COGNITIVE AND NEUROPSYCHOLOGICAL PREDICTORS OF
JUVENILE ADJUDICATIVE COMPETENCY:
THE ROLE OF EXECUTIVE FUNCTIONING

by
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ABSTRACT

The relationship between juvenile adjudicative competence and executive functioning was investigated in a sample of 96 middle and high school students. Measures of adjudicative competence (selected questions from the Fitness Interview Test—Revised Understanding scale) and legal decision-making were administered together with cognitive and neuropsychological testing assessing various domains of executive functioning. Adolescents ages 13-14 performed less well than older adolescents (ages 17-18) with regard to competency abilities. Significant correlations were observed between competency scores and working memory, response inhibition/impulsivity, and metacognition/insight, but not cognitive flexibility. Hierarchical regression analyses testing the incremental predictive ability of executive functions indicated that metacognition/insight remained a significant predictor of competency beyond age and intelligence.

Keywords: adjudicative competence; juvenile competence; executive functioning; fitness to stand trial; legal abilities; legal decision-making
To my parents
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<th>Description</th>
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<tbody>
<tr>
<td>COWAT</td>
<td>Controlled Oral Word Association Test</td>
</tr>
<tr>
<td>CST</td>
<td>competent to stand trial</td>
</tr>
<tr>
<td>ECST-R</td>
<td>Evaluation of Competency to Stand Trial—Revised</td>
</tr>
<tr>
<td>FIT-R</td>
<td>Fitness Interview Test—Revised</td>
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<tr>
<td>fMRI</td>
<td>functional magnetic resonance imaging</td>
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<td>GIA</td>
<td>general intellectual ability</td>
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<td>ICCs</td>
<td>intraclass correlation coefficients</td>
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<td>ICST</td>
<td>incompetent to stand trial</td>
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<tr>
<td>IG T</td>
<td>Iowa Gambling Task</td>
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<tr>
<td>JATA</td>
<td>Judgment Assessment Tool for Adolescents/Adults</td>
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<tr>
<td>KBIT</td>
<td>Kaufman Brief Intelligence Test</td>
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<tr>
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<tr>
<td>MacCAT-CA</td>
<td>MacArthur Competence Assessment Tool—Criminal Adjudication</td>
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<td>MacCAT-CR</td>
<td>MacArthur Competence Assessment Tool—Clinical Research</td>
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<td>MacJEN</td>
<td>MacArthur Judgment Evaluation</td>
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<tr>
<td>SFU</td>
<td>Simon Fraser University</td>
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<tr>
<td>WAIS-III</td>
<td>Wechsler Adult Intelligence Scale (3rd ed.)</td>
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<tr>
<td>WCST</td>
<td>Wisconsin Card Sorting Test</td>
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<tr>
<td>WISC-IV</td>
<td>Wechsler Intelligence Scale for Children (4th ed.)</td>
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<tr>
<td>WJ-III</td>
<td>Woodcock-Johnson Cognitive Assessment Battery (3rd ed.)</td>
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<tr>
<td>WWU</td>
<td>Western Washington University</td>
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<td>YCJA</td>
<td>Youth Criminal Justice Act</td>
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INTRODUCTION

Legal Background for Adjudicative Competence

Most Western countries have provisions in the criminal law designed to protect the right to a fair trial. In Canada, this is referred to as fitness to stand trial, while in the United States it is referred to as competency to stand trial. Current laws in both countries are based on English common law, which required that defendants facing criminal charges must be able to understand the charges against them, appreciate the consequences of legal proceedings, and communicate with their lawyers (Zapf & Roesch, 2006). This requirement is designed to protect vulnerable individuals as well as to maintain the integrity and fairness of the justice system (Bonnie, 1992). In the United States, this aspect of due process was established as a constitutional right in Youtsey v. United States (1899). However, while the law has long since recognized the importance of a defendant’s competency, there was no substantive legal standard to define competency in the United States until 1960. The development of competency law saw the creation of a 2-part test of competence in Dusky v. United States (1960). The Dusky standard outlined that a defendant must have a “sufficient present ability to consult with his lawyer with a reasonable degree of rational understanding” and have a “rational as well as factual understanding of the proceedings against him” (p. 402).

In Canada, the criteria for determining adjudicative competence (often referred to as fitness to stand trial) are found Section 2 of the Criminal Code, which provides the following definition:

Unfit to stand trial means unable on account of mental disorder to conduct a defense at any stage of the proceedings before a verdict is rendered or to instruct counsel to do so, and in particular, unable on account of mental disorder to:

a) understand the nature or object of the proceedings
b) understand the possible consequences of the proceedings, or
c) communicate with counsel.

These criteria were derived from earlier case law, specifically *R. v. Pritchard* (1836). In this case, the judge ruled that there were three components to competency: “whether the prisoner is mute of malice or not; whether he can plead to the indictment or not; and finally, whether he is of sufficient intellect to comprehend the course of the proceedings on the trial, so as to make a proper defense” (p. 304). In *R. v. Podola* (1960), the court ruled that the *Pritchard* case “laid down the tests which ought to be applied when juries are considering whether a prisoner ought not to be tried by reason of his mental condition” and that “these tests have been followed so often that they may be said to be firmly embodied in our law” (p. 238).

In 1992, changes were made to the *Criminal Code* of Canada. Bill C-30 established new legal procedures related to the determination of fitness to stand trial and criminal responsibility. The revised Code set out procedural guidelines pertaining to fitness assessment orders as well as treatment during the assessment. A 5-day limit was placed on assessment orders unless the defendant and prosecutor agreed to a longer period not exceeding 30 days. (This period could be extended to a maximum of 60 days only under compelling circumstances.) Fitness evaluations could take place in a jail, an outpatient clinic, or an inpatient facility. Bill C-30 minimized restrictions on the accused person’s freedom by making an explicit presumption against custody for persons under assessment order, except where the offense is serious, or where “the court is satisfied that on the evidence custody is necessary to assess the accused” (s. 672.16). Bill C-30 also stated that treatment may not be ordered as part of the assessment, and it provided for involuntary treatment only after the assessment in the event that the person is found unfit (s. 672.19).

**Bonnie’s (1992) Model of Adjudicative Competence**

While both the *Dusky* Standard and the *Criminal Code* of Canada provide specific legal criteria for adjudicative competence, Bonnie (1992) argued that these legal formulations have not been firmly anchored by a theory of competence. While the courts have traditionally viewed competence as a single construct, Bonnie proposed that competence is better conceptualized as two separate but related constructs. Bonnie’s
theoretical framework describes competence to stand trial as involving: (a) a foundational competence to assist counsel and, (b) a contextualized decisional competence. Competence to assist counsel is defined as “the minimum conditions required for participating in one’s own defense” (p. 297). These criteria generally include: (a) capacity to understand the charges, the purpose of the criminal proceedings and the adversarial system, especially the role of one’s defence attorney; (b) capacity to appreciate one’s situation as a defendant; and (c) ability to recognize and relate pertinent information to counsel regarding the facts of the case. By contrast, decisional competence is defined as the defendant’s ability to understand and choose among alternative courses of action. Such decisions include the plea to be entered and whether or not to testify and/or be present at trial. Bonnie’s (1992) model of competence is relevant to the present study for two reasons. First, it has been suggested that decisional capacities in particular (and the related construct of judgment) may be especially relevant to adolescents, as both developmental and contextual factors may differentially affect the legal decision-making of adolescents and adults (Scott, Reppucci, & Woolard, 1995). Second, Bonnie’s description of decisional competence implies the involvement of higher order cognitive processes, which we posit should logically relate to aspects of executive functioning.

Background on Juvenile Adjudicative Competence

From its inception in 1899, juvenile court was designed to divert children away from the adult criminal system and to take into account children’s immaturity and presumed vulnerability. In contrast to adult criminal court, juvenile court was non-adversarial and non-punitive in nature. Instead, the focus was on rehabilitation and working towards a resolution that would serve the “best interests of the child.” As a result, juvenile adjudicative competence was a non-issue and remained unaddressed by the U.S. Supreme Court until the 1960s (Goldstein, Thomson, Osman, & Oberlander, 2002).

Two landmark cases, Kent (1966) and In re Gault (1967), led to a restructuring of the juvenile justice system. The Kent case established that juveniles were entitled to hearings before they could be waived to adult court for criminal charges. The following
year, the U.S. Supreme Court concluded that the juvenile justice system had deprived children and adolescents of the rights of due process afforded to adults and had failed to meet its fundamental principle of rehabilitation. The end result was that even greater legal protections were afforded to juveniles. These protections included the right to receive a written notice of charges, the right to legal counsel, protection from self-incrimination, and the opportunity to confront and cross-examine witnesses in an adversarial fact-finding process (In re Gault, 1967). In order to exercise these rights in accordance with due process, the defendant must be competent. Therefore, the notion of juvenile adjudicative competency was brought to the fore and became an important issue in juvenile proceedings (Savitsky & Karras, 1984; Small, 1997).

Recent concerns over the increasing frequency and severity of youth violence has forced the juvenile justice system to undergo a shift in its focus from the protection of juveniles to the protection of the public (Burnett, Nobler, & Prosser, 2004). For example, the Youth Criminal Justice Act (YCJA) enabled more serious sanctions to be imposed on young offenders in Canada (2003). Similarly, transfer of juveniles to adult court has increased in recent years in the U.S (Grisso, 1998). It is important to note that these legal changes have been highly controversial, with many scholars arguing that they are not supported by research on youth violence. Further, subsequent harsher responses to youth crime have generally not impacted recidivism rates in the expected direction. In states that have reduced the maximum age of juvenile court jurisdiction and moved 16- and/or 17-year-old defendants to adult criminal court, no evidence of a general deterrent effect has been shown (Jensen & Metzger, 1994; Zimring, Fagan, & Kupchik, 2001). In fact, such transfer laws perhaps make it more likely that youth raised to adult court will recidivate (Bishop, Frazier, Lanza-Kaduce, & Winner, 1996; Fagan, 1995, 1996; Myers, 2001). This may be particularly true for transferred violent offenders (Lanza-Kaduce, 2005).

As a result of the above noted changes to the youth justice system, competency law has become increasingly relevant to criminal proceedings involving juvenile defendants. Grisso (1997) notes that "When society punishes adolescents like adults, due process requires that they must be afforded the same rights and protections as adults when defending themselves against legal allegations" (p. 3). Based on the extension of adults' rights of due process to juveniles, most states have recognized the
concept of juvenile adjudicative competency as outlined in the *Dusky* standard (1960; Grisso, 1998). However, competency requirements for children and adolescents vary across states. States may simply apply the adult standard of competence to juveniles. Indeed, Heilbrun, Hawk, and Tate (1996) note that “Almost without exception, case law supports the use of the [adult] standard in defining the parameters of trial competence in juvenile proceedings” (p. 574). This is problematic as Grisso (2003) suggests that while mental illness or mental retardation has traditionally provided the basis for incompetence in adult criminal court, other variables, such as developmental immaturity, may be more relevant when the question is raised for a juvenile defendant. Further, while case law may support the downward extension of an adult standard of competency to juveniles, the growing body of psychological research in this area offers evidence that argues against this policy. Research examining the myriad cognitive, social, and emotional differences that exist between children, adolescents, and adults has demonstrated that juveniles typically do not perform at an equivalent level to adults on measures of adjudicative competency (Cooper, 1997; Cowden & McKee, 1994, 1995; McKee, 1998; Savitsky & Karras, 1984). Further, significant differences in competency abilities are reported even across early, middle, and late adolescence.

Age consistently emerges as an important predictor in the juvenile competency literature. In a study comparing 108 juveniles to 145 adult trial defendants undergoing competency to stand trial (CST) evaluations, juveniles performed at an equal level to adults on simple competency abilities (e.g., knowledge of detention as a possible consequence, the importance of proper conduct in court, and their wish for positive outcomes for their cases) (McKee, 1998). However, many juveniles were less competent than adults when faced with more complex decisions that only an accused can decide (e.g., whether to testify, what plea to enter, whether to accept a plea bargain). On the basis of these findings, McKee (1995) concluded that “preteens’ extensive deficits clearly challenge the law’s presumption of competence to stand trial in person’s facing criminal charges” (p. 97).

In a comprehensive study comparing adolescents’ and adults’ trial capacities, 927 adolescents from a juvenile detention facility and 466 young adults in jails and in the community were evaluated using the MacArthur Competence Assessment Tool—Criminal Adjudication (MacCAT-CA; Grisso et al., 2003). The MacCAT-CA is a 22-item
structured interview that uses a vignette format and objectively scored questions to assess abilities relevant to adjudicative competency, namely Understanding, Reasoning, and Appreciation. An additional measure, the MacArthur Judgment Evaluation (MacJEN), was developed for the study with the goal of providing data regarding age-related differences in legal decisions and the psychosocial factors that might influence those choices. The MacJEN employs a vignette format to assess legal decision-making in regards to: (a) responding to police interrogation, (b) disclosing information during consultation with a defence attorney, and (c) responding to a plea agreement. Results of this study indicated that “juveniles aged 15 and younger were significantly more likely than older adolescents and young adults to be impaired in ways that compromise their ability to serve as competent defendants in a criminal proceeding” (p. 356). More specifically, roughly one-third of 11- to 13-year-olds and one-fifth of 14- to 15-year-olds performed at a level indicating impairment as severe as mentally ill adults who would likely be classified as incompetent to stand trial. By contrast, the researchers reported that 16- to 17-year-olds on the whole did not differ significantly from young adults with respect to competence abilities. This pattern of results held true across gender, ethnicity, SES, and across individuals in both community and justice system settings.

Burnett et al. (2004) investigated adjudicative competency in a juvenile population by comparing the performance of 70 individuals awaiting adjudication with 40 age-matched controls on the MacCAT-CA. Scores on the Reasoning scale, but not the Understanding scale, were significantly related to age for both the offender and control groups, with 10- to 12-year-olds scoring significantly lower than 15- to 16-year-olds on this scale. For the offender group, scores on the Appreciation scale were also related to age. Again, differences were found between 10- to 12-year-olds and 15- to 16-year-olds. (The Appreciation scale was not administered to the control group.) When the samples’ mean scores were compared to adults’ mean scores, as reported in an earlier study by Otto et al., 1998, several significant differences emerged. Mean scores on Understanding and Reasoning for both the offender and control groups were lower than those reported for unscreened jailed adults. Similarly, juvenile offenders’ mean scores on the Appreciation scale were significantly lower than those reported for adults. When the offender and control groups were combined and juveniles’ scores were examined by age group (i.e., 10-12, 13-14, 15-16, 17), only the 17-year-olds performed at an equivalent level to adults on the Understanding and Reasoning scales. No significant
differences on the Appreciation scale were reported for juvenile offenders aged 15-17 compared to adults.

Viljoen and Roesch (2005) examined predictors of youths’ legal capacities and decisions in a sample of 152 male and female defendants aged 11-17. Consistent with previous research, performance on the Fitness Interview Test—Revised (FIT-R; Roesch, Zapf, Eaves, & Webster, 1998; Roesch, Zapf, & Eaves, 2006) increased with age. Defendants aged 11-14 evidenced significantly higher rates of impairments than defendants aged 15 to 17. Over 85% of 11- to 14-year-olds were classified as impaired on one or more scales of the FIT-R (i.e., score of two or more standard deviations below adult norms) compared to roughly 54% of the older adolescents. An examination of specific abilities required for adjudicative competence revealed that for defendants aged 11-14, over 68% demonstrated significant impairment on Understanding and 50% were impaired on Communication (i.e., three or more standard deviations below adult norms). By contrast, among defendants aged 15-17, rates of impairment were approximately 35% and 21%, respectively.

In summary, the above studies illustrate that juveniles, particularly those below the ages of 15-17, do not perform at equivalent levels to adults on measures of adjudicative competence. Across these studies, age consistently emerges as a robust predictor of competence abilities, with significant differences from early to late adolescence. Possible explanations for the relationship between age and competency are explored below.

Cognitive and Neuropsychological Correlates of Adjudicative Competency

In view of the above findings, researchers have sought to uncover factors that might account for the relationship between age and competency abilities. Some researchers have argued that the relationship between age and competence is likely a function of cognitive maturation and further, that competence to stand trial is largely a cognitive skill (Burnett et al., 2004). Intelligence, for example, is related to competency. Positive associations between intelligence and scores on measures of competency have been reported for both adults and juveniles (Cooper, 1997; Savitsky & Karras, 1984;
Beyond this general relationship, researchers have more recently taken a reductionist approach to determine which specific cognitive abilities are most relevant to the construct of competence to stand trial. Some examples of cognitive abilities that have been hypothesized to contribute to scores on measures of competence include: verbal ability, verbal memory, problem solving, attention, social intelligence, and executive functioning (Grandjean, 2004; Lexcen, 2000; Nestor, Daggett, Haycock, & Price, 1999; Viljoen & Roesch, 2005).

Viljoen and Roesch (2005) reported that age-related differences in competency abilities among juvenile defendants were partially mediated by cognitive development. The cognitive abilities examined included: general intellectual ability, verbal ability, reasoning, long-term retrieval, attention, and executive functioning, as measured by the Woodcock-Johnson III Cognitive Assessment Battery (WJ-III; Woodcock et al., 2001). General intellectual ability (GIA) was significantly related to adjudicative competency abilities as measured by the FIT-R. The relationship between age and legal abilities significantly decreased when GIA was accounted for. Verbal ability emerged as a particularly robust predictor of legal abilities and was associated with performance on all scales of the FIT-R. Attention was also associated with performance on Appreciation and Communication, though to a lesser degree than verbal ability.

A small number of studies have attempted to deconstruct the construct of competence to determine how it might be related to modern neuropsychological models of cognition. In one such study, researchers accessed retrospective clinical judgments of defendants’ competence as well as test scores available from a neuropsychological test battery (Nestor et al., 1999). Files of 309 adult patients in a psychiatric hospital were reviewed. Results indicated that defendants recommended as competent to stand trial (CST) scored significantly higher on measures of intelligence, attention, and memory, especially verbal memory compared to those adjudged incompetent to stand trial (ICST). CST individuals also scored higher on tests of social intelligence and episodic memory, but not semantic memory. No significant differences were reported on tests of executive function or academic performance (i.e., past school grades).

Lexcen (2000) examined neuropsychological, psychopathological, and psychosocial variables associated with juvenile competence to stand trial in a sample of 66 adolescent male psychiatric inpatients. The author reasoned that since
neuropsychological testing can be used to assess cognition and psychopathology (which are the two most common threats to the functional abilities relevant to competence to stand trial) it would be useful to explore whether neuropsychological tests can be used to help develop more parsimonious competence batteries. Further, it was hypothesized that neuropsychological testing can provide information about the developmentally influenced skills of judgment and legal decision-making in adolescents. Participants completed the MacCAT-CA, the Kaufman Brief Intelligence Test (KBIT; Kaufman & Kaufman, 1993), and a number of neuropsychological measures, including Trails A/B and the Rey Complex Figure task (Rey, 1941). Also administered was the Judgment Assessment Tool—Adolescents (Woolard et al., 1996), an earlier version of the MacJEN. The results indicated that intelligence was associated with higher scores on the Understanding scale of MacCAT-CA. Higher scores on the verbal scale of the KBIT were associated with higher Reasoning scores on the MacCAT-CA. Lower scores on Understanding were associated with poor performance on Trails, while aspects of Judgment were associated with short-term visual memory and perceptual organization. This study provides evidence to suggest that some neurocognitive abilities can be used to predict both competence and decision-making in juveniles. However, the author cautioned that competency evaluations should not be reduced to neuropsychological variables alone.

Grandjean (2004) examined neuropsychological predictors of incompetence to stand trial in a sample of 55 mentally disordered offenders in a maximum security state psychiatric forensic hospital who had been referred for competency restoration. Participants were evaluated with the revised edition of the Evaluation of Competency to Stand Trial (ECST-R; Rogers, Tillbrook, & Sewell, 2004). Participants also completed a battery of intellectual and neuropsychological testing, allowing for comparisons between competent and incompetent defendants along seven cognitive domains. Competent defendants exhibited significantly better performance on tasks of verbal comprehension, social judgment, verbal memory, and executive functioning compared to incompetent defendants. No differences were reported for measures of attention, visual spatial skills, or nonverbal memory. With respect to executive functioning in particular, the Controlled Oral Word Association Test (COWAT) was the only measure that yielded significant differences between competent and incompetent defendants. The author concluded that...
the results “suggest that the relationship between executive functioning and competency should not be ruled out, but perhaps refined” (p. 68).

The present study sought to build upon research by Grandjean (2004), Lexcen (2000), and Nestor et al. (1999) in its focus on the relationship between competency and neuropsychological functioning. However, rather than administering a comprehensive but broad-based neuropsychological battery, for the present study, we chose to adopt a circumscribed and in depth focus on the construct of executive functioning. Executive functioning is defined as the ability to maintain an appropriate problem-solving set for attainment of a future goal (Bianchi, 1922; Luria, 1966). Briefly, this may include abilities such as inhibition/deferral of inappropriate behavioural actions and emotional responses, cognitive flexibility, planning, and self-monitoring. In addition to the narrower focus on executive functioning, a second important difference is that the present study will focus on juvenile defendants rather than adults, in contrast to both Grandjean’s (2004) and Nestor et al.’s (1999) research.

We chose to focus on executive functioning for two reasons: (a) the developmental importance of executive functioning during adolescence, and (b) the proposed relationship between executive functioning and legal abilities and decision-making. With respect to the former, maturation of the frontal lobes of the brain and the emergence of adult-level functioning of associated executive functions are major developments that occur during adolescence (Welsh & Pennington, 1988; Rosso et al., 2004).

**Development of Executive Functioning in Adolescence**

Executive function skills have been studied extensively in normally developing children (Welsh & Pennington, 1988). While frontally mediated executive functions emerge in the first year of life, the developmental course is protracted, persisting until puberty, if not beyond (Rosso et al., 2004; Welsh & Pennington, 1988). A stage-like sequence of executive functioning development is characterized by “spurts” in executive abilities beginning as early as 12 months of age, with the majority of functions coming “online” around the age of 8 (Ardila & Roselli, 1994; Case, 1992; Luciana & Nelson,
However, while such abilities may come “online” at an early age, they continue to improve and may not reach maturity until years later. Working memory, for example, does not peak until 20-29 years of age.

Studies of children up to age 12 or 13 have shown that they do not perform at adult levels on tasks thought to require intact function of the prefrontal cortex, such as working memory, verbal fluency, and planning (Hooper et al., 2004). For instance, 12-year-olds have been shown to exhibit significantly inferior performance compared to young adults on tasks that required increasing levels of executive control (Shallice et al., 1982). While they were able to perform all tasks at low levels of demand, performance was inferior to adults when problem sets became more complex.

Developmental changes in executive functioning during adolescence are distinct from those in infancy and childhood, as changes in adolescence involve improvements in existing executive abilities rather than the acquisition of new abilities. Improvements in the performance of existing abilities include speed and capacity of information processing and the ability to have consistent cognitive control of behaviour (Luna & Sweeney, 2004). Other developmental changes during this period involve gains in attentional control, working memory capacity, response inhibition, and a gradual shift from relatively concrete to increasingly abstract thinking (Rosso et al., 2004). Structural changes in the brain are believed to underlie the functional integration of frontal regions with the rest of the brain during development in adolescence (Chugani, 1998; Thatcher, Walker, & Giudice, 1987). For example, there are reductions in cortical thickness in frontal regions between childhood and adulthood (Sowell et al., 2001). Elimination of unused or redundant synapses and myelination also contribute to the progressive speeding of cognitive responses and more efficient and complicated neural communication. Research has investigated changes in performance on tasks of executive functioning with age and the related changes in the level of brain activation. Findings from this line of research are discussed below.

Evidence for improved performance with age on executive tasks is found in research utilizing functional magnetic resonance imaging (fMRI). For instance, one such study reported increased activation of the prefrontal cortex in children compared to adults during a go-no-go task, suggesting the task requires more effort for children (Casey, Trainor, & Orendi et al., 1997). Similarly, age-related increases in prefrontal
Cognitive and Neuropsychological Predictors function have also been described during a Stroop interference task (Adleman et al., 2002). Luna and Sweeney (2004) conducted an fMRI study of participants ranging in age from eight to 30 years. Results indicated increased integration of distant brain regions and improved efficiency with maturity in brain regions supporting executive and attentional control, which are important in the development of voluntary response suppression. The authors suggest that their results indicate that adolescents’ executive brain functioning is still not fully mature, despite improved performance with age. They postulate that this may be a vulnerable system that could fail under demanding situations, such as heightened affect, motivation, or distracting stimuli and competing tasks.

Hooper et al. (2004) studied developmental changes in performance on one measure of executive functioning, the Iowa Gambling Task (IGT). They found that adolescents ages 14-17 made more advantageous selections and shifted choices to advantageous decks earlier than younger children, that is, they were better able to inhibit a prepotent response. This age group also evidenced fewer false alarms on go-no-go task and could manipulate more pieces of information in working memory (e.g., higher backward digit span). However, despite these developmental improvements, even the 14- to 17-year-olds had a pattern of performance distinct from adult participants. The researchers, therefore, surmised that adolescents do not have adult-level capabilities to make decisions that will be advantageous in the long run.

Overall, the results of studies on the development of executive functions suggest that executive functioning should be considered a multi-component construct, as different components develop at varying rates and reach maturation at different ages (Anderson et al., 1996, 2001). Similarly, impairment may be evident in one or more domains of executive functioning, while others remain within normal limits.

In view of such research, Miyake and colleagues examined the separability of three executive functions in order to determine whether executive functioning should be considered a unitary or diverse construct (Miyake, Friedman, Emerson, Witzki, & Howarter, 2000). They studied three domains of executive functioning and their respective contributions to complex ‘frontal lobe’ tasks in an adult sample. The first domain, mental set shifting, is the ability to switch attention between tasks, to disengage from an irrelevant task and subsequently engage in a more relevant one. This domain
may also be referred to as cognitive flexibility, and also involves the ability to consider multiple conflicting representations of an event or object. The second domain of executive functioning, information updating and monitoring, is closely tied to the concept of working memory. It involves one’s ability to monitor and code incoming information for relevance to the task at hand, to actively manipulate relevant information, and to replace old irrelevant information with new relevant information. Finally, inhibition of prepotent responses involves deliberately inhibiting dominant, automatic, or prepotent behavioural or emotional responses when necessary. This concept is closely related to the construct of impulsivity.

Miyake et al. (2000) reported that these three executive functions were moderately correlated with one another, but are clearly separate constructs. Moreover, structural equation modeling suggested that the three functions contribute differentially to performance on complex executive tasks. This suggests that executive functioning is, in fact, multidimensional. Therefore, an individual’s executive abilities cannot be adequately captured by a single test or score. For the purpose of this research, we will adopt the classification scheme of executive abilities described in Miyake et al. (2000), modifying the names of each domain and herein referring to them as: cognitive flexibility, working memory, and response inhibition/impulsivity, respectively. Finally, we included an additional executive ability, which we have labelled metacognition/insight. Metacognition has been referred to as “knowing about knowing” (Flavell, 1979). It involves aspects of self-awareness, including knowledge of one’s own thoughts and cognitive processes and the factors that influence one’s own decision-making.

Proposed Relations between Executive Functions and Competency Abilities

Executive functioning includes abilities such as planning, strategic problem solving, self-monitoring, response inhibition/impulsivity, anticipation, and cognitive flexibility, which we hypothesized should logically contribute to the areas of legal decision-making and adjudicative competency. We proposed that response inhibition/impulsivity may be related to adjudicative competency and legal decision-making when an adolescent is given a choice between alternative courses of action.
We might expect that more impulsive youth would tend to focus on short-term consequences associated with their choices and to place comparatively less weight on long-term consequences. Such youth might even demonstrate difficulty generating potential long-term consequences. Cognitive flexibility may come into play in terms of the youth’s ability to understand the possible consequences of the proceedings. For example, this may play out as the defendant is asked to consider possible scenarios if he or she pleads guilty versus not guilty or when deciding whether to accept a plea bargain and to appraise the risks and benefits associated with each choice. Working memory may impact a youth’s ability to retain and evaluate information about decision-making alternatives, for example, the terms and consequences associated with accepting versus rejecting a plea agreement. Metacognition/insight may be relevant when a defendant is asked to articulate the reasons for his legal decisions.

Additionally, we expected that a youth’s general level of intelligence, and particularly verbal abilities, would likely influence factual legal knowledge, such as the understanding of the legal process and key legal participants. Finally, we anticipated that executive abilities would remain predictive of competency scores even after intelligence has been statistically controlled for. This prediction is made in view of Friedman and colleagues (2006) finding that not all executive functions are correlated with intelligence. Specifically, this study found that while information updating (working memory) was highly correlated with intelligence measures, two abilities of interest in our study, inhibition of prepotent responses (response inhibitions/impulsivity) and mental set shifting (cognitive flexibility) were not related to intelligence.

**Purpose and Rationale**

Previous research on the neuropsychological components of competency has yet to yield strong evidence of a relationship between executive functioning and competency abilities (e.g., Lexcen, 2000; Nestor et al., 1999; Viljoen & Roesch, 2005). Grandjean’s (2004) research found a relationship between executive functioning and competency on the COWAT, but not on other executive measures, such as the Wisconsin Card Sorting Test (WCST) or the Stroop task. On the WCST however, there was a trend towards significance, with competent defendants completing the task in fewer trials and with less
perseverative errors than incompetent defendants. It is possible the results reported may have been constrained by the relatively small sample size ($N = 55$).

There are several possible explanations for the null and conflicting findings regarding executive functioning and competency. We have identified several relevant issues inherent in the previous research and will attempt to address them in order to clarify the relationship between executive functioning and adjudicative competency. These issues or limitations are discussed in turn.

Executive function has often been treated as a unitary construct in past competency research, with researchers administering only one or two tests as an index of executive ability (e.g., Grandjean, 2004; Lexcen, 2000; Nestor et al., 1999). The results of Miyake et al.’s (2000) research indicates that, while the various areas of executive functioning are moderately correlated, there is evidence for at least three distinct constructs. It is possible that executive functioning may not correlate with competency on a broad level, and such research designs may have obscured significant relationships among more specific subsets of executive functioning. We contend that adjudicative competency may be related to some aspects of executive functioning but unrelated to others.

Related to the unitary construct issue is the scope of focus in past research. Previous research has taken the approach of administering comprehensive and broad-based neuropsychological batteries to determine which abilities are most relevant to competency (e.g., Grandjean, 2004; Lexcen, 2000; Nestor et al., 1999). This is a reasonable strategy during early stages of research to get a sense of the overall picture and determine which areas of functioning warrant further study in the future. However, this approach provides more general and less detailed information and places limits on the conclusions that can be drawn. Our strategy is to utilize the results of this past approach to now focus more narrowly on a domain of interest, namely executive functioning.

Finally, in research using adult participants (e.g., Grandjean, 2004; Nestor et al., 1999), there may have been a restricted range in the levels of executive functioning. These abilities are more likely to be fully developed in adults compared to those of adolescents, who are still undergoing significant change and development in the
prefrontal cortex. Thus, such research may have potentially obscured significant correlations between executive functioning and adjudicative competency that are present when a wider range of ability levels are available for analysis.

In summary, as the adolescent brain develops and matures, executive functioning abilities improve with age. Similarly, research has consistently demonstrated that competency increases from early to late adolescence and into early adulthood. The purpose of the present research is to explore the relationship between juvenile adjudicative competency abilities and specific domains of executive functions during adolescence as guided by Miyake et al.’s (2000) classification of executive abilities into the following areas: response inhibition (impulsivity), mental set shifting (cognitive flexibility), and information updating and monitoring (working memory). This study investigated whether one or more executive abilities function as useful predictor variables of adolescents’ scores on measures of adjudicative competency. We hypothesized that response inhibition/impulsivity, cognitive flexibility, working memory, and metacognition/insight would be related to scores on measures of adjudicative competency and legal decision-making (i.e., FIT-R and MacJEN). Further, we proposed that executive functioning would contribute incremental predictive utility of competency beyond the variables of age and intelligence. We also expected to find significant developmental differences in executive abilities. Finally, consistent with past research we expected to observe significant relationships between (a) age and competency and (b) intelligence and competency.
METHOD

Measures

Assessment of Competency and Legal Decision-making

Questions from the Fitness Interview Test—Revised Understanding Scale

Selected questions from the Fitness Interview Test—Revised (FIT-R; Roesch, Zapf, Eaves, & Webster, 1998; Roesch, Zapf, & Eaves, 2006) were administered to assess adjudicative competency abilities. The FIT-R was designed as a guide for mental health professionals conducting fitness evaluations in Canada (Roesch et al., 1998). The revised edition takes into account the 1992 changes to the Criminal Code. The FIT-R consists of a semi-structured interview that guides evaluators through a set of defined criteria determining fitness to stand trial. The interview is followed by the completion of a rating scale assessing the degree of incapacity for each issue. The instrument is divided into three sections, which parallel the Criminal Code’s criteria for fitness. Each section contains a list of questions regarding specific abilities. For each item, there is a definition and a list of questions to be asked. The three sections are:

1. Understand the Nature or Object of the Proceedings: Factual Knowledge of Criminal Procedure
2. Understand the Possible Consequences of the Proceedings: Appreciation of Personal Involvement in and Importance of the Proceedings
3. Communicate with Counsel: Ability to Participate in Defence

After administering the interview questions in these three areas, the evaluator rates the accused’s level of impairment in each area on a 3-point scale where: 2 = Definite/Serious Impairment, 1 = Possible/Mild Impairment, and 0 = No Impairment.
Based on these scores, the evaluator uses clinical judgment to make an overall determination of the person’s fitness to stand trial.

Research on the psychometric properties of the FIT-R found that the average interrater reliability for overall determination of fitness was 0.98, with intraclass correlations for individual items within the 0.80s and 0.90s (Viljoen, Roesch, & Zapf, 2002). Reliability for sections of the FIT-R ranged from .54 to .70 for groups of raters. Results of this study also indicated that physicians, forensic psychologists, nurses, and graduate students in psychology were able to conduct reliable fitness assessments using the FIT. Research indicates that the FIT-R demonstrates excellent utility as a screening instrument. For example, in a study of 57 males remanded for fitness, scores on the FIT-R were compared to decisions made following institution-based evaluations of fitness (Zapf & Roesch, 1997). The FIT-R reliably screened out individuals that were clearly fit to stand trial and achieved perfect sensitivity and negative predictive power for this sample. The measure correctly identified 86% of defendants, with a false positive rate of 14%. Predictive validity of the FIT-R has also been established (see Zapf, Roesch, & Viljoen, 2001). Evidence for the construct validity of the FIT-R is found in the reasonably high agreement between the FIT-R and the MacCAT-CA (Zapf & Roesch, 2001). Confirmatory factor analysis supports a three-factor solution, which includes understanding and reasoning about legal proceedings, appreciation of the charges and possible consequences of the proceedings, and the ability to communicate with counsel. Research has also found support for the FIT-R’s psychometric properties in youth (Viljoen, Vincent, & Roesch, 2006).

For the present study, selected questions from Section I of the FIT-R were administered (Appendix A). These questions assessed participants’ understanding of: (a) the role of key legal participants, (b) the legal process, (c) pleas, and (d) court procedure. Because our sample consisted of adolescents not currently involved in the legal system, Sections II and III were not applicable, as they refer to the details of a defendant’s specific legal case. For example, Section II includes items evaluating a defendant’s understanding of the range and nature of possible penalties, appraisal of available legal defences, and appraisal of likely outcome. Section III items include an evaluation of a defendant’s capacity to: communicate facts to their lawyer, to relate to their lawyer, to plan a legal strategy, to engage in their own defence, to challenge
prosecution witnesses, to testify relevantly, and to manage courtroom behaviour. Similarly, items from Section I that pertain to a defendant’s understanding of his or her specific legal case were also omitted (i.e., understanding of arrest process and understanding of nature and severity of current charges).

It is important to note that this resulted in a relatively small set of the FIT-R items being administered (i.e., 4 of the 16 items). Eight questions pertained to the role of key legal participants (Item 3), 4 questions each assessed understanding of the legal process (Item 4) and understanding of pleas (Item 5), and finally, 5 questions assessed understanding of court procedure (Item 6). A score of 0, 1, or 2 was assigned for each of the 21 questions administered from the four Section I items. This resulted in a maximum possible total score of 42 points, with higher scores reflecting greater knowledge/understanding. Since only a subset of FIT-R questions was administered in the current study, we chose to depart from the typical scoring procedure used for this measure (i.e., 0, 1, or 2 points per item) and scored the questions within each item. In this way, we were able to examine potential variability or inconsistency of adolescents’ knowledge and understanding within each of the four items.

**MacArthur Judgment Evaluation (MacJEN)**

The MacJEN was administered to assess decision-making abilities relevant to adjudicative competence (Woolard, Reppucci, Steinberg, Grisso, & Scott, 2003). The MacArthur Judgment Evaluation (MacJEN) was based on an earlier instrument, the Judgment Assessment Tool for Adolescents/Adults (JATA; Woolard, Reppucci, & Scott, 1996) and developed for a subsequent study comparing the trial capacities of adolescent and adult defendants (Grisso et al., 2003). The MacJEN was designed to provide data regarding age-related differences in legal decision-making and psychosocial factors. The instrument uses vignettes that describe a male who has committed a robbery and faces a series of decisions common in the delinquency/criminal process: (a) responding to police interrogation, (b) disclosing information during consultation with a defence attorney; and (c) responding to a plea agreement for reduced consequences in exchange for a guilty plea and testimony against other defendants.

Respondents are asked to recommend a “best choice” and a “worst choice” for the vignette character from several possible options. For the police interrogation
vignette, options include confessing to the offense, denying the offense, or refusing to speak. Choices for the attorney consultation vignette include full disclosure, partial disclosure, denying the offense, or refusing to cooperate. Finally, for the plea agreement vignette, options include accepting or rejecting the offer for reduced charges in exchange for testimony against other defendants. Respondents’ “best” choice recommendations are coded to assess the readiness to comply with authority figures. Responses are also scored according to criteria designed to evaluate three aspects of psychosocial maturity that might influence one’s legal choices: (a) risk appraisal, (b) future orientation, and (c) resistance to peer influence (see Grisso et al., 2003 for details).

Preliminary research using the MacJEN revealed a number of age-related differences in legal decision-making (Grisso et al., 2003). First, age was significantly related to choices in both the police questioning and plea agreement vignettes, and this finding was consistent across all IQ levels. In all three of the legal contexts, youth 15 years and younger were significantly more likely to make choices that represented compliance with authorities. Younger adolescents differed from young adults in their appraisal of risk. Specifically, younger adolescents were less likely to recognize risks, to think that risks were likely, or to think that risks were serious. Youth under 14 were significantly less likely to anticipate possible long-range future consequences when explaining their choices. Finally, a complex relationship between age and resistance to peer suggestions was reported. Taken together, the authors suggest that these findings indicate that “psychosocial immaturity may influence the performance of youths as defendants in ways that extend beyond the elements of understanding and reasoning that are explicitly relevant to competence to stand trial” (Grisso et al., 2003, p. 357).

**Cognitive Measure**

**Kaufman Brief Intelligence Test (2nd ed.)**

The Kaufman Brief Intelligence Test is brief, individually administered measure of verbal and non-verbal intelligence (KBIT-2: Kaufman & Kaufman, 2004). The measure is suitable for ages four through 90 years and can be administered in approximately 15-30 minutes. The KBIT-2 measures two distinct cognitive abilities through two scales: Crystallized and Fluid. The Crystallized (Verbal) Scale comprises two subtests, Verbal
Knowledge and Riddles. This scale includes receptive and expressive vocabulary items that do not require reading or spelling. The Fluid (Nonverbal) Scale consists of a Matrices subtest. In addition to verbal and nonverbal scores, the KBIT-2 provides an IQ composite.

The KBIT-2 was normed on a standardization sample of 2,120 individuals, which was stratified according to race/ethnicity, geographic region, and education. Test items and norming procedures were developed with cultural fairness in mind. Psychometric characteristics of this measure are strong. Internal consistency coefficients of 0.93, 0.91, and 0.88 are reported for the IQ Composite, Verbal, and Nonverbal scores, respectively. IQ composite test-retest reliability was 0.90 over an approximately one-month interval ($r = 0.91$ for Verbal and $r = 0.83$ for Nonverbal). KBIT-2 IQ composite scores correlate strongly with Wechsler Intelligence Scale for Children (4th ed.; WISC-IV) Full Scale IQ ($r = .77$) scores and Wechsler Adult Intelligence Scale (WAIS-III) Full Scale IQ scores ($r = 0.89$).

The neuropsychological measures described below were chosen to reflect the three domains of executive functioning posited by Miyake et al. (2000). These domains include: cognitive flexibility, response inhibition/impulsivity, and working memory. Tasks were administered within each domain of executive functions. In addition to domains described by Miyake et al. (2000), we administered a measure of metacognition/insight.

**Measure of Cognitive Flexibility**

**Wisconsin Card Sorting Test**

The Wisconsin Card Sorting Test (WCST) was developed to evaluate flexibility in thinking (Grant & Berg, 1948). The test materials consist of four stimulus cards and two decks of 64 response cards. Respondents are required to sort the cards according to different principles (i.e., colour, form, number) during the test administration. These sorting principles change several times throughout the test, forcing respondents to re-evaluate their problem solving strategies and adjust their responses accordingly. The examinee receives feedback for each response (i.e., correct or incorrect), but he or she is never told the correct sorting principle. Successful performance requires respondents to develop and maintain an appropriate problem-solving strategy across changing
stimulus conditions in order to achieve a future goal (Luria, 1973; Shallice, 1982). Several aspects of performance are measured including: conceptualization of the task, perseveration, failure to maintain a cognitive set, and inefficient learning across stages of the test.

Normative data are provided for ages 6.5 through 89 years, corrected for education for ages 20 and older. The normative sample consists of 899 individuals aggregated from six district samples. The first sample included 453 children and adolescents enrolled in U.S. public schools. Huettner et al. (1989) reported high interscorer and intrascorer reliability for the WCST using a sample of 50 children and adolescents referred for neuropsychological assessments. Interscorer reliability coefficients of the WCST ranged from 0.895 to 1.000 for the 11 scores of the test, with the exception of the Learning to Learn score ($r = 0.658$). A subset of 46 child and adolescents from the normative sample were administered the WCST on two occasions with a mean interval between testings of one month. Generalizability coefficients ranged from 0.39 to 0.72, with a mean of 0.57 and a median of 0.60. With the exception of two scores (Percent Perseverative Responses and Percent Perserverative Errors) the WCST demonstrated moderate to good reliability.

The WCST has shown specific sensitivity to frontal brain lesions and dysfunction in adults (Drewe, 1974; Milner, 1963; Robinson, Heaton, Lehman, & Stilson, 1980). While many neuropsychological measures have not been designed specifically for use with children or adolescents and may also lack appropriate norms, research indicates that the Wisconsin Card Sorting Task is sensitive to frontal functioning in school-age children (Chelune & Thompson, 1987; Milner, 1963; Welsh, Pennington, & Groisser, 1991).

For our study, we administered the 64 card version of the WCST. The rationale for this decision was to: (a) maintain a manageable test battery in terms of administration time and (b) preserve rapport by reducing the potential level of frustration experienced by lower-functioning examinees. The 128-card version can take upwards of one hour or more to administer in impaired individuals (Robinson, Kester, Saykin, Kaplan, & Gur, 1991). Further, the task length and complexity can result in impaired examinees’ failure to complete the task (Axelrod, Paolo, & Abraham, 1997). Research indicates that multiple regression equations can reliably predict WCST whole test scores from a 64-
Measure of Response Inhibition/Impulsivity

Stroop Colour and Word Test

The Stroop Test was designed to assess the effects of verbal interference (Stroop, 1935). The task consists of three conditions. In the first condition, examinees are instructed to read a list of colour words as rapidly as possible. The second requires the examinee to name patches of colour on a page (i.e., non-verbal stimuli). Finally, in the inference condition, the words are printed in a dissonant coloured ink (e.g., the word red may be printed in green ink). The examinee must inhibit the automatic task of word reading and instead name the colours in which the words are printed. Colour-word interference measures the individual’s ability to inhibit a dominant response (word reading) in favour of a requested response. In this way, the test also measures the overlapping construct of impulsivity.

Research suggests that the Stroop test is sensitive to frontal functioning in children (Perret, 1974). A review of 50 years of data on the Stroop effect reports a decrease in interference from childhood through adolescence (ages 7-18 years), suggesting a progressive development of inhibitory control that lasts until late adolescence (McLeod, 1991). Recent research consistent with this finding reported decreased interference between the ages of 10 and 17 years (Leon-Carrion, Garcia-Orza, & Perez-Santamaria, 2004).

Measures of Working Memory

Wechsler Intelligence Scale for Children (4th ed.; WISC-IV) Letter-Number Sequencing Subtest

Intelligence may be defined as the “capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment” (Wechsler, 1944, p. 3). While intelligence is characterized as the whole of an individual’s behaviour, it is comprised of qualitatively different abilities (Wechsler, 1997). The WISC-IV is an individually administered test of intelligence for use with children ages 6 years through
16-years-11-months-old (Wechsler, 2003). The test measures the cognitive domains of verbal comprehension, perceptual reasoning, working memory, and processing speed as well as providing a composite score intended to represent general intellectual ability. In the U.S., the test was standardized on a stratified sample of 2,200 individuals ages 6:0 through 16:11.

In the letter-number sequencing subtest, the examiner reads sequences of numbers and letters, which increase in length as the subtest progresses. Examinees are asked to repeat the sequences with the numbers in ascending order and then the letters in alphabetical order. Five practice trials are administered prior to the scored items. The subtest was designed to be a novel task that is not likely to be encountered in the real-world. This subtest measures the examinee’s ability to manipulate and hold information in short-term or working memory. Others factors such as attention and concentration, distractibility, and anxiety may also be captured by this subtest. With respect to psychometric properties, this subtest has an average split-half reliability of 0.90 and an average test-retest reliability of 0.83 (corrected stability coefficient). The average standard error of measurement is 0.97. Although, the WISC-IV is intended for children up to the age of 16:11, the measure will be extended to 17- and 18-year-olds in the present study for the purpose of making age-based comparisons.

**Wechsler Intelligence Scale for Children (4th ed.; WISC-IV)**

**Digit Span Subtest**

In the digit span subtest, the examiner reads strings of numbers at a rate of one number per second. The examinee must repeat back these number strings, which increase in length as the subtest progresses. This subtest measures the individual’s capacity to hold information in working memory. Similar to the letter-number sequencing task, performance on this subtest may be influenced by factors such as attention and concentration, distractibility, and anxiety. The digit span subtest has a split-half reliability of 0.87 and a test-retest reliability of 0.83 (Wechsler, 2003).
Additional Measure of Executive Functioning

Wechsler Intelligence Test for Children (4th ed.; WISC-IV) Comprehension Subtest

Finally, the WISC-IV Comprehension subtest was administered. In this subtest, participants are asked to provide solutions to everyday problems and social concerns. This subtest provides a measure of metacognition/insight, common sense reasoning, and judgment. Additionally, some of the questions address themes related to the law by tapping into expectations for legal and moral behaviours (e.g., Why is it important for police to wear uniforms?; What should you do if you find someone’s wallet or purse in a store?; What is the thing to do if a boy or girl much smaller than yourself starts to fight with you?). The split-half reliability coefficient for the Comprehension subtest is 0.81 and test-retest reliability is 0.82.

Participants and Procedures

Participants included 96 adolescents (50 males and 46 females) ages 13 to 18 selected from a Washington state high school and middle school. The sample comprised students in grades eight through 12. For the purpose of statistical analyses, participants were divided into three age categories: 13-14 years, 15-16 years, and 17-18 years. Research in the juvenile competency literature frequently analyzes age as a categorical rather than a continuous variable (e.g., Grisso 2003; Viljoen & Roesch, 2005). Specific cut points for each age category tend to vary somewhat across studies however, often depending on the age range of participants studied. The age categories adopted for the present study are consistent with a number of previous studies (e.g., Baerger, Griffin, Lyons, & Simmons, 2003; Burnett, Noblin, & Prosser, 2004), which included the age categories of 13-14 years and 15-16 years.

The majority of participants in our study were Caucasian (n = 81, 84.4%). Six participants were Hispanic (6.3%), 3 were Asian (3.1%), 3 were of a mixed ethnic background, 1 participant was African American (1%), and 1 was South Asian. All participants indicated that English was their first language. IQ scores were obtained for 94 of the 96 participants. (The remaining 2 students chose to discontinue testing prior to the completion of the IQ measure). The average KBIT-2 composite IQ score was 101.35
(SD = 13.92), with a range of 66 to 147. The average verbal IQ score was 104.3 (SD = 15.71), with a range of 77 to 160.

All study procedures were approved by the university ethics review board. Approval for the study was also granted by the high school and middle school principals and the school district superintendent. At the high school, the primary researcher met with students enrolled in the school’s psychology course to describe the study and recruit potential volunteers. Written parental consent forms (Appendix B) were distributed to the class. Interested students were asked to return their signed consent forms to the office. When the psychology class participants had completed testing, other students were informed of the study by way of a notice board posted in the school library, as well as by word of mouth. (Participants who completed testing were encouraged to tell their friends and classmates about the project.) All students in the school were eligible to participate.

At the middle school, the principal approached several teachers to describe the study and request their class participation. Teachers who expressed interest in the study met with the principal and a research assistant for a further explanation of the study and an opportunity to ask additional questions. These teachers then briefly introduced the study to their students and distributed the parental consent forms. Students were asked to return their signed consent forms to the classroom teacher. Eight parents of middle school students withheld consent for their child to participate in the study.

Testing was completed by the primary researcher or a research assistant. Research assistants were undergraduate psychology majors from Simon Fraser University (SFU) and Western Washington University (WWU) or had completed an undergraduate degree in psychology. Research assistants received written material describing the study measures and consent procedures. They then attended a training session where they received instruction on the administration of the study measures. This session included time for the research assistants to practice their test administration and receive subsequent feedback. Following this, research assistants observed one or more test administrations at the school. They were then observed during their first test administration. Immediate verbal feedback was provided, and written feedback was provided after their first few test protocols were scored and coded by the primary
researcher. Periodic feedback regarding test administration was also provided to the research assistants over the course of the study.

Once the school principal or classroom teacher identified potential participants, their testing sessions were typically scheduled in advance. Participants met individually with the primary researcher or a research assistant for testing. Prior to commencing testing, participants were provided with an oral and written summary of the research project. Informed consent was obtained and participants reviewed and sign an informed consent form (see Appendix C). An adapted version of the MacArthur Competence Assessment Tool for Clinical Research (MacCAT-CR) was also administered to facilitate the informed consent process (Appelbaum & Grisso, 2001). This measure evaluated potential participants’ understanding of the nature of the study, its risks and benefits, and the limitations to confidentiality (see Appendix D). If a student was unable to demonstrate adequate understanding of the salient aspects of the study, testing was not administered. For the present study, all students demonstrated sufficient understanding and none were excluded from participation on the basis of their performance on the MacCAT-CR measure.

Testing took place in a quiet area within school (e.g., vacant office or library). Testing was completed in a single session whenever possible, with breaks offered as needed. However, in some cases, it was necessary to complete testing over two sessions to accommodate the teachers’ class schedules. Participants were assured confidentiality of their responses, except in the event of risk of harm to self or others or in accordance with the U.S. Patriot Act. In particular, students were told that their test scores would not be shared with teachers, parents, or other students. Further anonymity of responses was maintained by using a research ID code in place of student names on all test forms. Students were also informed that the research project was not affiliated with the school in any way, and that their participation would not affect their class grades. Participants were not financially compensated for their time, but received an excused absence from class to complete testing. At the end of the testing session, interested students were also given the opportunity to ask the examiner any further questions about the research or about education and career paths in psychology. Participants were asked not to reveal any of the study questions or answers to their classmates in order to maintain the integrity of the study results. Administration order of
the study measures was flexible in order to accommodate students’ class schedules and the school bell schedule.
RESULTS

Legal Abilities and Legal Decision-making

Questions from FIT-R Understanding Scale

Consistent with previous research, we expected to find a significant relationship between age and participants’ scores on measures of adjudicative competency (FIT-R understanding questions). Age was positively correlated with total score on the selected FIT-R understanding questions ($r = 0.42$, $p < 0.01$). Results of a one-Way ANOVA revealed significant differences in total scores across the three age categories, $F (2, 95) = 7.607$, $p = 0.001$. Pairwise comparisons indicated that younger adolescents (13-14 years) scored lower on the FIT-R questions than older adolescents (17-18 years), $t (62) = -3.996$, $p < 0.01$. However, younger adolescents’ scores were comparable to those of middle adolescents (15-16 years), $t (52) = -1.984$, $p = 0.052$. Similarly, a comparison of scores on the FIT-R questions for middle and older adolescents was not significant, $t (72) = -1.890$, $p = 0.063$. Table 1 below presents the mean total scores on the FIT-R questions for each age group.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Mean Total Score (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-14</td>
<td>16.96 (5.96)</td>
</tr>
<tr>
<td>15-16</td>
<td>20.06 (5.44)</td>
</tr>
<tr>
<td>17-18</td>
<td>22.24 (4.77)</td>
</tr>
</tbody>
</table>

There were no gender differences in participants’ scores on the selected FIT-R questions. Males had a mean total score of 20.54 ($SD = 5.73$) and females had a mean total score of 20.04 ($SD = 5.31$). Scores on the FIT-R questions correlated with both Verbal IQ ($r = 0.444$, $p < 0.001$) and Composite IQ ($r = 0.420$, $p < 0.001$), as measured by the KBIT-2.
Analysis of individual FIT-R questions revealed that adolescents demonstrated a good understanding of the role of the defence attorney and the jury in the courtroom, with roughly three-quarters of participants providing 2-point responses on these items. In contrast, the role of the prosecuting attorney and the judge were less well understood, with just over 40% of participants providing 2-point responses to these questions. Of note, participants had particular difficulty articulating the role of the defendant/accused. In fact, nearly two-thirds of participants received a score of zero on this question. Review of individual participants’ verbatim responses indicated that many adolescents believed that the role of the accused person is to defend him/herself in court. Participants’ understanding of other courtroom players, such as witnesses, police, and mental health professionals was also variable. Interestingly, review of individual responses indicated that a considerable number of students indicated that a psychiatrist’s or psychologist’s role in the courtroom is to provide therapy or “emotional support” to the defendant or the victim of the crime.

Participants showed a good understanding of the meaning of an oath as well as what can be used as evidence in court, with more than 80% of adolescents providing full credit responses to these questions. Understanding of the jury selection process and the requirement that juries must be unanimous in their verdict was more variable. Roughly 40% of participants received a score of zero on this item, and nearly half received only partial credit.

Most striking was participants’ poor grasp of the meaning of a guilty or not guilty plea, with more than 90% of adolescents receiving scores of zero on these items. Analysis of individual responses revealed that the vast majority of participants believed that a guilty plea is a literal admission of guilt and a not guilty plea means that the person did not commit the crime. Participants’ scores increased when asked to specify what happens following a guilty or not guilty plea. Still, very few individuals were able to adequately articulate the important consequences of one’s plea (e.g., go to trial versus immediate sentencing). Table 2 summarizes the mean item scores and percentage of participants who received scores of 0, 1, or 2 on each of the FIT-R questions.
Table 2. Mean Item Scores and Percentage of Participants Receiving 0-, 1-, or 2-point Responses on the FIT-R Questions

<table>
<thead>
<tr>
<th>FIT-R Question</th>
<th>Mean Score</th>
<th>SD</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of defence counsel</td>
<td>1.66</td>
<td>0.65</td>
<td>9.4</td>
<td>15.6</td>
<td>75.0</td>
</tr>
<tr>
<td>Role of prosecution</td>
<td>1.10</td>
<td>0.85</td>
<td>31.3</td>
<td>27.1</td>
<td>41.7</td>
</tr>
<tr>
<td>Role of judge</td>
<td>1.34</td>
<td>0.63</td>
<td>8.3</td>
<td>49</td>
<td>42.7</td>
</tr>
<tr>
<td>Role of jury</td>
<td>1.64</td>
<td>0.67</td>
<td>10.4</td>
<td>15.6</td>
<td>74.0</td>
</tr>
<tr>
<td>Role of defendant</td>
<td>0.41</td>
<td>0.59</td>
<td>64.6</td>
<td>30.2</td>
<td>5.2</td>
</tr>
<tr>
<td>Role of witnesses</td>
<td>1.50</td>
<td>0.65</td>
<td>8.3</td>
<td>33.3</td>
<td>58.3</td>
</tr>
<tr>
<td>Role of police</td>
<td>0.66</td>
<td>0.63</td>
<td>42.7</td>
<td>49.0</td>
<td>8.3</td>
</tr>
<tr>
<td>Role of psychiatrist/psychologist</td>
<td>0.70</td>
<td>0.80</td>
<td>51.0</td>
<td>28.1</td>
<td>20.8</td>
</tr>
<tr>
<td>Meaning of an oath</td>
<td>1.63</td>
<td>0.77</td>
<td>17.7</td>
<td>2.1</td>
<td>80.2</td>
</tr>
<tr>
<td>What can be used as evidence in court?</td>
<td>1.79</td>
<td>0.48</td>
<td>3.1</td>
<td>14.6</td>
<td>82.3</td>
</tr>
<tr>
<td>Jury composition/selection and requirement of unanimity</td>
<td>0.73</td>
<td>0.67</td>
<td>39.6</td>
<td>47.9</td>
<td>12.5</td>
</tr>
<tr>
<td>Certainty/beyond reasonable doubt</td>
<td>0.44</td>
<td>0.61</td>
<td>62.5</td>
<td>31.3</td>
<td>6.3</td>
</tr>
<tr>
<td>Who is the only one who can call on the defendant to testify?</td>
<td>0.61</td>
<td>1.16</td>
<td>70.8</td>
<td>3.1</td>
<td>25.0</td>
</tr>
<tr>
<td>Order of questioning of defendant</td>
<td>1.45</td>
<td>1.09</td>
<td>25.0</td>
<td>11.5</td>
<td>62.5</td>
</tr>
<tr>
<td>Why does the prosecutor ask the defendant questions?</td>
<td>1.19</td>
<td>1.05</td>
<td>25.0</td>
<td>37.5</td>
<td>36.5</td>
</tr>
<tr>
<td>What will the judge do if the defendant pleads guilty?</td>
<td>1.30</td>
<td>1.13</td>
<td>30.2</td>
<td>15.6</td>
<td>53.1</td>
</tr>
<tr>
<td>Questions to ask lawyer before deciding on a guilty or not guilty plea</td>
<td>1.02</td>
<td>0.97</td>
<td>24.0</td>
<td>56.3</td>
<td>18.8</td>
</tr>
<tr>
<td>Meaning of not guilty plea</td>
<td>0.07</td>
<td>0.30</td>
<td>93.8</td>
<td>5.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Consequences of not guilty plea</td>
<td>0.70</td>
<td>0.55</td>
<td>34.4</td>
<td>61.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Meaning of guilty plea</td>
<td>0.03</td>
<td>0.18</td>
<td>96.9</td>
<td>3.1</td>
<td>0</td>
</tr>
<tr>
<td>Consequences of guilty plea</td>
<td>0.78</td>
<td>0.49</td>
<td>25.0</td>
<td>71.9</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Interrater reliability was evaluated for total scores on the FIT-R questions selected for the present study. Intraclass correlation coefficients (ICCs) were calculated for single raters using a 2-way mixed effect model (Model 2, McGraw, & Wong, 1996). Level of absolute agreement was “excellent” (see Cicchetti, Showalter, & Tyrer, 1985), with an ICC of 0.996 averaging over a sample of 15 ratings.

MacJEN

Age Differences in Choices on Decision-making Vignettes

Chi square analyses were conducted to investigate age differences in participants’ best choice responses on the three MacJEN vignettes. For the police
interrogation vignette, participants were asked to decide the best choice for the story character from the following three options: (a) deny involvement in the robbery, (b) admit involvement, or (c) remain silent. There were no significant differences in choices among the age groups, $\chi^2 (4, N = 96) = 5.603, p = 0.231$, with the most popular choice being admitting involvement (60.9%), followed by remaining silent (38.5%). Only one participant recommended denying involvement in the robbery.

For the attorney consultation vignette, participants were asked to decide whether the story character should: (a) tell the attorney everything, (b) deny his involvement in the crime, (c) tell the attorney only some things, or (d) not tell the attorney anything/remain silent. Participants were asked to make the choice under two different conditions: (a) with a private attorney and (b) with a public attorney. There were no significant differences in participants’ decisions across the age groups for either the private attorney condition, $\chi^2 (4, N = 96) = 2.597, p = 0.627$) or the public attorney condition, $\chi^2 (2, N = 96) = 0.686, p = 0.710). For both conditions, and across the age groups, the overwhelming majority of participants chose to disclose everything to the attorney (93.75% for private attorney and 90.63% for public attorney).

In the final vignette, participants chose whether to accept or reject a plea bargain under a specified set of circumstances. No significant age differences were found for participants’ best choices, $\chi^2 (2, N = 96) = 1.994, p = 0.369$. For this vignette, across all three age groups the most popular choice was to accept the plea agreement (77.1% of participants). Table 3 summarizes participants’ best choice responses to the MacJEN vignettes.

Compliance with Authorities

In each of the three decision-making vignettes, one choice represents compliance with authority (i.e., confessing to police, full disclosure to the attorney, and accepting the prosecutor’s plea agreement). An authority compliance score summed the number of compliant choices made across the three vignettes. A one-way ANOVA was conducted with authority compliance as the dependent variable and age category as the independent variable. Results failed to demonstrate a significant effect for age $F (2, 95) = 0.814, p = 0.446$, indicating that younger adolescents were no more likely to make
compliant choices than older adolescents. Additionally, there was no relationship between intelligence and authority compliance, \( r = 0.11, p = 0.83 \).

### Table 3. “Best Choice” Responses to MacJEN Vignettes

<table>
<thead>
<tr>
<th>Recommended response</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Police interrogation vignette</strong></td>
<td></td>
</tr>
<tr>
<td>Refuse to talk</td>
<td>38.5</td>
</tr>
<tr>
<td>Deny the offense</td>
<td>1.0</td>
</tr>
<tr>
<td>Admit to offense</td>
<td>60.4</td>
</tr>
<tr>
<td><strong>Private attorney consultation</strong></td>
<td></td>
</tr>
<tr>
<td>Fully disclose</td>
<td>93.8</td>
</tr>
<tr>
<td>Partially disclose</td>
<td>5.2</td>
</tr>
<tr>
<td>Refuse to disclose</td>
<td>0</td>
</tr>
<tr>
<td>Deny</td>
<td>0</td>
</tr>
<tr>
<td><strong>Public defender consultation</strong></td>
<td></td>
</tr>
<tr>
<td>Fully disclose</td>
<td>90.6</td>
</tr>
<tr>
<td>Partially disclose</td>
<td>9.4</td>
</tr>
<tr>
<td>Refuse to disclose</td>
<td>0</td>
</tr>
<tr>
<td>Deny</td>
<td>0</td>
</tr>
<tr>
<td><strong>Plea agreement vignette</strong></td>
<td></td>
</tr>
<tr>
<td>Accept plea offer</td>
<td>77.1</td>
</tr>
<tr>
<td>Refuse plea offer</td>
<td>22.9</td>
</tr>
</tbody>
</table>

### Defence Orientation

In contrast to compliant choices, in each vignette, one decision choice also represents a strategic defence orientation (i.e., remaining silent during police interrogation, fully disclosing to the attorney, and accepting the prosecutor’s plea agreement). A strategic defence orientation score sums the number of defence-oriented choices made across the three vignettes. Results of a one-Way ANOVA did not reveal differences in strategic defence orientation across the three age categories, \( F (2, 95) = 1.636, p = 0.200 \). Intelligence was also unrelated to the tendency to adopt a strategic defence orientation \( r = 0.12, p = 0.25 \).

### Psychosocial Factors and Legal Decision-making

#### Risk Appraisal

Risk appraisal in the decision-making vignettes was assessed by three variables: risk recognition, risk likelihood (participant’s perception), and risk impact (rating of the
unpleasantness of the negative consequences if they occurred). With respect to risk recognition, no effect of age was found for the total number of risks identified \( F(2, 95) = 1.741, p = 0.181 \) or the balance of positive to negative consequences identified \( F(2, 95) = 0.486, p = 0.617 \). Similarly, no significant age differences were found in participants’ perception of risk likelihood, \( F(2, 95) = 0.772, p = 0.465 \), or their ratings of risk impact, \( F(2, 95) = 0.061, p = 0.941 \). With regard to intelligence, adolescents’ with higher IQs identified a greater number of risks than those with lower IQs, \( r = 0.30, p = 0.004 \). However, intelligence was unrelated to participants’ evaluations of risk likelihood or risk impact.

**Future Orientation**

The absolute number of long-term consequences identified across the decision-making vignettes provides one index of participants’ future orientation. ANOVA results revealed a significant effect of age \( F(2, 95) = 9.325, p = <0.01 \). Independent sample \( t \)-tests of the age effect indicated that younger adolescents identified significantly fewer long-term consequences across the vignettes than adolescents aged 15 through 18, \( t(50.064) = –3.900, p < 0.01 \). The middle age group did not differ from the oldest age group (17-18 years) in this respect, \( t(54.082) = –0.46, p = 0.96 \). Younger adolescents (13-14 years) identified a mean of 3.27 long-term consequences across the vignettes (\( SD = 1.162 \)). Middle adolescents (15-16 years) and older adolescents (17-18 years), identified a mean of 5.02 (\( SD = 1.162 \)) and 5.04 (\( SD = 1.520 \)) long-term consequences, respectively. Future orientation may also be indexed by evaluating the balance of the potential long-term and short-term consequences an individual identified. A significant effect of age was similarly found using this measure of future orientation, \( F(2, 95) = 8.468, p = < 0.01 \). Intelligence was correlated with the absolute number of long-term consequences identified, \( r = 0.283, p = 0.006 \), but not the balance of long-term to short-term consequences, \( r = 0.076, p = 0.465 \).

Finally, for each of their three vignette decisions participants were asked “You have just given me a number of good reasons why [best choice] is better than [worst choice]. What is the one most important reason that you think [best choice] is better than [worst choice]?”. Participants’ main reasons were recorded verbatim and subsequently coded as either short-term or long-term in nature. Examples of short-term main reasons include “police will call parents” or “will be placed in detention for the
night.” In contrast, examples of long-term main reasons include “will get sentenced to jail” or “will have a criminal record.” Chi-square analysis of main reasons revealed a significant age effect across the vignettes, \( \chi^2 (4, N = 96) = 10.178, p = 0.038 \), whereby younger adolescents were less likely to base their decisions on long-term reasons than older adolescents. Tables 4 and 5 provide descriptive categories of adolescents’ main reasons for their decisions in the interrogation vignette and plea vignette, respectively. The percentage of responses is reported for each main reason across the three age categories.

**Table 4. Main Reason Categories for Adolescents’ Decisions on MacJEN Interrogation Vignette**

<table>
<thead>
<tr>
<th>MacJEN Main Reason Categories</th>
<th>Age Group (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interrogation Vignette 13-14</td>
<td>15-16</td>
</tr>
<tr>
<td>1. Anger Produced/Avoided</td>
<td>4.5</td>
</tr>
<tr>
<td>2. Questioning Pursued/Curtailed</td>
<td></td>
</tr>
<tr>
<td>3. Freedom/Temporary Detainment</td>
<td>3.1</td>
</tr>
<tr>
<td>4. Assumption of Innocence/Guilt</td>
<td>3.1</td>
</tr>
<tr>
<td>5. Leniency/Harshness</td>
<td>36.4</td>
</tr>
<tr>
<td>6. Counsel Provided/Withheld</td>
<td>13.6</td>
</tr>
<tr>
<td>7. Investigative Action Pursued/Avoided</td>
<td>3.1</td>
</tr>
<tr>
<td>8. Disposition</td>
<td></td>
</tr>
<tr>
<td>9. Court Proceedings Initiated/Avoided</td>
<td>3.1</td>
</tr>
<tr>
<td>10. Other</td>
<td>45.5</td>
</tr>
<tr>
<td>11. Lawyer Effectiveness or Assist/Refuse to Help, Lack of Assistance</td>
<td>2.4</td>
</tr>
<tr>
<td>12. Plea Agreement or Deal Reached/Refused</td>
<td></td>
</tr>
<tr>
<td>13. Parent Assistance</td>
<td></td>
</tr>
<tr>
<td>14. Friend Impact</td>
<td>3.1</td>
</tr>
<tr>
<td>15. Lawyer Trust/Confidentiality</td>
<td></td>
</tr>
<tr>
<td>16. Item Missing</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

For the interrogation vignette, nearly half of younger adolescents’ main reasons did not fall into any of the descriptive categories. Review of individual responses falling in the “other” category revealed that a number of these participants cited moral reasons for their choices. For example, several participants recommended admitting involvement in the police interrogation vignette because this choice represented “being honest…it’s the right thing to tell the truth” and “doing what’s right.” Other reasons were idiosyncratic
in nature and did not reflect a common theme. For the plea vignette, all three age
groups were most likely to provide main reasons for their choices that focused on
leniency/harshness.

Table 5. Main Reason Categories for Adolescents' Decisions on
MacJEN Plea Agreement Vignette

<table>
<thead>
<tr>
<th>MacJEN Main Reason Categories</th>
<th>Age Group (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interrogation Vignette</td>
<td>13-14</td>
</tr>
<tr>
<td>1. Anger Produced/Avoided</td>
<td></td>
</tr>
<tr>
<td>2. Questioning Pursued/Curtailed</td>
<td>4.5</td>
</tr>
<tr>
<td>3. Freedom/Temporary Detainment</td>
<td></td>
</tr>
<tr>
<td>4. Assumption of Innocence/Guilt</td>
<td></td>
</tr>
<tr>
<td>5. Leniency/Harshness</td>
<td>63.6</td>
</tr>
<tr>
<td>6. Counsel Provided/Withheld</td>
<td></td>
</tr>
<tr>
<td>7. Investigative Action Pursued/Avoided</td>
<td></td>
</tr>
<tr>
<td>8. Disposition</td>
<td>4.5</td>
</tr>
<tr>
<td>9. Court Proceedings Initiated/Avoided</td>
<td></td>
</tr>
<tr>
<td>10. Other</td>
<td>22.7</td>
</tr>
<tr>
<td>11. Lawyer Effectiveness or Assist/Refuse to Help, Lack of Assistance</td>
<td></td>
</tr>
<tr>
<td>12. Plea Agreement or Deal Reached/Refused</td>
<td></td>
</tr>
<tr>
<td>13. Parent Assistance</td>
<td></td>
</tr>
<tr>
<td>14. Friend Impact</td>
<td>9.1</td>
</tr>
<tr>
<td>15. Lawyer Trust/Confidentiality</td>
<td></td>
</tr>
<tr>
<td>16. Item Missing</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Resistance to Peer Influence

Participants' resistance to peer influence was measured by comparing their
original choices in each of the three decision-making vignettes to their choice under a
condition of peer influence in which peers recommended the opposite decision (e.g., if a
participant stated they would confess to police, peers recommended remaining silent).
For each vignette, resistance to peer influence was measured as a dichotomous variable
(resisted peer influence and retained original choice = 1 point or influenced by peers and
switched to peers' choice = 0 points). The final resistance to peer influence score is the
sum of scores from the three vignettes, with higher scores indicating greater resistance
to peer influence. Results did not indicate any age differences in resistance to peer
influence, $F(2, 94) = 0.40, p = 0.961$. Table 6 below summarizes participants’ scores on the MacJEN variables by age group.

**Table 6. Age Group Comparisons on MacJEN Variables**

<table>
<thead>
<tr>
<th>Risk appraisal variables ($M$ (SD))</th>
<th>Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13-14</td>
</tr>
<tr>
<td>Risk recognition</td>
<td>3.16 (1.15)</td>
</tr>
<tr>
<td>Risk likelihood</td>
<td>13.00 (1.95)</td>
</tr>
<tr>
<td>Risk impact</td>
<td>14.93 (1.29)</td>
</tr>
<tr>
<td>Future orientation&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.27 (1.16)</td>
</tr>
<tr>
<td>Future orientation&lt;sup&gt;b&lt;/sup&gt;</td>
<td>55.71 (15.30)</td>
</tr>
<tr>
<td>Resistance to peer influence</td>
<td>2.09 (0.92)</td>
</tr>
</tbody>
</table>

<sup>a</sup> Absolute number of long-term consequences identified.<br><sup>b</sup> Percentage of consequences that are long-term (versus short-term).

**Note.** Bolded items indicate significant differences across age groups.

**Comparison of Performance on the Selected FIT-R Questions and the MacJEN**

Correlational analyses were conducted to investigate relationships among participants’ scores on the MacJEN variables and their total scores on the FIT-R questions. A significant positive relationship existed between scores on the selected FIT-R questions and one index of future orientation (the absolute number of long-term consequences generated on the MacJEN), $r = 0.385, p < 0.001$. (There was no relationship between scores on the FIT-R questions and the balance of long-term versus short-term consequences identified, however.) Total scores on the FIT-R questions were also correlated with risk recognition, $r = 0.40, p < 0.001$. No significant relationships were found between participants’ ratings of risk likelihood or risk impact and their scores on the FIT-R questions. Finally, performance on the FIT-R questions was unrelated to the MacJEN variables of authority compliance, strategic defence orientation, or resistance to peer influence.

Interrater reliability was evaluated for the classification of participants’ responses into long-term and short-term consequences. Intraclass correlation coefficients (ICC) were calculated for single raters using a two-way mixed effect model. Level of absolute agreement was “good” for short-term consequences, with an ICC of 0.748 averaged over 15 ratings, and “excellent” for long-term consequences, with an ICC of 0.855.
Age Differences in Executive Functioning

We hypothesized that age would be associated with the primary executive abilities of cognitive flexibility, working memory, and impulsivity/response inhibition, as well as an additional executive measure of metacognition/insight. This hypothesis was partially supported. Namely, there was a significant age effect for scores on one measure of working memory (WISC-IV Letter-Number Sequencing total raw score), $F(2, 94) = 3.843, p = 0.025$ as well as the measure of metacognition/insight (WISC-IV Comprehension total raw score), $F(2, 95) = 4.617, p = 0.012$. In contrast, no significant age effects were observed for our second measure of working memory (WISC-IV Digit Span total raw score), for inhibition/impulsivity (Stroop Colour-Word interference raw score), or cognitive flexibility (WCST total number correct or number of categories completed).

Relationship between Executive Functioning and Legal Abilities

We hypothesized that adolescents with higher levels of executive functioning should perform better on measures of adjudicative competency. This hypothesis was supported for several of our executive measures. Specifically, total score on the FIT-R questions was positively correlated with scores on measures of working memory ($r = 0.24, p = 0.009$ for Digit Span total raw score and $r = 0.22, p = 0.015$ for Letter-Number Sequencing total raw score) and response inhibition/impulsivity ($r = 0.19, p = 0.032$ for Stroop Colour-Word interference raw score). The strongest relationship was observed between adjudicative competency and the measure of metacognition/insight (WISC-IV Comprehension total raw score; $r = 0.507, p < 0.001$). In contrast, correlations between scores on the selected FIT-R questions and measures of cognitive flexibility did not reach significance ($r = -0.032, p = 0.38$ for WCST total number correct; $r = -0.072, p = 0.245$ for WCST number of categories completed).

For the MacJEN, we examined whether a greater working memory capacity would be associated with the ability to generate a larger number of potential consequences for each of the MacJEN vignettes (risk recognition). Results revealed
that participants with higher scores on the WISC-IV Digit Span and Letter Number Sequencing subtests did not identify significantly more potential consequences on the MacJEN vignettes ($r = 0.076$, $p = 0.463$ for Digit Span and $r = -0.009$, $p = 0.930$ for Letter Number Sequencing). In contrast, we found that higher scores on a measure of metacognition/insight (WISC-IV Comprehension) were associated with higher levels of risk recognition on the MacJEN, $r = 0.434$, $p < 0.001$. Next, we examined whether participants with higher levels of impulsivity would be more likely to focus on short-term rather than long-term consequences on the vignettes. However, impulsivity was not found to be related to degree of future orientation, as participants’ scores on the Stroop Colour-Word Interference condition did not correlate with either the number of long-term consequences generated for each vignette ($r = 0.129$, $p = 0.210$) or the percentage of long-term versus short-term consequences identified ($r = 0.035$, $p = 0.731$). Finally, results of correlational analyses revealed an inverse relationship between cognitive flexibility and defence orientation, whereby participants with higher total number correct scores on the WCST were less likely to adopt a strategic defence orientation across the three vignettes.

**Executive Functioning in the Prediction of Adjudicative Competency**

In order to test the hypothesis that executive functioning would predict participants’ scores on a measure of adjudicative competency, we conducted a simple regression analysis. Participants’ total raw scores on the following executive measures were entered into the model simultaneously: WISC-IV Digit Span, Letter Number Sequencing, Comprehension, and Stroop Colour-Word Interference. Since initial correlational analyses failed to yield a significant association between measures of cognitive flexibility (WCST total number correct and number of categories completed) and total scores on the FIT-R questions, these variables were not entered into the regression model. Table 7 below summarizes the results of the regression analysis. This model accounted for 27.5% of the variance in scores on the selected FIT-R understanding questions. Of the executive measures entered into the model, only WISC-IV Comprehension emerged as a significant predictor.
Table 7. Summary of Simple Regression Analysis for Executive Functions Predicting Total Scores on FIT-R Questions (N = 94)

<table>
<thead>
<tr>
<th>Variable (Raw Scores)</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>WISC-IV Digit Span</td>
<td>0.119</td>
<td>0.153</td>
<td>0.080</td>
<td>0.438</td>
</tr>
<tr>
<td>WISC-IV Letter Number Sequencing</td>
<td>0.187</td>
<td>0.212</td>
<td>0.087</td>
<td>0.381</td>
</tr>
<tr>
<td>WISC-IV Comprehension</td>
<td>0.550</td>
<td>0.115</td>
<td>0.484</td>
<td>&lt;0.010</td>
</tr>
<tr>
<td>Stroop Colour-Word Interference</td>
<td>-0.024</td>
<td>0.050</td>
<td>-0.049</td>
<td>0.629</td>
</tr>
</tbody>
</table>

Note. \( R^2 = 0.275 \).

Incremental Validity of Executive Functioning in the Prediction of Adjudicative Competency

In order to test the hypothesis that executive functioning would predict participants’ competency scores beyond the contribution of age and intelligence, we conducted a hierarchical regression analysis. Age and a modified IQ measure combining crystallized verbal knowledge with nonverbal fluid reasoning (KBIT-2 Verbal Knowledge + Matrices total raw score) were entered into the first step of the model. Rather the using the KBIT-2 composite IQ score, the Riddles subtest was removed to control for conceptual overlap with the WISC-IV Comprehension subtest in terms of executive functioning. Unlike the Vocabulary subtest, which measures acquired verbal knowledge, both the Comprehension and Riddles subtests also require higher order cognitive abilities, such as abstract reasoning and metacognition. Consistent with this rationale, initial correlational analyses revealed strong associations between the Riddles and Comprehension subtests \( r = 0.606, p < 0.01 \).

In the second step of the model, we entered WISC-IV Comprehension total raw scores, as this executive measure emerged as the only significant predictor in our regression analysis of executive functions. Table 8 below summarizes the results of the hierarchical regression analysis. The first model was significant, with the predictors accounting for 35.3% of the variance in scores on the FIT-R understanding questions. The second model (which added WISC-IV Comprehension total raw scores as an additional predictor) was also significant and accounted for 40.1% of the variance.
Table 8. Summary of Hierarchical Regression Analysis Predicting Total Scores on FIT-R Questions (N = 94)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>SE $B$</th>
<th>$\beta$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.999</td>
<td>0.315</td>
<td>0.281</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>KBIT-2 Verbal Knowledge + Matrices (raw)</td>
<td>0.257</td>
<td>0.051</td>
<td>0.445</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.975</td>
<td>0.305</td>
<td>0.274</td>
<td>0.02</td>
</tr>
<tr>
<td>KBIT-2 Verbal Knowledge + Matrices (raw)</td>
<td>0.154</td>
<td>0.063</td>
<td>0.267</td>
<td>0.016</td>
</tr>
<tr>
<td>WISC-IV Comprehension (raw)</td>
<td>0.323</td>
<td>0.121</td>
<td>0.283</td>
<td>0.009</td>
</tr>
</tbody>
</table>

*Note.* $R^2 = 0.353$ for Step 1; $R^2 = 0.401$ for Step 2; $p = 0.009$. 
DISCUSSION

The present research examined the role of executive functioning in the development of adolescents’ legal knowledge and decision-making as pertaining to adjudicative competency. While previous research has investigated the role of cognitive and neuropsychological predictors of adjudicative competency (e.g., Grandjean, 2004; Lexcen, 2000; Nestor et al., 1999) these studies implemented a broad-based approach to examine a variety of neuropsychological abilities. In adopting this type of approach, previous studies treated executive functioning as a unitary construct and employed only one or two measures as indices of executive functioning. Consequently, the results of previous studies in this area have generally led to conclusions that executive functioning is unrelated to adjudicative competency or suggested a possible relationship between these constructs that could only be described in broad terms. However, research in the neuropsychological literature (Miyake et al., 2000) indicates that the construct of executive functioning is not unitary in nature and is best conceptualized a set of separate, but related abilities.

To our knowledge, this is the first study in the adjudicative competency literature to focus on the construct of executive functioning at an in depth level. A more focused approach allowed for the assessment of multiple domains of executive functioning, including cognitive flexibility, response inhibition/impulsivity, working memory, and imetacognition/insight. In this way, the present research was able to explore the possibility of more complex relationships between various executive functions and adolescents’ legal knowledge and decision-making. This made it possible to test the hypothesis that different areas of executive functioning may be differentially related to the development of adjudicative competency abilities and to subsequently describe these relationships in greater detail than previously possible.

In much the same way that reliance on a single measure of executive functioning may obscure findings of more complex relationships with adjudicative competency, previous research utilizing adult participant samples (e.g., Grandjean, 2004; Nestor et
al., 1999) may have been limited by a restricted range in executive abilities. We chose to focus on adjudicative competency in an adolescent sample because executive abilities are still in development during this stage of the lifespan. By including participants in their early, middle, and late adolescent years, we were able to observe greater variability in executive functioning, as well as legal abilities. In terms of executive functioning, within our participant sample, we observed significant age effects for scores on one measure of working memory and for metacognition/insight. In contrast, older adolescents did not perform significantly better than younger adolescents on measures of cognitive flexibility or response inhibition/impulsivity.

With respect to legal abilities, results of our study revealed significant age differences in adolescents’ scores on questions relevant to adjudicative competency. Specifically, younger adolescents (ages 13-14) performed less well than older adolescents (ages 17-18) on the four FIT-R understanding questions administered in the present study. Our results are consistent with those of previous research studies with delinquent youth populations, which demonstrate that younger adolescents (age 14 or 15 and younger) display impairment on measures of adjudicative competency, such as the FIT-R and MacCAT-CA when compared to older adolescents or adults (e.g., Grisso et al., 2003; Viljoen & Roesch, 2005). Our study also found a significant relationship between adolescents’ verbal and overall intelligence scores and their scores competency related questions, a finding that has been reported in both the juvenile and adult competency research literature (e.g., Cooper, 1997; Savitsky & Karras, 1984; Viljoen & Roesch, 2005).

Interestingly, despite our finding that age was associated with greater performance on the FIT-R understanding questions, participants in our study demonstrated a considerable lack of knowledge or understanding of a number of important legal concepts, regardless of age. In particular, the overwhelming majority (i.e., more than 90%) were unable to articulate the meaning of entering a guilty or not guilty plea to the court. Similarly, participants of all ages had a poor understanding the role of the defendant during the trial, the level of certainty required for conviction, and the related concept of “beyond reasonable doubt.” These findings are concerning given that even those adolescents who received reasonably high total scores on the FIT-R understanding questions evidenced significant gaps in their comprehension of the law.
A failure to understand the meaning and implications of one’s plea or one’s expected role in the courtroom could have serious negative implications for the uninformed juvenile defendant.

However, it is possible that due to the nature of our sample, these non-delinquent adolescents may have been less familiar in their knowledge of the criminal justice system. For juvenile defendants, it is expected that any gaps in this knowledge would be addressed through interactions with their lawyer. Consistent with this premise, while results of research examining the history of arrests in predicting legal capacities remains equivocal (see Grisso, 1997), more recent research with juvenile defendants awaiting trial indicates that history of attorney contact predicts performance on various indices of interrogative and adjudicative competence (Viljoen & Roesch, 2005).

With respect to the MacJEN, previous research reported significant age differences in participants’ “best choice” responses for two of the three vignettes (Grisso et al., 2003). More specifically, the proportion of participants who chose confession in the police interrogation vignette decreased with age, as did the proportion who chose to accept the plea agreement. (No age differences were reported for the attorney consultation vignette). In contrast, no age differences were found among our participants’ “best choice” responses for any of the MacJEN vignettes. This discrepancy in findings may have resulted in part from differences in participant sample composition, as well as sample size. Namely, Grisso et al.’s study assessed 927 adolescents and young adults, ranging in age from 11-24, and also included both detained and community participants. In this way, a comparatively restricted age range and smaller sample size may have limited our ability to observe age-related differences in adolescents’ legal decision-making.

An important component of the MacJEN is its capacity to assess a number of psychosocial factors in relation to legal decision-making. Researchers have argued for the importance of psychosocial variables in terms of learning how to direct and apply one's cognitive resources (Bonnie & Grisso, 2000). With respect to psychosocial variables, Grisso et al (2003) reported age-related differences in risk appraisal, authority compliance, future orientation, and resistance to peer influence. Results of our study revealed age differences in future orientation only. That is, younger adolescents (age 13-14) identified fewer total long-term consequences across the vignettes, had a lower
proportion of long-term to short-term consequences, and were less likely to articulate “main reasons” for their choices that focused on long-term consequences. On the other hand, results of the present study yielded no age differences with respect to authority compliance or resistance to peer influence. Measures of risk appraisal (i.e., risk recognition, risk impact, and risk likelihood) were similarly unrelated to age; however, participants with higher IQ scores identified a greater number of risks. Overall, with the exception of one measure of future orientation, indices of psychosocial maturity on the MacJEN were unrelated to performance on the FIT-R understanding questions in our study.

The results of our study provided preliminary support for the hypothesis that certain domains of executive functioning are related to adolescents’ legal knowledge and decision-making. In particular, we observed significant correlations between scores on the FIT-R understanding questions and measures of working memory, response inhibition/impulsivity, and metacognition/insight. Cognitive flexibility, in contrast, was unrelated to performance on the FIT-R understanding questions. As described earlier, cognitive flexibility involves the ability to switch attention between tasks, to disengage from an irrelevant task and subsequently engage in a more relevant one. Cognitive flexibility also involves the ability to consider multiple conflicting representations of an event or object. The absence of a significant relationship between cognitive flexibility and adjudicative competency in the present study may be explained by the possibility that this domain of executive functioning does not come into play in terms of basic legal knowledge questions or hypothetical vignettes, but rather becomes more salient when a juvenile defendant is engaged in real-life decision-making regarding his or her own legal situation. The psycholegal measures administered in the present study require knowledge and understanding of the legal system and the capacity for abstract and hypothetical thought. However, for juvenile defendants, adjudicative competency also involves a conceptual shift whereby the individual moves back and forth between one’s own situation and the larger, more abstract criminal justice system, a process that includes both a cognitive and an experiential component (Warren, Aaron, Ryan, Chauhan, & Du Val, 2003).

Regression analyses conducted to test the incremental validity of executive functions in the prediction of adjudicative competency (over and above the contributions
of age and intelligence) indicated that metacognition/insight remained a significant predictor in the model. With regard to future research, it will be necessary to better understand more specifically what factors account for the relationship between WISC-IV Comprehension scores and scores on measures of adjudicative competency abilities. As proposed in this study, it may be an underlying neuropsychological ability (i.e., metacognition/insight) that predicts legal abilities. However, alternative explanations must also be explored. For example, while the WISC-IV Comprehension subtest purports to measure the constructs of social judgment and reasoning (which should logically extend to legal decision-making) other commonalities also deserve further consideration. In addition to metacognition/insight and social intelligence, performance on the Comprehension subtest is also influenced by the examinee’s level of verbal comprehension and expression. As previous research has demonstrated, verbal ability is one of the strongest predictors of performance on the FIT-R (Viljoen & Roesch, 2005). Therefore, it may be the shared reliance on verbal ability that leads the Comprehension subtest to be a strong predictor of scores on adjudicative competency measures. However, our model attempted to control for verbal ability (i.e., vocabulary), so it appears that Comprehension requires additional and unique abilities.

Due to the nature of our participant sample, a number of limitations were inherent in the present research. In the development phase of this research, we sought to obtain permission to conduct our research in a juvenile detention facility. Unfortunately, this was not possible, and we were ultimately left with the option to utilize a normative school sample. The use of an adolescent school sample required revision of the study’s intended procedures. In particular, because our participants were not currently involved in the legal system, we were unable to administer the FIT-R in its entirety. More specifically, while we selected the FIT-R questions that assessed participants’ factual knowledge of criminal procedure, we had to omit sections of the measure intended to evaluate individuals who are currently facing legal charges. Consequently, we were unable to assess important aspects of the construct of adjudicative competence, such as appreciation of the personal consequences of the court proceedings, ability to communicate with counsel and participate in a defence, and capacity to manage courtroom behaviour. It is possible that relationships may also exist between executive functioning and these aspects of adjudicative competency. With respect to the MacJEN, this measure is limited by the use of hypothetical vignettes, rather than one’s own legal
situation. It is uncertain to what degree adolescents’ decision-making choices for a vignette character under relatively neutral conditions would correspond to actual legal decisions which are more personally salient, emotionally charged, and have the potential for long-term and life changing consequences.

Finally, our use of a normative sample may have produced results indicating less impairment than would be observed in a juvenile delinquent sample, as adolescents who enter the juvenile justice system tend to suffer from a greater prevalence of academic and neurodevelopmental delays (Wrightsman, Nietzel, & Fortune, 2002). Other factors with the potential to impair complex decision-making, such as ADHD, history of head injury, fetal alcohol exposure, and substance abuse are also more likely to be observed among delinquent youth. While we were able to observe a range of abilities in executive functioning by including participants from early to late adolescence, even greater variation may have been possible with the inclusion of a juvenile delinquent sample, allowing for increased power to detect subtle relationships between executive functioning and adjudicative competency.

In sum, the results of the present study indicate that a number of executive functions, namely response inhibition/impulsivity, working memory, and metacognition/insight, share a relationship with the construct of adjudicative competency. It was discovered that metacognition/insight in particular contributes additional predictive utility beyond the variables of age and IQ, which are cited as robust predictors in the adjudicative competency literature. Future research in this area should attempt to further delineate the relationship between executive functioning (and other forms of neuropsychological impairment) and adjudicative competency in juveniles awaiting trial. Ideally, researchers would have the opportunity to compare juvenile defendants’ performance on measures of adjudicative competency and neuropsychological testing to judges’ subsequent determinations of competency.

A greater knowledge of the role that neuropsychological factors play in adjudicative competency may provide useful for several reasons. Executive functioning influences many aspects of our lives: our decision-making, problem solving, social interaction, and our behavioural and emotional responses. In contrast to a basic knowledge of relevant legal players and courtroom procedures, which may be improved through the provision of information and education, abilities and deficits at the
neuropsychological level may be less amenable to change. Therefore, an evaluation of a juvenile defendant’s neuropsychological functioning may prove useful in making determinations of whether he or she is likely to benefit from competency remediation efforts. Similarly, since the level of executive functioning is tied to age during childhood and adolescence, low scores in this area may simply signal developmental immaturity that will only advance with the passage of time. Such knowledge would enable treatment providers to focus their efforts and interventions on areas that are most likely to benefit the individual and yield significant improvements. Perhaps most importantly, a greater understanding of adolescents’ developmental limitations may ultimately lead to better protection of their legal rights.
REFERENCES


In re Gault, 387 U.S. 1 (1967).


Youtsey v. United States, 97F.937 (1899).


Appendix A.

Fitness Interview Test—Revised (FIT-R): Questions Used in Present Study

Understanding of the Role of Key Participants

This set of items calls for a minimal understanding of the adversarial process by the accused, and also the role of the police and the court process. The accused should be able to identify prosecuting attorney and prosecution witnesses as foe, defence counsel as friend, the judge and police as neutral, and the jury as determiners of guilt or innocence.

Score 2: The accused can identify defence counsel as friend (e.g., “Defend you”), prosecuting attorney as foe (e.g., “Try to make you look guilty”), and the judge and jury as determiners of guilt or innocence (e.g., “Decide if your guilty”). During a trial, the defendant’s job is to be quiet, answer questions if asked, and be polite and well behaved (e.g., “Say ‘yes, Your Honour,’ ‘no, Your Honour’). Witnesses provide an account of what happened (e.g., “Say what happened”). Police maintain order and/or provide a statement account of the arrest (e.g., “Make sure no one gets out of hand,” “Tell what happened”). The psychologist examines the mental state of the defendant (e.g., “See if you have mental problems”).

Score 1: The examinee fails to understand the role of one key participant, they may be given a score of 1. Note: A person should be given a score of 2 if they define all key participants adequately except for psychologist since understanding the role of a psychologist is less important for defendants who are not referred for evaluations.

Score 0: The examinee fails to understand the role of one or more key participants.

In the courtroom during a trial, what is the job of:

Your lawyer (defence counsel)?

- The judge?
- The jury?
- The defendant/accused?
- The witnesses?
- The police?
- The psychiatrist (psychologist)?

Understanding of the Legal Process

This set of items calls for a minimal understanding of key issues in the legal process.

Score 2: The accused should be able to identity that an oath means a promise (e.g., “A promise to tell the truth,” “Swearing on the bible”). A variety of things can suffice as examples of evidence (e.g., “Fingerprints,” “What you say,” “A knife or gun”). There are 12 people on a jury, they are selected randomly from people in the community, and all must be certain of guilt. Although it is not necessary for an individual know the exact number of jurors, they should recognize that all or most have to believe you are guilty to be convicted. The accused should recognize that a judge or jury has to be very certain to an accused guilty (e.g., “Really sure”).
Score 1: The answer to one of these sets of questions is incorrect or unknown. For example, if the accused states that the judge or jury has to be “Kind of sure” to find a defendant guilty, or that they “Don’t have to be sure” they can receive a score of one.

Score 0: The answer to more than one of these sets of questions is incorrect or unknown.

- Can you tell me what is meant by an oath?
- What can be used as evidence in court?
- How many people are on a jury?
  - How are jurors selected?
  - How many jurors have to believe you are guilty for someone to be convicted?
- How certain does the judge or jury have to be in order to find someone guilty?
  - What does “beyond a reasonable doubt” mean?

Understanding of Court Procedure

This item calls for an assessment of the degree to which the accused understands the basic sequence of events in a trial and their importance for him/her, e.g., the different purposes of direct and cross-examination.

Score 2: The only one at the trial who can call on the accused to testify is their lawyer. Then the prosecutor can ask them questions to try to reveal that they are guilty. If the accused pleads guilty, the judge will sentence him/her. Before an accused pleads guilty, they might ask a lawyer about how good the case against him is, the likelihood that he will found not guilty, the possible consequences of being found guilty, etc.

To receive a score of 2, a person should understand most of these concepts.

Score 1: The person demonstrates partial understanding of these concepts. Alternatively, a person may receive a score of 1 if they provide information that is plausible but is not the key concept (e.g., The judge will “say they’re guilty” if they plead guilty rather than “sentence them”).

Score 0: In general, an examinee should receive a score of 0 if more than one of questions is incorrect or unknown.

- Who is the only one at your trial who can call on you to testify?
- After your lawyer finishes asking you questions on the stand, who can ask you questions next?
- Why does the prosecutor (Crown counsel) ask you questions?
- What will the judge do if you plead guilty?
- What questions would you ask your lawyer before you decide whether or not to plead guilty?

Understanding of Pleas

This set of items calls for a minimal understanding of possible pleas and their consequences.

Score 2: The accused should be able to recognize that a plea of not guilty means a statement to the court that they are not guilty rather than that they literally are not guilty (e.g., “He’s saying he didn’t do it”), and that if they plead not guilty the case will go to trial. When someone wants to plead not guilty, the lawyer might try to figure out how good the case against him is, the likelihood that he will found not guilty, and the possible consequences of being found guilty.

The accused should similarly recognize that a plea of guilty means a statement to the court that they are guilty rather than that they literally are guilty (e.g., “He’s admitting he did it”), and that if they plead guilty the judge will sentence them (they waive the right to trial). When someone wants
to plead guilty, the lawyer might try to get a plea bargain for them and/or investigate the possible consequences of being found guilty.

To receive a score of 2, a person should understand most of these concepts.

Score 1: The person demonstrates partial understanding of these concepts. Alternatively, a person may receive a score of 1 if they provide information that is correct or plausible but is not the key concept (e.g., If a person pleads guilt then the lawyer will “Tell the judge he pleads not guilty” versus “Tries to prove he’s not guilty”).

Score 0: In general, an examinee should receive a score of 0 if more than one of questions is incorrect or unknown.

- What does it mean when a person pleads not guilty?
- What happens in court to someone who pleads not guilty? (What are the consequences of pleading not guilty?)
  - What things might a lawyer do when someone wants to plead not guilty?
- What does it mean when a person pleads guilty?
- What happens in court to someone who pleads guilty?
  - What things might a lawyer do when someone wants to plead guilty?
  - What rights do you waive (give up) when you plead guilty?
Appendix B.

Letter to Parents (High School)

Dear Parent or Guardian,

Your child has the opportunity to participate in a psychology research study about the development of adolescents’ legal knowledge and decision-making. The research is being conducted by Kimberly Kreklewetz, a PhD student at Simon Fraser University, BC Canada and is supervised by Dr. Ronald Roesch, a psychology professor at SFU. The project has been approved by the SFU Research Ethics Board.

If your child chooses to be in this study, he or she will be asked some questions about the law. They will also complete some activities that will measure different types of thinking and problem-solving. The tasks selected for this study should provide both an interesting and educational experience for your child. Testing will take place during regular school hours and will require about two hours of your child’s time.

To help protect your child’s privacy, the researchers will not ask any personal or sensitive questions. Participants’ responses will remain anonymous. That is, they will not be required to write their names on the study forms, nor provide any other identifying information. The study will not access your child’s academic records or file and a photo will not be taken. All study forms and data will be kept in a secure location and destroyed at the end of the study. Your child’s responses will not be shared with teachers or other school staff. Participation in the study is voluntary. Your child can choose to not be in the study. If you do not wish to allow your child to participate (or your child declines to participate) this will have no negative effects on their grades or evaluation in any class or coursework. Study results will be available to parents, teachers, and students at the conclusion of the study.

By taking part in the study, your child will help contribute to a greater understanding about adolescents’ knowledge of the law. The goals of this study are to learn more about how legal abilities and decision-making develop from early to late adolescence and how adolescents’ legal abilities differ from those of adults. A longer term objective is that research in this area may ultimately lead to a better protection of adolescents’ legal rights.

If you have any questions, please feel free to contact me at (school phone number) or (principal’s email). Page 2 of this letter must be completed and returned to the school by yourself or your child in order for your child to participate.

Sincerely,

Name
Principal
Name of High School
Research Study on Adolescents’ Legal Knowledge and Abilities: Parent/Guardian Consent Form

*Please return this page to the school at your earliest convenience.

Yes, I give consent for my child to participate in the psychology research study.

Name and signature of parent/guardian ________________________________

Name of child ________________________________

No, I do not give consent for my child to participate in the psychology research study.

Name and signature of parent/guardian ________________________________

Name of child ________________________________
Appendix C.

Consent Form

A Study about the Law

Would you like to be in a study? You are invited to participate in a research study about people’s knowledge of the law.

What would happen in the study? If you choose to be in this study, you will be asked some questions about the law. You will also complete some activities that will measure different types of thinking and problem-solving. You will complete some of these activities on your own and on others, we will work together. In total, the study will require about two hours of your time. Testing will take place during regular class hours.

What are the good things about being in the study? By taking part in the study, you may help us learn more about adolescents’ knowledge of the law. By being a participant in the study, you will also learn about what the job of a psychologist is like and how they conduct research. The tasks we have selected for the study should make for both an interesting and educational experience. You will also get to take a break from class to do something different than usual.

Are there bad things about being in the study? Some people may find the questions tiring or not very interesting. There are no other risks for taking part in the study.

Who would the information go to?

To help protect your privacy, we will not ask you any personal or sensitive questions. Although this is a study about the law, we will not ask about whether you have ever been charged with a crime, whether you have done any crimes that you have not been caught for, or any questions that relate to dangerous behaviours. You also will not be asked to write your name on the study forms so that your identity can be protected.

In almost all cases, we will not tell your parents or teachers how you answered the study questions, and your answers will not affect your grades or evaluation in any classes or coursework. However, it is important that you know that we cannot guarantee that all your answers will be kept entirely confidential or private. Due to something called the USA Patriot Act, the government can ask who was in the study and what their answers were to any of the questions. Also, if we find out that you are going to hurt yourself or someone else, we have to tell the staff at the school in order to help keep you safe.

You do not have to take part. The principal of your school has given consent for you to be in the study. Your parent(s) or guardian(s) have also received a letter describing the study. However, participation in the study is voluntary. You can choose not to be in the study. Even if you decide to be in the study, you can change your mind later. Your decision of whether or not to be in the study will not affect your grades or evaluation for any class or coursework. We will not be mad if you decide not to take part.
Questions? If you have any questions, please feel free to ask us. If you would like to find out about the results of the study, you can contact Kimberly Kreklewetz or Dr. Ronald Roesch at the phone numbers listed below, or write to us at the address below. If you have any concerns or complaints about the study, you may contact Dr. Hal Weinberg at the phone number below or email him at hal_weinberg@sfu.ca

TELEPHONE:
Researcher: Kimberly Kreklewetz (604) 291-3354 (psychology dept. office)
Supervisor: Dr. Ronald Roesch (604) 291-3370
Chair of Psychology Dept: Dr. Daniel Weeks (604) 291-3358

ADDRESS:
Department of Psychology
RCB 7206, 8888 University Drive
Burnaby, B.C. Canada V5A 1S6

Yes, I have decided to be in the study. This project is run by Kimberly Kreklewetz and Dr. Ronald Roesch. I have been told about the study, and I have read and understood this form. I know I can change my mind, or decide not to be in the study. If I have any questions or concerns, I will contact Kimberly Kreklewetz, Dr. Ronald Roesch, or Dr. Daniel Weeks.

Name/Signature of participant __________________________________________
Date_______________________

Signature of witness_____________________________________________
Date_______________________
Appendix D.

MacArthur Competence Assessment Tool for Clinical Research

**Instructions**

1. Write participant number on top of this sheet and coding sheet (if not already there).
2. Give participants consent form to follow along and to keep.
3. If a person’s answer is correct, acknowledge that it is correct. When a person is unable to answer a question correctly then re-explain the item.
4. If someone appears to have severely impaired understanding or appreciation of the study even after re-explanation, especially if they do not understand they don’t have to be in the study, do not proceed with further testing.
5. Code responses on the separate coding sheet after the first test session is complete. Code initial responses (not after re-explanation).

You are being asked if you would like to take part in a study. If you decide to be in this study, we will ask you questions about the law. You will also complete some activities that will measure different types of thinking and problem-solving. You will complete some of these activities on your own and on others, we will work together. In total, the study will require about two hours of your time.

**Item 1: Nature of project**

The point of this study is to learn about people’s knowledge of the law (what people think about lawyers, police, and going to court).

If you take part in this study, one good thing for us is that you may help us learn more about people’s knowledge of the law. By being a participant in the study, you will also learn about what the job of a psychologist is like and how they conduct research. The tasks we have selected for the study should make for both an interesting and educational experience. You will also get to take a break from class to do something different than usual.

**Item 2: Disclosure of benefits of participation**

One bad thing about being in the study is that some people may find the questions tiring or boring. But there are no other risks for taking part. **Item 3: Disclosure of risks/discomforts**

Do have any questions about what I just said? Y  N

Can you tell me about what I just said?
1. Nature of the project
   a) Duration
   [If participant fails to mention spontaneously, ask: “How long will the study last?”]
   ________________________________________________________________
   ________________________________________________________________
   b) Nature of participation
   [If participant fails to mention spontaneously, ask: “What sorts of things will we do if you decide
to take part in the study?”]
   ________________________________________________________________
   ________________________________________________________________

2. Disclosure of benefits of participation
   a) Society benefit
   [If subject fails to mention spontaneously, ask: “What might we learn if people decide to be in
this study? What are the good things for us?”]
   ________________________________________________________________
   ________________________________________________________________
   b) Personal benefit
   [If subject fails to mention spontaneously, ask: “What are the good things about being in this
study for you?”]
   ________________________________________________________________
   ________________________________________________________________

3. Disclosure of risks/discomforts
   [If subject fails to mention spontaneously, ask: “What are the bad things about taking part in
this study? Anything else?”]
   ________________________________________________________________
   ________________________________________________________________

To help protect your privacy, we will not ask you any personal or sensitive questions. Although
this is a study about the law, we will not ask about whether you have ever been charged with a
crime, whether you have done any crimes that you have not been caught for, or any questions
that relate to dangerous behaviours. You also will not be asked to write your name on the study
forms so that your identity can be protected.

In almost all cases, we will not tell your parents or teachers how you answered the study
questions, and your answers will not affect your grades or evaluation in any classes or
coursework. However, it is important that you know that we cannot guarantee that all your
answers will be kept entirely confidential or private. Due to something called the USA Patriot Act,
the government can ask who was in the study and what their answers were to any of the
questions. Also, if we find out that you are going to hurt yourself or someone else, we have to tell
the staff at the school in order to help keep you safe.
[Item 4: Confidentiality]

It’s important to know that no one has to be in this study. Even if you decide to be in this study, you can change your mind later. We will not be mad if you decide not to take part.
[Item 5: Ability to decline/withdraw will be respected]

Your decision whether or not to take part will not affect your grades or evaluation for any class or coursework
[Item 6: No impact on school standing]

If you have any questions, please feel free to ask me. If you have any questions or concerns about this study later on, you may call us at the number listed below.

Do have any questions about what I just said? Y N

Can you tell me about what I just said?

4. Confidentiality
[If subject fails to mention spontaneously, ask:] “Can we tell people stuff about what we talk about? Can we tell parents? Can we tell teachers? What if you planned to hurt yourself?”

5. Decisions to decline/withdraw will be respected
[If subject fails to mention spontaneously, ask: “What will happen if a person refuses to be in the research project, or decides to stop once it begins? What makes you think that?”]

6. No impact on school standing
[If subject fails to mention spontaneously, ask: “Do you think being in this study will affect your grades or evaluation in any course? What makes you think that?”]

7. Ability to make stable choice
What do you think now that we have talked about all of this? What do you want to do? Do you want to be in the study? Y N DK
Coding Sheet for MacArthur Competence Assessment Tool for Clinical Research

Scoring Criteria
0 Impaired performance on item/section, does not meet criteria
1 Mild or possible impairment on item/section
2 Meets item/section criteria, no impairment

Section I: Understanding
   Item 1: Nature of the project
   Item 2: Disclosure of benefits of participation
   Item 3: Disclosure of risks and discomforts of participation
   Item 4: Confidentiality

Section II: Appreciation
   Item 5: No impact on court case or care
   Item 6: Decisions to decline/withdraw will be respected

Section III: Ability to Make Choice
   Item 7: Ability make stable choice about decision to participate