present study the interpretive power or driving force of participants’ initial teaching schemas maintained its original overall course, as evidenced by its resistance to change and its post fieldwork justification, and may have been further fueled by participants’ conscious/unconscious need to avoid cognitive conflict or obstacles.

Although the degree to which such interpretive power yielded distorted and or incomplete memories, as earlier discussed, is uncertain due to method limitations, it is probable that the strength of candidates’ initial schemas overpowered the potential of any significant modification of prior beliefs. It is also possible that the field experience itself was not entirely conducive to schema modification. That is, while the observation of the teaching process may have expanded candidates’ knowledge base, with respect to the changing nature of teaching concerns and the teacher role, it may not have compelled candidates to accommodate and adapt their initial, idealistic teacher schemas to the realities of the classroom, since they were not actually teaching or in the actual driving seat, so to speak, and did not have any classroom obstacles to face, i.e., demands placed upon them, and further, did not engage in any structured reflective activities, that prompted belief confrontation. Although it is feasible that the impetus for belief modification may be somewhat stronger once candidates begin to actively engage in the teaching process, reports of a null effect of fieldwork on student teachers’ initial schemas (Brookhart and Freeman, 1992; McDiarmid, 1990) doesn’t corroborate this claim.

The findings of the present research reflect the necessity of establishing more ecologically and developmentally sound teacher education and training programs that unify theory with practice (Hammerness, 2006; Schulz and Mandzuk, 2005; Zeichner, 2005) and provide candidates with the cognitive understanding and practical experience to comprehend teaching as a dynamic, reflective, and adaptive process that continues to evolve in a multisystemic, contextual environment that is not always under one’s control. Such an ecological understanding of teachers and teaching, which is implicit in a systems perspective (Bronfenbrenner 2004), necessitates that candidates must be continuously provided with courses that engage them in self reflection, where they can become cognitively aware of their prior teacher/teaching schemas or beliefs, merged with numerous, structured and mentor-supervised fieldwork experiences that will allow candidates to safely contemplate, openly discuss, purposefully test, and, when necessary, modify such schemas, when confronted with classroom experiential demands that are irreconcilable with their existing beliefs (Daniels and Shumow, 2003; Hammerness, 2003; 2006; Richardson, 1996). One specific cognitive goal, in this regard, is to enable
candidates to view adaptation and its accompanying cognitive conflict as an opportunity for cognitive and professional growth as opposed to something to be avoided. In addition candidates need to be able to experiment with new schemes, with respect to classroom practice, and develop a variety of lesson plans infused with management skills based on theories that address the interdynamics of human development, learning and behavior, all under the guidance of experienced teacher mentors (Doyle, 1997; Johnston, 1994; Tiezzi and Cross, 1997). From a realist standpoint, it may not be possible to prevent potential mismatches between candidate needs and classroom demands. However, providing candidates with a comprehensive, ecological map or compass of understanding and experience, which addresses all their concerns simultaneously and incorporates a variety of alternate routes of cognitive schemas that incorporate thoughts and/or behavior/instruction, may help them cognitively navigate and endure a variety of potential stormy environmental weather conditions of any given classroom experience and provide them with a developmental bumper that allows them to safely reach their ultimate cognitive and professional destination, by minimizing the amount of turbulence experienced and ultimately preventing the onset of burnout (Byrne, 1999), often experienced in the teaching profession.

REFERENCES


An Ecological Interpretation of Teacher and Teaching Schemas


Chapter 2

REFLECTIONS ON THE PAST
AND EXPLORATIONS OF THE FUTURE:
UNDERSTANDING FOOD CONSUMPTION
IN ROMANTIC RELATIONSHIPS

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ABSTRACT

Before romantic relationships are even formed, individuals make decisions about eating out. Although this is a common everyday decision, it is also complex in nature requiring one to consider many factors such as time, money, and healthy food choices (Langholtz, Ball, Sopchak, and Auble, 1997). Past research has identified many factors that increase the likelihood of dining out. These include a desire to avoid cooking, economic reasons for those living alone (Morris, Schneider, and Macey, 1995), and shortage of time to prepare meals at home (Lazar and Smallwood, 1977).

When individuals form couples in romantic relationships, decisions involving food consumption continue to occur daily. However routine this occurrence is, it is nevertheless a critical component of romantic relationships beginning during the courtship stage and extending later into marriage (Sobal, Bove, and Rauschenbach, 2002; Rappoport, 2003).

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Typically, in the early stage of a relationship, individuals merge independent food systems to create a joint food system (Bove, Sobal, and Rauschenbach, 2002). This transition is crucial as it relates to marital conflict and daily interactions (Doumas, Margolin, and John 2003).

Research has identified numerous strategies that couples employ when making decisions about eating out. Genre and familiarity of the restaurant are two important attributes that are related to the decision strategy employed (Bonds-Raacke, 2006). This line of research has also discovered that the stage of the relationship, dating versus married, is important in many ways. For example, the stage of the relationship influences the number and type of strategies utilized and who in the couple is more influential in making the decisions (Bonds-Raacke, 2008).

This commentary will elaborate on the topics presented above (i.e., the social experience of eating and decision-making strategies of couples when eating out). Additionally, current research endeavors will be presented on romantic relationships in relation to satisfaction, eating regulation, and behavioral habits of eating out. Although past and current research has greatly advanced the understanding of the importance of eating in romantic relationships, this line of research is not without limitations and specific challenges that need to be discussed. One facet that remains virtually untapped is investigating how couples make decisions regarding the decision to eat at fast food restaurants. This commentary will conclude by exploring why researchers should focus on decisions of couples related to the fast food industry.

**INTRODUCTION**

Before romantic relationships are even formed, individuals make decisions about eating out. Although this is a common everyday decision, it is also complex in nature requiring one to consider many factors such as time, money, and healthy food choices (Langholtz, Ball, Sopchak, and Auble, 1997). Past research has identified many factors that increase the likelihood of dining out. These include a desire to avoid cooking, economic reasons for those living alone (Morris, Schneider, and Macey, 1995), and shortage of time to prepare meals at home (Lazar and Smallwood, 1977). The purpose of this commentary is to explore the relationship between romantic relationships and food consumption. To begin, scholarly observations and previous research findings will be presented. This will include a review of information gathered about food decisions using both survey and experimental methodologies. Next, current developments in the area will be presented. Specifically, this commentary will review literature on relationship satisfaction and food
practices, the benefits of regulating partner’s eating behaviors, and how habit predicts fast food behavior.

Finally, the commentary will conclude with a discussion of the limitations to research findings and suggestions for future inquiry.

**Previous Findings**

Research on the role of food in romantic relationships begins with anecdotal observations. Rappoport (2003) describes how eating and sex for a couple are intertwined and change over the course of the relationship. For example, when individuals are getting to know one another, this typically occurs over a meal. In fact, the dinner date is a social norm in North America, followed by one member of the couple preparing a home cooked meal. As the relationship proceeds over meals, the couple becomes more intimate. In fact, food has an important role at wedding ceremonies as a means of communicating information about the couple to people in attendance. However, the couple will face transitions in the relationship as they move from the novel dating stage to the day to day life of marriage. Rappoport (2003) states that compromise is always needed and food details can become problematic. Survey research on food and romantic relationships support many of the observations described by Rappoport. To begin, couples report talking over a meal as a frequently occurring behavior (Dianton, 1998). Sobal, Bove, and Rauschenbach (2002) collected information about eating from couples about to marry and one year after marriage. These interviews confirmed that eating was an important part of the dating stage of the relationship. In addition, marriage shifted individuals’ eating behaviors such that eating with spouse became the primary commensal unit. Using a daily diary method with married couples, Doumas, Margolin, and John (2003) found that food was related to daily marital interactions. However routine the behavior may be, decisions about food are important in relationships as they can lead to conflict when unresolved (Bove, Sobal, and Rauschenbach, 2003).

In addition to surveys, research has experimentally investigated how couples make decisions in a dynamic task related to eating. Bonds-Raacke (2006) manipulated restaurant type and familiarity creating a 3 (type of restaurant: steakhouse, seafood, and Italian) X 2 (familiarity with restaurant: well known and not well known) within-subjects design. Married couples (n=26) viewed sample restaurant menus for each of the 6 restaurants and indicated how likely they would be to eat at the restaurant. First, this task was
completed independently with the participant receiving instructions to pretend it was their birthday and their partner had agreed to eat at any restaurant they selected without complaining. Next, the task was completed collectively with instructions that it was no longer a birthday situation and the couple was to rate how likely they would be to eat at the restaurant together. Results indicated that common decision-making strategies did exist for married couples and these strategies were not related to individual difference variables such as ethnicity and length of marriage. The common decision-making strategies included: the familiarity strategy, the flexible strategy, and the genre based strategy. As can be inferred by the names of the strategies, couples using the familiarity strategy based their likelihood ratings on the familiarity of the restaurants, with well known restaurants receiving higher likelihood ratings than not well known restaurants. The flexible strategy was utilized by couples who had high likelihood ratings for all restaurants and the genre based strategy was utilized by couples who had ratings greatly influenced by the genre of the restaurant. Bonds-Raacke (2006) also found that when comparing independent decisions to joint decisions within couples, the majority of couples’ joint decisions resembled the husbands’ independent decisions. In a follow-up study, Bonds-Raacke (2008) replicated the experiment above with extended dating couples allowing for a comparison between the two populations. Extended dating was defined as couples who had dated the same person for one year or longer (Bonds-Raacke, Bearden, Carriere, Anderson, and Nicks, 2001). Results indicated that the stage of the relationship, dating versus married, was important in many ways. For example, the stage of the relationship influenced the number and type of strategies utilized (e.g., dating couples employed more strategies than married couples) and who in the couple was more influential in making the decisions (i.e., collective strategies resembled the male’s independent in married couples and collective strategies resembled the female’s independent in extended dating couples).

**CURRENT DEVELOPMENTS**

Researchers are beginning to realize the important link between romantic relationships and food behaviors as demonstrated by current publications on the topic. In part, this idea stems from previous findings that relationship satisfaction for women is related to body satisfaction and unhealthy dieting (Friedman, Dixon, Brownell, Whisman, and Wilfley, 1999; Markey, Markey, and Birch, 2001). Boyes, Flechter, and Latner (2007) recently conducted a
study with 57 couples to replicate and extend prior research. Individuals in the couples were asked to complete a battery of surveys including: a relationship satisfaction survey (Fletcher, Simpson, and Thomas, 2000), the Rosenberg self-esteem scale (Rosenberg, 1965), and the Beck Depression Inventory (BDI-II; Beck, Steer, and Brown, 1996). Individuals also indicated how satisfied they were with their bodies and completed a weight control behavior scale (French, Perry, Leon, and Fulkerson, 1995). Results replicated previous findings in that women with higher self-esteem were more satisfied with their bodies and dieted less. For men, higher self-esteem was related to increased body satisfaction and higher levels of healthy dieting. Results also extended the line of research by demonstrating how romantic relationships are linked to dieting and self-esteem in different ways for men and women. Specifically, it was found that women with higher levels of self-esteem had male partners with higher levels of dieting. Furthermore, men who were more satisfied with the romantic relationship had female partners who were more satisfied with their bodies and dieted less.

Similarly, Bonds-Raacke (unpublished) is currently examining how relationship satisfaction and distortions in thinking about the relationship are related to how dating couples make joint decisions about eating out. Specifically, couples completed the Evaluation and Nurturing Relationship Issues, Communication and Happiness (ENRICH) Martial Satisfaction Scale (EMS), containing two subscales which measure marital satisfaction (MS) and idealistic distortions (Fournier, Olson, and Druckman, 1983). Scores from both partners on the MS and the ID scales were summed to provide one score for each couple. Results indicated no differences in relationship satisfaction and idealistic distortion based on decision-making strategy employed. However, when interpreting these results, it is important to consider that this exploratory study had a very small number of participants. Increasing the sample size to raise the power will aid in detecting any differences on the measures.

Markey, Gomel, and Markey (2008) examined eating regulation in the context of romantic relationships due to the fact that romantic partners have the ability to positively or negatively influence eating behaviors (Markey, et al., 2001; Schafer, Keith, and Schafer, 2000). In order to do so, five measures were obtained from participants. First, eating regulation was measured using a revised version of three subscales (i.e., monitoring, pressure, and restriction) from the Child Feeding Questionnaire (Birch, Fisher, Grimm-Thomas, Markey, Sawyer, and Johnson, 2001). Next, satisfaction with romantic partners’ bodies was assessed using the Contour Drawing Rating Scale (Thompson and Gray, 1995). Specifically, participants were asked what their
partner currently looks like and what they would like their partner to look like. Scores on the two scales provided a discrepancy score. Third, weight status was measured using the Body Mass Index score. Finally, weight concerns were assessed through an amended version of the Weight Concerns Scale (Davison, Markey, and Birch, 2000) and healthy dieting behavior through a subscale of the Weight Control Behavior Scale (French et al., 1995). Results indicated that women monitored eating and dieting of their partners more than men and women who monitored eating and dieting of their partners were generally unsatisfied with their partners’ bodies. Similarly, men who monitored eating and dieting of their partners were unsatisfied with partners’ bodies. Furthermore, both men and women who reported monitoring the eating behaviors of their partners had partners with relatively high BMIs. Although monitoring partners’ eating behaviors may have a negative connotation, results suggest that such monitoring was positively associated with healthy dieting behaviors.

Finally, current developments in the literature remind readers that although decisions around food are everyday occurrences they are still complicated in nature. In fact, part of the decision to consume fast food may be due to habit according to Ji and Wood. Ji and Wood (2007) conducted a seven day diary study. Prior to the study, participants were asked how many times in a week they buy fast food and their intentions to consume fast food for the future. Researchers also measured performance context of the behavior including location and mood. Results demonstrated that despite intentions individuals will purchase fast food out of habit when the performance context is congruent to past behavior.

**CONCLUSION**

Although past and current research has greatly advanced the understanding of the importance of eating in romantic relationships, this line of research is not without limitations and specific challenges that need to be discussed. To begin, the majority of research reviewed in this commentary relied on self-report measures. Because completing self-report measures involves retrospection, there exists the possibility of memory loss and distortion. Additionally, verification of the accuracy of these memories is not feasible. Furthermore in cases where couples are recalling past decisions, individuals may not be fully aware of the influence their partners had on their decision at the time. However, for many topics of interest, the accuracy of the
memory is not as important as how the participant views the event in their mind. Dynamic experiments in which participants make decisions during the experiment allow the researchers to measure partner influence but in an experimental setting with its own set of limitations. Another challenge to investigating the role of eating in romantic relationships is recruiting both the male and the female partner currently involved in the relationship. It is certainly possible but often leads to smaller sample sizes and less diversity in the sample.

One facet that remains virtually untapped is investigating how couples make decisions regarding eating at fast food restaurants. The lack of research on the topic is surprising considering the amount of research available on the nutritional problems of frequent fast food dining such as weight gain (Larson, Neumark-Sztainer, Story, Wall, Harnack, and Eisenberg, 2008) and research examining fast food behaviors of children and teenagers. For example, researchers have found that many factors are related to fast food dining in childhood and adolescence. Specifically, greater flexibility in parental workplace (Allen, Shockley, and Poteat, 2008) and peer support (Larson et al., 2008) reduce the amount of fast food consumed by children and young adults. Furthermore, educating young adults on fast food nutrition can lead to healthier choices. In an experimental task, Allen, Taylor and Kuiper (2007) had adolescent participants view a fast food restaurant menu and select items. After the selection, information was provided to the participants regarding the food choices in terms of calories, fat, cholesterol, and other nutritional information.

This information served as an educational intervention. Participants were asked to select food items again from the same menu. Results indicated that items selected after the educational intervention were significantly healthier than items selected before the intervention.

Despite these steps to learn more about when fast food is consumed and how healthier choices can be made, information is still needed to better understand how individuals in romantic relationships reach joint decisions with regard to fast food. New developments suggest that the decision to eat at fast food restaurants is related to the stage of the relationship. Amiraian and Sobal (2009) found fast food restaurants were rated as the least appropriate place to eat on a date when compared to casual/family restaurants, upscale restaurants, and in the home. Yet, eating at fast food restaurants was more acceptable in long-term relationships than on a first date. There are many reasons why decisions regarding fast food behaviors of couples in romantic
relationships deserve continued focus, least of which is to provide suggestions for how healthy eating habits can be cultivated.

Similarly, research is needed to explore how the role of food relates to satisfaction and length of relationships. Finally, understanding food behaviors of romantic couples will provide useful information to the field of consumer marketing in exploring ways to attract patrons to eating establishments.

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Chapter 3

**MMPI-2 CORRELATES OF PTSD AMONG GULF WAR COMBAT VETERANS**

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**ABSTRACT**

This study examined the MMPI-2 clinical presentation of a sample of 80 Gulf War veterans seen in an outpatient clinic who were divided into PTSD or non-PTSD groups. Results indicated that MMPI-2 profiles differed significantly, with the PTSD group scoring higher on each of the clinical scales, with the exception of scale 5. The groups were best differentiated by effect size differences among scales F, K, 2, 7, 8, and PK. The PTSD group yielded a mean 8-1 MMPI-2 code type, whereas the non-PTSD group yielded a mean 1-3 MMPI-2 code type. The findings are generally consistent with the previous literature examining the clinical presentation of Gulf veterans.

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As one of the most widely used personality assessment instruments, the Minnesota Multiphasic Personality Inventory, Second Edition (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, and Kaemmer, 1989) is utilized in various settings and heavily emphasized in psychology training programs. In addition to structured clinical interviews, mental status examinations, psychophysiological assessments, and other psychometric instruments (Keane, Wolfe, and Taylor, 1987; Penk, Rierdan, Losardo, and Robinowitz, 2006), the MMPI-2 is regarded as an integral component of a comprehensive psychiatric evaluation for posttraumatic stress disorder (PTSD).

The diagnostic utility of the MMPI-2 is an important consideration in discriminating individuals diagnosed with PTSD from non-patients and individuals diagnosed with other clinical conditions, such as major depression and schizophrenia.

The clinical presentation of combat veterans has been evaluated in several studies. Researchers have suggested that significant mean profile elevations on clinical scales 2 and 8 discriminated combat veterans diagnosed with PTSD from non-patients and that the 2-8/8-2 code type configuration might be indicative of a PTSD profile (Keane, Malloy, and Fairbank, 1984; Munley, Bains, Bloem, and Busby, 1995; Wilson and Walker, 1990). Wise (1996) analyzed several research reports and found that 13 (62%) of 21 studies showed an 8-2 codetype, with only 6 of the 13 demonstrating a mean profile of 8-2 that significantly discriminated PTSD patients from non-PTSD patients. Other profile patterns found included 1-2 (3/19%), 4-8 (3/14%), 4-2 (3 14%), and 8-7 (3/14%).

Moreover, an elevated scale F (T = 70-90) in conjunction with the 2-8/8-2 code suggested a PTSD profile (Keane et al., 1984; Wilson and Walker, 1990; Wise, 1996). Lyons and Wheeler-Cox (1999) noted that elevations on scale 7 might suggest another PTSD profile, 8-7/7-8.

In addition to validity and clinical scales, the posttraumatic stress disorder scale (PK) developed by Keane et al. (1984) has been effective in discriminating between patients diagnosed with PTSD and non-PTSD comparison groups (Graham, 2006). PK scale validation and cross-validation analyses were conducted among 100 male Vietnam combat veterans who had diagnoses of PTSD and 100 male veterans who had other psychiatric diagnoses (Keane et al., 1984).
The authors concluded that a raw score cutoff of 30 was optimal in correctly classifying 82% of veterans diagnosed with PTSD. Furthermore, PTSD patients produced higher scores on the PK scale than non-PTSD patients, respectively $M = 37$ and $M = 20$.

Munley et al. (1995) compared 27 veterans diagnosed with PTSD to veterans diagnosed with bipolar disorder, alcohol dependence, drug dependence, and adjustment problems. Munley et al. sought to assess the accuracy of raw score cutoff of 28 for Vietnam combat veterans recommended by Lyons and Wheeler-Cox (1999). A raw score cutoff of 28 correctly identified 67% of the PTSD group and 85.2% of the non-PTSD group, with an overall classification rate of 76% for both groups.

Optimal raw score cutoff values have ranged from 8.5 to 30 (Graham, 2006) and may need to be lower or higher depending on the type of samples being compared (e.g., inpatient, outpatient, combat, noncombat, and racial/ethnic composition; Lyons and Keane, 1992).

The MMPI-2 mean code types and PK scale cutoff values that are typically produced by samples composed of largely Vietnam veterans may not generalize to Gulf veterans. According to Haley, Kurt, and Hom (1997), Gulf veterans may be more likely to present somatic complaints, thought disturbances, depression, and anxiety. Sillanpaa, Agar, and Axelrod (1999) also noted that the psychological distress reported by Gulf veterans is characterized by somatic complaints, a sense of dissatisfaction, attention/concentration problems, and emotional lability. Glenn et al. (2002) compared MMPI-2 profiles of Vietnam ($n = 134$) and Gulf ($n = 38$) war combat veterans diagnosed with PTSD.

While the Vietnam veterans had their highest elevations on the schizophrenia and depression scales (8-2 code type), Gulf veterans produced elevations on the schizophrenia and hypochondriasis scales yielding a mean 8-1 code type. These data suggest that veterans who served in the Gulf war era may be more likely to complain of health concerns and may vary in their symptom presentation from Vietnam veterans.

Other common code types produced by the Gulf veterans were 6-8/8-6 and 1-3/3-1. Further research is needed, however, regarding the clinical presentation of Gulf veterans, as this study involved a small number of Gulf War participants.

The purpose of the present study was to further examine the clinical presentation and mean profile code type among a sample of Gulf War veterans. It was hypothesized that participants in this investigation would produce an MMPI-2 clinical profile similar to that of the Gulf veterans.
described by Glenn et al. (2002). The sensitivity and specificity of the PK scale as well as the suitability of the recommended cutoff score of 28 for Vietnam veterans (Lyons and Keane, 1992) also were assessed in this study.

**METHOD**

**Participants**

The sample consisted of 80 Gulf War veterans consecutively referred for outpatient psychological evaluation as part of a comprehensive examination through the Department of Veterans Affairs Persian Gulf Registry for treatment of psychological symptomatology secondary to overseas military service in Operation Desert Shield/Desert Storm. For the purposes of this investigation, a retrospective review of patient records was performed with Institutional Review Board approval. Based on evidence obtained through clinical interview by a doctoral-level clinician 39 of the participants were diagnosed with PTSD, while the remaining participants (n = 41) were diagnosed with other psychiatric and/or medical conditions, excluding PTSD.

<table>
<thead>
<tr>
<th>Measure</th>
<th>PTSD (n = 39) M (SD)</th>
<th>Non-PTSD (n = 41) M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>36</td>
<td>35</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Age (in years)</td>
<td>34.6 (7.3)</td>
<td>34.7 (8.4)</td>
</tr>
<tr>
<td>Education (total years)</td>
<td>13.4 (1.8)</td>
<td>13.7 (2.0)</td>
</tr>
<tr>
<td>Ethnicity (% non-white)</td>
<td>28%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Objective evidence of service during Operation Desert Shield/Desert Storm was obtained from review of military records. Both the PTSD and non-PTSD groups were composed predominantly of male European Americans with ethnic/racial minorities, namely African Americans, Native Americans, and Hispanics, comprising 28% and 20% of each study group respectively. The
groups did not vary significantly in age or years of education. The demographic information for the PTSD and non-PTSD groups is presented in Table 1.

Participants were excluded from the analyses if their MMPI-2 profiles met at least one of the following criteria: Cannot Say (CS) raw score >30; L scale T-score >75; F scale T-score >120; K scale T-score >75; Variable Response Inconsistency Scale (VRIN) T-score >75; True Response Inconsistency (TRIN) >75. Moreover, three participants were excluded due to significant central nervous system injury (i.e., stroke or traumatic brain injury).

**Procedure and Instruments**

*Minnesota Multiphasic Personality Inventory-2 (MMPI-2).* The MMPI-2 is a widely used 567-item self-report instrument with sound psychometric properties (see Graham, 2006). The current study analyzed the measure’s three validity (L, F, and K) and ten clinical scales, hypochondriasis (Hs; scale 1), depression (D; scale 2), hysteria (Hy; scale 3), psychopathic deviate (Pd; scale 4), masculinity-femininity (Mf; scale 5), paranoia (Pa; scale 6), psychasthenia (Pt; scale 7), schizophrenia (Sc; scale 8), hypomania (Ma; scale 9), and social introversion (Si; scale 0) as well as the posttraumatic stress disorder scale (PK). All patients completed the MMPI-2 as part of a more comprehensive psychological evaluation.

**RESULTS**

An exploratory analysis was performed with K-corrected T scores from MMPI-2 Scales L, F, K, and 1 through 0 to examine the clinical presentation of the PTSD and non-PTSD groups. Mean MMPI-2 validity and clinical scale T-scores for the two groups are presented in Figure 1. Gulf veterans diagnosed with PTSD were found to score significantly higher on every clinical scale with exception of scale 5 (masculinity-femininity). The PTSD group yielded a mean 8-1 MMPI-2 code type, whereas the non-PTSD group scored highest on scales 1 and 3, resulting in a mean 1-3 MMPI-2 code type. Frequently occurring high points on clinical scales among the PTSD group were 2, 3, 6, 7, and PK.

Among the 80 participants, 36.33% of the sample generated valid MMPI-2 code types, as described by Graham (2006). The Gulf veterans diagnosed
with PTSD produced a mean MMPI-2 profile code type of 8-1, schizophrenia and hypochondriasis.

![Figure 1. Gulf Veterans Profiles for MMPI-2 Validity, Clinical, and PK Scales.](image1)

- Posttraumatic Stress Disorder Group.
- Non-PTSD Group.

![Figure 2. Effect Size Differences for MMPI-2 Validity, Clinical, and PK Scales.](image2)

- Partial Eta Squared effect size differences.

Frequency analyses of the true clinical 2-point code types among the 80 participants revealed that approximately 35% of the code types found were 1-3/3-1. Other common 2-point clinical code types were 6-8/8-6 (10.3%) and 8-
9/9-8 (10.3%). Although many of the clinical scales were statistically different, this does not give any indication of the magnitude of those differences. We computed a one-way analysis of variance (ANOVA) comparing MMPI-2 validity and clinical scale T-scores of the PTSD and non-PTSD groups. A large effect size was found on the PK scale, $F(1,78) = 54.16, p < .001$. Medium effect sizes were found on scale F ($F(1,78) = 34.36, p < .001$) and scale 8 ($F(1,78) = 34.58, p < .001$), and small effect sizes for scales 7, K, 6, 2, 1, 0, and 4. Differences between the groups according to effect size are presented in Table 2 and graphically in Figure 2.

During the development and validation of the PK scale, a raw score of 30 led to the correct classification of 82% of veterans diagnosed with PTSD. As previously stated, Lyons and Keane (1992) recommended a raw score cutoff of 28 for Vietnam veterans. A chi-square test of independence was calculated to determine the optimal cutoff raw score for correct classification of Gulf veterans in our sample diagnosed with PTSD.

### Table 2. MMPI-2 Validity, Clinical, and PK Scale Score Differences in order of Effect Size

<table>
<thead>
<tr>
<th>MMPI-2 Scale</th>
<th>PTSD ($n = 39$)</th>
<th>Non-PTSD ($n = 41$)</th>
<th>$F$-test (1,78)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Pk</td>
<td>84.1</td>
<td>15.2</td>
<td>59.1</td>
</tr>
<tr>
<td>F</td>
<td>80.0</td>
<td>20.8</td>
<td>56.5</td>
</tr>
<tr>
<td>8 (Sc)</td>
<td>82.6</td>
<td>18.6</td>
<td>61.3</td>
</tr>
<tr>
<td>7 (Pt)</td>
<td>74.9</td>
<td>13.1</td>
<td>60.9</td>
</tr>
<tr>
<td>K</td>
<td>37.7</td>
<td>8.2</td>
<td>47.2</td>
</tr>
<tr>
<td>2 (D)</td>
<td>74.9</td>
<td>12.0</td>
<td>63.1</td>
</tr>
<tr>
<td>1 (Hs)</td>
<td>78.7</td>
<td>13.0</td>
<td>68.0</td>
</tr>
<tr>
<td>0 (Si)</td>
<td>63.4</td>
<td>11.5</td>
<td>53.6</td>
</tr>
<tr>
<td>4 (Pd)</td>
<td>62.8</td>
<td>12.7</td>
<td>54.4</td>
</tr>
<tr>
<td>L</td>
<td>50.6</td>
<td>10.1</td>
<td>56.6</td>
</tr>
<tr>
<td>9 (Ma)</td>
<td>61.1</td>
<td>12.9</td>
<td>53.9</td>
</tr>
<tr>
<td>3 (Hy)</td>
<td>73.9</td>
<td>17.9</td>
<td>64.8</td>
</tr>
<tr>
<td>6 (Pa)</td>
<td>70.2</td>
<td>17.9</td>
<td>55.3</td>
</tr>
<tr>
<td>5 (Mi)</td>
<td>48.7</td>
<td>9.9</td>
<td>48.3</td>
</tr>
</tbody>
</table>

An optimal raw score cutoff of 22 ($\chi^2(1, n = 80) = 28.78, p < .001$) revealed 80% sensitivity, that is correct classification of 80% of the combat
veterans diagnosed with PTSD, and 80% specificity, reflecting the correct classification of non-PTSD veterans.

**DISCUSSION**

As measured by the MMPI-2, the clinical presentation of Gulf War combat veterans diagnosed with PTSD was significantly different in overall profile configuration and across many of the MMPI-2 clinical scales as well as the posttraumatic stress scale relative to that of Gulf War veterans without PTSD. The PTSD and non-PTSD groups in the current study were best differentiated by scales F, K, 2, 7, 8, and PK. Elevations were observed in the profile of the PTSD group on scales 1, 2, 3, 6, 7, 8, and PK. The findings of this study correspond with previous research among Vietnam veterans, as there were corresponding elevations on scales F, 2, 7, and 8. The current sample of Gulf veterans’ presentations of elevations on scales 1, 3, and 6 suggests that those suffering from PTSD, however, may experience relatively higher levels of somatic problems, depression, proneness to hysterical reactions to stress, feelings of persecution, abnormal fears, and thought disturbance.

The recommended cutoff value of 28 for Vietnam veterans did not yield adequate sensitivity and specificity in discriminating our PTSD and non-PTSD groups. The lower optimal cutoff value of 22 for the current sample suggested that this sample of Gulf veterans may have experienced higher levels of distress. The PK scale assesses symptoms that are associated with diagnoses of posttraumatic stress, as well as intense emotional distress, anxiety, sleep disturbance, guilt and depression, excessive rumination, fear of losing control of emotional or cognitive functioning, or feeling mistreated or misunderstood (Graham, 2006).

The most common 2-point code type found among the entire sample of Gulf veterans was 1-3/3-1 (34.5%). This suggests that veterans, in general, who served during the Gulf era may experience higher levels of concerns over bodily functioning and may not respond well to stress. It should be noted, however, that other common 2-point code types included 6-8/8-6 (10.3%) and 8-9/9-8 (10.3%). These findings suggest that some Gulf veterans may experience feelings of persecution, suspiciousness, social alienation, and thought disturbance. Another symptom picture of Gulf veterans may involve thought disturbance, elevated mood, and accelerated speech and motor activity.
The MMPI-2 clinical presentation of Gulf War veterans diagnosed with PTSD differs from the common code types found among samples of diagnosed Vietnam combat veterans, i.e., 1-8/8-1 and 2-8/8-2, respectively. Understanding of the relative differences in the clinical presentation of Gulf veterans has important implications with respect to treatment decision-making. According to the MMPI/MMPI-2 literature, Gulf veterans with a 1-8/8-1 code type may tend to be unhappy and depressed, unable to express their feelings of hostility and aggression in an adaptive manner, feel socially inadequate, lack trust in others, have a poor work history, and be confused in their thinking (Graham, 2006). They may have diagnoses of schizophrenia, anxiety disorders, and schizoid personality disorders. Rather than providing further support for the suggested PTSD profile (Wise, 1996; Keane et al., 1984; Wilson and Walker, 1990), the findings of the present study suggest a unique presentation of Gulf veterans (Glenn et al., 2002) that involves higher levels of somatic concerns (Haley et al., 1997; Sillanpaa et al., 1999) relative to Vietnam veterans.

One methodological limitation of the study involves the classification of participants into PTSD and non-PTSD groups on the basis of clinical interview alone. A formal structured instrument with well-established psychometric properties, such as the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995), would have better met the recommendations (Keane et al., 1987; Penk et al., 2006) regarding the components of a comprehensive evaluation of posttraumatic stress disorder. Comorbid diagnoses, medical or psychiatric, also were not considered in this investigation, which may have served to influence to some degree the participants’ endorsements. Furthermore, the compensation-seeking status of veterans was not established.

It is possible that highly motivated patients may have malingered their symptoms, irrespective of the MMPI-2 validity indicators, in order to procure a service-connected disability. Arbisi, Ben-Porath, and McNulty (2006) examined the utility of the MMPI-2 validity scales to discriminate between veterans asked to feign PTSD and veterans instructed by the standard protocol. Their study revealed that MMPI-2 Infrequency (F) scales were able to identify veterans who were exaggerating PTSD symptoms. Despite these limitations, the results of the current study support previous findings regarding differences in clinical presentation as assessed by the MMPI-2 combat veterans with PTSD versus veterans without PTSD.
REFERENCES


MMPI-2 Correlates of PTSD Among Gulf War Combat Veterans

Chapter 4

COGNITIVE ISSUES IN IDIOPATHIC EPILEPSY

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ABSTRACT

Epilepsy is a common medical problem. Several studies suggest that idiopathic generalized or focal epilepsies can adversely affect mental development, cognition and behavior. Epileptic patients may experience reduced intelligence, attention, problems in memory, language and frontal executive functions. The exact mechanisms of epilepsy-related cognitive dysfunction are poorly understood. Cognitive deficits with epilepsy may be transient, persistent or progressive. Transient disruption of cognitive encoding processes may occur with paroxysmal focal or generalized epileptic discharges while epileptogenesis-related neuronal plasticity, reorganization, sprouting and impairment of cellular metabolism are fundamental determinants for progressive cognitive deterioration. Also antiepileptic drugs (AEDs) have differential, reversible and sometimes cumulative cognitive adverse consequences. AEDs not only reduce
neuronal irritability but also may impair neuronal excitability, neurotransmitter release, enzymes and factors critical for information processing and memory. The present article serves as an overview of recent studies in cognition in adult and children patients with epilepsy. In this review, we will also discuss the known adverse mechanisms of epilepsy and AEDs on cognition.

**Keywords:** Epilepsy; antiepileptic drugs; cognition; memory.

**ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>AEDs</td>
<td>antiepileptic drugs;</td>
</tr>
<tr>
<td>TLE</td>
<td>temporal lobe epilepsy;</td>
</tr>
<tr>
<td>SE</td>
<td>status epilepticus;</td>
</tr>
<tr>
<td>KA</td>
<td>kainic acid;</td>
</tr>
<tr>
<td>MRI</td>
<td>Magnetic Resonance Imaging;</td>
</tr>
<tr>
<td>EEG</td>
<td>Electroencephalogram;</td>
</tr>
<tr>
<td>BDNF</td>
<td>brain derived neurotrophic factor;</td>
</tr>
<tr>
<td>CBZ</td>
<td>carbamazepine;</td>
</tr>
<tr>
<td>PHT</td>
<td>phenytoin;</td>
</tr>
<tr>
<td>VPA</td>
<td>valproate;</td>
</tr>
<tr>
<td>PB</td>
<td>phenobarbital;</td>
</tr>
<tr>
<td>GBP</td>
<td>gabapentin;</td>
</tr>
<tr>
<td>OXC</td>
<td>oxcarbazepine;</td>
</tr>
<tr>
<td>LTG</td>
<td>lamotrigine;</td>
</tr>
<tr>
<td>TPM</td>
<td>topiramate;</td>
</tr>
<tr>
<td>ZNS</td>
<td>Zonisamide;</td>
</tr>
<tr>
<td>TGB</td>
<td>tiagabine;</td>
</tr>
<tr>
<td>VGB</td>
<td>vigabatrin;</td>
</tr>
<tr>
<td>LEV</td>
<td>levetiracetam;</td>
</tr>
<tr>
<td>GABA</td>
<td>γ-aminobutyric acid;</td>
</tr>
<tr>
<td>NMDA</td>
<td>N-methyl-D-aspartate;</td>
</tr>
<tr>
<td>AMPA,</td>
<td>α-amino-3-hydroxy-5-methylisoxazole-4-propionate;</td>
</tr>
<tr>
<td>LTP</td>
<td>long-term potentiation.</td>
</tr>
</tbody>
</table>
1. **INTRODUCTION**

Epilepsy is one of the most common neurological disorders. It nearly affects 1% of the population with the highest incidence during the first year of life [1]. During the last years, the increasing evidence from experimental pathological studies and in vivo imaging, and neuropsychological studies of patients with long-term epilepsy, have substantially increased our awareness about the possibility that briefer recurring focal or generalized seizures may cause a striking progressive cognitive decline which can be more detrimental to an individual’s overall life [2-4]. Determining the frequency of cognitive dysfunction due to epilepsy is difficult to estimate. Community based studies reported that approximately 26.4-30% of children with epilepsy when first diagnosed, have evidence of subnormal global cognitive function or mental retardation with inferior academic achievement [5]. Problems in attention and memory are observed in about 30% of newly diagnosed and untreated epileptic patients with single or several seizures of cryptogenic origin [6].

Recent epilepsy researches have uncovered that impairments of neuronal plasticity and accumulating neuronal damage which evolves over a period of time after the initial seizures may underlie cognitive impairment and behavioral changes associated with epilepsy [3,7]. In addition, the deleterious effect of antiepileptic drugs (AEDs), the only available treatment for epilepsy, on cognitive is well documented in epileptic patients and volunteer studies. In general, AEDs suppress or prevent seizure recurrence and secondary spread of epileptic activity to the surrounding normal brain through their blockage action on voltage dependent ion channels or their modulatory effect on excitatory or inhibitory neurotransmitters. In doing so, AEDs may abort some of the toxic mechanisms leading to neuronal damage. It is expected that AEDs could improve patients’ cognitive functions by controlling the number of overt and subtle epileptic activities as well as improving the psychosocial environment which provides additional benefit to cognition. However, a deleterious effect on cognitions has been observed with some AEDs even in the therapeutic ranges of the drug. Even AEDs of little negative impact on cognition in normal subjects may have detrimental cognitive effects in patients with epilepsy [8,9]. Some patient groups may be at particular risk (e.g., fetus, children and elderly) [10-13].

Some parents reported difference in child cognition and behavior after starting therapy as impaired attention, vigilance, slowness in response, talkative less, or difficulty to control. Even in patients who do not report
cognitive changes, neuropsychological tests have shown significant impairments [9].

The above information make neurologists and neuroscientist clearly recognize that prevention or suppressing seizures by AEDs is alone insufficient without clear predictions of disease outcome and a challenge is how to keep patients free of seizures without interfering with normal brain function.

2. EPILEPSY AND COGNITION

Animal studies have paralleled human studies in that chronic idiopathic epilepsy can result in progressive cognitive decline and behavioral impairment in developing and mature brains. Problems in various cognitive domains are recorded with epilepsy including poor attention, problems in memory, language, frontal executive functions and reduced scores in intelligence tests [2].

2.1. Evaluation of Cognition: Basic Definitions

The term cognition (obtained from the Latin word: cognoscere, “to know or to recognize”) refers to the set of integrated and inter-related mental processes and systems involved in acquiring knowledge and comprehending, storing, retrieving and using this knowledge to perform day-to-day activities. Cognition is considered an abstract property of advanced living organisms and is studied as a direct property of the brain or of an abstract mind. Most neuropsychological assessment models require the independent evaluation of 6 specific areas of cognition (domains): 1) attention, 2) perception, 3) memory and learning, 4) executive functions, 5) verbal and language functions, and 6) spatial/constructural processing abilities. During infancy and early childhood, the more basic elements of attention and perception undergo the most rapid development, while in later childhood and adolescence, the development of higher-order linguistic, spatial and executive elements is primary [14-16].

Attention: a process that enables an individual to focus on the relevant information in the stimulus array while also inhibiting further processing of non-relevant information. Attention is the function of the frontal lobe.

Perception: is the central step in the processing of sensory/attentional information perceived through sensory (olfactive, visual, gustative, tactile and
auditory) systems. The perception representation areas of the brain (cortical associative areas) have the function to store shapes and structure of the objects, faces and words, making abstraction of their semantic meaning. The right half of the brain cortex stores the biographic memory, emotional recalls, autobiographic and time-related memories, like the first day of the high school. The left half of the brain cortex stores the cognitive and factual memories (like Cairo is the Egypt's capital, words, numbers and so on). The sensations reach the amygdala (brain’s emotional center) to decide the autobiographic and emotional meaning of a sensation within seconds.

Memory and learning: memory is the set of processes that temporarily holds new information while it is being utilized or processed for other purposes, or that more permanently holds learned information or experiences of the past generations and that of the others for future reference and use, while learning is defined as developing habits of thought or action. In general, memory may be A) Declarative (explicit): which include all deliberate, effortful and strategic activities with the main goal is to learn or remember, i.e. all the memories that can be recovered voluntary. Declarative memory is subdivided into: a) the immediate memory: which lasts milliseconds and allows one to memorize rapidly things like a phone number or a name, b) the short term or working memory: which is a temporary easy accessible storing of important information in consciousness to be useful in a particular activity, like the shopping list or dialing a phone number after having looked in your agenda, c) the long-term memory: it is subdivided into: i) the episodic history memory: which preserves and turned into conscious all the happenings of a lived personal episode which occurred at specific time and place, i.e. autobiographical information or events like "yesterday I made that thing", and ii) the semantic culture memory: which concerned with information poorly defined by temporo-spatial context. In other words, it represents what remains recorded in the brain after forgetting things following a learning process, from exams to experiences and decoding processes. This includes depersonalized information or facts as language, rules and general world knowledge. In the end, culture is what persists after we have forgotten it all. The hippocampus and the associated temporal lobe structures, mammillary bodies and dorsomedial nucleus of the thalamus are important for declarative memory [17,18]. B) Non-declarative (implicit or procedural): which include effortless remembering of habits and automatic behaviors with the goal of the activity is other than to remember. The cerebellum and basal ganglia have been found to be important in non-declarative memory. In other words, the voluntary movements may first performed and controlled by relaying on cerebral
feedback from sensory organs but after some practice, the same movement will be performed by feed-forward (subconscious control by the cerebellum and basal ganglia). The movements become more quickly and automatically performed with less conscious effort. Thus the cerebral cortex could be omitted from control process once the sequence (motor act) has been learned. The results of anatomical studies clearly indicate that the cerebellum and basal ganglia participate in multiple circuits or ‘loops’ with cognitive areas of the cerebral cortex. The cerebellum is largely connected via the thalamus, to many brain areas relevant to cognition and behavior, including the dorsolateral prefrontal cortex, the medial frontal cortex, the parietal and superior temporal areas, the anterior cingulate, and the posterior hypothalamus [19-21]. The basal ganglionic-cortical circuits involved in non-motor functions are connected to the dorsolateral prefrontal cortex (area 46), the lateral orbitofrontal cortex (area 12), and the anterior cingulate/medial orbitofrontal cortices (areas 24 and 13). These frontal regions are known to be involved in planning, working memory, rule-based learning, attention, and other aspects of higher executive function [22]. In functional neuroimaging studies of normal subjects, the cerebellum is activated in tasks involving learning and word generation. The cerebellum stores the memory involving movement, like playing guitar or swimming [23]. In a PET study, Jueptner and colleagues [24,25] asked normal subjects to learn sequences of eight finger movements (key presses). They then compared the brain activity during learning of new sequences with that seen during performance of previously learned sequences. An examination of their data showed that rostrodorsal portions of the globus pallidus as well as portions of areas 9 and 46, the dorsolateral caudate, and the ventroanterior nucleus of the thalamus displayed increased activation preferentially during the learning of new sequences. It is important to summarize that the extensive connections between the prefrontal cortex and other brain regions including hippocampus and temporal lobe explain the importance of frontal lobes in memory functions. Memory from the past has been found to be encoded in lateral and medial temporal systems while future memory is related to frontal-prefrontal cortex [26].

Executive functions: are those functions involved in deliberately pursuing any type of goal in the face of difficulty or stress, especially novel non-routine tasks or complex organizationally demanding tasks. This include the following: self-awareness of strengths and limitations, ability to set adequately reasonable goals, ability to plan and organize goal-directed behavior, ability to self-initiate goal-directed behavior, ability to self-inhibit competing behaviors, ability to self-monitor behavior, ability to self-evaluate behavior in relation to
goals, ability to solve problems and think and act strategically in the face of obstacles, ability to flexibly shift focus of attention, strategies, behaviors, and perspectives as required by context and goals and as dictated by feedback from previously unsuccessful behavior and strategies. Prefrontal cortex is responsible for executive functions [27,28].

**Verbal and language functions versus Spatial/constructural processing abilities:** left cerebral hemisphere is responsible for all activities related to verbal materials such as naming, writing, word lists, stories, etc, whereas the right cerebral hemisphere is responsible for all activities related to non-verbal materials such as geometric, drawings, construction, dressing, facial recognition, etc [29].

Neurological examination, computed tomography (CT), magnetic resonance imaging (MRI), electroencephalography (EEG) and positron emission tomography (PET) scans look at the structural, physical and metabolic condition of the brain while the neuropsychological (cognitive) testing is the only way to formally assess brain function. During the past decade neuropsychological testing has become very sophisticated. Specifically designed cognitive tests are used to measure a psychological function known to be linked to a particular brain structure or pathway. They are categorized according to the aspect or "domain" of cognitive ability that they aim to assess. However, the more common approach today, however, is to use a flexible battery based on hypotheses generated through a clinical interview, observation of the patient and review of medical records [30].

It must be remembered that the term cognition is not a synonym of intelligence quotient (IQ) or intelligence. IQ represents the summary scores on standardized “intelligence tests”. The IQ score may include measures of cognition, but can also include and often assess sensory, motor and related abilities that are not typically included under the term of cognition. Another important difference is that the traditional intelligence tests measure what is known as convergent thinking which means that there is just one correct answer to each question as definition of words, questions and arithmetic problems, but do not measure what is known as divergent thinking which means that there is multiple answers to one question. Convergent thinking is the function of the parietal and temporal lobes while divergent thinking is the function of the frontal lobe. This means that lesions in parietal or temporal lobes may produce reliable decrease in IQ but in frontal lobe lesions, IQ is often normal [31]. Thus, intelligence is term that can be narrowly employed to refer to those abilities that are evaluated by intelligence tests.
2.2. Evidences for Cognitive Impairment in Epilepsy

Cognitive comorbidity associated with epilepsy is confirmed in pathological, psychological, physiological and imaging studies [32-38].

2.2.1. Experimental Studies

Kindling involves progressive potentiation of electrographic and behavioral seizure activity resulting from controlled repeated application of initially sub-convulsive electrical or chemical stimulation. In kindling models of TLE, the controlled repeated seizure discharges, trigger a precise sequence of complex activity-dependent neurodegenerative changes with features of excitotoxic active cell death [39]. Using a number of behavioral and cognitive tests as the radial arm maze and Morris water maze which assess hippocampus-dependent spatial learning and memory, it was demonstrated that multiple neonatal seizures in kindled rodents can be associated with reduced development of grey and white matter, lowered seizure threshold, memory impairment and significant long-lasting impairment of spatial learning, the severity of which correlates with the number of seizures experienced [7]. Assessment of functional properties of hippocampal circuitry in adult rats which experienced seizures induced by kainic acid on specific days during early postnatal development revealed presence of long-term loss of hippocampal plasticity manifested as reduced capacity of long-term potentiation, reduced susceptibility to kindling, and impaired spatial learning, which was associated with enhanced paired-pulse inhibition in the dentate gyrus [40]. Kindling-evoked seizure activity may thus prime synapses via calcium-dependent mechanisms, thereby affecting threshold, magnitude, and saturation of long-term plasticity at these synapses and this contributes to the alteration in memory performance and emotional behavior observed in TLE patients [41-43].

2.2.2. Neuropsychological Clinical Studies

Large, comprehensive, long-term and cross-sectional neuropsychological studies in TLE patients spanning observational periods as long as 25-30 years have documented that the cumulative cognitive impairments increase proportionally with the duration and poor control of seizures or its intractability to AEDs [43-45]. Children with severe, frequent and prolonged seizures, children with severe epileptic syndromes and those acquire seizure from a variety of initial precipitating insults early in life, tend to show early rapid, marked and progressive intellectual decline [43]. However, patients with
Cognitive Issues in Idiopathic Epilepsy

TLE may also develop poor performance on tests of memory function, as well as on measures of intelligence, language, and executive functions suggesting that cognitive dysfunction is not limited to limbic-related tasks [45]. Rzezak et al. [46] found frontal lobe dysfunction in children with TLE. The worst performance in those with mesial TLE was associated with early onset, longer duration of disease, and use of polytherapy. The authors suggested that temporal lobe epileptogenic activity affects the extratemporal regions that mediate attentional and executive functions. Guimarães et al. [47] did a comprehensive neuropsychological assessment to a population of children with TLE including: IQ; forward digit; Trail Making Test for Children B; Wisconsin Card Sorting Test; block design; Boston naming test, verbal fluency and wide range assessment of memory and learning testing including visual learning, verbal memory, visual memory, delayed recall of verbal learning, delayed recall of stories and recognition of stories. The authors found that despite normal IQ, TLE presented with several neuropsychological deficits. The authors concluded that dysfunction of cerebral areas other than temporal lobe, particularly the frontal lobes, might be present in TLE. This is supported by the pronounced topographic organization of neocortical inputs along the septotemporal axis of the hippocampus documented in both anatomical and behavioral studies [48]. Moreover, recent studies signify the importance of cerebellum, basal ganglia and thalamus in cognition [23,26,49]. The adverse consequences of AEDs, on cognition and behavior must not be ignored when evaluating the results of neuropsychological studies [50].

2.2.3. Neuroimaging Studies

A growing number of multi-parametric MRI follow-up and prospective longitudinal imaging studies in TLE indicate that progressive atrophy after the first SE evolves over a prolonged period of time (weeks, months, or even years) in the hippocampus, amygdala, thalamus and piriform cortex [51]. Some cross-sectional cohort studies reported association of cognitive deficits with smaller hippocampal volume in TLE [52]. Neuroimaging clinical studies also provide evidence that hippocampal volume reduction has been linked with the longer duration of epilepsy and considered a marker as well as a predictor of cognitive decline in patients with epilepsy.

In the longitudinal study done by Briellmann et al. [38], 24 patients with mild TLE were studied via quantitative MRI over 3.5 years, the volume of the hippocampus decreased by 10%, the degree of volume loss was correlated with the number of generalized seizures. Over a similar period, Fuerst et al. [53] observed hippocampal volume loss in 12 patients with refractory TLE by
volumetric MRI. Liu et al. [54] observed progressive cortical volume loss in patients with recurrent neocortical epilepsy.

Recent quantitative MRI volumetric studies confirmed the presence of volumetric abnormalities in both temporal and extratemporal regions consistent with the generalized cognitive compromise associated with early-onset localization-related epilepsy syndromes as TLE. Abnormalities were identified in amygdale, fornix, entorhinal cortex, parahippocampus [55], thalamus and basal ganglia [56], cerebellum [52] and whole brain volumes [57]. Hermann et al. [57] reported reduction in total cerebral white matter volume, increased total CSF and reduced gray matter volume, both ipsilateral and contralateral to the side of temporal seizure onset. Seidenberg et al. [58] reported bilateral thalamic volume reduction in chronic unilateral temporal lobe epilepsy. Thalamic atrophy was significantly correlated with performance in memory and non-memory cognitive domains. In support, generalized reduction of cerebral volume has also been observed in children with mixed seizures, as well as focal temporal and frontal lobe epilepsy which are proportionately associated with delayed neurodevelopment [59].

Results of volumetric quantitative MRI studies are in accordance with generalized reduction in neuropsychological function including intelligence, language, visuoperception, memory and executive function in patients with TLE [57]. The extensive networks and interconnections between cortical regions are considered a contributing factor for the demonstrated widespread and remote cerebral atrophy from the putative epileptic focus. Functional MRI studies revealed that retrieval from working memory is associated with activation of dorsolateral frontal cortex.

Other cortical and thalamic brain areas are also activated including the anterior cingulate cortex which is associated with executive function and the posterior parietal cortex which is associated with attention [60].

2.2.4. Neurophysiological Studies

The P300 component of event related potential (ERP) is impaired in patients with epilepsy and correlates with the degree of cognitive impairment encountered in neuropsychological testing [5]. P300 is considered as a "cognitive" neuroelectrical phenomenon because it is generated in psychological tasks when subjects attend and discriminate stimuli that differ from one another on some dimensions.

P300 is an objective, non-invasive and clinically relevant method for evaluation of mental processing. P300 latency increases as the dementia symptoms increase, while P300 amplitude is depressed in all levels of
Cognitive Issues in Idiopathic Epilepsy

dementia [61]. The hippocampus, thalamus and frontal cortex are possible locations of the P300 generators, structures important for learning and memory.

Also the changes in electroencephalography (EEG) peak frequency observed in quantitative occipital EEG are correlated with subjective cognitive complaints [62].

2.3. Factors Associated with Cognitive Deterioration in Patients with Epilepsy

Cognitive issues in epilepsy are associated with number of variables including genetics, basic brain lesion, type of epilepsy, site and side of brain lesion, etiology of epilepsy, age at onset, duration of epilepsy, seizure frequency and severity, ictal as well as interictal transient focal or long-lasting EEG epileptic discharges, adverse effects from antiepileptic medications [9,63-66] and psychosocial variables [67,68].

Genetics: hereditary predisposition to abnormal brain activity has been accounted for 30–50% of phenotypic IQ variance of children born to mothers with epilepsy [69,70].

Age at onset: cognitive and behavioral functioning in patients with epilepsy is an important area in various age groups. Earlier studies reported that seizure onset before the age of 14 years is a risk factor for cognitive decline. In controlled studies, significant neuropsychological impairment has been demonstrated in children and adolescents with chronic epilepsy [10]. However, recent studies indicated that negative effect on cognition, even progressive cognitive deterioration, may occur in older adults with chronic partial or generalized seizure disorders.

Type, site and side of epilepsy: some studies found greater cognitive problems in patients with generalized than partial seizures [71], others vice versa [72]. Complaints of memory difficulties are common among patients with TLE where memory-related brain structures are directly involved by seizure activity. TLE is associated with more memory impairments than extratemporal epilepsies and both have more memory impairments than that associated with generalized epilepsy [73,74]. Frontal lobe epilepsy is associated with performance deficits in executive functioning [75]. However, most recent case-control and longitudinal studies revealed that patients with generalized as well as localization-related epilepsies may develop poor performance on tests of memory function, as well as on measures of
intelligence, language, and executive functions suggesting that cognitive
dysfunction is not limited to limbic-related tasks presented in the
hippocampus, amygdala or the piriform cortex but extents to involve diverse
brain areas [45,52,76]. The nature and localization of epilepsy is also
important determinant of the extent and nature of cognitive deficits. Patients
with secondarily generalized seizures showed greater impairment in
concentration and mental flexibility than patients with complex partial seizures
[77]. Problems of delayed recall of words were observed in newly diagnosed
patients with partial seizures prior to medication [61]. TLE is associated with
cognitive decline in confrontational naming, visual memory, verbal memory
and motor speed [10]. TLE affects declarative memory systems, while non-
declarative learning (e.g. procedural learning) appears more or less unaffected.
Verbal oriented problems are specifically involved in left-sided epileptogenic
coci. Left TLE, especially impairs verbal episodic memory (e.g. word list
learning), long-term verbal associations, learning of semantically-related
verbal information, speed of learning and delayed memory with deficits in
consolidation of verbal information [10]. Visuoconstructive memory dysfunction
has been found in patients with right TLE [73,74]. Silva et al. [74] found
that epileptic patients with mesial temporal injuries had low cognitive
performance in attentional span, memory, speech, daily problems resolution,
while patients without injury showed more compensated cognitive
performance except mild attentional alterations. Duration of epilepsy: cross-
sectional and longitudinal studies of cognitive change in epilepsy suggest that
longer duration of epilepsy is associated with decline in many areas of
cognition [65].

Etiology of epilepsy: cognitive impairments are more prevalent in
symptomatic and cryptogenic compared to idiopathic epilepsy [6].

Psychosocial variables: mood state in epileptic patients may be additional
factor that negatively affects cognitive functions. Epileptic patients who are
depressed may suffer a double burden of cognitive deficits [78]. Seizures
occurring at school or work can result in poor self-perception and reduced
social interaction.

Stigma resulting from epilepsy and learning problems may lower the
parental and teacher expectations. Decreased expectations can negatively
affect the academic effort and consequently the performance. Scholastic
underachievement, intellectual impairment, lower educational levels and
potentially mental retardation are the long-term consequences in children with
epilepsy, while low functional status, less educational levels, low rates of
employment and poor quality of life are the long-term consequences in adults with epilepsy [67,68].

In some patients with epilepsy, many of the above factors are intercorrelated and independently contributed making it difficult to clearly delineate the relative contribution of any given factor (e.g. cognitive deficits in epilepsy occur regardless patients' age, type and duration of epilepsy or associated diseases).

2.4. The Pathophysiologic Mechanisms Underlying Cognitive Impairment in Epilepsy

The mechanism of cognitive impairment in epilepsy is complex. Negative effects on cognition may occur in presence or absence clinically manifest seizures, convulsive or nonconvulsive SE that occur during awakening or during sleep, and may occur due to focal or generalized EEG epileptic discharges without epileptic symptomatology [64]. Cognitive deficits associated with epilepsy and EEG epileptic discharges may be transient [79,80], persistent [81] or progressive [3,53].

a) The Mechanisms of Transient Epileptic Amnesia Associated with Ictal and Subictal Epileptic Activity

In transient epileptic amnesia, the main manifestation of seizures is recurrent episodes of amnesia. During manifest epilepsy and paroxysmal epileptic activity, transient disruption of cognitive processing is attributed to the following: a) the involvement of a neuronal circuitry in epileptic spiking rendering the same neurons unavailable for normal physiological processes, b) antidromic corticothalamic backfiring, that would collide and annihilate any incoming information through orthodromic thalamocortical pathways, and 3) prolonged membrane hyperpolarization following paroxysmal depolarization shift mediated by recurrent postsynaptic inhibitory mechanisms which electrophysiologically correspond to the after-coming slow wave [82,83]. Presence of slow EEG activity in the same regions showing abundant spike wave has been interpreted as reflecting increased cortical inhibition mediated by hypersynchronous GABAergic inhibitory postsynaptic potentials. This increment of cortical inhibition might temporarily alter normal physiological processing of cognitive disruptions [84]. High seizure frequency disrupts the first encoding state of the memory process and specifically disrupts attention,
concentration and working memory. However, in individual cognitive performance, even single seizures can generate long-term attentional slowing in the post-ictal period that exists for at least 24 hours. A single tonic-clonic generalized seizure may have a lasting negative effect on attention for about 30 days [71].

There may be an association between transient cognitive deficits and transient EEG epileptiform (generalized or focal) discharges that are not accompanied by obvious clinical events. This phenomenon is known as a state of transient cognitive impairment (TCI) [79]. It is found in about 50% of patients and regarded as subclinical or interictal [85]. These brief subclinical EEG paroxysms or TCI may cause deficits that usually pass unrecognized by standard memory tests, however, sensitive methods of observation as continuous psychological testing, commonly show brief episodes of impaired cognitive function during such discharges. TCI may adversely affect the patient's psychosocial functioning in daily life as educational skill, learning tasks, attention, behavior, sleep disruption and motor dysfunction [64]. TCI was first demonstrated during 3 cycles/second generalized spike-and-wave discharges [79]. Sirén et al. [86] found that the duration of generalized 3-Hz spike-wave discharges and clinical absence seizures was negatively correlated with performance on the visual memory tasks. TCI was also demonstrated in many cases of benign childhood epilepsy with centrotemporal spikes, a disorder once thought to have no adverse psychological effects [66]. TCI is not simple inattention. The effects of TCI are material and site specific, i.e. lateralized discharges are associated with deficits of functions mediated by the hemisphere in which the discharges occur (e.g. left-sided focal spiking frequently produces errors in verbal tasks, whereas right-sided discharges are often accompanied by impairment in handling nonverbal material). Conversely, specific tasks can activate or suppress focal discharges over the brain regions that mediate the cognitive activity in question. In patients with benign childhood epilepsy with centrotemporal spikes, deficits in IQ were found to be significantly correlated with the frequency of EEG spikes but not with the frequency of seizures [87]. Autistic features observed in some children with epilepsy have been suggested as a consequence of apparently subclinical spikes interfering with specific cerebral processes [88].

b) The Mechanisms of Cognitive Impairment Associated with Continuous Epileptic Activity during Sleep

Recently, the mechanism of cognitive impairment of some specific epileptic syndromes with continuous spikes and waves during sleep (CSWS)
has been explored [81]. Landau-Kleffner syndrome (LKS) and the syndrome of continuous spike-and-wave discharges during slow sleep (CSWS) represent a spectrum of epileptic conditions which share many common features including: 1) onset during childhood, 2) deterioration of cognitive functions that were normally acquired in the past, 3) continuous spike-and-wave discharges during slow wave sleep, 4) pharmacological reactivity, 5) regression of the neuropsychological symptoms when the EEG abnormalities improves (spontaneously or after drugs as corticosteroids) and 6) absence of obvious structural lesion detected by CT or MRI scan [89,90]. The cognitive deficits of children with CSWS are long-lasting, present during months or years, and complete recovery is unusual. The pathophysiology of cognitive deficits CSWS and LKF is complex and different from that described with TCI as some patients with CSWS or LKS may have a completely normal awake EEG while cognitive deficits are present in the awake state when interictal epileptiform discharges are rare or absent. Recently, positron emission tomography (PET) studies using [18F]-fluorodeoxyglucose (FDG) during acute and recovery phases of CSWS in a group of children with epilepsy, showed that increased glucose metabolism at the epileptic focus was associated with hypometabolism in distant connected areas and both hypermetabolism and hypometabolism resolved at the recovery phase of CSWS [91,92]. Altered effective connectivity between focal hypermetabolism (centro-parietal regions and right fusiform gyrus) and widespread hypometabolism (prefrontal and orbitofrontal cortices, temporal lobes, left parietal cortex, precuneus and cerebellum) was found at the acute phase of CSWS and markedly regressed at recovery whether spontaneously or with corticosteroids [92]. The parietofrontal altered connectivity observed in patients with hypermetabolism is interpreted as a phenomenon of remote inhibition of the frontal lobes induced by highly epileptogenic and hypermetabolic posterior cortex [91].

c) The Mechanisms of Progressive Cognitive Deterioration with Epilepsy

Many animal and human studies reported persistent and progressive cognitive decline and behavioral impairment in developing and mature brains with epilepsy [53]. In TLE, a specific stereotypical pattern of pathology occurs in the hippocampus, amygdale, entorhinal region, piriform cortex and mediodorsal thalamus, areas primarily involved in memory processing. In complex partial and generalized epilepsy, a characteristic pattern of hippocampal sclerosis occur [32] Loss of neural density in the left mesial temporal regions (i.e. CA3 of the hippocampus) and right hippocampal structures can explain the verbal and non-verbal memory impairments in patients with epilepsy [35].
Recent research data indicate that in TLE epilepsy, the loss of hilar cells of the dentate gyrus may be the underlying cause for the lowered seizure threshold [93], whereas damage to hippocampal principal cells is often associated with memory impairment in animals [94] and humans [95]. Electrophysiological studies of the rodent hippocampus show that repeated seizure activity has a profound, deleterious effect on an important form of synaptic plasticity (LTP) which has been suggested to underlie memory formation. Long-term synaptic plasticity (e.g. long-term potentiation or LTP and long-term depression or LTD) is thought to be an important cellular mechanism for learning and memory [96]. Long-term potentiation (LTP) is defined as a persistent increase in the efficacy of synaptic connections induced by high frequency stimulation, while in long-term depression, a transient decrease in synaptic strength caused by repetitive stimulation of the presynaptic neuron. Most experimental and human studies of long-term synaptic plasticity have focused on the hippocampus, a structure related to learning and memory [18]. The induction of LTP and LTD requires the appropriate integration of GABAergic inhibitory and glutaminergic excitatory transmission [97]. Human neuropsychological studies indicate that hippocampal NMDA receptors are necessary for mediating repetition/recognition effects of limbic event-related potentials to continuous word recognition paradigms as well as for intact verbal memory performance [98]. In LTP, a train of postsynaptic potential (PSP) continues to come in, due to the high frequency stimulation, the NMDA receptor’s channel is kept open causing Na⁺, K⁺ and Ca²⁺ flow in through this channel and the Mg²⁺ blockade is relieved. Ca²⁺ inside the postsynaptic neuron triggers Ca²⁺ dependent kinases (protein kinase C and Ca²⁺/calmodulin kinase II) that induce LTP. This mechanism plays also an important role in memory formation and in epileptogenesis. In LTD, the slow process of building of the synaptic vesicle causes decrease in the neurotransmitter release and decrease in post-synaptic potentiation [99]. Repeated seizure activity has been found to incrementally cause an indiscriminate and widespread induction of LTP, consuming and reducing overall hippocampal plasticity available for information processing [100].
3. cogNITIVE STATES WITH ANTIETEPILEPTIC MEDICATIONS

3.1. The Differential Effect of AEDs on Cognition

Differential effects on cognition are seen with various AEDs. Carbamazepine (CBZ) [101,102], phenytoin (PHT) [103] and valproate (VPA) [104] can adversely affect cognition to a similar extent and appear to be less than that of barbiturates (PB) and benzodiazepines (BZ) [105,106]. The limited studies done to detect the effect of new AEDs on cognition revealed that topiramate (TPM) reported to have the worst effect on cognition [107] and zonisamide (ZNS) has mild adverse effect on cognition [108] while gabapentin (GBP) [8,109,110], lamotrigine (LTG) [111-113], tiagabine (TGB) [114,115], vigabatrin (VGB) [116,117] and levetiracetam (LEV) [118,119] have no adverse effect on cognition. However, even their modest effects can be clinically significant and impact the patient’s quality of life. Increased doses of AEDs, rapid initiation and polytherapy entail an increased risk. In general, the cognitive effects of AEDs are less than the sum total of other factors and are usually reversible. Conversion of polytherapy to monotherapy may consequently improve cognitive functioning [120].

Phenobarbital (PB) and Benzodiazepine (BZ)

Animal and human studies confirmed the deleterious effect of PB and BZ on cognition compared to other conventional and new AEDs. The offsprings of pregnant mice treated with PB demonstrated more hyperactivity, less rapid habituation, impaired performance in operant behavior, impaired performance in repeated acquisition task and a conditioned avoidance task compared to control offsprings [37,121]. Adult rats exposed to PB demonstrated deficits in hippocampal 8-arm maze, spontaneous alternations, and water maze performance [122]. In the largest prospective study done by Shapiro et al. [105] on a large number of children exposed to PB monotherapy in-utero (the number of children exposed to PB with mothers of epilepsy was 35 while 4705 of exposed children had mothers without epilepsy) demonstrated that the latter group did not differ from control children with respect to IQ measured at 4 years of age. The study done by Reinisch et al. [106] on 114 male offspring demonstrated that the effect of PB exposure occurred if maternal treatment lasted for at least 10 days during pregnancy. The authors reported reduced verbal IQ scores (~7 IQ points) in two cohorts of men exposed in-utero. PB
and BZ are known to impair cognition in healthy volunteers and patients with epilepsy [9]. Children on PB demonstrated low IQ that was improved with discontinuation of PB [123]. In the study of Farwell et al. [123], the long-term cognitive effects of early postnatal PB exposure was investigated in a randomized, placebo-controlled, blinded study with 217 toddler-aged children having febrile seizures, in which they were randomized to receive either PB (4–5 mg/kg/day) or placebo. Children were examined at age 7, several years after discontinuation of PB, 64% of these children were examined with the Wide Range Achievement Test (WRAT-R) and the Stanford–Binet Intelligence Scale. Compared with the placebo group, PB exposed children were found to have significantly impaired performance in WRAT-R reading scores, but not in the Stanford–Binet Scale. Sulzbacher et al. [124] demonstrated that the deleterious effect of long-term use of PB remained several years after drug discontinuation when children were tested for cognition 3-5 years later. This suggests there is persistent complex effect of PB on developmental maturation in addition to interfering with acquired cognitive function.

**Phenytoin (PHT)**

PHT has shown mild adverse effect on cognition [125,126]. Limited animal studies revealed that PHT resulted in reduced brain weight, impaired startle responses, hyperactivity, alter neuronal membranes in the hippocampus, delay neurodevelopment and impair special memory and motor coordination when given to rats' mothers during pregnancy. The AED-induced dysfunction in rats is related to both the dose and the duration of PHT exposure [127,128]. Shapiro et al. [105] reported reduced IQ results (five points lower than that of control children of mothers without epilepsy) in a cohort on cognition and PHT. To some extent, cerebellar atrophy a known association with chronic exposure or toxicity from PHT may be responsible for cognitive impairment in patients with epilepsy. It has been found that MRI cerebellar volumetric change is proportionately correlated with the chronic exposure or toxicity from PHT [49] Purkinje cells of molecular layer were found to show selective vulnerability to both the excitotoxic and/or toxic PHT models of cerebellar atrophy [32].

**Carbamazepine (CBZ) and Oxcarbazepine (OXC)**

CBZ utilization may be associated with mild cognitive dysfunction including excessive sedation, compromise in attention, concentration, visual motor coordination and psychomotor slowing [129]. Small risk in learning and
memory has been registered especially with high serum concentrations of the drug. Some children are at high risk for developing cognitive side effects due to CBZ [101]. EEG slowing associated with CBZ might be significantly related to the magnitude of cognitive decline on later IQ subset performance [102]. OXC is an analogue of CBZ, with a comparable anticonvulsant efficacy but has better cognitive profile compared to CBZ. It has both neuropsychological impairment and EEG slowing in healthy volunteers but of less magnitude compared to CBZ [130,131].

**Valproate (VPA)**

Behavioral studies demonstrated that prenatal VPA exposure decreases locomotor activity and increases swimming maze errors in rats tested by the 8-arm radial maze and passive avoidance test [132]. Studies revealed that children exposed to VPA in-utero had learning difficulties, behavioral problems, increased need for special education [133]. In one large prospective study, increased memory deficits, reduced verbal IQ by 8-15 points and excess of additional needs were reported in children exposed to VPA prenatally [134]. Studies in healthy volunteers revealed that VPA may produce a modest but statistically significant cognitive disruption [9].

**Topiramate (TPM)**

TPM receives greatest concern among the new AEDs due to its documented worst cognitive profile. Its cognitive adverse events are reported in 10-20% [135,136]. The symptoms of cognitive deficits associated with TPM include: concentration/attention difficulty, confusion, abnormal thinking, slow thoughts, dull thinking, mental slowing, blunted mental reactions, word finding difficulties, calculation difficulties and memory impairment. The greatest changes were found in verbal IQ, verbal fluency, verbal learning and digit span [107]. Martin et al. [8] observed that among healthy young adults, the negative effects of TPM on measures of attention, word fluency, verbal memory and psychomotor speed, were greater than those with LTG and GBP when tested 3 hours after large initial doses and its effect persisted for 2- and 4-weeks intervals. Leonard et al. [137] found that motor tasks were affected with TPM as observed by bimanual sequential tapping. This is one of the motor measures that require the most cognitive processing, as patients must tap in a different specific sequential order with the two hands simultaneously. The task involves attention, perception and the capacity to monitor and coordinate out-of-phase movement. Functional MRI and cognitive testing revealed disruption of information processing in prefrontal cortex and more
heterogeneous patterns of cortical activation with TPM [138]. Lee et al. [139] observed improvement in both verbal and non-verbal fluency scores by ≥70% after TPM discontinuation. Kockelmann et al. [140] and Huppertz et al. [141] reported significant improvement in performance on tests of verbal fluency, verbal working memory, spatial short-term memory and attentional functions after withdrawal of TPM. Whether TPM side effects are dose-dependent and if they critically depend on the speed of drug titration, are matters of debate [140]. It has been suggested that low starting dose, slow upward drug titration and reduction of polytherapy will control seizures as well as produce tolerance to the drug with minimal cognitive side effects [107,120,139]. In the longitudinal study done by Thompson et al. [107], the authors demonstrated deterioration in verbal IQ, verbal fluency and verbal learning following introduction of higher doses of TPM (150-600mg/d) as adjunctive therapy in patients with epilepsy with improvement in verbal fluency, verbal learning, and digit span occurred when TPM was reduced or withdrawn. Reife et al. [136] observed psychomotor slowing with lower dosage (200mg/day) of TPM and language disturbances in higher doses.

In contrast, recent animal studies have suggested some neuroprotective effects for TPM on cognition. Zhao and colleagues [142] administered TPM or saline during and following series of seizures in 25 neonatal rats. After completion of the TPM treatment, rats treated with TPM performed better in the water maze than rats treated with saline. Koh et al. [143] used a “two-hit” rodent seizure model to study the therapeutic efficacy of a postseizure treatment with TPM in reversing the perinatal hypoxia on later Kainite seizure-induced neuronal damage. The authors observed that repeated administration of TPM given for 48 hours after hypoxia-induced seizures prevented the increased hippocampal neuronal injury induced by Kainite.

**Zonisamide (ZNS)**

Studies on the effect of ZNS were limited and controversial. Weatherly et al. [144] reported little cognitive decline in some patients with epilepsy on ZNS as add-on therapy. Recently, Park et al. [108] in a prospective randomized and open-labelled study, observed that after one year of starting treatment with ZNS (received as monotherapy in a dose of 100, 200, 300, and 400mg/day), although ZNS decreased seizure frequency and EEG abnormalities, however, mood changes and cognitive deficits were observed in 15% and 47% of patients and were dose related. Cognitive performance was worse on delayed word recall, Trail Making Test Part B and verbal fluency.
3.2. The Known and Hypothesized Mechanisms of Cognitive Impairment with AEDs

In general, the mechanisms of AEDs are to reduce neuronal irritability and increase postsynaptic inhibition or alter synchronization of neural networks to decrease excessive neuronal excitability associated with seizure development and secondary spread of epileptic activity to the surrounding normal brain. AEDs modulate brain activity through their action on voltage dependent ion channels [sodium or Na\(^{++}\) and low threshold (T-type) calcium or Ca\(^{++}\) channels], inhibitory [GABA] and excitatory neurotransmitters and their receptors [145]. However, slowed motor and psychomotor speeds, poor attention and memory processing are common side effects of sodium channel blockade [146,147], increasing GABAergic inhibitory activity and decreasing neuronal excitability [148].

Sodium channel blockade decreases the release of neurotransmitters including excitatory neurotransmitters and contravenes depolarization by interfering with propagation of action potentials i.e. limitation of sustained repetitive firing and stabilizing neuronal membranes [146]. In hippocampal neurons, intracellular increased Na\(^{+}\) increases the probability to open NMDA receptors and thus might control excitatory synaptic transmission [147]. The cognitive side effects of some AEDs have been attributed to their Na\(^{+}\) channels blockade activity including: PHT, CBZ and OXC and VPA [146,148].

Increasing GABAergic brain activity by AEDs results in re-establishment of the background level of inhibition and helping the return of the nervous system to its normal balance between excitation and inhibition. Drugs that increase the extracellular levels of brain GABA or mimic GABA transmission are widely used in the treatment of epilepsy in children and adults including PB, BZ, VPA, GBP, TPM, ZNS and VGB [145,148]. In general, the mechanisms of enhancing GABA-mediated inhibition are: 1) Direct modulation of GABAergic neurotransmission induced by allosteric modulation of GABA receptors through direct binding to the receptors and changing its shape or configuration, hence increasing GABAergic inhibitory neurotransmission and inhibitory postsynaptic potential. PB directly binds to GABA\(_A\)/benzodiazepine receptor complexes (GBRs) while BZ has a unique receptor site on GABA/Cl\(^-\) channel complex and are potent GABA agonists, and 2) Indirect modulation of GABAergic neurotransmission through enhancing synthesis and/or decreasing reuptake of GABA.

Drugs that mediate indirect modulation of GABAergic neurotransmission include: VPA, GBP, VGB, TGB, TPM, ZNS. VPA do not directly interact...
with GABA receptors, but they increase brain levels of GABA, possibly by enhancing glutamate decarboxylase or inhibiting GABA transaminase [149]. GBP is a structural analogue of the inhibitory neurotransmitter GABA. Nuclear Magnetic Resonance (NMR) Spectroscopy indicates that GBP enhances the levels of GABA in the brain and decreases brain glutamate concentration. Its actions include modulation of GABA synthesizing enzyme, glutamic acid decarboxylase (GAD) and glutamate synthesizing enzyme, branched-chain amino acid transaminase [150]. VGB is an AED that elevates brain GABA several-fold by irreversibly inhibiting the GABA-metabolizing enzyme, GABA-transaminase [151]. TGB is selective GABA reuptake inhibitor. It induces its effect by increasing synaptic GABA availability via selective inhibition of the GAT-1 GABA transporter [152]. TPM rapidly raises brain GABA [153]. Mental slowing, memory impairment, inattention and language dysfunction are suggested to be due to increasing GABAergic activity in the prefrontal cortex caused by TPM [138].

Drugs that directly increase GABAergic inhibitory neurotransmission and inhibitory postsynaptic potential as PB and BZ produce significant disruption of short-term memory and attention [37]. Indirect modulation of GABA neurotransmissions have modest (e.g. VPA) or even little effect on cognition than direct GABA modulation, i.e. GBP, VGB, TGB and LEV have good neuropsychological profile or little or negligible effect on cognition.

Decrement in glutamate-mediated excitation as by antagonizing the response mediated by NMDA or AMPA/KA subtype of glutamate receptors are believed to underlie the mechanism of some AEDs as TPM [154]. Slowed motor and psychomotor speeds, poor attention and memory processing are adverse effects of reduced neuronal excitability as well as increasing GABAergic inhibitory activity on the brain.

Some AEDs can cause cognitive deficits through multiple mechanisms. For example: VPA modest effect on cognition has been attributed to 1) indirect modulation of GABA neurotransmissions, 2) An enhancement of GABAA receptor-mediated hyperpolarizing responses caused by VPA will inhibit the activation of NMDA receptors in a dose-related manner [155-157]. It suppressive effect on synaptic response mediated by NMDA receptors may contribute to the impairment of LTP and LTD caused by VPA [158]. Lee et al. [139] reported that VPA suppresses the expression of LTP in the CA1 region of the hippocampal slices. Gean et al. [158] reported that in rat amygdaloid slices, VPA suppresses response mediated by NMDA receptors in dose related manner, and 3) VPA reduces repetitive neuronal firing via blockade of voltage-dependant sodium (Na⁺) channels [149].
Several mechanism(s) has been suggested to explain the adverse effect of TPM on cognition. TPM increases cortical GABA notably in the frontal lobes. GABAergic dysfunction in the prefrontal cortex could lead to mental slowing and subsequent spread of this dysfunction to the dorsolateral areas including Broca’s area, could underlie impairments of language production with TPM [135]. Clinical studies demonstrated that TPM adverse effects on cognition including impaired concentration and memory, slowed thinking, and word finding difficulties have been attributed to its inhibitory effect on carbonic anhydrase isoenzymes II and IV, causing increased magnesium-dependent tonic inhibition of NMDA receptors and apoptosis [159]. TPM also has negative modulatory effect on the AMPA/KA subtype of glutamate receptors [153,154]. In addition, TPM blocks Na⁺ channels [160].

No studies were done to explore the mechanisms of cognitive deficits observed with Zonisamide (ZNS), however one can speculate that its blockage effect on voltage-sensitive Na⁺ channels and modulatory effect on GABA-mediated neurotransmission inhibition may explain the cognitive impairment elicited by ZNS [147].

3.3. Mechanisms of the Beneficial Effect of AEDs on Cognition

Some AEDs are able to improve cognition through mechanisms other than their anticonvulsant effect. In general, the beneficial effects of AEDs on cognition are due to: 1) reduction of seizure activity, 2) modulating effect on neurotransmitters, lowering excitotoxicity associated with a reduction in glutamate release from presynaptic terminals and by preventing anoxic depolarization capacities, 3) inhibition calcium-mediated cellular functions (protein phosphorylation and neurotransmitter release) and calcium-dependent depolarization 4) scavenging of free radicals, and 5) their psychotrophic effect.

Several studies provide information about the beneficial effect of PHT on cognition. In support: 1) PHT was reported to prevent stress and corticosterone-induced reductions in CA3 apical dendritic length and branch point numbers [161], 2) PHT may reverse stress-induced impairment of spatial learning and hippocampal atrophy [162], 3) PHT could keep LTP, an important component of memory, from being inhibited by stress [163], 4) In vivo, PHT decreased the dimension of cerebral infarct in animals with bilateral or unilateral carotid occlusion [164], and 5) Recently, PHT was found to be associated with increased hippocampal volume in patients with post-traumatic stress disorder (PTSD) assessed by MRI and this was associated with
improvement in hippocampal-based verbal declarative memory function [165]. PHT has effect on glutamatergic function which affects brain structure. PHT arrests calcium-mediated cellular functions and calcium-dependent depolarization, both associated with neuronal death. It blocks cellular responses to excitatory amino acids. PHT antagonizes glutamate-induced excitation of cerebrocortical neurons and blocks the effect of glutamate at NMDA receptors [163,165,166].

Several studies demonstrated that CBZ does not compromise and even improves the learning performance of non-epileptic animals in different learning and memory tasks [167,168]. Rostock et al. [168] reported that administration of low doses of CBZ was able to reverse amnesia induced by electroconvulsive shock as well as to improve learning during an active avoidance test treated with repeated doses with ethanol. CBZ affords significant protection against glutamate neurotoxicity in hippocampal cell cultures and reduces NMDA-mediated brain injury. It inhibits KA-induced $\text{Ca}^{++}$ ion elevation [169]. Ambrosio et al. [169] suggested that at concentrations that do not cause toxicity, CBZ has a neuroprotective effect on KA-induced toxicity in hippocampal neurons which is essentially mediated by the activation of AMPA receptors. CBZ increases brain acetylcholine level in the hippocampal structure and simultaneously reduces choline level. The role of cholinergic function in memory and related cognitive processes is well known. Deterioration of cholinergic neurons in the medial septal nucleus that project to the hippocampus, amygdala and cortex (e.g. critical memory areas) was demonstrated in rat models of epilepsy [170]. In support: acetylcholine esterase inhibitors are shown to improve memory functioning in diverse neurological conditions [171]. The hippocampus, a cerebral structure highly involved in learning and memory, is a target for abundant cholinergic innervation and hippocampal nicotinic acetylcholine receptors that modulate synaptic plasticity via mechanisms involved in LTP [172]. The normothymic effect (effect on mood) of CBZ may be related to its impact on the neurotransmitter systems (GABA-ergic, serotonergic, noradrenergic or adenosine and additionally demonstrate G-protein or inositol phosphate modulating effects [173].

GBP may also promote an improved mood and sense of well-being independent of seizure reduction and hence improvement of cognitive functions [109]. Dimond et al. [174] demonstrated increases in ratings of quality of life and well-being when patients were switched to this drug. Harden et al. [109] demonstrated significant reduction in depressive scores on
a dysthymia rating scale in patients receiving GBP independent of seizure reduction.

Although, no studies were done to explore the mechanisms of beneficial effect of LTG on cognition, however, the neuroprotective effect of LTG may be attributed to lowering excitotoxicity mainly in the hilus and the CA3 subfield of the hippocampus as well as the piriform cortex [173,175].

Possible mechanisms underlying mechanisms by which LEV improves cognitive function and quality of life (QOL) remain unknown. LEV is postulated to inhibit seizure activity through a totally different mechanism. LEV seems to partially inhibit N-type high-voltage-activated Ca2+ currents and reduces the Ca2+ release from intraneuronal stores. It also reverses inhibition of GABA and glycine gated currents induced by negative allosteric modulators, and effects voltage gated potassium channel conductance. LEV also has a specific stereoselective binding site in the CNS at the synaptic vesicle protein 2A (SV2A) [176]. LEV can reduce neuronal necrosis and maintain LTP in the hippocampus [177], which may also contribute to its effects on cognition. Piracetam and its derivative LEV belong to the pyrrolidine class; drugs in this class can protect against brain insults and have low toxicity [178]. They might enhance the efficacy of higher integration mechanisms in the brain and improve mental function such as learning and memory, while protecting against seizures. Piracetam seems to improve learning, memory, and attention [179] and has been used to treat age-related cognitive disturbances and aphasia [180]. Hence it is reasonable to assume that LEV may also influence the metabolism of some frontal areas leading to improved cognitive function [118]. Zhou et al. [181] evaluated the effect of LEV as an add-on treatment, on cognitive function and QOL in patients with refractory partial seizures. Their study comprised two phases: a) a short-term phase (randomized, double-blind, placebo-controlled design) for 8-week baseline period, 4-week titration interval, and 12-week period at the maximum LEV dose (1500 mg twice daily), and b) a long-term phase (an open-label study) in which the maximum LEV dose was administered for another 24 weeks. After short-term LEV treatment, performance time on the Wisconsin Card Sorting Test (WCST) and Delayed Logic Memory were significantly improved for the patient but not the control group. Subscale scores on the QOLIE-31, including scores on cognitive functioning and social function, were also improved only with LEV group. At the end of the long-term phase, these improvements were maintained, and both groups performed better in more areas, as measured by the Trail Making Test, WCST, Delayed Visual Memory and the QOLIE-31 subscales.
ZNS decreases secretion of excitatory amino acids and reduces post anoxic depolarization as well as scavenges of free radicals including hydroxyl and nitric oxide radicals and these effects are contributed to its neuroprotective effect against cognitive impairment [182].

4. THE VULNERABILITY OF IMMATURE BRAINS TO THE COGNITIVE ADVERSE CONSEQUENCES OF EPILEPSY AND ITS MEDICATIONS

Normally, biological development and organization of the brain in human is very rapid in-utero and start to slow down in the second year of postnatal life [183]. Although gross organization is nearly complete by 2 or 3 years of age, maturation may continue through adolescence and beyond [184]. The period of infancy is characterized by peak hippocampal and cortical regional development, as well as myelogenesis, dendritogenesis, and synaptogenesis in the brain and changes in these processes underlie deficits in spatial learning and memory processes [185]. Many of the human studies on cognition and behavior have focused on infants, preschool, and school-age children. There is a developmental component to the relation between poor seizure control and mental performance. The presence of epilepsy and its treatment during a period of maximal white-matter growth could affect development of white matter.

4.1. The Vulnerability of Immature Brains to Seizures and Its Consequences

Systematic studies indicated that neuronal computation of immature brain is different from mature brain and the vulnerability of the brain to seizures and its consequences is age-specific. Compared to adult brains, experimental studies showed that immature brains are highly prone to develop seizures and SE, but are more resistant to seizure and SE induced damage. Even if epilepsy occurs, it may not be intractable to treatment. In the developing brain, NMDA receptor subunits create populations of receptors that flux more Ca++, open more easily and block less frequently than mature forms, making the immature brains more electrically excitable with increased susceptibility to develop SE compared to mature brains [186,187]. Previous and recent studies indicated
that structural, functional, and neuro-chemical changes occur after brief and prolonged seizures in immature brains. However, not all of them are necessarily detrimental to brain function and the immature brain appears to be resistant to seizure-induced neuronal damage and neurogenesis [188,189]. Little or no neuronal damage in animal models of kindling and SE was observed in animals younger than 3 weeks. Also, synaptic reorganization did not occur until after the third postnatal week. Repeated episodes of pilocarpine-induced SE during post-natal days 7–9 resulted in abnormal distribution of neocortical inter-neurons and reduction of natural apoptosis in rats at post-natal day 35 and there was no hippocampal damage [190]. Occasional hippocampal damage can be detected in rats from the second post-natal week onwards but the pattern was different from that in adult rats. The damage might not be related to the seizure itself but to stress associated with the seizure [191].

Studies examined the effects of electroconvulsive-induced seizures in rats at various developmental stages revealed that in early development, seizures selectively impaired myelin accumulation of proportion to their effect on brain growth [192]. In epileptic rats, examination of cerebroside and proteolipid protein, relatively specific myelin lipids, was found to be reduced by about 11-13% in immature rats [193]. Executive functions, mainly under frontal lobe control, seem to be particularly vulnerable to epileptic EEG activity during the period of maturation; their disruption possibly interferes with the normal development of learning processes [125]. Adults rats experiencing kainic acid-induced seizures on specific days during early postnatal development revealed the presence of a long-term loss of hippocampal plasticity as manifested by reduced capacity in LTP, which has been suggested to underlie memory formation, reduced susceptibility to kindling and impaired special learning [194].

The Proposed mechanisms for the relative resistance of immature hippocampus to repeated seizures and SE-induced damage has been attributed to the fact that in immature brain there are: 1) preservation of GABA synthesis which declines with maturation [195], 2) increased expression of GABAA receptor-1 subunit in contrast to adults [196], 3) presence of mitochondrial uncoupling protein [197], 4) absence of mitochondrial oxidative stress [198], 5) absence of glia activation and cytokine production [199], 6) absence of GluR2 down-regulation or even up-regulation of GluR2 and down-regulation of GluR3 receptor subunits [200], and 7) presence of higher expression of growth factors and neurotrophins (as BDNF) [201].
4.2. The Vulnerability of Immature Brain to the Cognitive Adverse Consequences of AED

The effects of in-utero exposure to AEDs are increasingly being investigated and differential drug risk is considered for both anatomic and cognitive outcomes. Although information on the role of fetal and postnatal exposure to AEDs is limited in humans, there is a growing body of information from animals suggesting that AEDs may have substantial effects on brain development. The pathophysiologic mechanisms responsible for these deficits remain largely unknown, however, there is evidence that AEDs can adversely affect neuronal proliferation and migration and increase apoptosis [202-206].

Normally, neuroblast migration is influenced by crucially promoting signals (motility, acceleratory and stop signals) from GABA and glutamate neurotransmitters that act on several receptors subtypes (GABA$_A$, GABA$_B$ and NMDA). Neuronal migration may be influenced not only by genetic alterations but also by drug intake. GABA$_A$ agonists are frequently used in mothers with epilepsy or their offspring as sedatives and anticonvulsants. Neuronal migration can adversely be affected by AEDs [206]. Manent and colleagues [206] reported occurrence of hippocampal and cortical dysplasias in rat pups exposed to VGB and VPA in-utero. The authors found that prenatal exposure to VGB (200 mg/kg/day), and VPA (100 mg/kg/day) from embryonic days 14 to 19 (in doses which are similar to those used clinically) resulted in neuronal migration defect and neuronal death observed postnatally in the form of hippocampal and cortical dysplasias. These effects were not found with CBZ (20 mg/kg/day).

There may be a relationship between AED-induced apoptosis and cognitive function. Recent discovery of neuronal apoptosis following in-utero AED exposure in animals during a period that corresponds to the third trimester and early infancy in humans raises further concerns. Utilization of PB to rat pups results in significant decreases in brain weight and DNA, RNA, protein, and cholesterol concentrations and reduced neuronal number [202,207]. Chronic exposure of cultured mouse spinal cord neurons to PB leads to reduced cell survival and decreased length and number of dendrite branches. Brain concentrations of dopamine and norepinephrine were reduced and the uptake of dopamine, norepinephrine, serotonin, and GABA into synaptosomal preparations of brain tissue was greater for offspring of pregnant mice treated with PB [203]. Studies demonstrate that PHT, PB, BZ, VGB and VPA cause wide spread apoptotic neurodegeneration in the developing rat brain.
brain at plasma concentrations relevant for seizure control in humans. In these studies, the drugs were administered to the fetus or rat pup during a period of intense synaptogenesis [204,205]. Jevtovic-Todorovic and colleagues [208] observed widespread apoptotic neurodegeneration and impaired long-term potentiation in hippocampal slices obtained from 7-day-old infant rats 3 weeks administered midazolam, nitrous oxide, and isoflurane. Persistent deficits in memory and learning were demonstrated when the rats were tested subsequently during the Morris water maze or the radial arm maze. In contrast, similar apoptotic effects were not seen at therapeutic dosages for CBZ, LEV, LTG, or TPM in monotherapy dosages [209-211]. However, preliminary results suggest that CBZ, LTG, and TPM, but not LEV, may potentiate cell death when given in combination with pro-apoptotic agents such as other AEDs.

The apoptotic effect of some AEDs appears to result from reduced neurotrophins and protein kinases, which are important for neuronal survival. Postnatal VPA exposure suppresses the synthesis of the neurotrophins, BDNF and neurotrophin-3 (NT-3) and reduces the levels of survival-promoting proteins in the brain, which reflected an imbalance between neuroprotective and neurodestructive mechanisms in the brain [204]. Lee et al. [212] found that VPA suppressed protein kinase C (PKC) activity in both membrane and cytosol compartments in hippocampal slices. PKC is highly enriched in the brain and plays a major role in regulating both pre- and postsynaptic aspects of neurotransmission, including neuronal excitability, neurotransmitter release, and long-term alterations in gene expression and plasticity. PKC is critical for the induction of LTP and LTD [213]. There is also evidence from lab studies that blockage of NMDA receptors can increase neuronal apoptosis resulting in chronic behavioral, structural and molecular effects. Harris et al. [214] studied the long-term consequences of NK-801 (0.5 mg/kg), NMDA antagonist, in a group rats treated postnatally day 7. The authors observed reduced volume and neuronal number within the hippocampus and altered hippocampal NMDA receptor (NR1 subunit). The same treated adult rats with MK-801 developed prepulse inhibition deficits and increased locomotor activity. The same mechanism for neuronal apoptosis can be applied for AEDs that cause decrement in glutamate-mediated excitation by antagonizing the response mediated by NMDA or AMPA/KA subtype of glutamate receptors.
5. CLINICAL AND RESEARCH IMPLICATIONS

a) The Nature, Timing and Course of Cognitive Progression with Epilepsy Are of Considerable Concern as Follow

It has been suggested that the first year of life is a critical period for the subsequent development of intellectual abilities. Development of epilepsy in the first year of life is associated with high incidence of intellectual impairment (82.4%) [34]. This highlights early identification and proper evaluation. Neurocognitive deficits may be subtle. Children born to mothers may have subtle deficits that may not be identified for years following delivery. Some learning deficits may not be apparent until the teenage years. Subtle neurocognitive deficits may induce long-term consequences and significantly reduce the child’s likelihood of achieving success in school and eventually reduce employment opportunities. Even static cognitive impairment in children and adolescents with epilepsy may have lifespan implications. Research in general population has shown that lower childhood intelligence level at age 11 is associated with the risk of adverse cognitive outcome decades later [215]. Also it is important to note that children born to mothers with epilepsy who appear to be functioning within the normal range may have disorders higher cortical function (as memory, attention, speech and language, abstract thinking, and executive control) that are not manifest themselves until the child reaches grade school. Thus relying solely on IQ is insensitive for assessing cognition. Careful sensitive neuropsychological tests that require appropriate professional input may reveal specific impairments [214]. Hence, comprehensive pretreatment evaluation and judicious management of all factors that contribute to cognition, behavior and educational problems in epilepsy, are essential for optimal outcome. For old individuals with chronic epilepsy, additional risk factors that are associated with abnormal cognition in which many of these risk factors present as early as midlife. It is important to systematically identify and treat known modifiable risk factors in order to protect and promote cognition in older persons with chronic epilepsy [216].

b) Optimized Therapeutic Modalities

AEDs are the major therapeutic modality for control of seizures. Provided that treatment decision may have lifelong implications, the neurologists should
be aware that the lack of cognitive side effects related to an AED should be relevant for their treatment decisions. For example, CBZ and LTG have been widely advocated for the treatment of women with epilepsy during pregnancy. Women on VPA should be discussed for gradual withdrawal of VPA and switch to one of the known safe AEDs during pregnancy. If there is no optimal seizure control with the alternative drugs, then alternative combination of low dose VPA with the additional drug might be acceptable. Also AEDs Levels should be monitored at least each trimester and for 2-3 months following delivery. Pharmacokinetic changes demand monitoring of free levels of highly protein bound AEDs to avoid confusion with increased seizures (or symptoms of toxicity) despite therapeutic total serum drug levels. If dose is increased during pregnancy, medication dose tapering should be anticipated in the postpartum period to avoid medication toxicity.

The argument stated that "the optimal treatment for epilepsy is not only to control seizures but also to reduce the risk or consequences of cognitive impair-ents and behavioral abnormalities as much as possible", also has to be made for decisions about epilepsy surgery. Preliminary findings indicate that postsurgical training improves memory deficits and encourage further research. Epilepsy surgery is an option for patients intractable for medical treatment with focal seizures that arise from noneloquent brain regions. Because the epileptogenic tissue that is resected is dysfunctional, seizures are reduced and the use of AEDs is reduced, the risk of significant cognitive decline is generally reduced. However, the risks of functional impairment due to tissue ablation need to be weighted carefully against the benefits of surgery on seizure control and overall functional state. Damage of functional tissue, low mental reserve capacity, and poor seizure outcome increase the risk for postsurgical memory impairment whereas functional release due to seizure freedom counteracts negative impact. Patients older than 40 years may be at increased risk of memory impairment postoperatively. Risk for verbal memory decline occurs with left anterior temporal lobectomy (ATL) while visuospatial memory impairment occurs with right ATL [217].

Furthermore, multidisciplinary management strategies in epilepsy have also to address the psychosocial variables: Proper neuropsychological assessment of the child will help the school personnel for planning the academic strategies. Strategies such as social skills training, educational, speech and language interventions, and psychopharmacotherapy are necessary. It is important to indicate epilepsy-specific optimistic orientation and the potential activities for overcoming stigma and increasing education and awareness related to epilepsy in community-based research studies [218,219].
c) Proper Assessment of the Neuropsychological Profile of the Available AEDs

Most neuropsychological drug effects have been incompletely described. A recent American Academy of Neurology (AAN) and Child Neurology Society (CNS) practice guidelines stated that behavioral and cognitive side effects need to be better evaluated especially for new AEDs and individual risks as well as group differences assessed on tests of cognition [220]. Further investigations of mediating factors such as serum concentrations, co-medication, and other potential risk factors are needed to enable appropriate targeting of treatment with the effective AED.

d) The Need to Design Studies That Address the Developmental Issues in Epilepsy Management

Experimental studies indicate that the immature brain responds differently to treatment than does the mature brain. Because AEDs have various adverse effects, which may interfere with normal developmental processes and affect cognitive functions, physicians must weigh up the adverse effects of more aggressive treatments with the benefits of complete seizure control. For example, it is known that glutamate plays key roles in successive steps of brain development. Interfering of glutamate receptors (as by NMDA blockers) may result in deleterious consequences in the developing brain [221], while antagonism of non-NMDA receptors (e.g., AMPA/KA) sites had shown neuroprotective and antiepileptogenic effect in immature as well as mature brains [143,222-224]. Furthermore, some AEDs which seem to be neutral in mature brains have shown neurotoxic effect and can exacerbate neuronal damage in some paradigms in immature brains (as VPA, PB, BZP and TGB) [205]. Large cohort and controlled prospective studies are necessary and should include a sufficient number of women and children exposed to newer AEDs. This demands provision of adequate information and counseling about drug treatment during childbearing years through epilepsy services programs. In addition, the basic mechanisms underlying AED-induced cognitive/behavioral teratogenesis need to be delineated through prospective clinical studies.
Demonstrations in animals that AEDs can induce neuronal apoptosis in developing brains raise concern that similar adverse effects may occur in children exposed in-utero or in the neonatal period.

e) The Need for Clear Definitions of the Clinical Paradigm and Adequate Outcome Measures

Assigning cause or effect, or detecting positive therapeutic impact in ‘complex systems’ of neural circuitry is critical because the aims are not necessarily equivalent. For example, it is difficult to conclude that administration of AEDs during the acute or latency phase would have an effect on the molecular cascades underlying epileptogenesis or predict the risk for later adverse consequences on cognition or behavior. Thus, it is necessary to design specific, sensitive, long-term outcome measures to assess cognition in epilepsy.

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INTRODUCTION

Performance, coping and anxiety are critical ingredients for the consultant in working with athletes at all levels. Consultation in sport requires competency and specificity. The greater the specificity of the service in terms of offering information and training that will assure athletes can adapt to both the known and unknown factors that will operate to pose threats to their career should be the primary goal (Miller, Ogilvie, Branch, 2008). In consultation with agents or coaches, appealing to individual athletes who could benefit from any aspect of sports consultation requires each having an empirical basis to the consultation services. New recruits whether to a college or pro team will
confront a number of issues within the purview of the sports consultant when signing a contract. As a consultant, it is essential to emphasize to agents and others within college or professional organizations why it is imperative that an extensive psychometric study be utilized for the benefit of both athlete and coaching staff. Individual assessment helps to diagnose potential problems and will be instructive for the organization in understanding enhancing the individual’s probability of making and completing effectively in the athletic arena.

**COMPETITIVE STATE ANXIETY**

Anxiety is a fundamental experience of life and in competitive sport it provides a significant role for the athlete, the coach and the sports psychologist (Miller, Kraus, Adams, Bilyeu, Ogilvie 1999; Miller, Ogilvie, Branch 2008). State anxiety was widely believed to be correlated with performance and arousal and was viewed as an uncomplicated Inverted-U (Yerkes and Dodson, 1908). This suggested that an athlete’s performance, that is the athletes best performance could be achieved with an average level of arousal. Furthermore, if the level of arousal were too low (or too high) poor performance would ensue. The Multidimensional Theory of Anxiety (Martens et al., 1990), and the Catastrophe Model (Hardy and Fazey, 1987), are the two prominent theories that have emerged in the study of this phenomenon. Competitive state-anxiety usually follows a pattern of subjective feelings of tension and inadequacy, combined with heightened arousal of the autonomic nervous system, (Hackfort and Schwenkmezger, 1989). The intensity and duration of the anxiety alternates according to; the amount of stressful stimuli the athlete encounters, and the period of subjective threat created by the stimuli (Hackfort and Schwenkmezger, 1989).

In the last decade of the twentieth century, Hardy and Parfitt, (1991) argued that when individuals are cognitively anxious, they continue in their attempts to deal with the demands of the task. Noteworthy is the fact that the amount of physiological arousal the athlete experiences could interfere with their performance, either by distraction, reducing their capacity to process cognitive information, or by causing them to consciously divert cognitive resources to maintaining effort, rather than to their performance in competitive sport. In the first decade of the twenty-first century, our understanding of this phenomenon is still best explained by Hardy and Fazey's (1988) “catastrophe model.”
Furthermore, it should also be noted that the majority of the research has been conducted by the same small number of sport scientists, thus limiting the evidence base of the research required to strengthen the model’s position as a solution to the competitive anxiety phenomenon.

**Career Development as a Developmental Process**

Preparing an athlete for an athletic career must be viewed as a “developmental process” (Ogilvie and Tutko 1996; Miller, 1996; Miller, Vaughn and Miller, 1990). This process requires at least three areas of concentration: First, an extensive examination of the personality the athlete brings to sport and competition. Second, the learning style of the athlete and how unique characteristic plays out in every aspect of their sport relevant behavior. Third a need for a summary report offering a practical program that transmits how best the coaching staff can enable the individual athlete to realize athletic ability and maximize skill and competitive potential, this their competitive style. Figure 1 summarizes the critical ingredients in preparing the athlete for effective performance, adequate coping with competitive sports and the anxiety often experienced in the game.

![Figure 1. Developmental Process and Clinical Assessment Factors for Athletes.](image-url)
COMPONENTS OF PERFORMANCE

In the sport environment, those who have invested in the talent will have little patience with moderate or mediocre practices or game performance. This will carry over to fan and community expectations. How then should athletes be trained to adapt to the expectations in the sport environment? The Learning Styles Profile (LSP) (Ogilvie, 1997) is composed of four separate factors grouped into the following configuration (TriModal Learning, Learning Preferences, Teachability, and Optimal Learning), with three independent categories (Cognitive Learning, Feedback Preference and Outcome/Process). These four factors are defined as follows:

Tri-Model Learning

This factor is composed of three categories: Visual Learning, Kinesthetic Learning and Trial and Experience, three modes or ways of learning athletic skills, from Limited Use (low scores) to Seeing, Feeling and Trying different ways of experiencing a skill while learning how to do it or do it better (high scores).

Learning Preferences

This factor is composed of the categories of Amount of Information, Rate of Change and Caution/Risking, which reflect the athlete’s preference for either less information, slower changes or a more conservative approach (low scores) to liking more information, faster changes and taking risks necessary to learn (high scores).

Teachability

This factor is composed of Willingness to Change, Interpersonal Control, Facilitation for Change and Ability to Trust, from needing proof, wanting control, with an independent, guarded and reluctant approach (low scores) to a more open-minded, easy-going style, able to seek help and invest trust in a coach/teacher and hence being ready to learn (high scores).
Optimal Learning

This factor is composed of Skill Rating, Learning Comfort, Ability to Change, Efforting Level, Frustration Tolerance, Commitment to Change and Compliance, from being dissatisfied with one’s skills, nervous while learning, have difficulty making changes, trying too hard, frustrated, uncommitted or not having good practice habits and needing guidance to change otherwise restricted learning (low scores) to being interested in improving, able to be relaxed while learning, adept at making necessary changes with a casual and patient approach, able to stick with skill changes and practice them well until effective (high scores).

Determination

This factor is composed of four categories: Intrinsic Motivation, Sport Commitment, Competitive Orientation, Ability to Activate and Will to Win. These attributes reflect individuals’ athletic motivation and investment in sport one’s ability to raise activation/energy to get up for competition and profiles how driven and competitive they perceive themselves to be, from Uninvested (low scores) to Committed (high scores).

Concentration

This factor is composed of External Distractibility, Internal Distractibility, Ability to Focus, Presence of Focus and Duration of Focus. These attributes are concerned with athlete’s attentional skills. Concentration is indicated from Distracted (low scores) to Focused (high scores).

Orientation

This factor is composed of Situational Focus, Extrinsic Motivation and Optimal Activation. These categories are less concerned with prescribed skills for athletes (such as concentration) and have to do more with individual and stylistic approaches to competition. Orientation is reflected from External (low scores) to Centered (high scores).
Poise

This factor is composed of Pre-Performance Activation, Ability to Deactivate, Fear of Failure, Fear of Success and Performance Under Pressure. These categories are concerned with an athlete’s response to competitive stress, fears associated with performing in competition and the mental skills and qualities necessary for optimal performance. It is measured from Affected (low scores) to Calm (high scores).

Mental Toughness

This factor is composed of Outlook, Self-Talk, Self-Confidence, Self-Concept, Victim/Fighter and Ability to Recover. These attributes measure and athlete’s approach towards competition, the personal characteristics supporting their performance and their tendencies during and after adverse circumstances, from Sensitive (low scores) to Tough (high scores).

Competitive Styles Profile Category Descriptions

**Determination**

*Intrinsic Motivation* – An athlete’s level of internal motivation, from unmotivated from within (low scores) to having a strong inner drive (high scores).

*Sport Commitment* – The importance and athlete places on their sport in relation to other life interests, from relatively unimportant (low) to invested (high scores).

*Ability to Activate* – The ability to raise one’s activation or energy levels for competition, from being difficult (low scores) to being able to get up for it (high scores).

*Will to Win* – The athlete’s attitude towards the results of competition, from being relatively unconcerned (low scores) to having a “killer instinct” (high scores).
Concentration

External Distractibility – The athlete’s tendency to be distracted before or during competition by sights or sounds (low scores) to being unaffected by outside sources (high scores).

Internal Destructibility – The tendency to be distracted by the inner noise of one’s own thoughts (low scores) to being able to achieve mental quiet while competing (high scores).

Ability to Focus – The ability to direct one’s attention and concentrate, from being difficult and unfocused (low scores) to being able to achieve an intense focus (high scores).

Presence of focus – The ability to focus on the task at hand, from drifting into the past or future (low scores) to concentrating well in the here and now (high scores).

Duration of Focus – The ability to sustain one’s concentration, from having a short span of attention (low scores) to being able to stay focused for an extended period of time (high scores).

Orientation

Situational Focus – The athlete’s tendency to focus only when it’s critical (low scores) to always concentrating, regardless of the situation (high scores).

Extrinsic Motivation – The athlete’s level of motivation from outside sources, from being driven by recognition, status or rewards (low scores) to external factors being unimportant (low scores).

Optimal Activation – The energy or activation level where athletes tend to compete or perform optimally, from being best when up (low scores) to being at their best when relaxed (high scores).

Poise

Pre-Performance Activation – The athlete’s energy or activation level experienced immediately before competing or performing, from being very nervous up (low scores) to performing best when relaxed (high scores).

Ability to Deactivate – The athlete’s ability to lower activation or energy levels when needed, from being difficult (low scores) to being able to relax (high scores).

Fear of Failure – The anxiety level associated with the possibility of competing/performing below one’s abilities, from being fearful (low scores) to being able to risk defeat (high scores).
Fear of Success – The anxiety level associated with the possibility of competing/performing at or above one’s abilities, from being burdened (low scores) to unaffected (high scores).

Performance Under Pressure – The effect of competitive pressure on one’s athletic abilities, from being sabotaged (low scores) to having the ability to perform optimally under stress (high scores).

Mental Toughness

Outlook – An athlete’s attitude going into a competition or performance, from being pessimistic (low scores) to being optimistic (high scores).

Self-Talk – The quality and emotional tone of one’s self-talk during competition, from being negative or critical (low scores) to being encouraging and positive (high scores).

Self-Confidence – The level of belief in one’s athletic abilities, from being doubting (low scores) to being confident (high scores).

Self-Concept – The level of one’s self-esteem, from being conflicted (low scores) to being secure (high scores).

Victim/fighter – The athlete’s tendency under adverse conditions to respond more as a passive victim (low scores) to being a pro-active fighter (high scores).

Ability to recover – The athlete’s response after negative circumstances, from being difficult to bounce back (low scores) to being resilient (high scores).

**ADAPTATION ISSUES IN ROOKIE CAMP**

There will be adaptation issues beginning in rookie training camps that the athletes may not anticipate. This will involve the reaction to them of the team veterans on the team. To some veterans, the new athlete will be seen as a threat to their career. If the rookie makes the team, one of the veterans is likely to be dropped or traded. The clinical issue is that the rookie may not be embraced by the team members and this may result in isolation with possible clinical implications.
The Influence of Coaching Style on Performance

The coaching staff will be composed of individuals, each with their own perception as how to develop new talent. They are extremely quick to develop their own particular stereotype, or characterize the recruit in personal terms. Each may have a different approach to refining their motor skills.

These coaches may have rather large egos and expect immediate conformity. Their goals for individual athletes are often extreme with regard to motor and kinesthetic challenges.

Coping with Loneliness and Isolation in Sport

A subtle threat for many athletes will have been the loss of supporting relationships once out of their high school or university programs. The loss of “superstar” status and the recipient of special attention and provisions may result in performance anxiety and functional depression. For the consulting sport psychologist, the question is: “How do we strengthen independence and reduce false expectations on the part of the rookie athlete?”

Prevention intervention training must address developing an awareness on the part of athletes to recognize and seek assistance for clinically related problems and teaching strategies for dealing with the media and how to conduct interviews that will be self protecting without causing resentment or misperceptions?

Teaching/Coaching

Assessment measures that can define in precise terms how the rookie learns most efficiently and how the rookie prefers to be taught and the quality of relationship that best fits the personal needs of the athlete while learning new material available. The ideal protocol involves completing a psychological evaluation. The clinician outlines essential differences and defines how each learning environment may be structured to meet such individual differences in the athlete. Coaches must realize that the diagnostic value of testing is designed to aid them achieving their goal if better understanding their attitude not trying to tell them how to coach. The consultant’s primary responsibility will be translating the coach’s goals by
applying insights derived from the study of their athletes. In order to survive, the consultant must maintain a wholesome balance between being an agent for the coach while never sacrificing the ethical responsibility to the athlete.

The Service Area Covered under Performance Enhancement

Assessment of sport specific attributes can enhance the direction of an athlete’s future. It is rare to find an athlete that could not benefit from working on less well developed personal attributes or learning and competitive skills that need improvement. This aspect of the consultation could require considerable special attention by the consultant. It would require attention to every aspect of performance such as the cognitive factors that supports or interferes with performance. Determining the mental or emotional factors that contribute to “personal best performances” is essential. The need for insight into all factors associated with arousal control and goal setting is essential for coaching staff to understand the needs of athletes for which they have coaching responsibilities (Miller, Vaughn, Miller 1990).

Once again the model of a detailed enhancement program for athletes exposing the insights generated, and how such are applied in modification program. Particular reference to how a member of the coaching staff should be trained to maintain the modification program. Ideally with the athlete’s approval, a detailed developmental program would be shared with the coach of the team. Every elite athlete has accepted the merit of this proposal. Obviously specific personal attributes have been excluded, those that would make no positive contribution to the athletes performance future.

Life Enhancement Assessment Program (LEAP)

Clinical research has shown that many athletes are poorly prepared for their careers or the subsequent retirement from competition and may face considerable difficulties in coping with the significant life changes that accompany their sport careers and sport identities (Miller, Adams, Kraus, Clayton,. Miller, Anderson, Ogilvie 2001; Miller, 1996). Athletes will likely encounter many of the following situations, frustrations, and realities during and/or following their professional career: problems with the cycles and career transitions and emotional and financial factors associated with the career developmental process. There will also be the need to work after they stop
playing retirement at a relatively young age, no idea how to logically approach
the end and no real control over the eventual outcome of their careers.

The causes for termination of an athlete’s career are most frequently a
function of one or more of three factors: age, deselection, or injury. The
factors influence a variety of psychological, social, and physical issues that
contribute to the likelihood of post-career distress and concern. Age: physical
deterioration causes ability and performance to decrease; deselection:
“survival of the fittest” disregards players who do not meet the necessary
performance criteria; injury: whether severe or minor, may force a premature
end to an athlete’s career and free choice: athletes chose to end their careers
voluntarily, recognizing they are ready for change. The LEAP program
provides consultation and services to identify post-career transition needs; to
determine feelings of athletes regarding career transition and to devise simple
workable solutions to meet the athletes’ needs. In order to achieve these goals,
several procedures are designed and implemented. These include: preparation
of player profiles; development of career portfolios; establishing relationships
with educational institutions and arranging flexible distance learning through
web based technology. Each athlete, no matter what level of education or
career aspiration engages in a series of interest and aptitude evaluations,
personality assessment and career placement opportunities.

In establishing a successful plan for the athlete will have to accept and
support the reality of “life during and after sport.” The best type of preparation
for career transition involves education geared toward this transitional phase in
their life. The term education is used in a broad sense and far exceeds the
bounds of the classroom and the traditional teacher/student situation. It
includes individual analysis through interest and aptitude inventories,
counseling and advisement, and placement services.

Critical Issues Regarding Athletes Emotional Welfare

This will be the most sensitive area of consultation. Should the athlete
show clinical signs of anxiety, depression or personality defects, signs of
pathology, areas where (s)he is experiencing serious emotional liabilities, it is
essential to consult with psychiatric and medically related specialists.
Hopefully your professional contract with agents or teams will stipulate your
ethical, moral and professional responsibilities with regard to areas of
privileged communication. In team situations, the consulting clinical specialist
must establish rapport and commitment from the athlete as to how one is
obligated to refer for treatment when confronting situations where clinical issues arise.

Professional issues related to “powers of referral” should be confirmed with the athlete. It is sometimes difficult to protect athletes from public exposure when they act out conflicts in the public’s eye. The art of salvaging the character at these times require inordinate skill by the consultant.

Once again the contracting party must be made aware as to how professionals will be expected to react while protecting the organization from community outrage, but still maintaining professional obligations to the athletes need for sheltering from the public eye.

**Transitioning a Career in Sports**

Transitioning issues in an athlete’s life are also a critical area and often a difficult one. There is always a question of agents and coaches feelings in preparing for the future needs of athletes. Some teams already bring in specialists for post-sport career planning. Several professional sport organizations have service but it is not well used by the athletes. There is little written about the effects, utility or practicality of such programs. Ogilvie (1961) initiated a career planning program for a professional football team. This was a time when most players had to work in the off season. The program generated great enthusiasm on the athletes part, but coaches did not accept the program. Most coaches did not want the players to think about anything else but the present during the season. Some coaches refused to let the players attend.

Consulting sport specialists should be cognizant of two cultural factors in this work (1) independence and (2) collaborative involvement. These seem to be very critical issues that consultants consider in the interference between coach, athletes and the organization. At what point do they become the coach’s or athletes private or personal consultant. Lowman (1998) explored relevant paradigms for creating an intellectually viable consulting role applicable to athletes and coaches. It is argued that consulting psychology (as applied to organizations) needs its own models and training paradigms that address organizational, group, and, above all, individual perspectives. Consulting psychologists providing services to sport programs in organizational consulting psychology need to be housed in their own academic homes, not as too-often-welcome guests in others’.
Sport consultants must deliver sound advice in career adjustment, transitions and in counseling. The great strength is the ability to deliver objectivity and a willingness to call it as it is. Together with objectivity there must possess good problem-solving ability, identified in an occupational analysis of consulting psychology as the single most important component of professional identity among consulting sport specialists (Robinson-Kurpius, Fuqua, Gibson, Kurpius, and Froehle, 1995).

A viable “theory of change” has been advocated by Lowman (1998) and Miller, TW, Kraus, RF, Adams, J, Bilyeu, J, Ogilvie, B. (1999). Miller (2008) argues consulting needs a viable theory of change and of changing with application to the sport and athletic arena. Such a theory must be based on and consistent with an understanding of the component parts of organizations—individual, group, and organizational. Argyris’s (1971) model, for example, advocated that the organizational interventionists’ goal was not the generation of change per se but rather the creation of the conditions of self-awareness and recognition from which decisions about change can be made. Process theories (e.g., Schein, 1987) additionally have their role and value in a vigorous consulting sport psychology to teams and to athletic organizations.

Transitions in Sport Consulting

Sport consultants are moving through a series of transitions. The transitions include culture, vulnerability, and willfulness, which are three prominent components of any organizational change effort. Even robustly healthy teams and athletic organizations are fragile, vulnerable systems, highly dependent on their environment and, with a few wrong or unintentional moves, fast on their way to their inevitable demise. Sport cares not one bit about the survival of a particular team, much less of a single athlete. Against this reality, defenses are critical. Denial, for example, is a markedly efficient tool that creates a necessary illusion of invulnerability often used by athletes. Individual and organizations whose existence has been threatened grow thicker defenses or die.

From traditional models, sport consultants and others will become part of a network of healthcare professionals contracting with multiskilled specialists in a network of athletic services. These shifts will be driven by cost containment, captivation and contracts for services that focus on efficiency and use financial incentives to replace what has come to be known as fees for services by consultants.
As we approach the challenges of the next decade, physicians in sports consultants providing clinical care and treatment must begin to consider a number of the issues raised by Covey et al., which encourage us to understand our unique endowments as human beings. These endowments reside in the space between stimulus and response, as well as in the art and science of good consulting. They capture what Covey called the four endowments.

The Four Endowments Covey discusses are self-awareness, which is our capacity to stand apart from our winds and losses and examine our thinking, our understanding of the whole person and our motives in sports medicine. The second human endowment is well recognized in the clinician’s personal development and addresses the Jungian concept that is known as conscience. Covey et al. Argue that conscience connects us with the wisdom of the ages and the understanding of human potential. It adds a character component to the development of our players and ourselves. The third endowment is that of independent wealth, which is seen as our ability as sports medicine specialists to recognize all that we are capable of being and to act in our best interest as well as in the best interest of our players. The fourth endowment is imagination, which is the power to envision creative innovation and the direction for which we are responsible for the personal and professional development of our athletes.

Consulting sport specialists which vision for the future must engage fellow professionals and consumers through: (i) effective interpersonal skill development; (ii) new models of conflict management; (iii) quality tools for athletic management; and (iv) research on mastering cognitive and kinesthetic skills as well as communication skills. All of these tools are within the repertoire of the sports medicine profession, which has a rich history of development and use of a ‘multiple intelligence’ perspective. As changes in the profession employ the use of multiple intelligence pathways, we must begin to recognize that athlete expectations coaching outcomes must be the result of mutually discussed and agreed dimensions of clinical services.

Sports scientists must possess a good understanding of the use of multiple intelligence and a medium of educating and coaching athletes. Throughout his theory of multiple intelligences, Gardner identified several intelligence models that enrich our understanding of how athletes and other learn new material. Linguistic intelligence reflects the ability to see and develop patterns in language and to shape words and phrases that embody concepts and convey meaning, an essential factor in good coaching. Logical-mathematical intelligence includes the ability to visualize relationships between objects and the environment, and how actions would alter the relationships, an essential
skill for athletes to master. Spatial intelligence is characterized by the spatial aptitude which encompasses the ability to imagine, sense environmental changes, solve mazes and interpret locations using maps. The spatial intelligence, which relates directly to visual acuity, allows one to visualize how an object would look or feel from a different perspective (Miller, TW, Kraus, RF, Adams, J, Bilyeu, J, Ogilvie, B. (1999).

Of critical importance to athletes and their coaches is bodily kinesthetic intelligence, which is characterized by the ability to use the body to accomplish complex and intricate activities or manipulate objects with well-controlled finesse. Overt actions are not the sole reflections of the bodily kinesthetic intelligence. Detailed movement, including manual dexterity, is the core of bodily kinesthetic aptitude. Interpersonal intelligence is characterized by Gardner as the ‘teacher’ or coach. This model encompasses the ability to understand people’s motivations, as well as skills in leadership, organization and communication. The ability to comprehend aspects of character in players is a primary feature of this intelligence model.

The interpersonal model of intelligence is what Gardner calls ‘one’s self-understanding.’ This intelligence allows individuals to recognize their strengths and weaknesses, motivations, and aptitudes. Interpersonal intelligence allows an individual to assess situational in light of personal strengths and weaknesses and to determine the best approach to ensure successful resolutions in both sport and in life.

Consultants in sports, no matter what their location or specific job titles or duties, are the Yankees in the tradition-dominant South. They are the interlopers whose ideas are often prima facie wrong simply because they are different and because they address not just the prospect of change but also the necessarily painful self-awareness that usually must precede all long-lasting change. As organizations and as individuals within organizational settings, we are programmed to put the best face on situations we may know to be wrong or bed. Organizational consultants who would deal with more than the superficial, who would create more than well-paying but ephemeral organizational “change lite,” need strong medicine, but first they need strong skills in assessment to know what medicine goes with what dysfunction. As Harry Levinson (1972) has so often and persistently reminded us, intervention without diagnosis is doomed to futility or superficiality.

Sports medicine, and sport psychology a science-based practice of organizational consulting psychology, remain elusive. Micro-theories and techniques are no substitute for an integrated theory of organizational health and of organizational dysfunction that recognizes and accounts for all relevant
levels: individual, group, organizational, and systemic. Consulting sport psychologists who would be effective need to understand and integrate viable theories of individuals, groups, and organizations, and need robust and tested “theories of change” and the subsequent stresses related to change in order to help the athletes that they serve.

Clinical models that tap social psychological models of life stress and how it is processed is of critical value. Miller and Veltkamp (1994) have introduced a model that helps us understand how athletes and other process such things as “fear of success” and “fear of failure.” Miller (1996) summarizes several theories and models that suggest stressful life events cause psychopathology. This is based on empirical studies of extreme situations that are often life threatening, and it is referred to as the victimization model. A second model argues a predisposition approach, wherein social conditions mediate the causal relation between stressful life events and resulting psychopathology. Such a model argues that one has a vulnerability to stressful life experiences.

The “additive burden model” contrasts with the vulnerability model in that it argues that personal dispositions and social conditions make independent causal contributions make independent causal contributions to the occurrence of psychopathology rather than mediate a stressful life experience. The “chronic burden model” (Miller 1989) forgoes the issue of any recent life event but argues in favor of stable personal dispositions and social conditions, which alone can cause the adverse changes in psychological and physical condition.

The “proneness model” (Miller 1989; Miller, and Veltkamp, 1996) suggests the presence of disorder leads to stressful life events that, in turn, exacerbate the disorder. This adds a new dimension to the directionality of the causal relationship between stressful life events and psychopathology. Of considerable concern to the clinical research area is the interaction between personal predisposition and social circumstances, which is an estimate of the way in which any person adjusts to a stressful experience. Miller and Veltkamp (1994) suggest an anxiety based processing model that indicates stages in which the athlete moves. The process of moving through a transition does not always proceed in order, in predictable stages. Athletes may move through the process in different ways, often cycling back and forth among the stages and revisiting the implications of the stressful life transition. This figure depicts the process of accommodating change as part of stressful transitions. Miller and Veltkamp (1994), suggest that in processing of anxiety related to the sport activity, they proceed through a cognitive processing of the anxiety or fear. In the case of fear of failure, they experience thoughts related to such
fear that results in denial, avoidance, detachment, irritability, agitated behavior, hypervigilance, cognitive disorganization, sleep difficulty, recurrent distress, and re-experiencing of the perceived failure through flashbacks. It is in this period that feel entrapped within this cycle and feel numbing which results in failure to produce. Through some triggering event, the athlete is realized and the person can go through a cognitive re-evaluation of the anxious feelings and thoughts and fear of failure. Sport professionals can be of most help at this stage. In this process, they re-visit their anxiety provoking experiences and the psychological fear and helplessness that they have experienced. Based on the adaptation, support, and response of those who are involved in their lives and in their treatment, they work towards a resolution that may enhance their performance in sport. Figure 2 and summarizes the five stages in which the person transitions in dealing with the trauma.

Figure 2. Cognitive Processing of Anxiety with sport transitions.

Sports medicine will require a cutting edge understanding of the genetic interface with learning styles and systems of cognitive processing of athletes. Diagnostic evaluation as we have known it will be replaced by a more complex analysis system of networks which will analyze how genetic factors that influence motivation and behavior in athletes is affected by intellectual and personality markers that result in more complex thinking and reasoning in athletes. Physicians in sports medicine will, by necessity, be multiskilled specialists providing clinical services to athletes and coaches. Breakthroughs in technology, including new diagnostic models and intervention techniques, will impact athletic competition. Training programs and formal education in
sports medicine will be offered through new technology, and through mediums employing distance learning technologies featuring the world’s best recognized physicians, educators, scientists, researchers and professional consultants in sport and athletic competition.

Sports scientists, clinicians and educators will realize new paradigms of service provision that will include clinical algorithms and pathways of care modified by genetic breakthroughs, technology and new interventions for sports clinicians. Virtual reality technology will generate new models in the kinesiology of sport. Athletic ‘supercenters’ will feature medical health care, dietetics, exercise, medical screening and sport and behavioral counseling for athletes and coaches. New alliances in medicine, education, athletics and science will emerge with physicians as significant partners in treating the health care needs of athletes. Databases will hold key information in addressing patterns of play that can be expected of players influenced by physical, psychological, genetic and biochemical characteristics.

The role of sports medicine in the domains of academics, athletics and sports science represents an enormous wealth of talent and energy. Consultation issues in sports psychology whether with a division one, college basketball team or a professional team presents unique situations for the consultant? Considerations in the spectrum of training programs present a variety of areas in which the sport psychologist must prepare adequately. Adaptation issues in rookie camp, variable treatment by coaching staff members and the service area covered under performance enhancement are addressed.

The sports medicine specialist with 2020 vision must be competent and capable of understanding, adapting and making the necessary changes in practice, science, research and delivery of services to meet the growing changes in the world of sport over the next decade.

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Chapter 6

**FAMILY STRESS AND PSYCHOLOGICAL ADJUSTMENT AMONG WELFARE AND NON WELFARE IMMIGRANTS**

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**ABSTRACT**

The present study explored the psychological adaptation of immigrants to Israel, while comparing between two populations – immigrants treated by the Department of Social Services welfare system, and immigrants non treated by the welfare system.

Research findings show that the psychological adaptation of immigrants is predicted by the resources in the immigrant's possession, indicating that the psychological adaptation of population with special difficulties, such as – the elderly, single mothers, psychiatric patients etc., is more problematic (Ross et al. 1990, Cohen and Wills, 1985). These findings were refuted by the current study, according to which, unexpectedly immigrants treated by the welfare system reported higher satisfaction from their integration in Israel, from their process of Alyia and from their life condition in Israel, compared to non-welfare immigrants)

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It was found that married subjects reported more familial and economic difficulties, compared to non-married, and also related these difficulties more to negative psychological responses. The present research' findings point to differences between the studied groups regarding the experience of the immigration crisis, apparently the stresses of immigration act differently according to 'the experienced level of balance' former to immigration. Finally, the present study has practical implications, by which an absorbing state should differentiate its treatment and policy of immigration, according to immigrants' position prior to immigration. Moreover, the 'resilience' hypothesis which is apparently supported by the present study, should be further examined empirically.

**INTRODUCTION**

Immigration is a stressful life event associated with economic, social and psychological difficulties or crisis which may cause deterioration of physical, emotional and social well-being (Markovitzky, 1998; Furnham and Bochner, 1990). The family is found as very important in immigration process. Family provides the security and emotional reliance to sustain immigrant endeavors in a new culture.

Studies show that the immigration could be hazardous for family cohesion, family functioning and relations (Berry, Kim, Minde and Mok, 1987; Horowitz, 1989; Roen-Strier, 2001). But, immigration could be also positively related to family cohesion and produce positive outcomes for its members (Cohen and Haberfeld, 2003; Treas and Mazumdar, 2004). Immigration initiates a process of extending resources and creates opportunity to new chance and development (McGoldrick, 1999). In some families, immigration can be a source of development, in others, of impairment in their functioning and psychological reactions.

Nevertheless, the impact of losses and stressful life events (LE) prior to immigration, on the family following the immigration attracted relatively less attention. Moreover, the impact of Stressful LE on adjustment of immigrants' welfare recipients in comparison to regular population has been largely ignored.
LITERATURE REVIEW

Family Stress and Resilience at Immigration

Immigration is a powerful, stressful event which requires adaptation to a new, culturally unfamiliar environment that involves changes and challenges within the immigrant's family. Numerous studies have been devoted to different aspects of immigrants' family life: the impact of immigration on the quality of family life (Ben-David, 1994; Grant, 1982; Poskanzer, 1995; Thomas, 1995); the influence of various aspects of family life on the adjustment of the immigrants (Aroian and Spitzer, 1996; Boyd, 1989; Scott and Scott, 1989); and relations between the family and social support institutions (Ben-David, 1995; Krausz, 1994). The effect of immigration on family life, family structure and relationship is usually negative. Studies revealed breakdown of gender roles, norms, values, reduction of quality of life and emergence of marital conflicts (Aroian, Spitzer and Bell, 1996; Doron and Markovitky, 2006). It also found negative impact of immigration on family relations with support systems such as extended family, friends, community and social institutions (Ben David, 1995; Krausz, 1994).

Changes upon immigration can be viewed from two different perspectives - both as source of distress, and as source of support that could conceivably buffer the demands of immigration.

According to the Stress Theory, immigration is presented as an event of risk and crisis, requiring a developmental process to overcome it (Ben David and Lavee, 1994; Lazarus, R.S., and Folkman, S., 1984; Hill, R., 1949; Sicron and Leshem, 1998).

The family as a source of stress includes primary stress that originates within the family (e.g., demands and pressures encountered in one's family roles or lack of reciprocity) as well as outside stressors that find their way into the family and act as a conduit for stress. The relationship with the host culture and the coping efforts to adjust to the new country, may be accompanied by changes in the relationship within the family (Booth, Crouter, and Landale, 1997). These demands may follow with distress and in some case with crisis and trauma (Padilla and Perez, 2003; Stamm, Stamm, Hundnall, and Higson, 2004). Family may suffer a loss of resources like skills, roles, values, social status, and culture, and must learn to change in order to acquire a new equilibrium (Anson, Pilpel, and Rolnik, 1996; Furnhan and Bochner, 1986). The period of adjustment is accompanied by distress for both the
individual (Markovitzky, 1998) and the family (Berry, Kim, and Mindel, 1987).

The second perspective, the Resilience Theory, recognizes the family as providing a context for the stress process as well as a reservoir of coping and support (Boss, 1988; Pearlin and Turner, 1987; Farrell and Barnes, 1993; Walsh, 2006). The transition between countries may bear potential benefits for individuals and families including a solution for economic difficulties, opportunities for new status or a better future for the children. On the other hand, it also involves potential losses, such as separation from extended family members left behind or disturbances in the spouse equilibrium (Fox, 1991; Lipson and Miller, 1994).

Family support has an instrumental and emotional dimension and pertains to the commitment, caring, and aid provided by family relationships (Ross et al. 1990). Families can be highly dependable sources of social support when family functioning is healthy or if the family is adaptable to stress (Barnhill, 1979). Immigration, however, involves major changes in lifestyle and environment (Aroian, 1990) that can destabilize the family and overtax or deplete family resources (Sluzki, 1979).

Along with extensive literature on the negative effects of acculturation, studies also emphasize the way in which immigrants successfully fuse together the old and new to create a new kind of family life. Moreover, the new economical circumstances and the new social and health services given by the host society can moderate the acclimation and can enable the families to improve their conditions and accordingly their emotional state. Accordingly, in some contexts, immigrant's families seem to have stronger family ties and even higher incomes than their nonimmigrant counterparts (Basavarajappa and Halli, 1997). Instead of the unpromising prophesy of family disintegration, studies focused on the myriad ways in which new immigrants patterns are shaped and strengthened by cultural meanings, the social practices brought from home countries and the social, economic and cultural forces in the host country (Foner, 1997).

Both contrasting approaches - the stress and risk theory and strengths/resilience theory agree that immigration may bring about major changes in family and the transition may lead to changes in the emotional state. This process accompanies with economic, financial, parental, marital and interpersonal hardships that deteriorate the assimilation and psychological well-being. Amongst those, the economic stressor was found as one of the most important factors in the social environment that affect well being (Dooley, 2003).
Although sufficient evidence exists to support both a direct and an indirect relation between social support and family functioning, it has been argued that social support most likely enhances parenting under stressful conditions through its positive influence on parental functioning. Prior research has demonstrated that social support from friends and family enhanced maternal psychological well-being and self-esteem, which corresponded to more effective parenting practices, as well as less aversive parenting practices, among economically disadvantaged African American families (Simons, Lorenz, Wu, and Conger, 1993; Taylor and Roberts, 1995). Similarly, informal social support from family, friends, and neighbors is a particularly salient protective factor for economically disadvantaged African American single mothers, as they often rely on extended family networks, including neighbors, relatives, and church members, for support in childrearing tasks and parenting duties (Forehand and Kotchick, 1996). Thus, higher levels of social support may serve to promote effective parenting practices in the face of environmental stress by protecting parental psychological wellbeing (MacPhee, Fritz, and Miller-Heyl, 1996).

**Welfare Recipients among Immigrants to Israel**

Immigrants absorbing countries in the western world, and Israel which particularly espouses the idea of Jewish immigration, place as a considered purpose the psychological well being and health of their immigrants in the adaptation process, thus devote great efforts both to studying the phenomenon, identifying stress factors and to establishing ways to relieve the process and moderate the crisis at transition. To a certain extent, Israel succeeds in moderating immigrants' responses to the crisis (Sikron and Leshem, 1998).

The wave of immigration of about one million people from the Commonwealth of Independent States to Israel, brought about wide groups of immigrants characterized by special needs and hardships in their economic integration process. Israel was aligned to meet these needs, by means of special departments in the ministry of welfare, directed at handling these immigrants. 23% of the new immigrants to Israel use these welfare social services.

The Department of Social Service population (DOSS) comprises those individuals and families who suffer from poverty and other interpersonal difficulties caused by personal or family disorganization (Minuchin, Montalvo, Guerney, Rosman and Shumer, 1967) and often been called multiproblem
families. They often have emotional and behavioral difficulties that prevent them from adjusting to social norms and institutions. Individuals from these families have the tendency to drop out from work and are characterized by antisocial activities (Aponte, 1994). The phenomenon of DOSS population contains not only economic hardship but also personal and social disorganization that reflects on a wide range of problems such as poverty, poor housing conditions, troubled parental and marital relationship, children with school difficulties, lack of supportive social net and frequently poor physical and mental health. These different problem areas could lead to extreme distress (Sharlin and Shamai, 1996; Shamai and Sharlin, 2004).

One likely protective factor is social support (Belsky, 1984). In general, social support has been widely studied and found to be associated with a number of positive outcomes in the areas of both psychological and physical health (Pierce, Sarason, and Sarason, 1996,). In addition, social support has been found to have a buffering effect in stressful situations (Cohen and Wills, 1985; Forehand and Kotchick, 1996).

Research Purposes

In the current study we seek to understand the impact of FSE (family stress events) on two different populations – welfare recipients immigrants and non welfare immigrants. Since the welfare population is psychologically and socially weaker, we expected that welfare subjects will be lower on psychological adjustment and exhibit more adjustment difficulties. Since welfare population suffered previous stressful events, we expected to find higher level of stressful reactions among them.

In relation to the two different approaches - risk versus resilience - the present study examines/predicts which factors are most closely related to well-being among welfare and non-welfare recipients immigrants. Additionally, the study sought to explore the effect of psychological adjustment on stress.

METHOD

Sample and Procedure

The sample included 322 immigrants, living in three towns in the northern part of Israel, divided into two groups as follows:
1. 121 immigrants who are receiving treatment in the Department of Social Services (DOSS). From lists of three agents in the northern area of Israel, subjects were chosen randomly for the purpose of the current research.

The Department of Social Services sample was based on list of immigrant’s families that were treated with family problems (marital, parental conflicts). The head of immigrants unit in the social welfare Dep. who speak Russian received from each interviewed family a permission to participate in the research.

2. 201 immigrants who are not treated by the department of social services (DOSS).

The second sample was based on a list of immigrants kept by the neighborhood cultural centers. After the interviewers visited the homes of the immigrants and explained the purpose of the research in their native language, the response rate was 100%. Each participant was interviewed individually at home in his native language (Hebrew or Russian) by social worker that was trained specially for the study by the researchers. Face validity of the questionnaire was tested by translation and re-translation from Hebrew to Russian and vice versa, in a pilot study, and amended accordingly. Table 1 describes sample characteristics.

**Table 1. Demographic characteristics of welfare and regular immigrants**

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</tr>
<tr>
<td>Male</td>
<td>86</td>
<td>43.0%</td>
<td>32</td>
</tr>
<tr>
<td>Female</td>
<td>114</td>
<td>57.0%</td>
<td>88</td>
</tr>
<tr>
<td>Marital Status</td>
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<tr>
<td>Not married</td>
<td>56</td>
<td>27.9%</td>
<td>58</td>
</tr>
<tr>
<td>Married</td>
<td>145</td>
<td>72.1%</td>
<td>63</td>
</tr>
<tr>
<td>Employment status</td>
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<tr>
<td>Employed</td>
<td>153</td>
<td>76.5%</td>
<td>61</td>
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<tr>
<td>Unemployed</td>
<td>47</td>
<td>23.5%</td>
<td>60</td>
</tr>
</tbody>
</table>

** p < .01; *** p < .001.

Welfare subjects were characterized by higher percent of females than regular subjects (73.3% vs. 57% respectively), higher percent of not-married
subjects than regular subjects (47.9% vs. 27.9% respectively) and higher rate of unemployed than regular subjects (49.6% vs. 23.5%, respectively).

Welfare subjects' were found to be less time in Israel the regular subjects (M=8.07, SD=4.61 vs. M=10.90, SD=4.12, respectively; t\((319)\) = 5.71, p<.001). The mean age and years of education were similar in both groups of subjects (t\((319)\) = .15, p = NS; t\((319)\) = .44, p = NS, respectively).

**Tools**

**Psychological Adjustment**

*Emotional state.* The authors administered a self-report questionnaire that was developed for the purpose of research with immigrants (Markovitzky, 1998), based on the theory of Lazarus (1991). The questionnaire examines 20 different emotions and encompasses three types of emotions: positive emotions, such as happiness, security, and hope (α = .90); negative emotions, such as disappointment, anger, and fear (α = .88); and pathological emotions, such as humiliation and guilt (α = .73). (In the present research, “pathological emotions” refers to extreme negative emotions that are liable to lead to psychopathology or situations of social alienation).

*Satisfaction.* A self-report questionnaire developed for the purpose of research with immigrants (Markovitzky, 1998) was administered to examine the immigrant’s satisfaction with six aspects of life in Israel. The respondents were asked to assess the degree to which they were content with the standard of living, democracy, financial situation, lifestyle, style of social relations, and social level in Israel (α = .89).

**Family Inventory of Life Events and changes-FILE**

The original FILE is a 71 dichotomic item questionnaire (response of happen / didn't happen for each item) that measures individuals’ perceptions of stressful events that the family has been subjected to during the previous 12 months (McCubbin, Patterson and Wilson, 1979).

The current study utilized 20 items representing four subscales of stressing situations yielded by factor analysis:

(a) Economical stress (Cronbachs' alpha internal consistency: α = .86):

Included items dealing with economical difficulties such as unemployment, banking overdraft.
Family Stress and Psychological Adjustment

(b) Family stress (Cronbachs' alpha internal consistency: $\alpha = .79$): Included items such as parent-child conflicts, conflict with spouse.

(c) Marital stress (Cronbachs' alpha internal consistency: $\alpha = .79$): Included items such as divorce or separation, physical violence or sexual abuse.

(d) Separation (Cronbachs' alpha internal consistency: $\alpha = .65$): Included items such as separation from spouse, child or parent/s.

Level of Symbolic Losses

A self-report questionnaire developed for the purpose of research with immigrants (Markovitzky, 1998) was administered to examine the immigrant's experience of a loss of personal resources. The symbolic resources express one's ideas, identity and relations with others. Separation from these symbolic resources is accompanied by emotional difficulties. The questionnaire includes 4 resources that are valuable when adjusting to a new country: leaving family relations, loss of culture like literature and music and parting from friends. ($\alpha = .81$).

RESULTS

Psychological Adjustment and Family Crises

Multivariate 3-way analysis (Group X marital status X occupational status) with years in Israel as covariate on stress variables as outcome variables pointed out to significant differences between the welfare and regular immigrants (Multivariate $F_{(5,308)} = 4.30, p < .001$) in terms of economical crisis ($F_{(1,312)} = 5.56, p < .05$), marital crisis ($F_{(1,312)} = 6.55, p < .01$), and symbolic crisis ($F_{(1,312)} = 14.40, p < .001$). Means according to group (see table 2) indicated that welfare immigrants reported fewer crises on each of these variables than regular immigrants. Nor 2-way neither 3-way interaction effects involving group of immigrants was found in the outcome variables. Main effect of marital status showed that married immigrants reported higher frequency of economical crisis ($F_{(1,313)} = 8.49, p < .01$) than non-married immigrants ($M=1.95, SD=2.22; M=1.28, SD=1.69$, respectively), and less marital crisis than non-married immigrant ($F_{(1,312)} = 14.40, p < .001; M=.22, SD = .62; M=.52, SD=.91$, respectively).

Additional 2-way Manova of group X gender revealed significant interaction effect of Group X gender with respect to economical crisis ($F_{(1,316)}$)
indicating opposite trend of difference between male and female welfare and regular immigrants. While regular female immigrants reported higher frequency of economical crisis than regular male immigrants \((M=2.28, SD=2.20; M=1.45, SD=1.98, \text{ respectively})\), welfare female immigrants reported less frequent economical crisis \((M=1.26, SD=1.82)\) than welfare male immigrants \((M=1.69, SD=2.18)\). The welfare subjects were higher also in satisfaction level \(F_{(1,319)} = 6.44, p < .01\) as compared to regular immigrants.

### Table 2. Means and SDs of Stress Variables among Welfare and Regular Immigrants

<table>
<thead>
<tr>
<th>Type of Stressors</th>
<th>Regular Immigrants</th>
<th>Welfare Immigrants</th>
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<tr>
<td>Economical</td>
<td>M 1.93</td>
<td>1.36</td>
<td>5.56*</td>
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<td></td>
<td>SD 2.15</td>
<td>1.91</td>
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<tr>
<td>Familial</td>
<td>M 1.59</td>
<td>1.30</td>
<td>1.46</td>
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<td></td>
<td>SD 1.47</td>
<td>1.41</td>
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<tr>
<td>Marital</td>
<td>M .42</td>
<td>.18</td>
<td>6.55**</td>
</tr>
<tr>
<td></td>
<td>SD .85</td>
<td>.52</td>
<td></td>
</tr>
<tr>
<td>Symbolic</td>
<td>M 1.60</td>
<td>1.11</td>
<td>14.44***</td>
</tr>
<tr>
<td></td>
<td>SD 1.31</td>
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<tr>
<td>Loss</td>
<td>M .59</td>
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<td>3.57</td>
</tr>
<tr>
<td></td>
<td>SD .95</td>
<td>.93</td>
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*Psychological Adjustment Measures*

<table>
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<th>Regular Immigrants</th>
<th>Welfare Immigrants</th>
<th>F df = 1,312</th>
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</thead>
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<tr>
<td>Satisfaction</td>
<td>M 2.72</td>
<td>2.99</td>
<td>6.44**</td>
</tr>
<tr>
<td></td>
<td>SD .83</td>
<td>1.06</td>
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</tr>
<tr>
<td>Feelings</td>
<td>M 3.51</td>
<td>3.56</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>SD .74</td>
<td>.73</td>
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* p < .05; ** p < .01; ***p < .001.

### The Relationship between Psychological Adjustment and Stressful Life Events

In order to examine the impact of stress and crisis on psychological adjustment, forced steps regression models were conducted (table 4). The predictors in the model were demographic variables that were entered in the
first step (marital status, years of schooling, employment) and stress variables in the second step (economical crisis, familial crisis, marital crisis, symbolic crisis and loss). The third step included all the stress variables as interaction with population (regular or welfare). Overall two models were examined: one model for general satisfaction level, and one model for psychological adjustment – feelings.

**Table 3. Factor analysis of stress factors: item loadings and explained variance**

<table>
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<tr>
<th>Factor (stress sources)</th>
<th>Factor loading</th>
<th>% of explained variance</th>
<th>Cronbach’s alpha</th>
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<td>Economical</td>
<td>.85</td>
<td>18.4</td>
<td>.86</td>
</tr>
<tr>
<td></td>
<td>.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.74</td>
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<td></td>
<td>.68</td>
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<td>.63</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>.55</td>
<td></td>
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</tr>
<tr>
<td>Family</td>
<td>.76</td>
<td>11.4</td>
<td>.79</td>
</tr>
<tr>
<td></td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.69</td>
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<td></td>
<td>.43</td>
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<tr>
<td>Marital</td>
<td>.82</td>
<td>10.5</td>
<td>.73</td>
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<td></td>
<td>.79</td>
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<td></td>
<td>.73</td>
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<tr>
<td>Symbolic</td>
<td>.77</td>
<td>10.4</td>
<td>.75</td>
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<tr>
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<td>.72</td>
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<tr>
<td>Loss</td>
<td>.70</td>
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<td>.59</td>
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Table 4. Forced steps regression results: standardized regression coefficients and $R^2$

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<th>Feelings</th>
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<td></td>
<td>Years of schooling</td>
<td>.10</td>
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<td>Employment status</td>
<td>.13*</td>
<td>.08</td>
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<td>Step 2</td>
<td>Marital Status</td>
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<td>Years of schooling</td>
<td>.12*</td>
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<td>Employment status</td>
<td>.13*</td>
<td>.06</td>
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<tr>
<td></td>
<td>Economical crisis</td>
<td>-.03</td>
<td>-.18*</td>
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<td>Family crisis</td>
<td>.05</td>
<td>-.12*</td>
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<td></td>
<td>Marital crisis</td>
<td>-.14*</td>
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<tr>
<td></td>
<td>Symbolic crisis</td>
<td>-.19**</td>
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</tr>
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<td>Loss</td>
<td>.09</td>
<td>.05</td>
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<td>Step 3</td>
<td>Marital Status</td>
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<td>Years of schooling</td>
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<td>.03</td>
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<td>Employment status</td>
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<td>.17</td>
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<td>Economical crisis</td>
<td>.02</td>
<td>-.35***</td>
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<td>Family crisis</td>
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<td>.06</td>
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<td></td>
<td>Loss</td>
<td>.07</td>
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<td>Economical crisis x group</td>
<td>.06</td>
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<td>.26**</td>
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<td>$\beta$ coefficient</td>
<td>Summary $\beta$ coefficient</td>
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<td>Symbolic crisis x group</td>
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<td>-.10</td>
</tr>
<tr>
<td></td>
<td>Loss x group</td>
<td>-.10</td>
<td>-.02</td>
</tr>
</tbody>
</table>

* $p < .05$; ** $p < .01$; *** $p < .001$. 


Satisfaction Level

The results indicated that higher satisfaction was associated with higher education ($\beta=.13, p<.02$), employment ($\beta=.15, p<.01$), less family crises ($\beta=-.23, p<.02$) and the interaction of family crises and marital crises with population ($\beta=.42, p<.001$, $\beta=-.17, p<.01$, respectively). All these variables accounted for 17% of the total variance ($F_{(13,296)}=4.52, p<.001$). Additional regressions within each population group revealed that welfare population's satisfaction level (higher level) was predicted by more family crises ($\beta=.32, p<.01$) and more marital crises ($\beta=-.21, p<.01$), while general population's higher satisfaction level was associated with less marital crises ($\beta=-.21, p<.05$).

Feelings

Forced steps regression indicated that more positive feelings were associated with less family crises ($\beta=-.36, p<.001$). This variable was found to predict feelings as interaction with group ($\beta= .26, p<.01$). Separate regression for each population group yielded that family crises predicted the feelings of general population ($\beta=-.34, p<.001, R^2=.11$) but not within welfare subjects.

DISCUSSION

The present study explored the psychological adaptation of immigrants to Israel, while comparing between two populations – immigrants treated by the Department of Social Services welfare system, and immigrants non treated by the welfare system. The importance of this study lies in examining the adaptation process of immigrants lacking of resources that suffer from psychosocial difficulties and are supported by welfare institutions, as well as an attempt to evaluate the contribution of constitutional aid, which is a part of the absorption policy of the state of Israel.

Research findings show that the psychological adaptation of immigrants is predicted by the resources in the immigrant's possession, indicating that the psychological adaptation of population with special difficulties, such as – the elderly, single mothers, psychiatric patients etc., is more problematic (Ross et
These findings were refuted by the current study, according to which, unexpectedly immigrants treated by the welfare system reported higher satisfaction from their integration in Israel, from their process of Aliya and from their life condition in Israel, compared to non-welfare immigrants. It was found that family distresses and crisis predict negative emotions (anger, disappointment, confusion, lack of confidence, lack of joy etc.) among the regular immigrants sample, but not among the welfare recipients immigrants sample.

Generally, this research findings point to that welfare population reports less familial and marital crisis, as well as relates them to a lesser extent to the psychological responses and to adaptation.

These findings stress the importance of distinction between the two populations, in order to differentially examine psychological adaptation patterns and factors affecting each. There is a need in exploring both groups and their psychological reactions, each according to its social and economic context.

The current findings are in contrast to the widespread notion of a relation between low socio-demographic welfare status, and negative psychological responses. Some researches presented mental and physical health compared to distress among a population of immigrants, despite inferior socio-demographic conditions, and accounted for this tendency through the 'epidemiologic paradox' theory (Li, 2006; Jasinskaja-Lahti, Liebkind and Reuter, 2006; Viruell-Fuentes, 2007).

It was claimed that many protective cultural characteristics (nutrition practices, parental protective behavior in native country) as well as active and supportive social network (relatives, friends and neighbors and warm interpersonal relations), act as strengthening factors which assist the immigrants in dealing with the numerous hardships of immigration and to establish good mental and physical health (McGlade et al, 2004; Jasinskaja-Laht jata et al, 2006; Viruell-Fuentes, 2007).

A possible partial explanation for this is that the welfare population in our research, while still in their native country, developed mental resilience that was built out of coping with distresses in the native country. Probably, the welfare population examines the immigration difficulties and its stresses and thus is affected by them, through a perspective of history and experience of prior problems, while for the normal (non-welfare) population the hassles of immigration constitute a stressful life event, one which violates a former psycho-social balance, thus affecting both the individual and the family, and catalyzes emotional and adaptation difficulties.
It is possible that for the welfare population the hassles of immigration are continual to the problems experienced in the native country, and the renewed absorption constitutes an opportunity to solve some of the former familial/marital stresses. Additionally, the economic aid system provided by the country's authority is a solution to the economic difficulties that characterized this population in their native country. This perspective is in accordance with the notion of 'problem' and 'solution' by Watzlawick, Weakland and Fisch (1974), claiming that a reality sometimes perceived as 'problematic' is in fact a solution for coping with prior difficulties. Therefore, in certain situations, the transition of immigration may serve as a lever to solving marital and familial difficulties. The non welfare immigrants population, on the other hand, experiences crisis and a decrease in their socio-economic status, therefore the negative psychological emotions.

The formal services dealing with welfare populations may provide another explanation for our findings: the services constitute an answer not only to the difficulties that rose following the transition to a new country, but to the problematic nature of this population former their immigration, so far untreated. Therefore the Welfare Social Services constitute an important corroborating factor, blurring the crisis of immigration and providing this special population with a positive breakthrough.

Our research explored immigrants staying in Israel for 5-10 years. The professional literature points to a connection between length of staying in the new country and positive adaptation (Markovizky and Samid, 2008). In the state of Israel the resources of support which immigrants are entitled to – the absorption basket – is valid for the first two years following immigration. It is possible that the ceasing of governmental aid to the non-welfare population depleted existing resources, while the welfare population is enriched by resources which are continually given to her by state constitutions.

Another finding reinforcing the need for a differential examination of the psychological responses according to each group's social context is women's responses. The literature is divided regarding gender influences upon immigrants' psychological reactions: women report more psychological distress on the one hand, on the other hand they show more flexibility and adapt better to the conditions of work and the absorbing society, and serve as 'foreign minister's of the entire family (Remennick, 2005; Markovitzky and Doron, 2007). In the present study it was found that while regular female immigrants reported higher frequency of economical crisis than regular male immigrants, welfare female immigrants reported less frequent economical crisis than welfare male immigrants. In accordance with the 'paradox' theory,
this finding can be explained through former resilience among welfare women, as their hardships started before immigration, and so has their coping process. Immigration by itself created a minor change in their lives, possibly even bettered their situation, in comparison to women from the non-welfare group.

In continuity with the above findings, and in contradiction with former immigration research (Slutzki, 1979; Ben David and Lavee, 1994), it was found that married subjects reported more familial and economic difficulties, compared to non-married, and also related these difficulties more to negative psychological responses. The social-cultural context may provide a useful explanation for this. The communist society encouraged equality between genders, particularly in the field of educational and occupational opportunities. Child rearing was usually made undertaken by the grandparents' generation, especially the grandmother. The immigration transition, connected with a decrease in man's ability to make a living (support a family), turned him to a 'burden' imposed on his wife's shoulders. The latter went out to work and dignifiedly supported the family while her children were reared by her mother. Former marital problems aggravated and the possibility to separate as a means of solving them is a legitimic option in the native country. Thus, non-married families are characterized by less conflicts comparing to married families amongst immigrants from Commonwealth of Independent States.

Summing up, the present research' findings point to differences between the studied groups regarding the experience of the immigration crisis, apparently the stresses of immigration act differently according to 'the experienced level of balance' former to immigration. Therefore, the welfare group which is accustomed to stressful life events, familial and economic difficulties prior to immigration, reveals seemingly higher 'resilience' to the hardships of transition to a new country, in contradiction the normal group, the latter containing families which achieved familial balance of some kind prior to immigration, therefore is more sensitive to the changes involved in the transition to a new country, and as a consequence responds in a magnified manner – manifested in the level of negative emotions and satisfaction.

Finally, the present study has practical implications, by which an absorbing state should differentiate its treatment and policy of immigration, according to immigrants' position prior to immigration. Moreover, the 'resilience' hypothesis which is apparently supported by the present study, should be further examined empirically.
Family Stress and Psychological Adjustment

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