



**University
of Cyprus**

DEPARTMENT OF PSYCHOLOGY

**EXAMINING AGGRESSION AND HOSTILE
ATTRIBUTION BIAS THROUGH NARRATIVE
TEXT PROCESSING**

DOCTOR OF PHILOSOPHY DISSERTATION

THALIA MOUSKOUNTI

2016



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**A Dissertation Submitted to the University of Cyprus
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy
November, 2016**

THALIA MOUSKOUNTI

Doctoral Candidate: Thalia Mouskounti

Doctoral Thesis Title: Examining aggression and hostile attribution bias through narrative text processing

*The Present Doctoral Dissertation was submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy at the **Department of Psychology** and was approved on theby the members of the **Examination Committee**.*

Examination Committee:

Research Supervisor: _____ Ειρήνη Άννα Διακίδου _____

Committee Member: _____ Κώστας Φάντης _____

Committee Member: _____ Γιώργος Σπανούδης _____

Committee Member: _____ Lucia Mason _____

Committee Member: _____ Κωνσταντίνος Πετρίδης _____

DECLARATION OF DOCTORAL CANDIDATE

The present doctoral dissertation was submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy of the University of Cyprus. It is a product of original work of my own, unless otherwise mentioned through references, notes, or any other statements.

Thalia Mouskounti

.....[Signature]

Acknowledgements

Firstly, I would like to express my sincere gratitude to my advisor, Associate Professor Irene-Anna Diakidoy for the continuous support of my Ph.D study and related research, for her patience, motivation, and immense knowledge. Her guidance helped me in all the time of research and writing of this thesis.

Besides my advisor, I would like to thank the rest of my thesis committee: Assistant Professor Kostas Fanti, Associate Professor George Spanoudis, Professor Lucia Mason and Professor Konstantinos V. Petrides, for their insightful comments and encouragement, but also for the hard question which motivated me to widen my research from various perspectives.

Last but not the least, I would like to thank my family: my husband and my mother for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis.

Thalia Mouskounti

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Abstract in Greek Language

Προϋπάρχουσες έρευνες έχουν καταδείξει ότι άτομα με υψηλότερα επίπεδα επιθετικότητας συχνά εμφανίζουν προκατάληψη ως προς την επεξεργασία κοινωνικών πληροφοριών, ερμηνεύοντας τις προθέσεις των άλλων ως εχθρικές, ειδικά σε διαφορούμενες και μη απειλητικές καταστάσεις. Αυτή η «εσφαλμένη απόδοση επιθετικής πρόθεσης» (hostile attribution bias) έχει πιθανολογηθεί ότι πηγάζει κυρίως είτε από κάτω προς τα πάνω (bottom-up) επεξεργασία ή από πάνω προς τα κάτω (top-down) επεξεργασία, με την προσοχή να εστιάζεται είτε σε εχθρικά ή σε άσχετα ερεθίσματα. Η παρούσα έρευνα εξέτασε το ζήτημα της κατανομής προσοχής, καθώς και την προέλευση της επιθετικότητας σε εφήβους, μέσω on-line μεθοδολογίας με τη χρήση διηγηματικών κειμένων και στα πλαίσια της «επίδρασης ασυμβατότητας» (contradiction effect). Εξετάστηκαν επίσης πιθανές συσχετίσεις μεταξύ της επιθετικότητας και της συναισθηματικής νοημοσύνης. Έφηβοι με υψηλότερα και χαμηλότερα επίπεδα «αντιδραστικής» και «ενεργητικής» επιθετικότητας διάβασαν διηγηματικά κείμενα τα οποία περιείχαν συμβατές και ασύμβατες προτάσεις οι οποίες περιέγραφαν τα χαρακτηριστικά του πρωταγωνιστή και τις ακόλουθες αντιδράσεις του, είτε ως ήπιες ή ως επιθετικές. Τα αποτελέσματα κατέδειξαν ότι και οι δύο τύποι της επιθετικότητας (αντιδραστική και ενεργητική), καθώς και η εσφαλμένη απόδοση επιθετικής πρόθεσης σχετίστηκαν γενικότερα με ταχύτερους χρόνους ανάγνωσης. Επίσης, η εσφαλμένη απόδοση επιθετικής πρόθεσης έτεινε να συσχετίζεται με την υπερεγρήγορη σε εχθρικά ερεθίσματα, πιθανόν λόγω από πάνω προς τα κάτω επεξεργασίας (top-down), και επίδρασης γνωστικού σχήματος. Ωστόσο, σε σχέση με προηγούμενες έρευνες, η αναμενόμενη «επίδραση ασυμβατότητας» (contradiction effect) δεν βρέθηκε, ενώ, όπως αναμενόταν, υπήρξε αρνητική σύνδεση της συναισθηματικής νοημοσύνης με την επιθετικότητα και την εσφαλμένη απόδοση επιθετικής πρόθεσης. Περαιτέρω, εξετάστηκαν οι συνέπειες αυτών των ευρημάτων σε σχέση με την ανάπτυξη αποτελεσματικών προγραμμάτων πρόληψης και παρέμβασης για την επιθετικότητα.

Abstract in an International Language

Prior research has shown that individuals with higher levels of aggression often exhibit hostile attribution bias (HAB), by interpreting others' intentions as hostile, especially in ambiguous and nonthreatening situations. Aggression and HAB have been hypothesized to be the outcome of either bottom-up or top-down processes, with attention allocated mainly on hostile or irrelevant cues. This study examined the issue of attention allocation, as well as the origins of aggression in adolescents, by employing an on-line narrative comprehension methodology in the context of a contradiction paradigm. Possible associations between aggression and trait emotional intelligence were also examined. Adolescents with higher and lower levels of reactive and proactive aggression read short stories containing consistent and inconsistent target sentences that described the main character's attributes and reactions as either mild or aggressive. While both types of aggression (reactive and proactive) were related to faster reading times in general, reading trends suggested that HAB was related to hypervigilance to hostility, due to top-down, schema influences. However, the expected text-based contradiction effect demonstrated in previous studies was not found, while, as predicted, trait emotional intelligence was negatively linked to aggression and HAB. The implications of these findings with respect to the development of effective prevention and intervention programs are discussed.

Chapter 1: Introduction to the Study

A large body of research has demonstrated that when highly aggressive individuals are instructed to infer other's intentions from their behavior, they attribute hostility more frequently compared to their nonaggressive counterparts (Dodge, 1986; Dodge & Crick, 1990). This "hostile attribution bias" (HAB) or "hostile attribution of intent" is particularly evident in situations where others' intentions and goals are ambiguous, but may also be present when most people would interpret others' intentions as benign (Nasby, Hayden, & dePaulo, 1980; Dodge & Somberg, 1987). According to Dodge (2006), individual differences in aggressive behavior occur as a function of characteristic styles of attributing hostile intent, or not, to others' provocative behavior. Specifically, hostile attribution bias has been found to be linked mainly with reactive aggression, which refers to the type of aggression manifested in reaction to a presumed threat and is usually accompanied by some visible form of anger (Crick & Dodge, 1996; Dodge et al. 2015; Dodge, 1991; Price & Dodge, 1989). In comparison, proactive aggression is described as unprovoked, deliberate and instrumental, and is more goal oriented than reactive aggression (Price & Dodge, 1989). Although, these two types of aggression are highly correlated, with recent evidence showing their co-occurrence (Fanti, Frick, & Georgiou, 2009), they are conceptually distinct (Dodge, 1991; Poulin & Boivin, 2000a) and show a differential pattern of correlation to hostile attribution bias (Bailey & Ostrov, 2008; Yaros, Lochman, Rosenbaum, & Jimenez-Camargo, 2014), to steps of social information processing (Oostermeijer, Nieuwenhuijzen, van de Ven, Popma, & Jansen, 2016), as well as to differential responses to varying intensities of peer provocation (Helseth, Waschbusch, King, & Willoughby, 2015).

Hostile attribution of intent is often attributed to deviations from normative social information processing (Dodge, 1986; Dodge & Crick, 1990). Although a stable attributional style has been shown to predict general tendencies in behavior, the specific response in a given circumstance also depends on other aspects of social information processing (such as response accessing and decision making). According to the social information processing model by Crick and Dodge (1994), social information has to be encoded accurately, represented correctly, an interaction goal needs to be specified and response alternatives have to be generated and evaluated for a best possible response to be selected and enacted. Research has shown that hostile attribution of intent is often

associated with irregularities in early processing steps and difficulties in the processing of situational cues. For example, numerous studies have demonstrated that during the encoding stage, aggressive children may be hypervigilant to cues of hostility or threat, by selectively attending more to hostile cues than to non-hostile cues (Crick & Dodge 1994; Dodge & Newman, 1981; Dodge & Tomlin, 1987; Dodge & Petit, 2003; Dodge & Price, 1994; Gouze, 1981; 1987; van Goozen, Cohen-Kittens, Mathys & van England, 2002; Smith & Waterman, 2004). Such encoding distortions may result from inaccurate cue-based, bottom-up processing, as well as from individual normative beliefs about aggression, such as long held beliefs in the form of pre-existing hostility schemata in long-term memory. In fact, many studies have shown that individual differences in the tendency to attribute hostile intent are at least partly due to the activation of hostile schemata stored in memory (Lochman & Lenhart, 1995; Zelli, Dodge, Lochman, Laird, & Conduct Problems Prevention Research Group, 1999; Zelli, Huesmann, & Cervone, 1995). For example, aggression prone individuals may be basing their social inferences on cognitive schemata that suggest that others are acting with hostile intent. As expected, early negative experiences, such as rejection by peers (Coie & Dodge, 1988) and harsh parenting (Weiss, Didge, Bates, & Pettit, 1992) have been found to predispose children to attribute hostile intent. Moreover, studies have indicated that pre-existing hostile schemata may be the basis of hypervigilance towards aggressive cues by guiding aggressive individuals to attend more to schema-consistent information (Lochman & Lenhart, 1995).

Zelli et al. (1995) hypothesized that hostile inferences are mainly due to the existence of hostile cognitive schemata and that this would be more evident in the initial spontaneous processing rather than in the conscious deliberate encoding of aggressive individuals. Using a cued recall paradigm, they found that aggressive university students, showed greater memory for sentences that were ambiguous, but open to hostile interpretations, compared to their non-aggressive peers. When processing occurred spontaneously, aggressive subjects recalled more material than low-aggressive subjects when prompted with hostile cues than with semantic cues. In contrast, low-aggressive subjects recalled considerably more information when prompted with semantic cues than when prompted with hostile cues. Consistent with the study's hypothesis, this result was obtained only under the spontaneous processing conditions. Based on these results, the authors concluded that aggressive individuals' hostile inferences reflect their initial

schema-driven encoding of the situations, evident when processing is spontaneous and do not reflect social information processing deficits, such as retrieval of cues in deliberate processing conditions. However, this differential pattern of results does not exclude the possibility that the differences manifested only in the spontaneous condition are mostly due to attentional bias caused by bottom-up, cue-driven processes instead of top-down schema influences.

Interestingly, a study by Zelli et al. (1999) indicated that there are two mechanisms that influence aggressive behavior and proposed a clear distinction between knowledge structures and beliefs about aggression on the one hand and deviant processing operations on the other hand. The study also suggested that hostile schemata are linked to information processing judgments and that both hostile schemata and steps of social information processing are linked to aggressive behavior.

Regardless of the extent of schema influence on social information processing, several studies have suggested that aggressive children and adults are hypervigilant towards aggression, by allocating their attention to hostile cues at the expense of other more benign information in the environment (Crick & Dodge 1994; van Goozen et al., 2002). Alternatively, other studies suggest that aggression and specifically aggressive schemas may influence the encoding process in a different manner. Rather than directing attention towards aggressive cues, hostile cognitive schemas may guide attention towards schema-inconsistent information that is novel and unexpected. Horsely, de Castro and der Schoot (2010) refer to this different possibility as the 'schema inconsistency hypothesis'. By measuring the eye movements of aggressive and non-aggressive children while looking at series of cartoons, they found that aggressive children, compared to non-aggressive children, attended more to non-hostile than hostile information. Horsely et al. (2010) interpreted this result as reflecting an attempt on the part of aggressive children, to verify information that is inconsistent with their schema. This effect was attributed mainly to top-down processing, which, in turn, prevents further processing and recall of schema-inconsistent information and leads to hostile intent attribution and aggressive responding. Similarly, Wilkowski, Robinson, Gordon and Troop-Gordon (2007) found that participants high on trait anger gazed longer at non-hostile cues in visual ambiguous scenes, relative to hostile cues.

Understanding hostile attribution bias and its sources is critical for the design of effective prevention and intervention programs, especially for children and adolescents. The most widely used type of intervention used with reactive or emotional aggression is anger management. Its focus is on helping the individual understand his/her emotional reactions and subsequently acquire techniques to control them (McGuire, 2008; Novaco, 2007). Nevertheless, if hostile attribution bias is primarily a result of processing deficits during the encoding stage of social information processing, then interventions should mainly focus on learning how to identify and interpret cues that signal that the actor has acted benignly rather than malevolently. Conversely, if aggressive individuals form inaccurate or biased social inferences by relying more on information from their own aggressive schemas, then interventions may focus on highlighting early positive experiences with others and secure social interactions while, at the same time, borrowing and adapting instructional methodologies that have been found to facilitate new learning through the restructuring of prior conceptions and knowledge (Carey, 1985; Diakidoy & Kendeou, 2001; Diakidoy, Mouskounti, Fella, & Ioannides, 2016; Diakidoy, Mouskounti, & Ioannides, 2011; Vosniadou & Brewer, 1992; Vosniadou, 2007). In this case, it is also imperative for prevention and intervention purposes to establish whether aggressive schemas guide attention towards, or away from hostile cues.

The current study will examine the hypothesized sources of hostile attribution bias by employing an on-line narrative comprehension methodology and obtaining reading time measures. Hostile attributions are said to occur quickly and simultaneously with social interaction, so the benefit of an on-line measure is that it examines real-time, spontaneous mental processing, and can increase ecological validity of the results (Fontaine & Dodge, 2006). Therefore, a reading methodology has been proven useful in investigating the sources of hostile attribution bias (e.g., Wingrove & Bond, 2005; Coleman & Kardash, 1999), as it can shed light on the underlying processes involved in the encoding of social information contained in narrative text. According to a memory-based text processing view, information still active in working memory reach other information processed earlier and stored in working memory, as well as information in long term memory, through a 'passive resonance mechanism' (Gerrig & McKoon, 1998; McKoon, Gerrig, & Greene, 1996; Myers & O'Brien, 1995). By employing a text contradiction paradigm, numerous studies have shown that readers notice inconsistencies between current and previous

information presented in a text, as manifested by the longer reading times for contradicting sentences (Albrecht & Myers, 1995; Albrecht & O'Brien, 1993; Myers, O'Brien, Albrecht, & Mason, 1994). Therefore, by varying the consistency of text information in relation to both a potential hostile schema and to previously presented information in text and by examining the reading times in each condition, it may be possible to observe differential patterns of attention allocation as a function of aggression and source of hostile attribution bias.

For the purposes of the current study, adolescents with high and low levels of aggression (14-18 years of age), matched for age and reading comprehension ability, read short narratives describing a main character and his/her reactions in situations common to their everyday experiences. All texts included a target sentence describing the main character's attributes as either benevolent or hostile and a target sentence describing his/her reactions towards the event as either mild/neutral or aggressive. Moreover, half of the narratives depicted reactions that were in accordance with preceding character descriptions, while the rest depicted reactions that were in contrast with character descriptions. Based on previous studies (Albrecht & O'Brien, 1993; Myers et al., 1994), it was expected that reading times for target sentences that contradict earlier text information would be several hundred milliseconds longer than sentences that were consistent with earlier text information. These longer reading times reflect the reader's awareness of the inconsistency and an attempt to incorporate this new information with previously presented text elements. Therefore, if the information were contradicting it would take longer for readers to process.

If hostile attribution bias is mostly the result of hypervigilance towards aggression leading to selective attention, then it was hypothesized that, consistent with previous research findings, participants high in aggression would attend more to hostile cues than to non-hostile cues. In this case it was expected that high-aggression participants would spend more time reading text and sentences with a hostile content, compared to texts and sentences with a mild content, but also compared to their lower aggression peers. If, however higher aggression participants' attention is directed towards novel and unexpected information (schema-inconsistency hypothesis), it was predicted that they would spend less time reading hostile texts and sentences and would allocate more attention on mild content, compared to lower-aggression participants.

Furthermore, regarding the source of aggression and HAB and whether there is a greater bottom-up and top-down processing influence on SIP, it was hypothesized that this could be manifested as differences in the reading times of mild texts and sentences between readers with lower and higher levels of aggression, as well as compared to baseline reading times. In the case that social information processing is mostly influenced by cue-based, bottom-up processes, no significant differences were expected as a function of aggression regarding the processing of mild content. In the case of greater top-down influences, it was hypothesized that mild content would come into contrast with the existence of a hostile schema, leading to longer processing times.

The results obtained with the inconsistent text versions were estimated to provide a better test concerning the allocation of attention and the nature of bottom-up or top-down influences. Since typical readers have been found to display a text-contradiction effect, that is, to spend more time on text information that contradicts information presented earlier in the text, it was expected that participants with lower levels of aggression would display this characteristic text-contradiction effect, resulting from noticing the discrepancies between text information. In contrast, it was hypothesized that adolescents with higher levels of aggression would either fail to display this text-contradiction effect, or would show a differential reading pattern in some cases, depending on attention allocation and on the nature of schema influences. More specifically, in the case of hypervigilance to aggression and regardless of the degree of bottom-up or top-down influences, participants with higher levels of aggression would generally read sentences with a hostile content slower than their subsequent mild reactions, but also slower than low aggression readers. This would result in longer reading times for hostile character descriptions and reactions regardless of text-based inconsistencies. Nevertheless, if attention is allocated to schema-inconsistent information, an opposite pattern was expected, with participants with higher aggression levels reading sentences describing hostile character descriptions and reactions at a faster pace than mild character descriptions and reactions. Again, the issue of bottom-up vs top-down influences could be clarified by comparing the reading times of participants for sentences depicting mild character descriptions and reactions. Also, since the study employed a reading methodology, reading comprehension was also measured and controlled for, to ensure that participants were comparable in this respect, regardless of aggression levels.

Moreover, previous research has shown that several factors may be associated with aggression and hostile attribution bias. For example, studies have indicated that aggressive boys who exhibit hostile attribution bias use less adaptive emotion-regulation strategies than non-aggressive boys (Orobio de Castro, Merk, Koops, Veerman, & Bosch, 2005; Nas, de Castro, & Koops, 2005). Additionally, aggressive individuals with anger management issues seem to have more difficulty, compared to controls, in understanding emotional information and using it strategically for self-management (Coccaro, Solis, Fanning, & Lee, 2015). Thus, it is not surprising that there is a strong link between pro-social behavior and constructs such as emotional intelligence (Petrides, Sangareau, Farnham, & Frederickson, 2006; Mavroveli, Petrides, Rieffe, & Bakker, 2007). Specifically, Trait Emotional Intelligence (or 'emotional self-efficacy'), concerns emotion related dispositions and self-perceptions measured via self-report, regarding one's ability to recognize, process, and utilize emotion-laden information, has been found to be negatively correlated with antisocial behavior (Petrides & Furnham, 2000a, 2000b, 2001; Mavroveli et al., 2007), as well as negatively correlated with emotional and behavior difficulties (Poulou, 2014). Therefore, an additional aim of the study was to further examine the relationship between aggression and Trait Emotional Intelligence. Based on previous research (Petrides et al., 2006; Poulou, 2014), it was expected that trait emotional intelligence would be negatively correlated with aggression and hostile attribution bias. Furthermore, since the current study used narrative texts describing emotional states and reactions of characters, emotional intelligence could influence reading times by facilitating the comprehension of narratives, although evidence on the relationship between empathy and reading times has been somewhat conflicting (Komeda, Kawasaki, Tsunemi, & Kusumi, 2009; Wingrove & Bond, 2005).

Lastly, factors such as intelligence and school achievement have also been shown to correlate with aggression, although this relationship has not been clearly established (Basch, 2011; Nas, Orobio de Castro, & Koops, 2005; Perše, Kozina, & Leban, 2003). While some studies have demonstrated a negative correlation between aggressive behavior, general intelligence and verbal intelligence (Ayduk, Rodriguez, Mischel, Shoda, & Wright, 2007; Huesmann, Eron, Lefkowitz, & Walder, 1984; Gomez & Hazeldine, 1996), other studies have found that hostile attribution bias is independent of intelligence level (Milich & Dodge, 1984; van Rest, van Bokhoven, van Nieuwenhuijzen, Embregts, Vriens, & Matthys, 2014). Although the exact nature of the relationship between aggression and

factors such as intelligence and school achievement is beyond the main scope of this study, it was deemed important to measure them, since they may influence aggression and hostile attribution bias and since prior research has been proven inconclusive. In addition, given that a reading methodology was used, it was imperative to employ measures of general and verbal intelligence, given that these factors have been shown to influence text processing speed and comprehension (Snow, 1991; Vauras, Kinnunen, & Kuusela, 1994; Alexander & Jetton, 2000). Therefore, any differences detected in reading times should be a manifestation of aggression alone and not of confounding factors.

Chapter 2: Literature Review

Hostile Attribution Bias

Given the destructive impact that aggression often has, it is imperative to ask why it is that some people are more prone to it than others. Although there are certainly multiple root causes of individual differences in aggression and anger, research has shown repeatedly that individuals who display a bias towards interpreting social cues from others as displays of hostility, even when the cues are benign, are more likely to engage in aggressive behavior (Crick & Dodge, 1996; Nasby, Hayden, & dePaulo, 1980). Similarly, Dodge (1980) found that, in reaction to a frustrating, but ambiguous as to the underlying intention event, aggressive boys displayed a bias towards attributing hostile intent, compared to non-aggressive boys, who mostly interpreted the peer's intentions as benign. In fact, a large body of research has shown that aggressive children display hostile attribution biases (Crick & Dodge, 1994; Dodge & Coie, 1987; Dodge & Frame, 1982; Dodge, Pettit, Bates, & Valente, 1995; Dodge et al., 1990; Guerra & Slaby, 1989; Lochman & Dodge, 1994; Quiggle et al., 1992; Steinberg & Dodge, 1983; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Hostile attribution bias has been found to predict chronic aggressive behavior problems in children, across a wide and diverse range of ethnic and socioeconomic groups (Dodge et al. 2015).

Hostile attribution bias (HAB) has been mostly linked to what is referred to in the literature as 'reactive' aggression (Bailey & Ostrov, 2008; Dodge et al. 2015; Yaros et al., 2014). Reactive aggression is performed in anger, in reaction to a presumed threat and is usually accompanied by some visible form of anger (Crick & Dodge, 1996; Dodge, 1991;

Price & Dodge, 1989). On the other hand, proactive aggression is described as unprovoked, deliberate and instrumental, and is more goal oriented than reactive aggression (Price & Dodge, 1989). Even though these two types of aggression are highly correlated and there is a high co-occurrence between them (Fanti, Frick, & Georgiou, 2009; Polman, Orobio de Castro, Koops, van Boxtel, & Merk, 2007), there is strong psychometric and neuropsychological evidence that supports their distinction (Blair, Mitchell & Blair, 2005; Dodge, 1991; Poulin & Boivin, 2000a). In addition, studies have found that hostile attribution biases are primarily associated with reactive, rather than with proactive aggression (Card & Little, 2006; Crick & Dodge, 1996; Dodge & Coie, 1987; Yaros et al., 2014) and that when children attribute hostile intent, they are more likely to respond with reactive aggression (Dodge et al., 2016). Furthermore, there are indications that the two types of aggression are differentially related to social information processing (Oostermeijer et al., 2016) and that children exhibiting reactive, proactive, or a combination of the two types of aggression, show different patterns of response to various intensities of peer provocation (Helseth et al., 2015). Due to the aforementioned discrepancies in associations between different types of aggression and hostile attribution bias, the current study will evaluate general aggression, as well as reactive and proactive aggression.

Over the years, different theories for hostile attribution of intent in aggressive individuals have emerged (Dodge, 1986; Dodge & Crick, 1990; Lemerise & Arsenio, 2000). Dodge's (1986) social information-processing (SIP) theory describes how attribution of intentionality is linked with aggressive behavior. The theory proposes a five-step cognitive process in children. Each step involves cognitive activities which may become deficient or distorted. A reformulation of the above model by Crick and Dodge (1994) describes how social information is typically processed: 1) the information has to be encoded accurately, 2) the encoded information has to be represented correctly, 3) an interaction goal needs to be specified, 4) response alternatives have to be generated, 5) these response alternatives have to be evaluated and a best possible has to be selected and 6) the selected response has to be enacted. The model describes how social information is processed in an on-line manner, that is, during engagement in social interaction. In addition, this array of processes interacts with the person's biological capabilities and his/her database of memories of past experiences. The processing steps are hypothesized to

be occurring relatively rapidly, and with several feedback loops between them, as well as with the memory database. This social information processing is usually highly automated and seldom is it conscious or reflective. According to the model, while the individual may be engaged in multiple social information processing activities simultaneously, the path from a particular stimulus to a behavioral response logically follows a sequence of steps.

According to the Crick and Dodge (1994) model, the first step in SIP, is to engage in codification of social information. During this process, some, but not all situational cues are perceived and placed into working memory. A key proposition of the model is that during the encoding stage, aggressive children develop a consistent processing pattern, such as hypervigilance to cues of hostility or threat, by selectively attending more to hostile cues than to non-hostile cues (Dodge & Newman, 1981; Dodge & Tomlin, 1987; Dodge & Petit, 2003; Gouze, 1981; 1987; van Goozen, Cohen-Kittens, Mathys, & van England, 2002). Aggressive individuals are seen to depart from normative information processing by selectively attending to social cues that favor hostile interpretations of a situation (Dodge & Frame, 1982; Gouze, 1987) or by disregarding those cues that would facilitate accurate interpretations of non-hostile settings (Dodge et al., 1984; Dodge & Newman, 1981). For example, Seager (2005) found that during a visual recognition task, hypervigilance for weapons was linked to increased aggression in violent offenders. Likewise, hypervigilance for hostile words during a dichotic shadowing task has been found to significantly correlate with a criminal history of persistent violence (James & Seager, 2006). This 'hypervigilance hypothesis' describes hostile attribution bias as mainly a cue-based, bottom-up process.

During the second step of Crick & Dodge's (1994) SIP model, encoded information is then interpreted. Interpretation of cues may involve one or more independent processes, such as causal analyses of the events, inferences about the other's intentions and interpretations of the situation, self-evaluations and evaluations of others. Therefore, interpreting social situations as hostile, increases the probability of an aggressive response. The likelihood of interpreting an event as hostile becomes even more probable if individuals allocate more attention towards hostile cues during the initial encoding stage, but also if this process is guided by preexisting beliefs.

Several studies have given support to the hypothesis that the phenomenon of hostile attribution of intent is associated with deviations during the aforementioned early stages of encoding and interpretation (Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002; Dodge & Newman, 1981; Dodge, 1986; Dodge & Crick, 1990; Rabiner, Lenhart, & Lochman, 1990). Aggressive children have been shown to differ in the quality of their cue search (Dodge & Tomlin, 1987), in the type of cues to which they attend (Cutrona & Feshbach, 1979; Dodge & Frame, 1982; Dodge & Newman, 1981), and in the overall number of cues they encode (Dodge & Newman, 1981). Moreover, since attention difficulties, disinhibition and impulsivity are common in aggressive children and adults (Harty, Miller, Newcorn, & Halperin, 2009; Shapiro, 1965; Serin & Kuriychuk, 1994), a failure to regulate behavior may be related to a difficulty to be reflective, or from a deficit in assimilating information. For example, James & Seager (2006) measured impulsivity and hostile attribution biases in forty male prisoners. The study found that impulsivity significantly correlated with persistent violence. However, they found no correlation between impulsivity and hostile attributions.

Social information is also encoded and interpreted partly based on mental representations of past events and preexisting cognitive constructs, such as schemata. Schemata are memory structures or cognitive frameworks that organize information, in a way that they facilitate comprehension (Gerrig, 1988). Relying on cognitive schemata can be useful since it can make processing more effective by taking shortcuts in interpreting the vast amount of information that is available in the environment, but may also result in judgment errors (Dodge & Newman, 1981). Thus, habitual inferences of hostility may stem from cognitive schemata that develop from repeated encounters with hostile, aggressive social environments (Crick & Dodge, 1994; Dodge, 1993; Dodge & Crick, 1990; Huesmann, 1988). Negative experiences, such as rejection by peers (Coie & Dodge, 1988) and harsh parenting (Weiss, Didge, Bates & Pettit, 1992) predispose children to attribute hostile intent. Therefore, hostility may be the result of a cognitive schema that is applied in the interpretation of ambiguous social situations and suggests aggressive solutions (Huesmann, 1988). Particularly in ambiguous situations, aggressive individuals may be formulating inaccurate or biased social inferences by relying more on information from their own past experiences, than on information presented concurrently to the situation being judged (Dodge & Tomlin, 1987). For instance, Zelli (1992) found that

personal beliefs regarding the degree to which the world is a hostile place or the self is a favorite target of others' hostile intentions, predicted judgments of hostile intent, and were better predictors than the level of behavioral aggression.

Zelli et al. (1995) investigated whether aggressive individuals' hostile inferences stem from accessible knowledge structures, such as schemata, evident more under spontaneous processing conditions, or whether they stem from generalized information-processing deficits, which could be apparent under conscious processing. To examine this, aggressive and nonaggressive participants (229 undergraduate students), classified on the basis of their responses on an aggression questionnaire, were asked to memorize sentences that could be interpreted either as hostile or benign. Half of the sample was asked simply to memorize the sentences (spontaneous processing condition), whereas the other half memorized the sentences while focusing on the possible reasons for the behaviors depicted in the stimuli (deliberate processing condition). A cued recall paradigm was used, with two kinds of recall cues presented to the participants; semantic, i.e. words that were linked semantically to the element of the sentences, and dispositional aggressive cues. For example, concerning the sentence "The receptionist raises his voice when Keith starts talking", an aggressive cue would be the word "mean", while a semantic cue would be the word "telephone". The study's hypotheses were that, within the spontaneous processing condition, aggressive individuals would show relatively greater recall in response to aggressive cues than in response to semantic cues, compared to nonaggressive participants. In contrast, they hypothesized that, within the deliberate processing conditions, levels of aggression would not affect subjects' relative level of recall when prompted with dispositional vs. semantic cues. The results confirmed the above hypotheses. In the spontaneous processing condition, low-aggressive subjects recalled considerably more information when prompted with semantic cues than when prompted with hostile cues. In contrast, aggressive subjects recalled more material when prompted with hostile cues than semantic cues. However, in the deliberate processing condition, aggressive and nonaggressive subjects did not differ in level of recall as a function of cue type. It was speculated that deliberate processing instructions attenuated the individual differences detected within the spontaneous processing groups. The authors also concluded that differences in aggressive and nonaggressive individuals' social inferences reflect highly

accessible knowledge structures, such as schemata, that drive the encoding of others' social behavior, and that this difference can be best observed in spontaneous processing.

Although the results of the above study indicate a disparity between aggressive and non-aggressive individuals' social information processing, hostile attribution bias was not directly measured. The study employed a cued recall paradigm, which is an indirect indication of encoding, and did not directly investigate the process by which encoding biases occur. Also, aggression was assessed using a questionnaire consisting of only three items, asking participants to indicate whether they had engaged in actual physical aggression in the past year (such as kicking, punching or shooting) (Huesmann, Eron, Lefkowitz, & Walder, 1984). Nevertheless, it is generally accepted that not all aggressive individuals, who might inaccurately attribute hostile intent, engage in physical violence. For example, Dodge et al. (1984) found that neglected children also display a hostile attributional bias, but their characteristic response was withdrawal, not aggression. Moreover, hostile attributions may not account for all the variance in aggressive behavior (Sancilio, Plumert, & Hartup, 1989). In addition, although the study by Zelli et al. (1995) lends support towards the link between hostility and recall of schema-consistent information, it does not delineate the process by which this occurs.

Zelli et al. (1999) hypothesized that there are two distinct mechanisms that influence aggressive behavior in children: social knowledge in the form of cognitive schemata and inaccurate social information processing. Data were collected from 387 children across three years. Normative beliefs regarding the use of aggression and violence following weak or strong provocation were assessed through a rating scale, while social information processing was assessed through hypothetical scenarios. The social information processing components assessed were the interpretation of peer's motives, accessing of aggressive responses and evaluation of aggressive solutions. The results supported the study's hypothesis that there are clear distinctions amongst normative beliefs legitimizing aggression and each measured step of social information processing.

Furthermore, Calvete and Orue (2012) attempted to examine the extent to which early cognitive schemas, relating to mistrust, narcissism and justification of violence, influence steps social information processing and are involved in aggressive behavior, through a longitudinal study. Adolescents were presented with hypothetical ambiguous

scenarios and subsequently completed paper and pencil measures assessing social information processing, namely, the interpretation of events, anger and aggressive response access, as well as measures of cognitive schemas and aggression. The study's hypothesis was that certain cognitive distortions would influence different social information components. Results indicated that each cognitive schema examined predicted different SIP components, while only the aggressive response access component of social information processing, i.e. the extent to which a participant would use an aggressive behavior, was related to reactive aggression. Nevertheless, social information processing was measured through a questionnaire which assessed only later processing steps and not early steps such as encoding of information. Therefore, the study had no way of examining any deviations in early processing.

Coleman and Kardash (1999) investigated whether hostile schemata held in long term memory operate primarily during the initial encoding of social information, or whether they come into play at the time of retrieval. Aggressive and non-aggressive boys, in Grades 3-5, listened to a story that presented potential for an aggressive interpretation, by containing sentences ambiguous as to the intention of the characters. The authors used a sentence verification task as an indication of encoding, during which, participants had to decide whether an aggressively slanted sentence was part of the previously presented narrative or not. A free recall task was used as an indication of retrieval. The results revealed that, in the retrieval task, while non-aggressive boys recalled a significantly greater proportion of unambiguous sentences, aggressive boys recalled an equal amount of ambiguous and unambiguous sentences. In the sentence verification task, non-aggressive boys recognized an approximately equal amount of aggressively and non-aggressively slanted sentences, while aggressive boys recognized significantly more aggressively slanted items. Contrary to the authors' hypothesis, no group differences were found in the recognition of ambiguous and unambiguous sentences. While the aforementioned study indicates that aggressive boys did recognize more aggressive sentences than non-aggressive boys, encoding was measured indirectly, through a sentence verification task. Encoding was not examined in real time, since the study required participants to engage in the tasks after listening to the narratives. Therefore, the encoding task may have involved similar memory retrieval processes as the free recall task. Although the authors speculated

than any effects found were due to schema influences, the tasks used did not clearly differentiate between bottom-up and top-down processes.

Dodge and Newman (1981) also put forth the idea that boys with aggressive tendencies were less efficient in encoding social information compared to non-aggressive boys, due to their hostile preconceptions. Their hypothesis was that aggressive boys holding hostile schemata would be predisposed to process and recall more hostile information compared to non-aggressive boys, while disregarding contradictory information. Aggressive and non-aggressive groups of boys participated in a detective game, during which they had to gather evidence in order to decide whether a fictitious peer acted with hostile intent or benevolence. The information came in the form of audio-recorded statements of other peers, regarding the suspects' character and behavior. The clues were supporting, unsupporting, or ambiguous towards the suspect. The authors measured the amount of information children chose to listen to before they made a decision, the free recall of information and their final decision. They found that aggressive boys in general, chose to listen to less information before deciding whether the peer acted with hostile intent, compared to non-aggressive boys. When aggressive subjects responded faster, they made more attributions of hostile intent than non-aggressive participants, especially when the situation presented was ambiguous. In addition, aggressive boys who selectively recalled hostile-cues over non-hostile cues attributed more hostile intent to peers. The authors concluded that HAB is correlated with a quick response to social situations and with selective attention and recall of hostile cues, while ignoring contradictory cues. They speculated that aggressive participants were more influenced by their preconceptions rather than by evidence, and subsequently sought to confirm their expectations. Although the latter may be a possibility, it cannot be explicitly inferred only from the above study, since attention towards cues was only measured indirectly, through recall. Also, all subjects, regardless of levels of aggression, recalled more hostile information compared to non-hostile clues. In particular, the difference in recall of hostile cues between the experimental and the control group did not reach significance. This may be in accordance with findings which indicate that aggressive children have a lower preference for non-hostile stimuli rather than a higher preference for hostile information (van Goozen, Cohen-Kettenis, Matthys, & van Engeland, 2002).

The aforementioned studies suggest that individuals high on aggression may be hypervigilant towards aggressive cues, either due to distorted bottom-up processing during encoding, or because pre-existing schemata of hostile intent may guide them in attending more to information consistent with their schema. As a result, aggressive individuals may be more inclined to encode cues that would confirm their expectations, while ignoring schema-inconsistent cues (Lochman & Lenhart, 1995; Zelli, Huesmann, & Cervone, 1995). Nevertheless, there are alternative explanations for attentional biases and hostile interpretations in individuals high in aggression. A different explanation for hostile attribution bias is what Horsely, de Castro and der Schoot (2010) refer to as 'schema inconsistency hypothesis'. It proposes that hostile intent schemata may indeed direct attention, but towards schema-inconsistent information, precisely because it is novel and unexpected. Allocating more attention to non-hostile cues may reflect an attempt to verify the inconsistent information, and this in turn causes more difficulty during the encoding process.

In an attempt to test their schema-inconsistency hypothesis, Horsely et al. (2010) examined whether aggressive children are hypervigilant towards hostile and threatening cues, or whether they attend more to non-hostile information, due to an inconsistency with their hostile schema. Participants were thirty, 10-13-year-old children with low levels of aggression, and thirty peers with high levels of aggression. They were presented with series of cartoons concerning real-life ambiguous provocation situations. The cartoons contained cues with both hostile and non-hostile intent. As participants looked at these cartoons, their eye movements were recorded in real time by means of an eye tracker. After each cartoon series, the children were asked recall questions, which the authors took as an indication of encoding, as well as questions pertaining to interpretation, taken as an indication of hostile intent attribution. The basic hypothesis was that, if aggressive children are hypervigilant to hostility, they would look at hostile cues longer than non-hostile cues. Alternatively, if the schema-inconsistency hypothesis applied, then aggressive children would manifest shorter viewing times for hostile cues and longer viewing times for non-hostile cues, compared to their non-aggressive peers. In agreement with the schema-inconsistency hypothesis, the results revealed that aggressive children looked longer at non-hostile cues than nonaggressive children did. Nonetheless, aggressive children recalled less non-hostile information, and attributed more hostile intent than their

non-aggressive peers. On the basis of these findings, the authors concluded that aggressive behavior is related to top-down, schema-based processing, with the schema influence leading to faster processing of schema-consistent information and longer processing for schema-inconsistent information. As a result, they interpreted aggressive children's lower recall of non-hostile cues as indicating the difficulty of processing and interpreting schema-incongruent information (Horsely et al., 2010).

In an analogous study, Wilkowski et al. (2007) examined whether hostile attribution biases correlate with biases in selective attention or alternatively, with the interpretation of ambiguous events. Participants were 45 male college students. The authors speculated that if hostile attribution biases are due to selective attention during encoding ('attention-first' model), then participants high on trait anger would attend more to hostile cues. On the other hand, if hostile attribution biases are guided by hostile schemata ('interpretation-first' model), then participants high on trait anger would gaze longer at non-hostile cues. Attention was measured using eye-tracking methodology and by measuring length of time of fixation on cues, while participants looked at visual scenes. All the scenes presented were ambiguous as to the intent of the perpetrator and included both hostile and non-hostile cues. Results showed that, regardless of trait anger, participants viewed the non-hostile cues for a longer period of time compared to hostile cues. In addition, participants low on trait anger spent less time looking at cues in general, compared to participants high on trait anger. More importantly though, participants high on trait anger exhibited longer gaze durations for non-hostile cues relative to hostile cues, thus indicating support towards the 'interpretation-first' model. Moreover, the authors examined very early aspects of selective attention, calculated as the amount of time elapsing from the initial presentation of the visual scene until the first fixation upon a cue. They found no support for prioritization of hostile cues, either earlier or later in processing, among individuals high in trait anger, effectively ruling out support for the 'attention-first' model.

Aggressive behavior and conduct problems have been proven difficult to treat and tend to persist throughout the life span (Dodge, 2006). Most interventions used to alter attributional style (behavioral, cognitive, social), have only been partially successful in changing hostile attribution bias, while this change did not always mediate change in behavioral outcomes (Hudley & Graham, 1993; Surhodolsky, Glob, Stone, & Orban,

2005). The most widely used interventions designed for reactive aggression involve the development of anger management skills, with a focus on enabling individuals to both understand their experiences of anger, and acquire a framework and techniques for regaining control where they may have lost it (McGuire, 2008; Novaco, 2007). Nevertheless, implementation of anger management training has not proved to be uniformly successful, especially in dealing with clinical populations, such as in the penal system (Howells, Day, Bubner, Jauncey, Parker, Williamson, & Heseltine, 2002). Moreover, it may be possible that anger management alone may be insufficient in altering cognitive distortions, such as hostile attribution bias. On the other hand, other types of intervention programs that focus on cognitive restructuring and altering erroneous beliefs appear to be fairly successful (Bush, 1995; Wilson & Lipsey, 2005). For example, Dodge, Godwin and Conduct Problems Prevention Research Group (2013) studied the impact of a preventive intervention program (Fast Track) aimed at reducing antisocial behavior in children and adolescents. They found that the program's effectiveness on changing antisocial behavior was largely based on altering social-cognitive processing, such as reducing hostile attribution biases. Nevertheless, even in effective interventions such as the aforementioned, it is rarely taken into account whether biases stem from a failure to properly encode and judge the situation or from deeply held beliefs. Given the importance of linking interventions to a functional understanding of aggression, it is essential to shed light on the sources of hostile attribution bias for the development of effective prevention and intervention programs that specifically target reactive aggression. For example, if hostile attribution biases are mainly caused by deficient encoding of cues during social information processing, a basic goal of intervention might be to learn to focus on and identify cues that signal that the actor has acted benignly rather than malevolently. Such an attribution would mitigate the tendency to retaliate with angry aggression. On the other hand, if hostile attribution biases are due to a hostile schema, the pattern itself may operate as a self-fulfilling prophecy, thus increasing its stability across the life span (Dodge, 2006). If this is the case, then prevention programs may capitalize on early positive experiences with others and secure social interactions, while successful interventions may focus on future life experiences that might restructure hostile schemata. Such interventions may be based on several long established instructional methodologies that have been found to facilitate new learning through the restructuring of prior conceptions and knowledge

(Carey, 1985; Diakidoy & Kendeou, 2001; Diakidoy et al., 2016; Diakidoy et al., 2011; Vosniadou & Brewer, 1992; Vosniadou, 2007).

In summary, aggressive individuals' tendency to attribute hostile intent when others' intentions are ambiguous or benign, has been hypothesized to mainly result from encoding distortions and interpretation during the early stages of social information processing. These distortions may result either primarily from distortions in bottom-up processing of cues in the environment (Crick & Dodge, 1994; Dodge & Newman, 1981) or mainly from the activation of pre-existing hostility schemata in long-term memory (Zelli et al., 1995). In both cases, attention is hypothesized to be allocated to hostile cues at the expense of other more benign information in the environment. However, other studies have indicated that attention could be directed mostly toward information that conflicts and is inconsistent with pre-existing schemata (Horsely et al., 2010; Wilkowski et al., 2007). The present study will examine whether aggressive individuals' attention is disproportionately allocated mostly on hostile cues or on irrelevant, schema-inconsistent cues. In addition, the study will attempt to clarify whether the aforementioned biases stem mainly from distorted encoding of social cues or from cognitive schemata held in long term memory.

Narrative Text Comprehension

The process of activating prior knowledge or cognitive schemata in order to comprehend new information has been identified and described in many areas of psychology. One such area concerns text processing and reading comprehension. Just as in social information processing, in order to successfully comprehend information in written discourse, a reader must form connections between the ideas expressed in the text and relevant prior knowledge. The process of activating prior knowledge or cognitive schemata while reading, results in the generation of knowledge-based inferences that serve to connect and elaborate text information. Therefore, text comprehension processing and outcomes may provide a fertile ground for examining potential attribution biases related to aggression. In recognition of this, several studies investigating social information processing have employed short auditory or written narratives that describe common social situations and have asked participants to generate causal inferences (Coleman & Kardash, 1999; Epps & Kendall, 1995; Quiggle, Garber, Panak, & Dodge, 1992; Tremblay & Belchevski, 2004). In the context of this study, the use of an on-line narrative comprehension methodology and reading-time measures can provide insights as to the

origins of hostile attribution bias and the nature of any schema-related influences. Moreover, the fact that an online methodology is used, more closely resembles the production of real hostile attributions made with actual peers, enhancing the ecological validity of the study.

Theoretical models of text comprehension hold that comprehension processes are guided largely by the underlying structure of the text. Although a number of aspects of the text structure influence comprehension, one of the essential features of a text, particularly of a narrative text, is the causal structure (e.g., Graesser et al., 1994; Trabasso, Secco, & van den Broek, 1984; Zwaan, Langston, & Graesser, 1995). There is extensive evidence showing that mature readers engage in the necessary cognitive processes to encode and/or infer the causal connections between characters and actions described in text, resulting in a coherent mental representation of the narrative as a whole (Bloom, Fletcher, van den Broek, Reitz, & Shapiro, 1990). Studies have shown that even children as young as age 4 are sensitive to the underlying structure of narratives, and that this sensitivity increases with age (Lynch, van den Broek, Kremer, Kendeou, White, & Lorch, 2008; van den Broek, Lorch, & Thurlow, 1996), while children as young as 9 years old regularly make causal inferences about events as they read short narratives (Casteel, 1993).

It is generally agreed upon that to fully understand the information in a text the reader must make connections between text elements and prior knowledge. Nevertheless, models of text comprehension differ in the extent to which they assume that readers will access relevant information stored in long term memory, during reading (online). According to the constructionist theory of narrative text comprehension (Graesser, Singer, & Trabasco, 1994) readers continually 'search after meaning' and attempt to integrate new information with prior text information, as well as with background knowledge when necessary, while reading. As a result, readers form a coherent mental representation or a mental model of the situations they encounter in text and make predictions regarding future emotional reactions of the characters. Depending on his/her goals, the reader strategically and frequently will reactivate information presented earlier in the text and will activate background knowledge to facilitate comprehension. Readers may draw a number of specific types of inferences online for comprehension to be achieved. According to the constructionist theory, three major classes of inferences are generated under most reading conditions, regarding: 1) the superordinate goals of characters that motivate their explicit

actions in the text, 2) causal antecedents, that explain why an action or event is mentioned in the text, and 3) global thematic inferences, that integrate major parts of the text or convey the point of a message (Graesser et al., 1994).

Aggressive-prone individuals' text processing has been found to reflect their hostile attribution of intent. Influenced by constructionist theory, Wingrove and Bond (2005) hypothesized that trait anger would be associated with faster reading of sentences that described characters reacting in anger, compared to sentences describing non-angry reactions. The study employed the Rapid Serial Visual Presentation (RSVP) technique, in which participants read passages, one sentence at a time, and the time spent reading each sentence was taken to reflect comprehension processing. If a sentence is consistent with the mental model that the reader is constructing, then reading time for that sentence should be shorter compared to the reading time for sentences that describe emotional reactions that do not correspond with reader's interpretation of the situation. Participants in the study were 24 men and 24 women from the general population. The Multidimensional Anger Inventory (MAI; Siegel, 1986) was used to assess trait anger. The results indicated that readers high in trait anger, read sentences describing angry reactions faster than sentences describing neutral reactions. However, trait anger was also positively correlated with faster reading of all sentences, regardless of their content. The results were interpreted to suggest that those with angrier dispositions responded faster to sentences describing angry reactions, because they were more likely to be anticipating angrier reactions on behalf of the main characters. The authors suggested that this occurred because the hostile information conveyed in text was congruent with readers' online inferencing and interpretation regarding the characters' hostile intentions (Wingrove & Bond, 2005). However, since trait anger was associated with faster reading of all sentences, it is possible that individuals with angrier dispositions simply responded faster to information in general, perhaps due to impulsivity or other variables, and not because they anticipated hostility. In addition, the study employed only a correlational design and, therefore, any potential differences between individuals high and low on trait anger regarding reading times were left unexplored. Finally, no measures of reading comprehension or verbal intelligence were taken despite their potential of influencing reading speed (Alexander & Jetton, 2000; Jonge & Jong, 1996; Snow, 1991; Stanovich, Cunningham, & Feeman, 1984).

An alternative theory to the constructionist view of text comprehension is the Memory-based text processing view, which specifies a ‘passive resonance mechanism’ by which text concepts in working memory reach other concepts processed earlier and stored in working memory, as well as information in long term memory. According to the Memory-based text processing view, information retrieval is a passive, fast-acting resonance process by which cues in working memory interact with all information in long term-memory in parallel. The long-term memory information that a piece of text evokes can be either general knowledge or information from earlier parts of the text itself. As the text is read, information in the text and in working memory trigger an activation in the reader’s knowledge base (Gerrig & McKoon, 1998; McKoon, Gerrig, & Greene, 1996; Myers & O’Brien, 1995). Background information becomes available as a function of its degree of featural overlap with the current contents of working memory.

In a series of studies based on the memory-based text processing view (Albrecht & Myers, 1995; Albrecht & O’Brien, 1993; Myers, O’Brien, Albrecht, & Mason, 1994; O’Brien, Rizzella, Albrecht, & Halleran, 1998), researchers demonstrated how readers make an effort to maintain a coherent text representation, even when information within the text itself are contradicting. For instance, Albrecht & O’Brien (1993) asked participants to read short narrative texts describing some physical or motivational characteristics of a protagonist. In one version of the text, a sentence was presented that described an action that came into contrast with the introductory information about the protagonist. For example, the protagonist of the story was described as a strict vegetarian, while a few sentences later, she is presented ordering a cheeseburger and fries. The neutral version of the text contained a target sentence that did not contradict any earlier statement in the text. Albrecht & O’Brien (1993) found that reading times for contradicting target sentences were several hundred milliseconds longer than for the consistent sentences. This text contradiction effect shows how readers can notice whether a sentence contradicts earlier text information, stored in working memory.

When it comes to hostile attribution bias, several studies propose that aggressive individuals may be hypervigilant to hostile cues and disproportionately allocate their attention on them, either due to distorted bottom-up processing during encoding, or due to an inaccurate interpretation based on the influence of an aggressive hostile schema held in long term memory (Crick & Dodge, 1994; Dodge & Newman, 1981; Wingrove & Bond,

2005). On the other hand, aggressive individuals may be drawing their conclusions based on aggressive schemata that may actually drive attention away from hostile cues and lead to longer processing times of schema inconsistent information (Horsely et al., 2010; Wilkowski, 2007). The use of narrative text describing common, potentially anger-provoking and neutral social situations, through examining readers' online and spontaneous processing potentially allows testing of the above predictions. If participants high on aggression are hypervigilant to hostile information, we expect them to manifest longer reading times for aggressive sentences compared to non-hostile sentences. On the contrary, if the schema-inconsistency hypothesis stands, we expect longer processing times of non-hostile sentences compared to hostile sentences. Subsequently, as it has been previously demonstrated, contradicting text information will cause a typical reader to slow down. Therefore, in the context of a text contradiction paradigm, different patterns of attention allocation between aggressive and non-aggressive readers may be observed, depending on whether attention is directed towards or away from hostile sentences. Any differences between bottom-up and top-down processes may become apparent in the reading times of mild sentences between those low and high in aggression.

Hostile Attribution Bias and Emotional Intelligence

Several studies have emphasized the importance of emotion in social information processing and have attempted to integrate emotional and cognitive processes in models of social competence (Lemerise & Arsenio, 2000; Orobio de Castro, Merk, Koops, Veerman, & Bosch, 2005). There is ample evidence that children who have difficulties regulating their emotions have a higher risk for maladjustment (Eisenberg, Fabes, Guthrie, Murphy, Maszk, Holmgren, & Suh, 1996), and that children with behavior problems have difficulty reading their own and other's affective signals (Casey, 1996; Casey & Schlosser, 1994). One factor which seems to be linked to aggressive behavior is emotional regulation. Emotional self-regulation or regulation of emotion is defined as the ability to respond to the ongoing demands of experience with the range of emotions in a manner that is socially tolerable and sufficiently flexible to permit spontaneous reactions, as well as the ability to delay spontaneous reactions as needed (Cole, Michel, & Teti, 1994). Under certain conditions, patterns of emotion regulation may impair functioning and support psychopathology. Such failure to regulate emotion experience and expression is referred to as emotion dysregulation (Cole et al., 1994). Difficulties in regulating emotion have been

linked to reactive aggression (Denson, DeWall, & Finkel, 2012), while self-control training has been found to decrease reactive aggression during provocation (Denson, Capper, Oaten, Friese, & Schofield, 2011). Lemerise and Arsenio (2000) proposed in their model that children with poor emotion regulation also show social information processing deficits, and that emotionality and regulatory ability affects both processing of social (and emotional) information and decision making in challenging social situations.

Children who are more competent in regulating their emotions are less likely to be overwhelmed by other people's feelings and are more able to show empathy (Eisenberg, Eggum, & Di Giunta, 2010). Eisenberg and colleagues (e.g., Eisenberg, Fabes, & Spinrad, 2006; Eisenberg, Shea, Carlo, & Knight, 1991) have defined empathy as an effective response that is identical, or very similar, to what the other person is feeling or might be expected to feel given the context—a response stemming from an understanding of another's emotional state or condition. As early as 1970, Rothenberg showed that children high on her measure of "social sensitivity" (the ability to describe how an actor felt and why), were rated higher, by both teachers and peers, on measures of interpersonal adjustment. Lovett and Sheffield (2007) reported a negative, significant relation between empathy and aggression for adolescents, especially when self-report measures of empathy were used. Similarly, in a study of young adolescents, self-reported dispositional empathy was negatively related to self-reported aggressive behavior and delinquent behavior (de Kemp, Overbeek, de Wied, Engels, & Scholte, 2007). Likewise, difficulties in understanding emotional information and controlling one's emotions have been linked to aggression and hostile attribution bias (Coccaro et al., 2015).

Factors such as emotional self-regulation and empathy are incorporated in the wider construct of emotional intelligence. Petrides and Furnham (2000a, 2000b, 2001) propose a clear conceptual distinction between two types of emotional intelligence (EI), i.e. trait EI and ability EI. Trait EI (or trait emotional self-efficacy) concerns emotion related dispositions and self-perceptions measured via self-report and refers to a constellation of behavioral dispositions and self-perceptions concerning one's ability to recognize, process, and utilize emotion-laden information (Petrides, Pita, & Kokkinaki, 2007). It encompasses various dispositions from the personality domain, such as empathy, emotion regulation, impulsivity, optimism and assertiveness, as well as elements of social intelligence (Thorndike, 1920) and personal intelligence (Gardner, 1983). These abilities exist in the

form of self-perceived abilities and are measured through self-report questionnaires. On the other hand, ability EI (or 'cognitive-emotional ability') refers to one's actual ability to recognize, process, and utilize emotion-laden information, and is usually measured through maximum-performance tests, i.e. tests that are based on items that have correct and incorrect answers. In the current study, the concept of Trait EI will be adopted, since the focus is on individual differences in emotion-related processing, as traits.

Research has shown that adolescents with higher levels of Trait Emotional intelligence are less likely to engage in deviant behavior, such as truancy and school exclusion (Petrides, Frederickson, & Furnham, 2004). Petrides, Sangareau, Furnham and Frederickson (2006) examined the relationship between Trait EI and seven distinct pro social and antisocial behavioral descriptions of elementary school children ('co-operation', 'disruption', 'shyness', 'aggression', 'dependence', 'leadership' and 'intimidation'), based on peer and teacher nominations. As expected, the study found a negative correlation between trait emotional intelligence and peer and teacher - rated aggression in children. Similarly, Mavroveli, Petrides, Rieffe and Bakker (2007) investigated the relationship between trait emotional intelligence, psychological well-being and peer relations. They hypothesized that trait EI would be negatively correlated with maladaptive coping styles, such as antisocial behaviors (disruption and aggression), as well as positively correlated with adaptive coping styles, as expressed through prosocial behaviors (co-operation and leadership). Participants (282 Dutch adolescents) completed self-report measures of trait EI and coping styles. Antisocial and prosocial behaviors were assessed through peer nominations. Consistent with the study's hypotheses, Trait EI related negatively to aggression, and positively to peer-rated social competence and adaptive coping styles. Similarly, a recent study by Poulou (2014) demonstrated that adolescents with higher trait emotional intelligence presented with less emotional, social and behavioral difficulties.

There are several findings that indicate that trait emotional intelligence, of which a major component is empathy, may be an important factor in social adaptability (Mavroveli et al., 2007; Poulou, 2014; Rothenburg, 1970) and negatively related to aggressive behavior (Petrides et al., 2006). However, it is not clear if and how trait emotional intelligence is linked to hostile attribution bias. Therefore, the current study employed a measure of trait emotional intelligence, in order to explore whether there is a connection between aggression and emotional intelligence. Incorporating such a measure was

considered important as any correlations found between trait EI and aggression measures will contribute to our understanding of the underlying bases of aggressive behavior and facilitate the design of effective interventions.

More importantly however, emotional intelligence may influence the reading process, since narrative comprehension requires readers to make assumptions and draw inferences regarding characters' emotional states and intentions (Gernsbacher, Hallada, & Robertson, 1998). In addition, there is evidence indicating that elements of emotional intelligence, such as extraversion and empathy, may facilitate the comprehension of narratives and the estimation of the emotional state of protagonists (Komeda, Kawasaki, Tsunemi, & Kusumi, 2009). Interestingly though, Wingrove & Bond (2005) had also hypothesized that readers high on trait anger would read sentences depicting anger, faster than irrelevant sentences, and that empathy, an important element of emotional intelligence, could influence these reading times. Nevertheless, while the results indicated that readers high on trait anger tended to read angry sentences faster, there were no significant correlations between empathy and response times on angry sentences (Wingrove & Bond, 2005). Since the current study will employ narratives conveying social and emotional information, it was imperative to include a measure of emotional intelligence in order to examine its influence on the processing of socio-emotional information in text and its hypothesized link with aggression.

Aggression, Intelligence, School Achievement and Gender influences.

Prior research on the relationship between intelligence, aggression and HAB has provided inconclusive and contrasting evidence. Some studies have documented a negative correlation between intelligence and hostile attribution bias (Huesmann et al., 1984; Gomez & Hazeldine, 1996), and have found that children with intellectual disabilities tend to encode more negative cues (Van Nieuwenhuijzen, Orobio de Castro, Wijnroks, Vermeer, & Matthys, 2004). Moreover, lower verbal intelligence and poor verbal skills have been associated with higher risk for delinquency and antisocial behavior (Lynam, Moffitt, & Stouthamer-Loeber, 1993; Warr-Leeper, Wright, & Mack, 1994). For instance, a study by Ayduk et al. (2007) demonstrated how verbal intelligence in interaction with other factors, such as self-regulatory skills, was associated with lower aggression in middle school aged boys. In contrast, other studies have indicated that hostile attribution bias in aggressive boys is independent of general intelligence (Milich & Dodge,

1984; Nas et al., 2005; van Rest et al., 2014) or more specifically, of differences in verbal intelligence (Dodge, Price, Bachorowski, & Newman, 1990).

Furthermore, other influential factors apart from intelligence may exist in the development and manifestation of aggression. Nas et al. (2005) compared three groups of adolescents, in terms of behavior problems, reactive and proactive aggression, social information processing, intelligence and education level. Participants were 42 incarcerated male delinquents, 40 non-delinquent adolescents in lower education (vocationally trained), and 54 non-delinquent adolescents in higher education (regular high school). All participants were presented with audiotaped vignettes, presenting social scenarios that could be either interpreted as hostile, ambiguous, or accidental. The study found that incarcerated delinquent juveniles showed more behavior problems and were more proactively aggressive than their higher educated peers, but no more than their lower educated peers. Concerning intelligence, while it was related to adaptive emotion-regulation strategies, aggressive-response generation, and problem-solving response generation, there was no direct link to hostile attribution of intent. Instead, the results indicated that education level may be a more influential factor in aggression.

Similarly, aggression has been negatively associated with school achievement, in both boys and girls of elementary school age (Risser, 2013) and of high school age (Basch, 2011; Hinshaw, 1992). Research has also indicated that children and adolescents who are exposed to peer aggression exhibit poor academic achievement in specific subjects such as Math and Science, compared to those not exposed to such circumstances (Perše, Kozina, & Leban, 2003).

Although, the above findings point loosely to the conclusion that there is a connection between HAB, and factors such as intelligence, school achievement and education level, there's no equivocal resolve as to the role the above variables play in aggression and in biased social information processing. While the relationship between hostile attribution bias and factors such as intelligence and education is beyond the scope of this study, their potential to influence HAB and text processing needs to be taken into account. Therefore, the current study will measure and control for the influence of variables such as intelligence, both verbal and non-verbal, education level and reading comprehension.

Lastly, past research has shown different relations between gender and subtypes of aggression. For example, men and younger boys are often classified as exhibiting higher levels of physical aggression as compared to women (Buss & Perry, 1992; Dodge, Dodge, Coie, & Lynam, 2006). Also, according to previous studies, boys tend to exhibit more proactive and reactive aggression compared to girls (Mayberry & Espelage, 2007), while boys tend to react more angrily to interpersonal conflicts than girls and present different coping styles to provocation (Burgess, Wojslawowicz, Rubin, Rose-Krasnor, & Booth-Laforce, 2006). Although the associations between gender and aggression were beyond the main scope of the study, possible gender differences in terms of aggression and hostile attribution were also considered.

Chapter 3: The Present Study

When it comes to hostile attribution bias, research has demonstrated that it may partly result from defective social information-processing skills, which limit or distort encoding and representation of social information. For example, a hypersensitivity to hostile cues and subsequently a failure to attend to non-hostile cues may lead to a bias towards hostility. One explanation for the allocation of attention towards hostile cues is that it can be attributed to cue-based, ‘bottom-up’ processing (Crick & Dodge, 1994). Alternatively, hypervigilance to hostile cues can also be explained by a top-down, schema-based processing approach, which suggests that preexistent schemata of hostile intent lead aggressive individuals to allocate more attention to hostile cues (Lochman & Lenhart, 1995). An alternative aspect of schema influence may be the ‘schema inconsistency hypothesis’, which describes how hostile intent schemata may indeed direct attention, but towards schema-inconsistent information, that is, away from hostile cues (Horsely et al., 2010; Wilkowski et al., 2007). If this is the case, then it was expected that individuals high on aggression would direct their attention more on schema-inconsistent, non-hostile cues. Aggression and behavioral problems are considered highly stable and have been proven difficult to treat effectively. Aggressive and antisocial behavior, if left untreated, tends to persist from early childhood throughout adulthood (Dodge, 2006). In fact, it is estimated that one quarter of initially marginally deviant children grow into more seriously aggressive youth over time (Caprara, Dodge, Pastorelli, & Zelli, 2007). The issue of the source of hostile attribution bias is essential for the development of effective interventions, since most interventions for reactive aggression have focused on altering attributional style

(Hudley & Graham, 1993; Sukhodolsky, Golub, Stone, & Orban, 2005). Hence, whether hostile attribution bias is primarily based on bottom-down processes, such as hypervigilance to hostility, or on top-down processes has important implications for the interventions that are being used with aggressive children.

Few studies have investigated hostile attribution bias online and most have used traditional self-report measures, under deliberate processing conditions. By employing the text contradiction paradigm (Albrecht & O'Brien, 1993), the current study attempted to examine whether processing biases can be manifested through on-line text processing, under spontaneous processing conditions. The first main research question was related to whether aggression is related to hypervigilance to cues of hostility or whether attention is mainly directed towards information inconsistent to aggression, which is novel and unexpected. Secondly, another aim of the current study was to examine whether hostile attribution biases are related to deviations in social information processing (bottom-up processing), or whether they are related to the activation of hostility schemata in long-term memory (top-down processing). Subsequently, if processing is mostly guided by hostile schemata, the aim is to investigate whether these direct attention towards, or away from hostile cues. Considering previous research findings (Horsely et al., 2010; Wilkowski, 2007), it is possible that individuals high in aggression encode social information largely guided by aggressive schemata, which in turn cause them to allocate attention mostly towards schema inconsistent cues.

An additional aim of the current study was to further examine the relationship between aggression and trait emotional intelligence. Previous research has attempted to incorporate emotional variables in SIP models, and has shown that emotional intelligence is positively linked to prosocial behavior and negatively associated with aggression (Mavroveli et al., 2007; Petrides et al., 2006). Moreover, since the current study adopted an online text processing methodology, the possibility was considered that emotional intelligence may influence the processing of social and emotional information conveyed in narratives. Most importantly, there are no known studies specifically exploring the relationship between trait emotional intelligence and HAB. The current study's hypothesis was that aggression and hostile attribution of intent would be negatively correlated with trait emotional intelligence. Lastly, since previous studies have indicated that factors such as general intelligence, verbal intelligence and education level may be linked to aggression

and hostile attribution bias (Huesmann et al., 1984; Gomez & Hazeldine, 1996; Nas et al., 2005; Risser, 2013), as well as influence reading speed (Jonge & Jong, 1996), the current study measured and controlled for general and verbal intelligence. Reading comprehension was also measured and controlled for, since the study employed narrative texts, in order to ensure that any differences found in reading times would be solely attributed to aggression and hostile attribution bias.

Participants were 116 adolescent males and females, aged between 15-18 years. The current study examined the hypothesized sources of hostile attribution bias by employing an on-line narrative comprehension methodology and by obtaining reading time measures. The narratives used described situations common to the everyday experience of adolescents. All experimental texts included a target sentence describing a main character's attributes as either benevolent or hostile and a target sentence describing his/her reactions towards the event as either mild or aggressive. In addition, half of the experimental narratives depicted reactions that were consistent with aforementioned character descriptions, while the rest depicted reactions that were inconsistent with character descriptions. Thus, four versions of the experimental texts were used according to a combination of characters' descriptions and subsequent reactions (i.e., mild character-mild reaction, hostile character-aggressive reaction, hostile character-mild reaction, and hostile character-aggressive reaction). These experimental texts appeared amongst filler texts describing neutral situations. Also, to enhance emotional involvement during reading, male participants read stories in which the main character was male, and female participants read stories with a female protagonist. Following the reading of each narrative, participants were asked to answer three multiple-choice comprehension questions relating to the topic of the text. This served as an additional measure of reading comprehension and ensured that participants stayed on task.

The reading times for the two target sentences in the experimental texts, that is, the character description and character reaction were recorded, since they were of particular interest. Data obtained with the filler texts were taken as baseline reading times, while reading times for consistent text versions (mild character-mild reaction, hostile character-aggressive reaction) served to establish baseline reading times for the two target sentences. It was hypothesized that the issue of attention allocation, i.e. the distinction between hypervigilance and schema-inconsistency hypothesis, could be evident by comparing the

reading times of mild and hostile sentences in both consistent and inconsistent text versions, as well as compared to baseline reading times. Furthermore, the distinction between bottom-up and top-down processes could be manifested as differences in the reading times of mild sentences between readers who are low and high in aggression, as well as differences in their reading patterns of contradicting sentences.

Therefore, in the consistent and mild text condition, in which the text describes a benevolent character exhibiting a mild reaction, no significant difference in reading times between the two sentences was expected, since there is no text-based contradiction. Moreover, if encoding of aggressive information is mostly based on bottom-up processing, we expected no differences in reading times as a function of aggression. If, however, encoding is mostly based on top-down processing, we expected that participants with higher levels of aggression would read mild sentences at either a faster or slower pace than participants lower in aggression, depending on the influence of their cognitive schemata. For example, if participants high in aggression present hypervigilance towards aggressive cues, it was expected that they would spend less time reading the mild sentences than participants with lower levels of aggression. Alternatively, if the schema-inconsistency hypothesis is more applicable, then it is likely that high aggression readers would read both mild sentences slower compared to low aggressive readers, therefore allocating more attention on sentences that come into contrast with their aggressive schema. Similarly, in the texts in which critical sentences describe a hostile character exhibiting a hostile reaction, if aggressive participants allocate their attention mostly towards aggressive cues, it was expected that they would spend more time reading these sentences with an aggressive content compared to their own reading times of mild sentences, as well as compared to readers lower in aggression. This was probable regardless of whether hypervigilance is mainly attributed to bottom-up or top-down processing. On the contrary, if the schema-inconsistency hypothesis applies, the reverse result was predicted, i.e. participants high on aggression would spend less time reading the aggressive sentences than participants low in aggression.

The introduction of contradicting text information within the narrative (e.g. mild character but hostile reaction) allows a further examination of attention allocation. For instance, in the contradicting text versions, where a mild character exhibits hostile behavior, it was hypothesized that low aggression readers would detect the text

inconsistency by slowing down during the reading of the second target sentence. If hostile attribution bias is mostly based on hypervigilance to hostile cues, similar results for readers high in aggression were expected, by reading the second target sentence describing the hostile behavior, slower than the first target sentence. This result is likely, both due to the detection of the text contradiction, as well as due to hypervigilance to aggression, regardless of whether it is due to bottom-up or top-down processing. On the other hand, if the attention is allocated on schema-inconsistent cues, it is possible that any effects of text contradictions would be leveled out, since aggressive readers would spend more time with the first target sentence, which is contradicting to their schema, rather than with the second, schema-consistent target sentence. Finally, in the inconsistent text version, when a hostile character exhibits a mild reaction, it was predicted that the low-aggression group would demonstrate a typical text inconsistency effect more clearly, by reading the second target sentence describing the mild reaction slower than the first sentence. For the high-aggression readers, a different pattern of attention allocation compared to those low in aggression was expected. If hostile attribution bias is based on hypervigilance to hostile cues, then it is possible that the aggressive readers will spend more time reading the first target sentence (hostile character description) compared to the second target sentence (mild reaction), but also compared to readers with low levels of aggression. This effect may be observed regardless of whether hypervigilance is due to a bottom-up or top-down influence. On the contrary, if aggressive readers allocate more attention on schema inconsistent cues, it was hypothesized that they would read the first target sentence faster than the second, but also faster than the low-aggression group. Although this result could be both due to a schema-inconsistency and the detection of text based contradictions, the comparisons between the high aggressive group's reading times across the inconsistent text conditions and in relation to those with low aggression may shed light as to the primary source for this effect.

Chapter 4: Method

Participants

The sample included 116 adolescents (48 females, 68 males), ranging in age from 14 to 18 years of age ($M = 16.3$ years, $SD = 1.2$ years). Fifty-eight participants were below the age of 16 years, while 58 participants were above the age of 16 years. Participants were recruited from both private ($n = 33$) and public ($n = 83$) Greek speaking high schools

(Gymnasiums and Lyceums) in the wider Nicosia and Limassol districts of Cyprus, from both urban (n = 71) and rural (n = 45) areas. Specifically, 33 of the participants were enrolled in Middle School and 83 participants were enrolled in High School. All 33 Middle school participants came from one rural school in Nicosia, while out of the 83 High school participants, 51 and 20 participants came from two urban schools in Nicosia respectively, and 12 participants came from a rural school in Limassol. Of the 116 participants, 33 were enrolled in the 3rd Grade of Middle School (Gymnasium), 51 were enrolled in the 1st Grade of High School (Lyceum), 8 were enrolled in the 2nd Grade of High School (Lyceum) and 24 were enrolled in the 3rd Grade of High School (Lyceum). Approval to conduct the study was obtained from the National Bioethics Committee and the Ministry of Education and Culture. Parental and student consent was obtained prior to the experimental sessions. Students were also informed beforehand that no teachers or parents will have access to the data obtained. Participation in the study was voluntary and students were informed that they could withdraw themselves from the procedure at any time they wished. Parental and student consent forms appear in Appendix A.

Materials

Measures of aggression.

Reactive-proactive aggression questionnaire (RPQ). In order to assess participants' levels of reactive and proactive aggression, the Reactive-Proactive Aggression Questionnaire (RPQ) (Raine, Dodge, Loeber, Gatzke-Kopp, Lynam, Reynolds, Stouthamer-Loeber, & Liu, 2006) was used. The RPQ is a self-report measure consisting of 23 items reflecting either physical or verbal reactive or proactive aggression. The items present different motivational and situational contexts for the aggressive behavior, in order to differentiate between the two forms of aggression. Reactive aggression is measured with 11 items (e.g. "How often have you gotten angry when frustrated?", "How often have you yelled at others when they have annoyed you?", "How often have you damaged things because you felt mad?"), while proactive aggression is measured through 12 items (e.g. "How often have you had fights with others to show who was on top?"). Participants were asked to rate each item as to its frequency of occurrence on a scale from 0 to 2 (0 = never, 1 = sometimes, or 2 = often). Completion time took about 5 minutes. The maximum possible scores are 22 for Reactive Aggression (range 2 - 19), 24 for Proactive Aggression

(range 0 – 15), and 46 for Total Aggression (range 2 – 31), with higher scores representing greater aggression.

The RPQ has demonstrated adequate reliability and validity properties when used with child and adolescent samples (Raine et al., 2006). The questionnaire has been translated in Greek and used with Greek-speaking adolescents, showing its reliability to range from a Cronbach's alpha .82 for Reactive Aggression and of .81 for Proactive Aggression (e.g., Fanti, Frick & Georgiou, 2009). With the current sample, Cronbach's alphas for the 11 Reactive and 12 Proactive Aggression items were .80 and .83, respectively.

The scores (0, 1 or 2) for reactive aggression items (1, 3, 5, 7, 8, 11, 13, 14, 16, 19, 22) were summed to form a Reactive Aggression score for each participant. Likewise, scores on the proactive aggression items (2, 4, 6, 9, 10, 12, 15, 17, 18, 20, 21, 23) were also summed up to calculate a Proactive Aggression score for each participant. The translated Reactive-Proactive Aggression Questionnaire appears in Appendix B.

Achenbach system of empirically based assessment - youth self-report (YSR) (Greek version). The Achenbach System of Empirically Based Assessment - Youth Self Report (YSR; Achenbach, 1991; Achenbach & Rescorla, 2011; Roussos, Francis, Zoubou, Kiprianos, Prokopiou, & Richardson, 2001) was used as a way of validating other measures of aggression used in the current study. It is a self-administered test for ages 11 to 18, which obtains youths' reports of their competencies and problems. It consists of 119 items, asking participants to rate how well each item describes them over the past 6 months, on a 3-point scale ranging from not true (0) to very true (2). All items, based on factor analyses, fall within one of eight Empirically Based Syndromes Scales: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior and Aggressive Behavior (Achenbach, 1991). Overall, for the empirically based syndrome scales, internal consistency reportedly ranged from .71 to .95 ($p < .01$; Achenbach & Rescorla, 2011). The YSR exhibited excellent reliability (119 items; $\alpha = .93$) with the present sample. For the purposes of the current study, only the Aggressive Behavior subscale was used in further analyses, which served as a validation measure for other measures of aggression. The subscale includes 17 items aimed at assessing general aggression (e.g. "I argue a lot",

“I get in many fights”, “I physically attack people”). Cronbach's alpha for the 17 items of the Aggressive Behavior subscale was .81.

Ambiguous intentions hostility questionnaire (AIHQ). Hostile attribution bias was assessed with the Ambiguous Intentions Hostility Questionnaire (AIHQ) (Combs, Penn, Wicher & Waldheter, 2007). The AIHQ was created to assess a social-cognitive bias for perceiving other people's actions in negative social scenarios as being directed at oneself in an intentional and malevolent way. It consists of 15 short written vignettes that reflect negative outcomes. The vignettes vary in intentionality (i.e., intentional, accidental and ambiguous intentions) and there are five items in each degree of intentionality. The AIHQ requires participants to read each vignette and to imagine the scenario happening to them. Overall, each item (vignette) requires five responses, two open-ended and three on a Likert scale. Therefore, it is possible to derive five scores from each item i.e., Hostility Bias, Intentionality Score, Anger Score, Blame Score and Aggression Bias. A Hostility Bias is obtained by asking participants to write down the reason they believe the other person (or persons) in the story acted in a particular way. These open-ended responses are rated on a scale from 1-5, ranging in the degree to which participants attribute hostility to the actions of the character(s) in the vignettes. The “Intentionality Score” is obtained, by asking participants to rate the degree to which the other person committed the act on purpose, using a Likert scale (1 = definitely no, 6 = definitely yes). Likewise, an “Anger Score” is obtained, by asking participants to rate how angry the situation would make them feel (1 = not at all angry, 5 = very angry), while a Blame Score is obtained by asking participants to rate how much they would blame the other person (or persons) for the outcome (1 = not at all, 5 = very much). Finally, an ‘Aggression Bias’ index is calculated, by asking participants to provide a behavioral response to the situation. In the current study, all open-ended responses were excluded, leaving only the three scaled responses (Intentionality Score, Anger Score, Blame Score). The average of the above-mentioned scaled responses (Intentionality, Anger, Blame) was then calculated to form a Composite Blame Score, which research has shown to be more psychometrically sound than using the three individual items separately (Combs et al., 2007). Additionally, Composite Blame scores were separately summed across items according to the degrees of intentionality reflected in the vignettes (intentional, accidental, ambiguous). This resulted in three scores: Composite Ambiguous, Composite Intentional and Composite Accidental,

which in previous studies have demonstrated good levels of internal consistency (Combs, Penn, Michael, Basso, Weideman, Siebenmorgan, Tiegreen, & Chapman, 2009; Combs et al., 2007). From the above-mentioned, only the Composite Accidental and Composite Ambiguous indices were of interest, since it was deemed that intentional items would naturally yield a higher score, not necessarily reflecting a hostile attribution bias. Composite Blame (45 items; Cronbach's $\alpha = .93$), Composite Accidental (15 items; Cronbach's $\alpha = .90$) and Composite Ambiguous (15 items; Cronbach's $\alpha = .90$) scores showed high reliability with the present sample. For analyses purposes, the above indices were then averaged across items to calculate a mean response, yielding a Mean Composite Blame, a Mean Composite Accidental and a Mean Composite Ambiguous score. Also, the last two scores were summed up to form a Mean Composite Ambiguous-Accidental score. Only the Mean Composite Ambiguous-Accidental score was used in analyses. Since the AIHQ was initially developed for use with adult samples, the questionnaire was adapted in order to better reflect the experiences of Cypriot adolescents. The AIHQ was first modified independently by two researchers, who then reached an agreement on the alterations. For example, whereas in the original questionnaire a scenario described: "You've been at a new job for three weeks", this was changed to "You've been at a new school for three weeks". The questionnaire was also translated in Greek according to cross-cultural research guidelines (Brislin, 1970). One bilingual translator translated the questionnaire from English to Greek, and another bilingual translator translated it back to English. In the case of differences between the original and the backtranslated versions of the questionnaire, the translators came to a joint agreement on how to resolve the issue. The translated version of the AIHQ used in the study appears in Appendix B.

Measures of ability.

Raven's progressive matrices (RPM). General intelligence was assessed with the Raven's Progressive Matrices (RPM) (Raven, 1941; Raven, 1981). The RPM is a non-verbal multiple choice test, which measures the ability to infer relationships within geometric patterns or among figural elements contained in a matrix. Items utilize either a complete pattern from which a piece has been removed, or figural elements placed in discrete rows and columns, with one element missing. The test has a total of 60 items presented in 5 sets (A–E), with 12 items per set. Correct answers receive a score of 1, while incorrect answers receive a score of 0. The sum of correct scores produces a single

raw score which can either be compared to a norm group or used to determine a participant's percentile rank in a sample. In the current study, raw scores were used in all analyses, since there are no comparative norms for the Greek-Cypriot sample. For the purposes of this study the RPM was group administered and completion time ranged between 20 and 40 minutes. Cronbach's alpha for all 60 items with the current sample was .83.

Mill-Hill vocabulary scale. Since the current study makes use of text materials, the Mill Hill Vocabulary Scale (MHV) (Raven, Court & Raven, 1998) was used to provide a measure of acquired verbal knowledge. It was chosen because it is known to be highly correlated with verbal intelligence (Raven, 1958; Raven et al., 1998; Raven, 2000) and general intelligence (Raven, 2000). The test is appropriate and can be used with persons from age 6 and above.

The MHV scale consists of 88 words equally divided between two parts (A and B) arranged in order of ascending difficulty. In the first part of the test, the Definitions or Open-ended Form modality (Set A), the test taker has to give a written explanation of the meaning of each stimulus word. In the second part of the test, Set B, test takers are asked to choose the most accurate synonym from a choice of six alternatives provided for each stimulus word. In the current study, the combined version of the test (both sets A and B) was administered. In both sets, each correct answer receives 1 point and incorrect answers receive 0 points. The test can be administered individually or in groups and the whole test takes about 20 to 40 minutes to complete. The psychometric properties of the test have been extensively investigated and considered good to excellent, with internal consistencies at .93 and .91, (for sets A and B respectively) and good convergent and discriminant validity (Raven et al., 1998).

The MHV scale was adapted in Greek (Spanoudis & Pahiti, 2012) following the same procedure used for the AIHQ (Brislin, 1970). For the purposes of the current study, the test was group administered. Completion time ranged from 20-40 minutes. The sum of correct scores produced a single raw score and since there are no comparative norms for the Greek-Cypriot sample used in the current study, raw scores were used in all analyses. The MHV (88 items; $\alpha = .91$), as well as Parts A (44 items; $\alpha = .79$) and B (44 items; $\alpha = .88$) separately, were found to be highly reliable with the current sample. Examples of the translated version of the MHV scale appear in Appendix B.

Emotional intelligence.

Trait emotional intelligence questionnaire - adolescent short form (TEIQue - ASF). In order to measure the emotional intelligence of the participants, the Trait Emotional Intelligence Questionnaire-Adolescent Short Form (TEIQue-ASF; Petrides, Sangareau, Furnham, & Frederickson, 2006) was used. The scale is a simplified version in terms of wording and syntactic complexity, of the adult short form of the TEIQue. It includes 30 short statements followed by a seven-point Likert scale (e.g. I often find it hard to understand other people). Half of the items are scored in reverse (items: 2, 4, 5, 7, 8, 10, 12, 13, 14, 16, 18, 22, 25, 26, 28) and then all responses are summed up to yield a global Trait EI score. All 30 items of TEIQue - ASF are sampled from the 15 subscales of the adult trait EI sampling domain (two items per subscale): adaptability, assertiveness, emotion perception, emotion expression, emotion management (others), emotion regulation, impulsiveness, relationship skills, self-esteem, self-motivation, social awareness, stress management, trait empathy, trait happiness and trait optimism. Higher scores on the TEIQue - ASF indicate higher levels of trait EI. Evidence of the TEIQue - ASF criterion and incremental validity comes from its administration in British, New Zealand and Spanish populations (Petrides & Furnham, 2001; Petrides & Furnham, 2003; Petrides, Perez-Gonzalez & Furnham, 2007a). TEIQue has been translated into Greek, with internal consistency of global trait Emotional Intelligence reportedly being 0.89 (Petrides, et al., 2007b).

In the current study, the Greek Adolescent Short Form of the TEIQue was used and was group administered. Completion time was approximately 10 minutes. Subsequently, the data were scored and analyzed in collaboration with the London Psychometric Laboratory at University College London. The TEIQue - ASF was found to be highly reliable with the current sample (30 items; $\alpha = .84$). Furthermore, the results were also grouped into four subscales. The Well Being subscale consisted of 6 items ($\alpha = .82$), the Self Control subscale consisted of 6 items ($\alpha = .32$), the Emotionality subscale consisted of 8 items ($\alpha = .65$) and the Sociability subscale consisted of 6 items ($\alpha = .31$). Due to the low reliability indices of most of the subscales, only the Total Score for the whole scale was used in further analyses. The Greek version of the TEIQue – ASF appears in Appendix B.

Texts. The experimental texts consisted of short narratives describing everyday ambiguous, possibly anger-provoking situations. All texts were seven sentences long. The

average length of each text was 98.15 words, while the average difficulty was 14 words per sentence. The narratives were loosely based on the vignettes used in Tremblay and Belchevski (2004). All texts began with the title, which was the protagonist's name. The first sentence of the text was the introduction of a main character. The second sentence in each text provided a description of the main character, showing him or her to be either a mild or an aggressive person. Immediately following this, there was a shift in topic back to the story line in the introduction; the main character was mentioned throughout the remainder of the passage, but there was no reference to the elaborated characteristic until the last (seventh) sentence was encountered. In the last sentence, the main character was described as engaging in either a neutral or a hostile action, which was either consistent or inconsistent to the earlier character description. The consistent text versions described mild characters reacting mildly and hostile characters reacting with hostility. The inconsistent text versions described mild characters reacting aggressively and aggressive characters reacting mildly. Thus, four types of experimental texts were formed i.e., mild-mild, hostile-hostile, mild-hostile, hostile-mild (see Table 1.). The main character description always appeared as the second sentence in the passage, while the main character's reaction always appeared as the last sentence. In addition, a set of filler texts was developed. Filler texts were identical to the experimental texts in length and format and comparable in terms of content. However, the social situations described in filler texts permitted no hostility- or aggression- related inferences. Overall, there were 5 filler texts and 3 texts in each experimental text version, a total of 17 texts. Out of the five Filler texts, two were used as practice texts and were excluded from further analyses. In order to maximize engagement during reading, for the male participants all texts contained male protagonists and similarly, for the female participants all protagonists were female. In order to counterbalance the order of text presentation, two sets with the texts appearing in a different order were created. Sample texts appear in Appendix C.

Each text was presented to participants on a laptop computer screen, sentence by sentence, using the Open Sesame software (Mathôt, Schreij & Theeuwes, 2012). Open Sesame is a freely available, open source software package written in Python for cognitive science experiments that runs on Windows, Mac OS X and Linux. Apart from the computer, no further equipment was required. The time taken for each participant to read each sentence was recorded in milliseconds and converted into an average msec/syllable in

order to control for word and sentence length (Albrecht & O'Brien, 1993). Of particular interest were the general reading times for the experimental texts (Mild and Hostile), as well as the reading times for the two target sentences which specifically described character attributes and their subsequent reactions. Reading times of Filler texts provided a control for each participant's text processing speed. A sentence verification task followed the reading of each text.

Sentence verification task. In order to ensure that participants read each text carefully and to control for any reading comprehension differences, a sentence verification task appeared at the end of each text. For each text, a list of literal and inferential statements was constructed. Literal statements represented single idea units extracted verbatim from the text (McNamara, 2012), while inferential statements represented connections and elaborations left implicit in the text (Diakidoy, Stylianou, Karefillidou & Papageorgiou, 2005). However, none of the statements were based on the main character descriptions and their subsequent reactions. Two independent raters evaluated each statement in each list as either literal or inferential and only items on which there was a 100% agreement were included. Specifically, each text was followed by three items, two literal and one inferential statement, each followed by a Yes/No option. Across all seventeen texts with a male protagonist, there was a total of 51 statements, 27 receiving an answer of 'Yes' and 24 receiving a 'No' answer. For the texts with the female protagonist there was a total of 51 statements, with 25 items receiving a 'Yes' response and 26 items receiving a 'No' response. Each correct response received a score of 1 and each incorrect response a score of 0, for both literal and inferential statements. The scores received on each statement following each text type were summed, yielding 15 scores, one for each text type (Filler text, Mild-Mild text, Hostile-Hostile text, Mild-Hostile text, Hostile-Mild text). The sentence verification task was found to be highly reliable with the current sample (15 items; Cronbach's $\alpha = .83$).

Procedure

All testing administration and experimental procedures were conducted by the author, who is also a licensed school psychologist, trained in test administration and experimental procedures. Testing took place in two sessions, of which the first involved the group administration of tests and the second involved text reading on an individual basis.

During the first session, participants completed all the paper and pencil measures. Specifically, they were tested using the Raven's Progressive Matrices and the Mill-Hill Vocabulary Scale. Furthermore, participants were asked to complete the Achenbach System of Empirically Based Assessment - YSR, the Trait Emotional Intelligence Questionnaire-Adolescent Short Form, the Reactive- Proactive Aggression Questionnaire and the Ambiguous Intentions Hostility Questionnaire. The first session lasted approximately two hours. The materials were presented in a counterbalanced order, with half of the participants completing the ability measures first, and the other half of the participants completing the aggression and emotional intelligence measures first.

Specific and detailed instructions were given for each measure. For the Raven's Progressive Matrices test, participants were instructed to identify the missing element that completes a pattern of shapes for each test item. For the first part of the Mill-Hill Vocabulary Scale, participants were asked to describe the meaning of each word. In the second part, they were asked to choose out of six words, the one who has the closest meaning to the word printed on bold letters. In the Achenbach System of Empirically Based Assessment – YSR, instructions were as follows: "Below is a list of items that describes kids. For each item that describes you now or within the past six months, please circle the '2' if the item is very true or often true for you. Circle the '1' if the item is somewhat or sometimes true of you. If the item is not true of you circle the '0'." Likewise, in the Trait Emotional Intelligence Questionnaire-Adolescent Short Form, participants were instructed to put a circle around the number that best shows how much they agreed or disagreed with each statement. If they strongly disagreed with a statement, they were instructed to circle a number close to '1' whereas if they strongly agreed with a statement, they were instructed to circle a number close to '7'. If they were not too sure if they agreed or disagreed, they were instructed to circle a number close to '4'. Similarly, in the Reactive- Proactive Aggression Questionnaire participants had to circle the '0' if the statement did not describe them, the '1' if the item was somewhat or sometimes true of them and to circle the '2' if the item was very true or often true for them. Lastly, in the AIHQ, participants were instructed to read each situation listed and imagine the situation happening to them. Subsequently, for each situation they were asked to write down a brief reason for it, rate whether they think the person acted that way towards them on purpose,

rate how angry it would make them feel, how much they would blame the other person and write down what they would do about that situation.

The second session took place around two weeks after the first session and was conducted on an individual basis. Its duration was approximately one hour. Participants read a total of 17 short narratives, 12 experimental texts and 5 filler texts, presented in a fixed random order. Two of the filler texts always appeared first and served as practice texts in interchangeable order. These two practice texts were subsequently dropped from further analyses. Before reading the texts, the instructions were explained and participants were informed that they would have to verify three sentences at the end of each text. The texts appeared on a laptop computer screen, sentence by sentence, using the Open Sesame software (Mathôt et. al., 2012). First, the instructions for the texts appeared on screen, followed by the texts. At the beginning of each text, the title appeared on the screen, i.e. name of the main character, signaling the commencement of a new text. Participants were instructed to press the SPACE key to move through the sentences. At the end of each text, the words “*end of text*” appeared to signal the ending of the text, as well as the sentence “*comprehension questions will follow*”. Then a statement pertaining to the text appeared on the screen and participants had to press the corresponding Yes/No option, depending on whether they agreed with the statement or not. Subsequently, they had to press the SPACE key to move to the next statement. Overall, three sentences appeared after each text.

Chapter 5: Results

Preliminary Analyses

Aggression measures. Preliminary analyses indicated that all measures related to aggression (Reactive Aggression, Mean Composite Blame, Mean Composite Accidental, Mean Composite Ambiguous, Mean Composite Ambiguous-Accidental score, TEI and YSR Aggressive Behavior scale) were normally distributed (skewness < 1), apart from Proactive aggression which was non-normally distributed with a skewness of 1.62 (SE = .23) and kurtosis of 2.1 (SE = .23). Therefore, Proactive Aggression was transformed using a square-root transformation, yielding a normally distributed variable (skewness < 1).

Descriptive statistics and correlations between the aggression related measures appear in Table 2 (Appendix D). As expected, Reactive Aggression was significantly

correlated to Proactive Aggression ($p < .01$) as well as to all the AIHQ measures: Composite Blame Mean ($p < .05$), Composite Ambiguous Mean ($p < .01$) and Composite Ambiguous Accidental Mean ($p < .05$). Reactive Aggression was also negatively correlated to Trait Emotional Intelligence ($p < .05$). Likewise, Proactive Aggression was also significantly correlated to AIHQ mean scores ($p < .01$) and negatively correlated to Trait Emotional Intelligence ($p < .05$). As expected, Trait Emotional Intelligence was also negatively correlated to Composite Blame Mean ($p < .05$), to the Composite Ambiguous Mean ($p < .01$) and to the Composite Ambiguous-Accidental Mean scores of the AIHQ ($p < .05$). Due to the high intercorrelation between AIHQ scores and the fact that the current study focused on participants' interpretation of ambiguous and accidental situations, only the Composite Ambiguous-Accidental Mean (AIHQ) was used in further analyses. In addition, the Aggressive Behavior scale of the YSR, which was mainly used to validate the use of the aggression measures, did not significantly correlate with Mean Composite Blame, Mean Composite Accidental and Mean Composite Ambiguous scores.

Ability measures. Preliminary analyses indicated that the Mill Hill and Raven PM scores were normally distributed (skewness < 1) and positively correlated with each other ($r = .50$, $p < .01$). Considering the relationship between these two ability measures and the nature of the materials and the task in this study, only the Mill Hill Score was selected to be included as a covariate in main data analyses.

The sentence verification tasks following the reading of each text served to ensure and provide an index of the text's comprehension. Scores on the sentence verification task were summed within each text type (Filler text, Mild-Mild text, Hostile-Hostile text, Mild-Hostile text, Hostile-Mild text) and converted into a proportion of correct responses for each text type and across all text types. A Total Proportion score was also calculated. Overall, in the sentence verification task, participants showed a very high proportion of correct answers across all text types, and specifically for Filler texts ($M = .87$, $SD = .11$), for Mild-Mild texts ($M = .85$, $SD = .17$), for Hostile-Hostile texts ($M = .88$, $SD = .14$), for Mild-Hostile texts ($M = .87$, $SD = .14$), and for Hostile-Mild texts ($M = .86$, $SD = .16$). Furthermore, analyses indicated that due to participants' high performance, these proportion variables were all negatively skewed (skewness > -1). Due to the aforementioned negative skewness resulting from the very high proportion of correct responses, the sentence verification variables were excluded from all further analyses.

Reading times. In order to control for word and sentence length, the reading times of participants for each text were converted into mean reading times per syllable. Specifically, the time taken to read each sentence (in milliseconds) was summed up for the seven sentences and divided by the number of syllables in each text. These reading times were then summed up for each text type and divided by the number of texts in each type. This procedure, yielded separate reading time measures for each text: Filler Text Reading Times, Consistent Mild Text Reading Times, Consistent Hostile Text Reading Times, Inconsistent Mild-Hostile Text Reading Times and Inconsistent Hostile-Mild Text Reading Times. Extreme values were identified and replaced with two standard deviations above/below the mean. This procedure resulted in normally distributed text reading times (skewness < 1). Reading times' means and standard deviations for each text type can be seen in Table 3 (Appendix D). Furthermore, there was high intercorrelation between all the text reading times ($p < .01$). Specifically, reading times for Filler texts significantly correlated with reading times for: Consistent Mild texts, $r(114) = .88, p < .01$, Consistent Hostile texts, $r(114) = .86, p < .01$, Inconsistent Mild-Hostile texts, $r(114) = .82, p < .01$ and Inconsistent Hostile-Mild Texts $r(114) = .82, p < .01$. The Consistent Mild text reading times significantly correlated with the Consistent Hostile text reading times, $r(114) = .84, p < .01$, the Inconsistent Mild-Hostile reading times, $r(114) = .73, p < .01$ and the Inconsistent Hostile-Mild reading times, $r(114) = .80, p < .01$. Similarly, the Consistent Hostile text reading times significantly correlated with the Inconsistent Mild-Hostile reading times, $r(114) = .83, p < .01$ and the Inconsistent Hostile-Mild reading times, $r(114) = .85, p < .01$, while the Inconsistent Mild-Hostile reading times significantly correlated with the Inconsistent Hostile-Mild reading times $r(114) = .80, p < .01$.

In addition, the reading times for the two critical sentences of the experimental texts were also converted into mean reading times per syllable and summed up according to text type. Specifically, reading times for each target sentence type were summed up according to text type and divided by the number of syllables in the sentences, yielding a mean reading time for each sentence type. This resulted in eight sentence variables, two critical sentences per text type, i.e. Reading Times for Sentences 2 & 7 of Consistent Mild Texts, Reading Times for Sentences 2 & 7 of Consistent Hostile Texts, Reading Times for Sentences 2 & 7 of Inconsistent Mild-Hostile Texts and Reading Times for Sentences 2 & 7 of Inconsistent Hostile-Mild Texts. Extreme values were identified and replaced with two standard

deviations above/below the mean resulting in normally distributed reading times (skewness < 1). Moreover, reading times for sentences were all positively and significantly intercorrelated ($p < .01$).

The correlations between reading time measures, aggression measures and ability related measures can be seen in Table 3 (Appendix D). Interestingly, the reading times for the Consistent Mild Texts, the Consistent Hostile texts and the Inconsistent Mild/Hostile Texts were all negatively correlated with Proactive Aggression ($p < .05$). In addition, Mill Hill scores were negatively correlated with the reading times for Filler Texts ($p < .05$), for Consistent Hostile texts ($p < .01$) and for Inconsistent Hostile/Mild Texts ($p < .05$).

Gender effects. A one-way between subjects ANOVA was conducted in order to explore possible gender differences on reading times for each text. Levene's test indicated equal variances across text types. The ANOVA revealed no significant effects of Gender on reading times for any of the text types ($p > .05$). Similarly, a one-way between subjects ANOVA was conducted with Gender as an independent variable and reading times for sentences as the dependent variable. Levene's test indicated equal variances, apart from the case of Sentence 2 in the inconsistent Mild-Hostile texts. Since the assumption of homogeneity of variance was violated in that case, the Brown-Forsythe F -ratio is reported. The ANOVA showed a significant effect of Gender on reading times for Sentence 7 (hostile character reaction) of the consistent Hostile texts, $F(1, 114) = 6.78, p = .010$, for Sentence 2 (mild character description) of the inconsistent Mild-Hostile texts, $F(1, 93.82) = 9.37, p = .003$, and for Sentence 7 (hostile character reaction) of the inconsistent Mild-Hostile texts, $F(1, 114) = 5.23, p = .024$. In all cases, male participants exhibited faster reading times than female participants.

Main Analyses

The aim of the main analyses was to answer the following three main research questions: 1) Are aggressive participants hypervigilant to cues of hostility or is attention directed towards schema-inconsistent information which is novel and unexpected ('schema inconsistency hypothesis'), 2) Is aggression and HAB mostly related to deviations in social information processing (bottom-up processing), or is it related to the activation of hostility schemata in long-term memory (top-down processing)?, and, 3) Is there a relationship between hostile attribution bias, aggressive behavior and Trait EI? For main analyses

purposes, a repeated-measures design was used. Text Type (Filler, Consistent Mild, Consistent Hostile, Inconsistent Mild-Hostile, Inconsistent Hostile-Mild) and Sentence Type (character descriptions and reactions) were used as independent variables in different combinations, depending on the question at hand. Reading Times for texts and sentences were used as the dependent variable. Reactive Aggression, Proactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill-Hill scores and Trait EI scores were used as covariates, unless otherwise specified.

Hypervigilance vs schema inconsistency. The first research question of the current study related to whether participants with higher levels of aggression exhibit hypervigilance to cues of hostility or whether their attention is mainly directed towards schema-inconsistent information which is novel and unexpected ('schema inconsistency hypothesis'). This was partly explored by comparing the reading times for texts and sentences with a mild and hostile content, as a function of aggression. It was expected that if participants higher in aggression are hypervigilant towards aggressive cues, they would exhibit longer reading times for texts and sentences with a hostile content compared to texts and sentences with a mild content, but also in relation to participants with lower levels of aggression. Alternatively, if attention is allocated to schema-inconsistent cues, it was hypothesized that participants with higher levels of aggression would read hostile texts and sentences faster compared to mild content and to participants with lower aggression levels.

Text-level effects. Initially, in order to establish that any differences obtained in reading times of the experimental texts were due to key differences in text content and not due to unrelated text variables, such as text structure, a repeated-measures ANCOVA was performed with Text Type (Filler vs Consistent vs Inconsistent) as a within-subject factor and Reactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill Hill and TEI as the covariates. The results indicated that there were no significant multivariate effects of Text Type, Wilks' $\lambda = .986$, $F(2, 222) = .817$, $p = .443$, $\eta_p^2 = .007$, or significant interactions ($p > .05$). The ANCOVA was repeated with Proactive Aggression as a covariate instead of Reactive Aggression, again indicating no multivariate effect of Text Type, Wilks' $\lambda = .979$, $F(2, 222) = 1.214$, $p = .299$, $\eta_p^2 = .021$, or significant interactions ($p > .05$). A series of follow up paired t-tests indicated that there were no significant differences between the reading times of Filler texts ($M = 151.36$, $SD = 54.19$) and

Consistent texts ($M = 152.99$, $SD = 52.41$); $t(115) = .72$, $p = .47$, nor between the reading times for Filler texts and Inconsistent texts ($M = 154.2$, $SD = 48.2$); $t(115) = 1.12$, $p = .26$. The above results illustrate that any further obtained significant differences in reading times could be attributed to text content and not to confounding text variables.

Furthermore, it was of interest to explore whether reading times differed within the greater categories of consistent and inconsistent texts, as a function of aggression, verbal ability and emotional intelligence. A repeated-measures ANCOVA was conducted, with Text Type (Consistent vs Inconsistent) as a within-subject factor and Reactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill Hill and TEI as covariates. The results revealed that none of the factors had a significant multivariate effect and there was no significant interaction between Text and Reactive Aggression ($p > .05$). However, there were significant covariate effects of Reactive Aggression, $F(1, 111) = 4.97$, $p = .028$, $\eta_p^2 = .043$, and Mill Hill, $F(1, 111) = 7.04$, $p = .009$, $\eta_p^2 = .060$. When the analysis was repeated with Proactive Aggression as a covariate, once more there were no significant multivariate effects, or interactions, ($p > .05$), but similarly there were significant covariate effects of Proactive Aggression, $F(1, 111) = 7.43$, $p = .007$, $\eta_p^2 = .063$ and Mill Hill, $F(1, 111) = 8.26$, $p = .005$, $\eta_p^2 = .069$.

To further explore any effects of aggression for the Consistent and Inconsistent text categories, participants were divided based on their performance on Reactive Aggression using a median split, yielding two groups indicating lower ($n = 58$) and higher ($n = 58$) scores. Likewise, participants were divided based on their performance on Proactive Aggression, using a median split, resulting in two lower ($n = 55$) and higher ($n = 61$) Proactive Aggression groups. As it can be seen from Table 4 (Appendix D), participants with higher levels of Reactive and Proactive Aggression tended to read both Consistent and Inconsistent text types at a faster pace than participants with lower levels of aggression. However, an independent samples t-test with Reactive aggression as the independent variable and reading times for Consistent and Inconsistent texts as the dependent variables, revealed that this difference was not significant, for either the Consistent, $t(114) = 1.30$, $p = .196$, or the Inconsistent texts, $t(114) = 1.48$, $p = .143$. Likewise, in the case of Proactive Aggression, an independent samples t-test also revealed that the differences in reading times between participants with lower and higher levels of

aggression did not reach significance for either the Consistent, $t(114) = 1.68, p = .096$, or the Inconsistent texts, $t(114) = 1.85, p = .066$.

While the above analysis did not reveal any significant effects of aggression on reading times, this could be due to the fact that the categories of Consistent and Inconsistent texts include a combination of texts with both a mild and hostile content. Since the question of attention allocation relied on differences in reading times for mild and hostile content in particular, a repeated-measures ANCOVA was conducted, with Text Type (Consistent Mild vs Consistent Hostile) as a within-subject factor and Reactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill Hill and TEI as covariates. The study's hypothesis was that there would be significant differences in reading times depending on mild or hostile content, as well as a function of aggression. However, contrary to the aforementioned predictions, there was no multivariate effect of Text, Wilks' $\lambda = .983, F(1, 111) = 1.87, p = .174, \eta_p^2 = .017$, but the analysis yielded a significant Mill Hill x Text Type interaction, Wilks' $\lambda = .962, F(1, 111) = 4.42, p = .038, \eta_p^2 = .038$. Moreover, there were significant covariate effects of Reactive Aggression, $F(1, 111) = 4.98, p = .028, \eta_p^2 = .002$, and Mill Hill, $F(1, 111) = 7.2, p = .008, \eta_p^2 = .038$. The analysis was repeated with Proactive Aggression instead of Reactive Aggression as a covariate, again indicating no significant multivariate effect of Text Type, Wilks' $\lambda = .983, F(1, 111) = 1.93, p = .167, \eta_p^2 = .017$. Once more, there was a significant Mill Hill x Text Type interaction, Wilks' $\lambda = .960, F(1, 111) = 4.65, p = .033, \eta_p^2 = .040$, as well as significant covariate effects of Proactive Aggression, $F(1, 111) = 7.6, p = .007, \eta_p^2 = .064$ and Mill Hill, $F(1, 111) = 8.47, p = .004, \eta_p^2 = .071$.

In order to further explore the effects of aggression on reading times, participants were divided based on their Reactive Aggression scores using a median split. A follow-up independent samples t-test was conducted with Reactive Aggression level as the independent variable and reading times for Mild and Hostile texts as the dependent variables. The results revealed no significant differences between the reading times of the lower and higher Reactive Aggression groups, for either the consistent Mild, $t(114) = 1.08, p = .282$, or for the consistent Hostile text, $t(114) = 1.41, p = .161$. Similarly, participants were divided based on their performance on Proactive Aggression using a median split, and an independent samples t-test was conducted with Proactive Aggression as the independent variable and reading times for Mild and Hostile texts as the dependent

variables. Again, there were no significant differences between the reading times of the lower and higher Proactive Aggression groups, for either the consistent Mild, $t(114) = 1.61, p = .109$, or for the consistent Hostile text, $t(114) = 1.68, p = .095$. The above results indicate that, as predicted, that Reactive and Proactive aggression influenced reading times. Nevertheless, this influence was irrespective of the texts' mild or hostile content. As it can be seen from Table 5 (Appendix D), participants with higher levels of Reactive and Proactive Aggression tended to read both Mild and Hostile texts at a faster pace compared to participants with lower aggression levels.

In addition, to further investigate the aforementioned interaction between Text Type and Mill Hill, participants were divided based on their performance on the Mill Hill using a median split. This yielded two groups indicating lower ($n = 59$) and higher ($n = 57$) Mill Hill performance. An independent samples t-test was conducted with Mill Hill as the independent variable and reading times for Mild and Hostile texts as the dependent variables. The results revealed that for the Consistent Mild Texts, there were no significant differences between participants with lower and higher Mill Hill scores, $t(114) = 1.07, p = .288$. There were however significant differences in reading times between participants with lower and higher Mill Hill scores for the Consistent Hostile texts, $t(114) = 2.25, p = .026, d = 0.42$. As it can be seen from Table 6 (Appendix D), participants who scored lower on the Mill Hill generally spent more time reading both types of texts than participants with higher Mill Hill scores. Also, participants with higher Mill Hill scores spent significantly less time reading the Consistent Hostile Text than participants with lower Mill Hill scores. The Consistent Hostile text was read the fastest by participants with higher Mill Hill scores.

Since the distinction between attention being directed mainly towards hostile or mild information could become apparent not just during reading of the consistent texts, but also during the reading of texts that contain inconsistencies, possible differences in reading times, as a function of aggression and other variables, were examined across all text types. A repeated-measures ANCOVA was conducted, with Text Type (Consistent Mild vs Consistent Hostile vs Inconsistent Mild-Hostile vs Inconsistent Hostile-Mild) as a within-subject factor and Reactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill Hill and TEI as covariates. The study's main prediction was that aggression would differentially influence reading times according to the texts' mild or hostile content and

presence of inconsistency. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(5) = 11.80, p = .038$, so degrees of freedom were adjusted using the Huynh-Feldt estimates of sphericity ($\epsilon = .93$). Contrary to the study's hypotheses, the results showed no significant main effect of reading times of different Text Types, Wilks' $\lambda = .945, F(2.97, 329.86) = 1.78, p = .15, \eta^2 = .016$, or any interactions between Text and other covariates ($p > .05$). However, again there were significant covariate effects of Reactive Aggression, $F(1, 111) = 5.25, p = .024, \eta^2 = .045$, and Mill Hill, $F(1, 111) = 7.02, p = .009, \eta^2 = .060$. The analysis was repeated with Proactive Aggression used as a covariate instead of Reactive Aggression, yielding similar results. Again, Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(5) = 11.86, p = .037$, so degrees of freedom were adjusted using the Huynh-Feldt estimates of sphericity ($\epsilon = .99$). Similarly, there was no multivariate effect of Text, Wilks' $\lambda = .948, F(2.97, 329.71) = 1.67, p = .174, \eta^2 = .015$, or interactions between Text and other covariates ($p > .05$), while once more there were significant covariate effects of Proactive Aggression, $F(1, 111) = 8.21, p = .005, \eta^2 = .069$, and Mill Hill, $F(1, 111) = 8.36, p = .005, \eta^2 = .070$. As it has already been demonstrated in previous analyses, participants with higher levels of Reactive and Proactive aggression, as well as with higher Mill Hill scores, exhibited faster reading times across all text types, irrespective of content or text-based inconsistencies.

Lastly, in order to examine any differences in reading times just within the category of inconsistent Texts in relation to aggression, a repeated-measures ANCOVA was conducted with Text Type (Inconsistent Mild-Hostile vs Inconsistent Hostile-Mild) as a within-subject factor and Reactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill Hill and TEI as covariates. The multivariate effect of Text Type nearly approached statistical significance, Wilks' $\lambda = .967, F(1, 111) = 3.74, p = .056, \eta^2 = .033$, while there were no significant interactions ($p > .05$). As previously demonstrated, the analysis revealed significant covariate effects of Reactive Aggression, $F(1, 111) = 4.89, p = .029, \eta^2 = .042$, and Mill Hill, $F(1, 111) = 5.97, p = .016, \eta^2 = .051$. The ANCOVA was repeated with Proactive Aggression as a covariate instead of Reactive Aggression. Again the effect of Text nearly approached significance, Wilks' $\lambda = .971, F(1, 111) = 3.34, p = .070, \eta^2 = .029$, and there were no significant interactions ($p > .05$). Similarly, there were significant covariate effects for Proactive Aggression, $F(1, 111) = 7.80, p = .006, \eta^2 = .066$, and Mill Hill, $F(1, 111) = 7.18, p = .008, \eta^2 = .061$.

Participants were divided through a median-split based on their Reactive and Proactive Aggression scores. As it can be seen from Table 7 (Appendix D), participants with higher levels of Reactive Aggression generally exhibited faster reading times compared to participants with lower levels of Reactive Aggression. Nevertheless, contrary to expectations, an independent samples t-test with Reactive aggression as the independent variable and reading times for inconsistent Mild-Hostile and Hostile-Mild texts as the dependent variables, revealed that this difference was not significant, for either the Mild-Hostile, $t(114) = 1.77, p = .079$, or the Hostile-Mild texts, $t(114) = 7.21, p = .202$. Likewise, participants with higher levels of Proactive aggression also displayed a tendency for faster reading times compared to participants with lower levels of Proactive aggression. An independent samples t-test revealed that, while this difference was significant in the case of the Mild-Hostile texts, $t(114) = 2.65, p = .009, d = 0.49$, it was not significant for the Hostile-Mild texts, $t(114) = 1.20, p = .232$.

Sentence-level effects. The issue of attention allocation was also based on potential differences in reading times for the two target sentences embedded in the texts. The first target sentence, i.e. Sentence 2 in each text described the protagonist as either benevolent or hostile, whereas the second target sentence i.e. Sentence 7, described the protagonists' reaction to an event as either mild or aggressive. The study's hypothesis was that in the inconsistent Mild-Hostile texts, lower aggression readers would detect the text inconsistency and display longer reading times for the second inconsistent target sentence (Sentence 7) compared to the first target sentence (Sentence 2). Similar results for readers higher in aggression were expected in the case of hypervigilance and due to a text-inconsistency effect. On the contrary, if participants higher in aggression assigned their attention to schema-inconsistent cues, it was hypothesized that a reverse pattern of reading times would appear, or that at least the effects of a text-based contradiction would be leveled out. In the inconsistent Hostile-Mild texts, it was expected that the low-aggression group would yet again read the second inconsistent target sentence (Sentence 7-mild character reaction) slower than the first sentence (Sentence 2-hostile character description) due to the text inconsistency. However, for participants higher in aggression, hypotheses varied depending on attention allocation. If higher-aggression participants are hypervigilant to hostile cues, then they were expected to read the first target sentence of the Hostile-Mild texts (hostile character description) at a slower pace compared to the second

target sentence (mild reaction), but also slower compared to readers with lower levels of aggression. On the contrary, if aggressive readers allocate more attention on schema inconsistent cues, it was hypothesized that they would read the first, hostile target sentence faster than the second, mild sentence, but also faster than the lower-aggression group.

The effects of aggression and of other covariates on Sentence Level reading times were examined across all text types. Since TEI had no significant effects on previous text-level analyses, it was excluded from subsequent Sentence-level analyses. A two-way repeated- measures ANCOVA was conducted with Text (Mild Text vs Hostile Text vs Mild-Hostile Text vs. Hostile-Mild Text) and Sentence (Sentence 2 vs Sentence 7) as the within-subject variables and Reactive Aggression, Mill Hill and Composite Ambiguous/Accidental Mean (AIHQ) as covariates. Mauchly's test was significant for the main effect of Text, $\chi^2(5) = 13.40, p = .020$, so degrees of freedom were adjusted using the Huynh-Feldt estimates of sphericity ($\epsilon = .98$). Results indicated no multivariate effect of Text, Wilks' $\lambda = .947, F(3, 327.93) = 1.66, p = .176, \eta_p^2 = .015$, but a significant multivariate effect of Sentence Level, Wilks' $\lambda = .927, F(1, 112) = 8.84, p = .004, \eta_p^2 = .073$. Furthermore, there was a significant Text x Sentence interaction, Wilks' $\lambda = .919, F(3, 334.57) = 3.18, p = .025, \eta_p^2 = .028$, and a significant Text x Sentence x Composite Ambiguous/Accidental Mean (AIHQ) interaction, Wilks' $\lambda = .929, F(3, 333) = 2.80, p = .040, \eta_p^2 = .024$. Pairwise comparisons using the Bonferroni correction indicated that there was a significant difference between the mean reading times for Sentences 2 and Sentences 7 ($p < .001$) and revealed that, as previously stated, Sentence 7 (character reaction) was generally read faster than Sentence 2 (character description). In addition, irrespective of aggression and HAB influences, there were significant differences in the reading times of target sentences in the consistent Mild and Hostile texts, with the first target sentence (protagonist description) being read faster in the Mild texts than in the Hostile texts. The reading times of target sentences also differed between the Mild and Hostile texts, as a function of Composite Ambiguous/Accidental Mean (AIHQ). Furthermore, the analysis revealed significant covariate effects of Reactive Aggression, $F(1, 112) = 6.00, p = .051, \eta_p^2 = .061$, and Mill Hill, $F(1, 112) = 4.28, p = .041, \eta_p^2 = .037$. The above analysis was repeated with Proactive Aggression used as a covariate instead of Reactive Aggression, generating similar results.

The aforementioned Text x Sentence x Composite Ambiguous/Accidental Mean (AIHQ) interaction was further explored by using a median split to divide participants into lower ($n = 59$) and higher ($n = 57$) AIHQ groups. A repeated measures ANCOVA was conducted again with Text (Mild Text vs Hostile Text vs Mild-Hostile Text vs. Hostile-Mild Text) and Sentence (Sentence 2 vs Sentence 7) as the within-subject variables, level of Composite Ambiguous/Accidental Mean (AIHQ) as the between-subject variable and Reactive Aggression and Mill Hill as covariates. Since Mauchly's test was significant for the main effect of Text, $\chi^2(5) = 13.41, p = .020$, degrees of freedom were adjusted using the Huynh-Feldt estimates of sphericity ($\epsilon = .98$). Results indicated significant multivariate effects of Text, Wilks' $\lambda = .901, F(2.93, 333.59) = 3.90, p = .010, \eta_p^2 = .034$, and of Sentence Level, Wilks' $\lambda = .897, F(1, 112) = 12.90, p < .001, \eta_p^2 = .103$, as well as a significant Text x Sentence x Composite Ambiguous/Accidental Mean (AIHQ) interaction, Wilks' $\lambda = .893, F(2.98, 333.59) = 4.29, p = .006, \eta_p^2 = .037$. The covariate effects for Reactive Aggression, $F(1, 112) = 6.03, p = .016, \eta_p^2 = .051$ and Mill Hill, $F(1, 112) = 4.36, p = .039, \eta_p^2 = .037$, were also significant. Within-subject contrasts revealed significant differences between the reading times for the inconsistent Mild-Hostile and the inconsistent Hostile-Mild texts, $F(1, 112) = 8.56, p = .004, \eta_p^2 = .071$, with the inconsistent Mild-Hostile texts being read significantly faster than the inconsistent Hostile-Mild texts. Surprisingly, participants with higher HAB levels, as measured through the Composite Ambiguous/Accidental Mean (AIHQ), exhibited a slower reading pace for the inconsistent Hostile-Mild texts than those with lower HAB levels, while they exhibited a faster reading pace for all other text types. In line with results from previous analyses, and as it can be seen from Table 9 (Appendix D), there were significant differences between the reading times of target Sentences 2 and 7, $F(1, 112) = 12.90, p > .001, \eta_p^2 = .103$, with Sentence 2 (hostile character description) being read substantially slower than Sentence 7 (mild character reaction). Similarly, there were significant differences between the reading times for target sentences in the Mild and Hostile texts, $F(1, 112) = 7.30, p = .008, \eta_p^2 = .061$, and in the Mild-Hostile and Hostile-Mild texts, $F(1, 112) = 5.36, p = .022, \eta_p^2 = .046$, with the character reaction (Sentence 7) generally being read faster than the character description (Sentence 2).

Follow-up paired samples t-tests revealed that, within the group of participants with lower AIHQ scores, there were significant differences in reading times for the consistent

Hostile texts and inconsistent Mild-Hostile texts, $t(58) = 2.13, p = .037, d = 0.173$, with the consistent Hostile texts being read at a significantly slower pace than the inconsistent Mild-Hostile text. Moreover, there were significant differences in reading times between the inconsistent Mild-Hostile texts and Hostile-Mild texts, since the Hostile-Mild texts were read at a slower pace than the Mild-Hostile texts; $t(58) = 2.82, p = .007, d = -0.236$.

Within the group of participants with higher AIHQ scores, there were significant differences in reading times between the consistent Mild and inconsistent Hostile-Mild texts, $t(56) = 3.62, p = .001, d = -0.364$, with the Mild texts being read faster than the inconsistent Hostile-Mild texts. As in the group of participants with lower AIHQ scores, the consistent Hostile texts were also read significantly slower than the inconsistent Mild-Hostile texts, $t(56) = 2.53, p = .014, d = 0.188$, while the consistent Hostile texts were read faster than the inconsistent Hostile-Mild texts, $t(56) = 3.48, p = .001, d = -0.264$. Similarly to the group of participants with lower AIHQ scores, the inconsistent Mild-Hostile texts were read significantly faster than the inconsistent Hostile-Mild texts, $t(56) = 5.33, p < .001, d = -0.466$.

Moreover, it can be seen from Table 9 (Appendix D) that, in the case of the Consistent Mild texts, Sentence 7 (mild character reaction) was read faster than Sentence 2 (mild character description) within the group of participants with higher AIHQ scores, $t(56) = 4.49, p < .001, d = 0.60$, than within the group of participants with lower AIHQ scores, $t(58) = 3.29, p = .002, d = 0.32$. Likewise, in the case of the inconsistent Hostile-Mild texts, Sentence 7 (mild character reaction) was read faster than Sentence 2 (hostile character description) within the group of participants with higher AIHQ scores, $t(56) = 3.31, p = .002, d = 0.48$, than in the group of participants with lower AIHQ scores, $t(58) = 2.55, p = .013, d = -0.30$. On the contrary, in the consistent Hostile texts, the differences in reading times between the two target sentences (2 & 7) were more profound in the group of participants with lower AIHQ scores, $t(58) = 6.21, p < .001, d = 0.69$, than for those with higher AIHQ scores, $t(56) = 3.88, p < .001, d = 0.42$. Also, in the inconsistent Mild-Hostile texts, the hostile character reaction (Sentence 7) was read faster compared to the mild hostile description (Sentence 2) within the group of participants with lower AIHQ scores, $t(58) = 7.99, p < .001, d = 1.14$ than in the group of participants with higher AIHQ scores, $t(56) = 6.65, p < .001, d = 0.70$. Therefore, while all participants read mild sentences faster than hostile sentences in the inconsistent Hostile-Mild texts, these differences were larger

in the group with higher AIHQ scores compared to the group with lower AIHQ scores. On the contrary, while hostile sentences were generally read faster in the inconsistent Mild-Hostile texts, differences in reading times were more profound in group with lower AIHQ scores compared to the group with higher AIHQ scores. This may be a sign that participants with lower hostile attribution bias allocate more attention on mild sentences, while participants with higher HAB levels exhibit an attentional bias towards hostile sentences, indicating hypervigilance to hostile cues.

Since the study's hypotheses were also based on the reading times of the critical sentences specifically for the inconsistent texts, a two-way repeated measures ANCOVA was performed with Text (inconsistent Mild-Hostile vs inconsistent Hostile -Mild) and Sentence level (2 vs 7) as the within-subject variables and Reactive Aggression, Mill Hill and Composite Ambiguous/Accidental Mean (AIHQ) as covariates. The results revealed that the multivariate effect of Text nearly approached significance, Wilks' $\lambda = .967$, $F(1, 112) = 3.78$, $p = .055$, $\eta_p^2 = .033$, while there was a significant multivariate effect of Sentence, Wilks' $\lambda = .966$, $F(1, 112) = 3.97$, $p = .049$, $\eta_p^2 = .034$. Furthermore, there was a significant Sentence x Reactive Aggression interaction, Wilks' $\lambda = .960$, $F(1,112) = 4.70$, $p = .032$, $\eta_p^2 = .040$. There were also significant covariate effects of Reactive Aggression, $F(1, 112) = 7.99$, $p = .006$, $\eta_p^2 = .067$, and Mill Hill, $F(1,112) = 4.11$, $p = .045$, $\eta_p^2 = .035$. Similarly, a two-way repeated measures ANCOVA was performed with Text (inconsistent Mild-Hostile vs inconsistent Hostile-Mild) and Sentence level (2 vs 7) as the within-subject variables and Proactive Aggression, Mill Hill and Composite Ambiguous/Accidental Mean (AIHQ) as covariates. The results revealed again that the multivariate effect of Text nearly approached significance, Wilks' $\lambda = .962$, $F(1, 112) = 3.55$, $p = .062$ and there was a significant Sentence x Proactive Aggression interaction, Wilks' $\lambda = .957$, $F(1, 112) = 5.05$, $p = .027$. Additionally, the analysis revealed significant covariate effects of Proactive Aggression, $F(1, 112) = 11.03$, $p = .001$, and Mill Hill, $F(1, 112) = 5.25$, $p = .024$.

In order to further explore the aforementioned Sentence x Reactive Aggression interaction, participants were divided in two groups of lower ($n = 58$) and higher ($n = 58$) Reactive Aggression, using a median split. An independent samples t-test was performed, with Sentence level as the dependent variable and lower and higher levels of Reactive aggression as the independent variable. This yielded significant differences between the

reading times of participants with lower and higher levels of Reactive aggression for Sentence 2 of the Mild-Hostile texts, $t(114) = 2.87, p = .005, d = 0.53$, and for Sentence 2 of the Hostile-Mild texts, $t(114) = 2.02, p = .046, d = 0.38$. In both cases, participants with higher levels of Reactive Aggression exhibited faster reading times compared to participants with lower levels of Reactive Aggression. However, Reactive Aggression did not influence reading times in the predicted manner, since the character description (Sentence 2) was read faster in both texts, regardless of mild or hostile content. Reading times for the two critical sentences across text types as a function of Reactive Aggression appear on Table 10 (Appendix D).

Also, with the intention of examining the Sentence x Proactive Aggression interaction and how Proactive aggression influences the reading pace of participants for each critical sentence across all text types, an independent samples t-test was carried out with Proactive Aggression as the independent variable and reading times for target Sentences 2 and 7 as the dependent variables. The results revealed significant differences between the reading times of participants with lower and higher levels of Proactive Aggression for the character reaction (Sentence 7) of the consistent Hostile texts, $t(114) = 2.18, p = .031, d = 0.41$. For the inconsistent Mild-Hostile texts, the results indicated significant differences between the reading times of participants with lower and higher Proactive Aggression, for both target Sentences 2, $t(114) = 3.77, p < .001, d = 0.70$ and 7, $t(114) = 2.01, p = .046, d = 0.37$. For the inconsistent Hostile-Mild texts the analysis revealed no significant differences between the reading times of higher and lower Proactive Aggression readers, for either the character description (Sentence 2), $t(114) = 1.73, p = .086$, or for the subsequent character reaction (Sentence 7), $t(114) = 1.75, p = .083$. As it can be seen from Table 11 (Appendix D), in all instances, participants with higher levels of Proactive Aggression displayed faster reading times compared to participants with lower levels of Proactive Aggression. Once more, the results are incompatible to the study's hypotheses which predicted differences in reading times depending on mild and hostile content and an influence due to text contradictions.

Regarding the above-mentioned interactions between Reactive Aggression and reading times for sentences of the inconsistent texts, and as it has already been previously indicated, participants with higher levels of Reactive Aggression displayed significantly faster reading times compared to participants with lower levels of Reactive Aggression for

sentences describing the main character (Sentence 2), as either benevolent or hostile, in both the Mild-Hostile texts, and the Hostile-Mild texts. In regards to Proactive aggression, both target sentences (2 & 7) in the Mild-Hostile text were read faster by participants higher in Proactive Aggression compared to participants with lower levels of Proactive Aggression, regardless of whether they referred to a protagonists' description or subsequent reaction. There were no differences in the reading times between lower and higher Proactive Aggression readers for either target sentence in the Hostile-Mild text.

Therefore, pertaining to the issue of attention allocation, and partly in accordance to the study's hypotheses, aggression levels influenced reading times of the target sentences embedded in texts. Generally, from the above-mentioned analyses, it is evident that participants exhibiting higher levels of Aggression (both Reactive and Proactive) largely displayed faster reading times. This result was especially obvious in the significant influence of Proactive Aggression on the inconsistent Mild-Hostile texts. Nevertheless, contrary to expectations, this tendency was generally present regardless of whether the texts and target sentences had a mild or a hostile content.

Moreover, in the case of the target sentences, while sentences pertaining to protagonists' reactions (Sentence 7) were generally read at a faster pace than sentences describing protagonists' attributes (Sentence 2), this effect was accentuated by higher levels of Reactive and Proactive Aggression. Both target Sentences were generally read faster in the Mild-Hostile texts than in the Hostile-Mild texts. However, Reactive Aggression did not influence reading times in the predicted manner, since the character description (Sentence 2) was read faster in both texts, regardless of mild or hostile content. Similarly, in the case of higher Proactive Aggression, both target sentences in the Hostile-Mild texts were read faster by higher aggression participants regardless of mild or hostile content. Interestingly, while participants with higher Composite Ambiguous/Accidental Mean (AIHQ) scores also generally displayed faster reading times, they exhibited a slower reading pace for the Hostile-Mild texts, with the target sentence describing a hostile protagonist being read at a slower pace compared to participants with lower AIHQ scores. More importantly, within-group differences for participants with lower AIHQ group indicated a preference towards mild sentences, while within the group with higher AIHQ scores there was an indication of preference towards hostile sentences, suggestive of hypervigilance towards hostile cues.

Bottom-up vs top-down social information processing. The second research question of the current study concerned the source of aggression and hostile attribution bias. Specifically, the current study aimed in examining whether aggression and HAB are mostly related to deviations in social information processing (bottom-up processing), or mostly related to the activation of hostility schemata in long-term memory (top-down processing). It was hypothesized that this distinction could be manifested as differences in the reading times of mild sentences between readers who are low and high in aggression, as well as differences between baseline reading times and for texts and sentences with a mild content, since mild information may come into contrast with the existence of a hostile schema. Differences in reading patterns of inconsistent texts and contradicting sentences between participants with higher and lower levels of aggression were also examined. It was speculated that, if encoding of aggressive information is mostly based on a cognitive schema (top-down processing), then its influence would be manifested as faster or slower reading times of mild content, regardless of whether sentences referred to a character description or reaction. In the case that encoding involves more bottom-up influences, no differences were expected in the processing times of mild content.

With respect to the above issue, a repeated-measures ANCOVA was conducted with Text Type (Filler vs consistent Mild) as a within-subject factor, and Reactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill Hill and TEI as covariates. Results indicated that the multivariate effect of Text nearly approached significance, Wilks' $\lambda = .969$, $F(1, 111) = 3.54$, $p = .063$, $\eta_p^2 = .031$, while there were no significant interactions ($p > .05$). The covariate effect of Mill Hill, $F(1, 111) = 5.53$, $p = .020$, $\eta_p^2 = .047$, was significant. Furthermore, a follow-up independent samples t-test was conducted with level of Reactive Aggression (higher vs lower) as the independent variable and reading times for Filler and consistent Mild texts as the dependent variables. The results revealed no significant differences between the reading times of the lower, and higher Reactive Aggression groups, for either the Filler texts, $t(114) = .756$, $p = .451$, or the consistent Mild texts, $t(114) = 1.08$, $p = .282$.

A repeated-measures ANCOVA was also conducted with Text Type (Filler vs consistent Mild) as a within-subject factor, and Proactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill Hill and TEI as covariates revealing a significant main effect of Text, Wilks' $\lambda = .960$, $F(1, 111) = 5.59$, $p = .034$, $\eta_p^2 = .040$.

The covariate effects of Proactive Aggression, $F(1, 111) = 5.07, p = .026, \eta_p^2 = .044$, and Mill Hill, $F(1, 111) = 6.46, p = .012, \eta_p^2 = .055$, were also significant. The consistent Mild text was read significantly faster than the Filler text. Evidently, reading times of participants generally differed as a function of Proactive aggression, with participants with higher levels exhibiting faster reading times for both texts compared to participants with lower levels. An independent samples t-test with level of Proactive Aggression (higher vs lower) as the independent variable and reading times for Filler and consistent Mild texts as the dependent variables revealed there were no significant differences between the reading times of the lower and higher Proactive Aggression groups, for either the Filler texts, $t(114) = 1.36, p = .175$, or the consistent Mild texts, $t(114) = 1.61, p = .109$.

Moreover, it was hypothesized that the comparisons between lower and higher aggressive group's reading times for mild sentences within each inconsistent text type could provide an indication as to the source of aggression and hostile bias. Specifically, if information processing mainly involves bottom-up influences, it was expected that participants with lower and higher aggression levels would show similar reading patterns for mild sentences, regardless of their position in the inconsistent texts. If, however, text processing is influenced more by cognitive schemata, then there would be significant differences in reading times between lower and higher aggression readers, since a hostile schema presumably contradicts mild information. As it was previously derived from previous analyses, Reactive and Proactive aggression differentially influenced the reading pace of target sentences depending on their position in the text. However, this influence was irrespective of the sentences' mild or hostile content. For both types of inconsistent texts, i.e. Mild-Hostile and Hostile-Mild texts, participants higher in Reactive Aggression, read character descriptions (target Sentences 2) significantly faster than participants with lower levels of Reactive aggression. On the other hand, the results illustrated that participants higher in Proactive Aggression read both target sentences (character descriptions and reactions) in the Mild-Hostile texts significantly faster than participants with lower Proactive Aggression levels. Since these sentences had a mild and hostile content respectively, the results prove inconclusive and assumptions for either bottom-up or top-down processing were not confirmed.

Nevertheless, the aforementioned results revealed that hostile attribution bias as measured through the AIHQ may have differentially influenced the processing of mild

content as it appeared through target sentences describing the protagonists' characteristics and reactions. Within the group with higher HAB levels compared to the group with lower HAB levels, target sentences with a mild content were read much faster than sentences with a hostile content, revealing an indication of preference towards hostile sentences within the higher HAB group. This finding is indicative of a top-down processing effect and the existence of a hostile cognitive schema incompatible with mild cues. Also, since, and as previously demonstrated, attention was primarily allocated on hostile sentences on the expense of mild sentences, the aforementioned finding is suggestive of hypervigilance, due to schema influence.

Gender Effects

In order to explore possible effects of Gender on text reading times, a repeated measures ANCOVA was conducted with Text Type (consistent Mild vs consistent Hostile vs inconsistent Mild-Hostile vs inconsistent Hostile-Mild) as a within-subject factor, Gender as the between subjects variable and Reactive Aggression, Composite Ambiguous/Accidental Mean (AIHQ), Mill Hill and TEI as covariates. Since Mauchly's test was significant for the main effect of Text, $\chi^2(5) = 12.05$, $p = .034$, degrees of freedom were adjusted using the Huynh-Feldt estimates of sphericity ($\epsilon = .99$). Results indicated that there were no multivariate effects of text type, Wilks' $\lambda = .945$, $F(2.78, 328.94) = 1.70$, $p = .167$ or any significant interactions ($p > .05$). The covariate effect of Mill Hill was significant, $F(1, 110) = 7.84$, $p = .006$, $\eta_p^2 = .067$. The analysis was repeated with Proactive Aggression instead of Reactive Aggression as a covariate. Again, Mauchly's test was significant for the main effect of Text, $\chi^2(5) = 12.12$, $p = .033$, so degrees of freedom were adjusted using the Huynh-Feldt estimates of sphericity ($\epsilon = .99$). Similarly, there was no significant multivariate effect of Text, Wilks' $\lambda = .952$, $F(2.99, 328.85) = 1.49$, $p = .216$ or any significant interactions ($p > .05$). However, there were significant covariate effects of Mill Hill, $F(1, 110) = 8.73$, $p = .004$, $\eta_p^2 = .074$, and Proactive Aggression, $F(1, 110) = 5.72$, $p = .018$, $\eta_p^2 = .049$.

Furthermore, possible effects of Gender on reading times for sentence type were explored. A two-way repeated measures ANCOVA was performed with Text (consistent Mild vs consistent Hostile vs inconsistent Mild-Hostile vs inconsistent Hostile-Mild) and Sentence level (2 vs 7) as the within-subject variables, Gender as the between subjects

variables and Reactive Aggression, Mill Hill, Trait EI and Composite Ambiguous/Accidental Mean (AIHQ) as covariates. Mauchly's test was significant for the main effect of Text, $\chi^2(5) = 13.18, p = .022$, and Sentence, $\chi^2(5) = 12.39, p = .030$, so degrees of freedom were adjusted using the Huynh-Feldt estimates of sphericity ($\epsilon = .99$). There was no significant multivariate effect of Text, Wilks' $\lambda = .955, F(2.97, 327.50) = 1.62, p = .184, \eta_p^2 = .015$, or of Sentence, Wilks' $\lambda = .970, F(1, 110) = 3.32, p = .070, \eta_p^2 = .030$, nor any significant interactions ($p > .05$). However, there were significant covariate effects of Mill Hill, $F(1, 110) = 5.40, p = .022, \eta_p^2 = .047$. When the analysis was repeated with Proactive Aggression instead of Reactive Aggression as a covariate, it indicated that, similarly, Mauchly's test was significant for the main effect of Text, $\chi^2(5) = 13.25, p = .023$, and Sentence, $\chi^2(5) = 12.61, p = .027$, so degrees of freedom were also adjusted using the Huynh-Feldt estimates of sphericity ($\epsilon = .99$). Again there were no significant multivariate effects of Text, Wilks' $\lambda = .963, F(2.98, 328.01) = 1.32, p = .267, \eta_p^2 = .012$, or Sentence, Wilks' $\lambda = .974, F(1, 110) = 2.99, p = .087, \eta_p^2 = .026$, but there was a significant Text x Sentence x Gender interaction, Wilks' $\lambda = .913, F(3, 329.96) = 2.81, p = .040, \eta_p^2 = .025$. Within-subject contrasts revealed significant differences in the reading times for the two target sentences (2 & 7) between the consistent Hostile texts and the inconsistent Mild-Hostile texts, as a function of Gender, $F(1, 110) = 6.38, p = .013, \eta_p^2 = .055$, with males exhibiting faster reading times compared to females. In addition, there were significant covariate effects for Mill Hill, $F(1, 110) = 6.09, p = .015, \eta_p^2 = .052$, and Proactive Aggression, $F(1, 110) = 5.39, p = .022, \eta_p^2 = .047$.

Text-based contradictions

Since the current study's hypotheses were partly based on the detection of text-based contradictions, it was important to establish that, regardless of aggression level, participants detected the text contradictions in the Mild-Hostile and Hostile-Mild texts. A series of paired t-tests were performed for Filler and experimental texts, illustrating that there were no significant differences between the reading times of Filler texts and Mild Texts, $t(115) = .35, p = .726$, or between reading times for Filler texts and Hostile Texts, $t(115) = -1.19, p = .236$. As predicted, there were significant differences in the reading times between baseline reading times and reading times for texts which contained contradictions. Specifically, there were significant differences in reading times between Filler and Inconsistent Mild-Hostile texts, $t(115) = 2.08, p = .040, d = 0.12$, as well as

between Filler and Inconsistent Hostile-Mild texts, $t(115) = 3.68, p < .001, d = -.20$, indicating that, regardless of aggression levels, the Inconsistent Mild-Hostile texts were read faster than the Filler texts, while the Inconsistent Hostile-Mild texts were read slower than the Filler texts. In general, the longest reading times were found for the Inconsistent Hostile-Mild texts, possibly indicating a text-based inconsistency effect. Descriptive statistics for reading times according to text type appear in Table 3 (Appendix D).

The above analyses illustrate that, in relation to any possible text-based contradiction effects, and regardless of aggression levels, the Inconsistent Mild-Hostile texts were read faster than the Filler texts, while, the Inconsistent Hostile-Mild texts were read slower than the Filler texts. This result was not anticipated, since it was hypothesized that both types of inconsistent texts would generally cause a deceleration in reading speed. Interestingly, participants exhibited slower reading times for the Hostile texts compared to the Inconsistent Mild-Hostile texts, and also slower times for the Inconsistent Mild-Hostile texts compared to the Inconsistent Hostile-Mild texts.

Furthermore, differences in the reading times for the two target sentences were examined regardless of aggression levels. Paired-sample t-tests revealed significant differences in the reading times between target Sentences 2 and 7 in all experimental texts, and specifically in the consistent Mild Texts, $t(115) = 5.53, p < .001, d = 0.46$, the consistent Hostile Texts, $t(115) = 7.14, p < .001, d = 0.56$, the inconsistent Mild-Hostile Texts, $t(115) = 10.19, p < .001, d = 0.86$, and the inconsistent Hostile-Mild Texts, $t(115) = 4.17, p < .001, d = 0.39$. As it can be seen from Table 8 (Appendix D), participants read the second target sentence describing the protagonist's reaction (Sentence 7) faster than the first target sentence (Sentence 2), regardless of its mild or hostile content. Since significant differences were found between the reading times of critical sentences in the consistent texts as well as in the inconsistent texts, this result was incompatible with the study's predictions regarding the different reading times between target sentences as a function of text inconsistencies.

Emotional intelligence and verbal ability influences. An additional hypothesis of the current study concerned the influence of Trait Emotional Intelligence on aggression. Specifically, the relationship between hostile attribution bias, aggressive behavior and Trait EI was examined. In order to more closely inspect the contribution of Trait Emotional

Intelligence to aggression, regression analyses were employed for each type of Aggression: Reactive and Proactive. It can be seen from Table 12 (Appendix D), that in line with the study's hypothesis, Trait Emotional Intelligence has a significantly negative contribution to both types of aggression.

With respect to Verbal Ability, as it has already been mentioned, participants with higher Mill Hill scores read all texts faster compared to participants with lower Mill Hill scores. This effect was evident across all text types, but more profound for the consistent Hostile Text. In order to examine the contribution of verbal ability, as measured through the Mill Hill, to aggression, regression analyses were employed for both Reactive and Proactive Aggression. It can be seen from Table 13 (Appendix D), that, while Mill Hill has no significant contribution to Reactive Aggression, it has a significantly negative contribution to Proactive Aggression.

Chapter 6: Discussion

The current study attempted to examine whether participants with higher levels of aggression exhibit hypervigilance to cues of hostility or whether their attention is mainly directed towards information which is novel and unexpected. Furthermore, regardless of attention allocation, the study investigated whether the differential processing that aggressive individuals potentially demonstrate when encountering hostile information is mostly related to deviations in social information processing and influenced by bottom-up processing, or mostly related to the activation of hostility schemata in long-term memory and mostly influenced by top-down processing. An additional aim of the study was to examine possible associations between aggression, hostile attribution bias and trait emotional intelligence (TEI). Lastly, the present study measured and controlled for intelligence and verbal ability, as well as for reading comprehension.

Hypervigilance vs Schema Inconsistency

Firstly, the issue of attention allocation was investigated by comparing the reading times of participants with higher and lower levels of aggression and HAB, for texts with a mild and hostile content, as well as for target sentences embedded in texts. These target sentences appeared in both consistent and inconsistent text versions and described a main character's attributes as either benevolent or hostile and his/her subsequent reaction towards an event as either mild or aggressive. In the consistent text versions, the reactions

described were consistent with the aforementioned character descriptions, while in the inconsistent texts the reactions came into contrast with character descriptions. Based on prior research findings, the study's predictions were that, if participants higher in aggression are hypervigilant towards aggressive cues, they would generally exhibit longer reading times for hostile texts and sentences compared to mild texts and sentences and compared to participants with lower levels of aggression. Alternatively, if attention is allocated to schema-inconsistent cues, it was expected that higher aggression readers would read hostile texts and sentences faster than mild texts and sentences, as well as faster compared to low aggressive readers. With the introduction of the inconsistent texts, it was expected that readers with lower aggression levels would display a typical text-based inconsistency effect and demonstrate slower reading times for the second, incompatible critical sentence compared to the first. This effect was anticipated for both inconsistent text versions. Conversely, it was speculated that higher aggression readers would show alternative processing patterns for mild and hostile texts and sentences. Specifically, higher aggression participants were expected to display similar reading patterns with the lower aggression participants in the inconsistent text versions in which a mild protagonist displayed a hostile reaction, only if hypervigilance to hostile cues applied. In the case that attention is allocated to schema-inconsistent cues, an alternative pattern of reading times was expected for participants higher in aggression, either by exhibiting faster reading times for the hostile sentences or by the effects of text inconsistencies becoming less evident. In the inconsistent text versions where a hostile protagonist exhibited a mild reaction, if hypervigilance applies, it was predicted that higher aggression participants, would read the first hostile target sentence slower than the second mild target sentence, but also slower compared to readers with lower levels of aggression. Alternatively, if attention is directed towards irrelevant information, they would exhibit a reverse reading pattern by allocating more attention on the mild sentence.

The study's results revealed that, as hypothesized, both reactive and proactive aggression had a significant impact on reading times on both mild and hostile consistent texts. Nevertheless, aggression levels did not influence reading times in the predicted manner, since, on the whole, participants with higher levels of aggression exhibited significantly faster reading times for all text types and target sentences compared to participants with lower levels of aggression, regardless of mild or hostile content. In

particular, results indicated that higher levels of proactive aggression were mostly linked to faster reading times for the inconsistent texts describing a mild character and a hostile reaction, compared to other types of texts.

Moreover, by examining more closely the differences in reading times between target sentences in texts containing inconsistencies, it was evident that the second target sentence (character reaction) was generally read faster than the first target sentence (character description), regardless of its hostile or mild content. This finding comes into contrast with the study's hypotheses which predicted that the differential content of target sentences would result in dissimilar reading patterns in both types of inconsistent texts, i.e. texts describing a mild character and a hostile reaction and texts describing a hostile character and a mild reaction. In addition, participants with higher levels of reactive and proactive aggression exhibited faster reading times for both sentences compared to participants with lower levels of aggression, also irrespective of sentence content. Specifically, while the second target sentence was generally read at a faster pace than the first target sentence across both inconsistent texts, this effect was more evident for participants with higher aggression, than for participants with lower levels of aggression.

Furthermore, an examination of how different types of aggression influenced the processing of each sentence revealed differential reading patterns for the target sentences of the inconsistent texts. Regarding the inconsistent texts containing a mild character and a hostile reaction, participants higher in reactive aggression read the first, mild target sentence, significantly faster than participants with lower levels of aggression. On the other hand, participants with higher levels of proactive aggression read both target sentences faster than participants with lower levels of proactive aggression. Regarding the inconsistent texts describing a hostile character exhibiting a mild reaction, while participants with higher levels of reactive aggression read the first, hostile target sentence at a faster pace than participants with lower levels of reactive aggression, there were no significant differences between the reading times of higher and lower proactive aggression readers, for either sentence. From the aforementioned it is clear that participants higher in reactive aggression exhibited faster reading times compared to participants lower in reactive aggression for the first target sentences in both inconsistent texts, regardless of their mild or hostile content. Participants higher in proactive aggression demonstrated faster reading times compared to those lower in proactive aggression for both critical

sentences, only in the inconsistent texts describing a mild protagonist and a hostile reaction and irrespective of mild or hostile content.

An interesting finding was that, while participants with higher levels of hostile attribution bias, as measured through the AIHQ, also generally exhibited faster reading times compared to participants with lower HAB levels for most texts and sentences, they displayed a slower reading pace for the inconsistent texts describing a hostile character and a subsequent mild reaction. Specifically, they displayed slower reading times for the hostile character description, compared to participants with lower HAB levels, possibly indicating hypervigilance towards this hostile content. Moreover, by comparing within-group differences for participants with higher and lower HAB levels, it was revealed that participants with different levels of hostile attribution bias (HAB) differentially influenced the processing of sentences with a mild and hostile content. Participants with higher HAB levels demonstrated a preference towards hostile cues, suggestive of hypervigilance to hostility, by displaying larger differences in their reading times of critical sentences describing a hostile character exhibiting a mild reaction, with the second, mild sentence being read significantly faster. In contrast, participants with lower HAB levels displayed larger differences in their reading times of critical sentences compared to participants with higher levels of HAB, for sentences describing a mild protagonist exhibiting a hostile reaction, with the hostile sentence being read significantly faster.

Consequently, the obtained results indicated that higher levels of aggression and hostile attribution bias were linked to faster reading times in general and that reactive and proactive aggression influenced reading patterns in a dissimilar manner. These results are more in line with findings by Wingrove & Bond (2005) which showed that, while individuals high in trait anger read hostile sentences faster than neutral sentences, they generally exhibited faster reading times for all sentences compared to participants with lower levels of trait anger. Nevertheless, in the present study, there was an indication of a preference on behalf of participants with higher hostile attribution bias levels towards hostile sentences, which may be suggestive of hypervigilance to hostile cues. While the aforementioned results do not unequivocally confirm the hypervigilance effects of aggression towards hostile cues that prior studies have found (Crick & Dodge 1994; van Goozen, Cohen-Kittens, Mathys & van England, 2002; Smith & Waterman, 2004), the allocation of attention to novel and unexpected information as described by Horsely et al.

(2010) was also not confirmed. Furthermore, the current results are in direct contrast to the outcomes reported by Wilkowski et al. (2007), according to which participants with higher levels of trait anger spent more time looking at cues regardless of content, compared to participants lower in trait anger.

The above-mentioned discrepancies between the obtained results and previous findings may be attributed to numerous factors. For example, in several studies, hypervigilance to hostile cues was measured through subsequent recall tasks (Zelli et al., 1995) or deliberate interpretation tasks (Crick & Dodge, 1996) and not through online methods. This may have resulted in participants engaging in deliberate processing of cues, reflected more in subsequent social information processing steps rather than in early processing. Moreover, even studies that have employed online tasks in order to examine attention towards hostile cues have measured gaze duration (Wilkowski, et al., 2007) for cues such as series of cartoons (Horsely et al. 2010). On the other hand reading tasks, which were used in the present study, have been shown to include different encoding processes (Graesser et al., 1994) and belong to a different class of representations compared to visual displays (Schnotz, 2002). Furthermore, the somewhat differential findings in relation to participants with higher HAB levels compared to participants with higher reactive and proactive aggression suggest the existence of separate constructs, predicting different behavioral outcomes. As several studies have indicated, even though reactive and proactive aggression are positively correlated, reactive aggression involves frustration and is a response to provocation, while proactive aggression is related to favorably evaluating aggression outcomes and for obtaining desired goals (Crick & Dodge, 1996). Since reactive aggression is seen as a more impulsive form, it is usually measured in real-time and is more likely situation specific. On the other hand, these two types of aggression seem to be differently linked to hostile attribution bias, which is said to occur as a defense against the peer perceived as harmful (Bailey & Ostrov, 2008; Dodge et al., 2006; Yaros et al., 2014). Therefore, the discrepancy in current findings between aggression levels and hostile attribution bias levels in regards to reading times is supported by prior research which shows that hostile attribution bias is differentially related to reactive and proactive aggression subtypes, as well as to social information processing (Card & Little, 2006; Crick & Dodge, 1996).

Bottom-up vs Top-down Social Information Processing

The second major aim of the current study was to examine the source of aggression and hostile attribution bias. Previous research has proposed that the presumed encoding distortions of aggressive individuals may be mostly based either on inaccurate bottom-up processing, or mostly on pre-existing hostility schemata. The present study hypothesized that the distinction between bottom-up and top-down processes could be manifested through possible differences between readers with lower and higher levels of aggression in the reading times of mild sentences, as well as through differences in their reading patterns of contradicting sentences. Specifically, it was speculated that, in the case of mild sentences, if encoding of aggressive information is mostly based on bottom-up processing, there would be no noticeable differences in reading times as a function of aggression and reading times were expected to be comparable to baseline times. If, however, encoding is mostly based on top-down processing, it was predicted that participants with higher levels of aggression and hostile attribution bias would show dissimilar reading patterns compared to participants lower in aggression, depending on the influence of their cognitive schemata. For example, if cognitive schemata drive attention towards hostile cues, then it was expected that readers high in aggression would read mild sentences faster compared to readers lower in aggression and baseline reading times, since mild sentences are inconsistent with a hostile schema. If cognitive schemata drive attention towards unexpected, benign cues, then perhaps participants higher in aggression would exhibit longer reading times for mild sentences compared to participants with lower levels of aggression.

The results illustrated that participants with higher levels of reactive and proactive aggression did not display significant differences between baseline reading times and reading times for texts with a mild content. Unfortunately these findings do not conclusively provide support towards either greater influences of bottom-up or top-down processing. There was however a tendency for higher reactive and proactive aggression participants to read texts with a mild content at a faster pace than participants with lower levels of aggression. In the case of hostile attribution bias there was an indication that mild sentences were processed faster than hostile sentences, especially within the group with higher HAB levels. This may be a sign of preference towards hostile sentences due to a

top-down processing effect and suggestive of the existence of a hostile cognitive schema incompatible with mild cues.

Furthermore, the analyses concerning the critical sentences of the inconsistent texts indicated that aggression was linked to faster reading times for the second target sentence compared to the first target sentence, in both inconsistent texts, regardless of a mild or hostile content. Again, this finding comes into contrast with the study's predictions for differential reading times depending on sentences' mild or hostile content. Also, regarding the comparison between the reading times of critical mild sentences as a function of aggression, only within the inconsistent texts, the results proved inconclusive. Participants with higher levels of both reactive and proactive aggression read mild sentences faster than participants lower in aggression, but this was only true for texts describing a mild character and a subsequent hostile reaction.

Overall, based on the above results, there is a slight indication of top-down influences on the processing of social information, since participants higher on aggression and hostile attribution bias tended to read mild texts faster than participants lower in aggression and faster than filler sentences. This is partially in accordance with studies which illustrate that individual differences in the processing of hostile stimuli are mostly based on the activation of hostile schemata stored in memory (Lochman & Lenhart, 1995; Zelli, Dodge, Lochman, Laird, & Conduct Problems Prevention Research Group, 1999; Zelli, Huesmann, & Cervone, 1995). Nevertheless, as it was previously mentioned, participants higher in aggression displayed faster reading times in general.

In the present study, the lack of definite evidence supporting either bottom-up or top-down influences on the processing of social information may be related to the relationship between the aforementioned influences. According to the Crick and Dodge (1994) model, while codification of social information occurs during the first step of SIP, the interpretation of cues occurs mainly during the second step of processing. Since other studies (Zelli et al., 1999) have indicated that influences of schemata and knowledge structures on the one hand and deviant processing operations on the other hand influence social information processing in a different manner, it is possible that hostile schemata come into play during later stages of social information processing and their impact was not adequately reflected on reading times. On the other hand, prior research has indicated

that hostile attribution bias is mostly related to deviations during the initial steps of social information processing (i.e. Crick & Dodge, 1994), which would explain the current results obtained pertaining to hostile attribution bias, of an indication of a top-down processing effect and the existence of a hostile cognitive schema incompatible with mild cues.

Text-based Contradiction Effects

In relation to the expected text-inconsistency effects, irrespective of aggression and HAB levels, the current study found that participants generally exhibited differential reading patterns for the consistent and inconsistent texts, indicating that there was a detection of the contradictions between the main characters' descriptions and subsequent reactions. While, on the one hand, there were no significant differences between baseline reading times and reading times for texts with consistent mild and hostile sentences, on the other hand, there were significant differences between baseline reading times and reading times for texts that contained inconsistent character descriptions and subsequent reactions. Nonetheless, while as predicted, reading times for the inconsistent texts in which a hostile character displayed a mild reaction were slower compared to baseline reading times, reading times for the inconsistent texts in which a mild character exhibits a hostile reaction were faster than baseline reading times. This result was not anticipated, since it was assumed that, due to the detection of text contradictions, participants would display longer reading times for both inconsistent text types compared to baseline reading times. In general, the longest reading times were found for the inconsistent text versions in which a hostile character exhibited a mild reaction, possibly indicating that based on their prior social knowledge, participants found the aforementioned characters' reaction as more surprising and unexpected. Moreover, regardless of aggression, participants read the second target sentence faster than the first target sentence in all experimental texts.

The above results are somewhat incompatible with findings of numerous studies that have shown that readers manifest longer reading times for contradicting sentences (Albrecht & Myers, 1995; Albrecht & O'Brien, 1993; Myers, O'Brien, Albrecht, & Mason, 1994). According to the memory-based text processing view, as a text is read, information in the text and in working memory activate the reader's knowledge base, which may contain elements of both general knowledge and previously presented text information (Gerrig & McKoon, 1998; McKoon, Gerrig, & Greene, 1996; Myers & O'Brien, 1995). Therefore,

readers can notice whether a sentence contradicts earlier text information. The process by which relevant information in long term memory becomes reactivated is manifested by longer reading times for contradicting sentences compared to consistent sentences (Albrecht & O'Brien, 1993). The lack of similar text-based contradictions effects in the current study could be attributed to a variety of possible factors. Firstly, the fact that the texts used were only seven sentences in length, may not have allowed readers to adequately construct a coherent text based situation model and reactivate relevant information presented earlier in the text, but that were no longer available in working memory. Therefore, at the time participants read the second target sentence, information provided in the first target sentence may have still been active in working memory and constitute a part of the active portion of the discourse model, with no necessity of being reactivated. Furthermore, an important difference between the materials used in the current study is that characters' descriptions consisted of only one sentence, while in previous studies (Albrecht & O'Brien, 1993; O'Brien et al., 1998) which have demonstrated a text-based inconsistency effect, target sentences appeared following extensive consistent and inconsistent elaborations of protagonists' descriptions. An alternative reason for the lack of text-based contradictions effects may be related to the mild and hostile content of sentences presented in the texts. It could be the case that the anticipated effect was not present because the contradictions used were only specifically related to protagonists' descriptions and reactions, and all had either a mild or hostile content. Since, all inconsistent texts included the same type of contradictions, it is possible that after a certain point, participants may have anticipated the second contradicting target sentence which described protagonists' mild or hostile reactions.

Emotional Intelligence, Verbal Ability and Gender Influences

Another major aim of the current study was to examine the relationship between aggression, hostile attribution bias and trait emotional intelligence. As expected, trait emotional intelligence was negatively correlated to measures of hostile attribution bias and aggression and had a significantly negative contribution to reactive and proactive aggression. This is in accordance with previous findings which show that emotional intelligence and elements such as empathy in adolescents are negatively related to aggressive behavior (de Kemp et al., 2007, Petrides et al., 2006). Nevertheless, in contrast to the model proposed by Lemerise and Arsenio (2000), the current study found no influences of trait EI on social information processing. This was demonstrated through the

lack of significant influences of trait EI on reading times, as well as through the sentence verification task, in which participants did not display a difficulty in processing emotional information presented in the texts. However, the lack of any trait EI influences on social information processing may be partly attributed to the fact that, in the present study, processing of emotional information was only measured through reading tasks and, contrary to findings of previous research, trait EI did not seem to influence the reading process (Gernsbacher, Hallada, & Robertson, 1998; Komeda et al., 2009). Therefore, the results of the current study are more in line with findings by Wingrove and Bond (2005), who showed that empathy did not have a significant influence on the processing of sentences with a hostile content.

The current study also measured and controlled for verbal ability, since there was a possibility of verbal ability and knowledge of words having an impact on reading speed. Consistent with previous findings, there was a strong link between verbal ability and general intelligence. Moreover, the results of the present study indicated that, while verbal ability did not have a significant contribution to reactive aggression, it had a significantly negative contribution to proactive aggression. While results of previous studies regarding the relationship between verbal intelligence and aggression remain inconclusive, the current finding is in line with findings of previous studies which suggest a negative correlation between verbal ability, aggression and hostile attribution bias (Gomez & Hazeldine, 1996; Huesmann et al., 1984; Van Nieuwenhuijzen et al., 2004).

In addition, verbal ability scores were negatively correlated with baseline reading times, as well as with reading times for consistent texts with hostile character descriptions and reactions and with reading times for inconsistent texts with hostile character descriptions and mild reactions. Specifically, participants with higher levels of verbal ability displayed shorter reading times for these particular texts and faster reading times in general. This effect was evident across all text types, but more profound for the consistent texts containing hostile character descriptions and reactions, which were read the fastest. These results are in accordance with findings by studies which show links between vocabulary acquisition and reading speed (Krashen, 2004; Tozcu & Coady, 2004). Interestingly, in the current study, higher aggression levels, as well as higher levels of verbal ability, were both related to faster reading times, even though verbal ability was negatively related to aggression. Thus, participants with higher levels of aggression, but

who nonetheless have lower levels of verbal ability exhibited faster reading times, similar to participants with higher levels of verbal ability who also exhibited faster reading times. It is therefore possible that participants with higher aggression and lower verbal ability displayed faster reading times for different reasons, such as impulsivity or lack of motivation, while participants with higher levels of verbal ability demonstrated superior reading skills.

Lastly, while the issue was beyond the scope of the current study, the influence of gender on reading times was examined. The current study found no significant effects of gender on reading times for any of the text types, while there were some significant effects of gender on reading times for particular target sentences. Specifically, male and female participants exhibited different reading times for the target sentences describing a hostile character reaction, within the consistent texts containing hostile descriptions and hostile reactions, as well as target sentences relating to mild character descriptions and subsequent hostile reactions in the inconsistent texts containing mild character descriptions and hostile reactions. In all cases, male participants exhibited faster reading times than female participants, while, apparently, this difference was irrespective of the sentences' mild or hostile content. Thus, although prior research has indicated differences in aggression levels and reaction to provocation between males and females (i.e. Burgess, et al., 2006; Mayberry & Espelage, 2007), the current study found no influence of gender on the processing of hostile information.

Limitations and Implications

The present findings and their implications need to be interpreted in light of the study's limitations. Firstly, there were limitations pertaining to the current sample, both in terms of size and in terms of characteristics. Due to these limitations, it was not possible to fully explore potential effects of background characteristics, such as grade or school type, on text processing and social information processing. Also, while the effects of factors such as gender were partially examined, unequal sample sizes in terms of gender only allowed for limited comparisons. Furthermore, since prior research has demonstrated that males exhibit higher levels of reactive and proactive aggression compared to females, the inclusion of both males and females in the sample may have had moderating effects and be a partial explanation for the lack of the expected significant results in the current study.

Therefore, it would be appropriate for future studies to examine possible differential processing patterns of SIP between males and females, within the context of a text-contradiction paradigm.

An additional limitation of the current study related to methodological restraints regarding the use of a median split in order to divide participants into lower and higher aggression and hostile attribution bias groups. In the present study, aggression and HAB were continuous variables and it was deemed that turning them into categorical variables would result in a considerable loss of statistical power, and a reduction in inherent variability (Aiken & West, 1991; MacCallum, Zhang, Preacher, & Rucker, 2002). Although the practice of dichotomizing continuous variables is common in psychological research, in the present case, a median split was used only to further explore significant interactions or trends. Even though the lack of use of a median split may have inevitably limited possible statistical comparisons, it was considered essential to preserve statistical power, taking into account issues with restricted sample size and in order to avoid the probability of a Type II error. In addition, since the current study employed multiple testing, the probability of a potential increase in Type I error was also taken into account. This was dealt by using Bonferroni corrections when applicable. However, a considerable strength of the current study was the obtainment of a diverse and random sample, derived from various areas and school types.

Moreover, while aggression and hostile attribution bias were specifically measured, the study did not employ a direct measure of possible hostile schemata held by participants. As an attempt to delineate the influence of the presumed cognitive schemata on processing of hostile information, an online methodology was used, which however, did not distinguish the types of hostile schemata possibly held. However, as other studies have demonstrated (Calvete & Orue, 2012), different kinds of normative beliefs held by aggressive individuals, may influence steps of social information processing in a different way.

One more limitation of the current study is related to the issue of spontaneous as opposed to deliberate processing. With the exception of a small number of studies (Horsely et al., 2010; Wilkowski et al., 2007) most have used off-line measures of social information processing. Even though the early steps of social information processing are considered to be occurring rapidly and unconsciously (Dodge, 1986; Crick & Dodge,

1994) the impact of such automatic encoding may be apparent in subsequent deliberate processing steps, as measured through tasks that involve recall and interpretation of hostile stimuli. In the present study, a sentence verification task was used to control for differences in comprehension and to ensure that readers stayed on task. Even though this measure showed that participants showed no difficulties with comprehending text information, recall of hostile stimuli was not specifically measured. Therefore, a possible limitation of the present study is the lack of utilization of a successive measure, such as a recall or an interpretation task, which may have revealed the full manifestation of hostile cue processing. Hence, it would be interesting for future research to examine the associations between patterns of on-line processing such as reading times and subsequent, deliberate off-line processing. For example, Horsely et al. (2010) found that while aggressive children looked longer at non-hostile cues than nonaggressive children in an online task, they recalled less non-hostile information in a subsequent off-line task.

Lastly, the finding that the second target sentence was overall read faster than the first target sentence revealed that participants failed to demonstrate the expected text-contradiction effect. A methodological limitation of the current study was the absence of texts with neutral content, but which would nevertheless contain text-based contradictions. This may have revealed whether failure to demonstrate the predicted contradiction effect was due to the mild and hostile content of texts, or whether it can be attributed to other factors.

Aggressive and antisocial behavior amongst children and young adolescents can have a long-term negative impact. Early intervention is crucial, since deviant behavior tends to be persistent, and to become more serious as age increases (Caprara, et al., 2007; Dodge, 2006). The development of programs aiming to prevent and treat antisocial and aggressive behavior should take into account the manner in which individuals process social information. For example, if aggressive behavior is the result of hostile attribution biases guiding attention mainly towards hostile cues, a basic goal of intervention might be to teach individuals to focus on and identify cues that indicate that the actor has acted benignly rather than malevolently. On the other hand, if aggressive behavior stems from prior beliefs in the form of cognitive schemata, interventions may give emphasis on cognitive restructuring and on altering erroneous beliefs. The current study clearly demonstrated a link between higher levels of aggression and faster processing of social

information. Nonetheless, there was no clear indication of hypervigilance towards aggressive content or alternatively, towards novel and unexpected information.

Furthermore, since the current results suggest that processing of hostile stimuli may be contingent on the activation of hostile schemata, any successful intervention should aim, amongst other goals, towards cognitive restructuring. In fact, there are several models of schema therapy for dysfunctional behavior which describe how early maladaptive schemas developed in childhood or adolescence and elaborated throughout lifetime, sustain aggressive behavior and aim in altering prior beliefs (Rafaeli, Bernstein, & Young, 2010; Young, Klosko, & Weishaar, 2003). Furthermore, interventions for aggression may borrow and adapt techniques from existing paradigms demonstrated within the context of reading comprehension research, which aim in altering erroneous prior knowledge and in facilitating conceptual change (Carey, 1985; Diakidoy & Kendeou, 2001; Diakidoy et al., 2016; Diakidoy et al., 2011; Vosniadou & Brewer, 1992; Vosniadou, 2007).

More importantly, the fact that reactive and proactive aggression influenced social information processing in a different manner should be seriously considered in the development of interventions. As previous studies have demonstrated, although reactive and proactive aggression are highly interrelated (Fanti, Frick, & Georgiou, 2009; Polman, Orobio de Castro, Koops, van Boxtel, & Merk, 2007), they may be differentially related to steps of social information processing (Oostermeijer et al., 2016). Therefore, an effective treatment for reactive aggression may not necessarily address the same social information processing and interpretation issues present in proactive aggression, and vice versa. Lastly, since the current study found a negative contribution of trait emotional intelligence to both types of aggression as well as negative correlations between trait emotional intelligence, aggression and hostile attribution bias, it would be interesting for future studies to explore whether skills such as adaptability, emotion perception and emotion regulation diminish aggressive behavior and hostile attribution bias.

Conclusions

In sum, the present study attempted to investigate whether adolescents with higher aggression levels exhibit hypervigilance to hostile information or whether they have a preference towards novel and unexpected information, compared to lower aggression adolescents. As predicted, aggression had a significant impact on reading times, since

adolescents with higher levels of both reactive and proactive aggression read texts and sentences faster than those lower in aggression. However, contrary to expectations, this effect was irrespective of a mild or hostile content. Thus, the current results have not provided a conclusive answer to the issue of attention allocation.

The finding that participants with higher levels of aggression have demonstrated faster reading times cannot be attributed to individual traits such as impulsivity, since this effect was manifested only in the case of mild and hostile content and not during reading of filler texts with neutral content. Likewise, these faster reading times of high-aggression participants cannot be ascribed to lower levels of verbal ability, since the study found no interactions between levels of aggression and Mill Hill scores. Interestingly however, even though verbal ability was negatively correlated with proactive aggression, participants with higher levels of verbal ability also demonstrated faster reading times. A possible aim of future research may be to examine the relationship between verbal skills, aggression and social information processing.

Pertaining to the issue of whether aggression is mostly based on inaccurate social information processing (bottom-up processing), or to the activation of hostility schemata in long-term memory (top-down processing), the study illustrated that adolescents higher in aggression exhibited faster reading times for texts with a mild content compared to filler texts with an irrelevant content and compared to lower aggression readers. Based on the study's hypotheses, this difference in the processing of mild information may indicate a hostile schema influence and a primary preference for hostile information. Although these findings do not preclude the possibility of bottom-up processing influences, the impact of top-down processing may be stronger in this case.

Participants generally detected text inconsistencies, as it was evident by the demonstration of differential reading patterns for the consistent and inconsistent texts. Nevertheless, text-based contradictions did not influence reading times in the expected direction. While the second target sentence was read at a faster pace than the first target sentence across both inconsistent texts, regardless of its mild or hostile content, this effect was more evident as aggression levels increased. More importantly, the study demonstrated the differential effects of reactive and proactive aggression particularly in the case where information was contradicting.

Lastly, consistent with previous findings, in the present study there were indications of a negative correlation between trait emotional intelligence, hostile attribution bias and both reactive and proactive aggression. This link highlights the importance of the acquisition and training of skills such as emotion recognition and empathy in the effective prevention and treatment of aggressive behavior.

On the whole, in regards to aggressive behavior and hostile attribution bias there are important issues to be scrutinized, such as attention allocation and sources of influence on hostile interpretations. Moreover, factors such as types of aggression, differences in processing of social information and emotional competence are important in the development of successful prevention and intervention programs.

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THALIA MOUSKOUNTI

Appendix A

ΕΝΤΥΠΟ ΣΥΓΚΑΤΑΘΕΣΗΣ ΓΟΝΙΟΥ για συμμετοχή παιδιού σε πρόγραμμα έρευνας
Σύντομος Τίτλος του Προγράμματος:
Κατανόηση κοινωνικών καταστάσεων μέσω διηγηματικού κειμένου.

Τα παιδιά σας καλούνται να συμμετάσχουν σε ένα ερευνητικό πρόγραμμα, το οποίο σκοπό έχει να εξετάσει την κατανόηση κοινωνικών καταστάσεων, μέσω κειμένων. Για τους σκοπούς της πιο πάνω έρευνας τα παιδιά θα κληθούν να διαβάσουν σύντομα κείμενα και να απαντήσουν σε απλές ερωτήσεις. Επίσης, θα τους ζητηθεί να συμπληρώσουν διάφορα σύντομα ερωτηματολόγια.

Με το τέλος της διαδικασίας, θα σας επεξηγηθεί τί ελπίζουμε να μάθουμε από το πρόγραμμα και το ευρύτερο επιστημονικό όφελος της έρευνας.

Η έρευνα θα διεξαχθεί σε δυο μέρη. Το πρώτο μέρος της έρευνας θα διαρκέσει περίπου 40 λεπτά και θα αποτελείται από συμπλήρωση ερωτηματολογίων. Το δεύτερο μέρος θα διαρκέσει επίσης περίπου 40 λεπτά και θα αποτελείται από ανάγνωση κειμένων.

Η όλη διαδικασία της έρευνας στηρίζεται στην πλήρη εμπιστευτικότητα και σε καμία περίπτωση δεν θα χρησιμοποιηθούν προσωπικά δεδομένα του παιδιού σας. Επίσης, είστε ελεύθεροι να αποσύρετε οποιαδήποτε στιγμή εσείς επιθυμείτε την συγκατάθεση σας για την συμμετοχή του παιδιού σας στο πρόγραμμα. Σε περίπτωση που διαφωνείτε με τη συμμετοχή του παιδιού σας στην έρευνα παρακαλώ όπως συμπληρώσετε και επιστρέψετε το έντυπο.

*Δηλώνω ότι **ΔΕΝ ΣΥΜΦΩΝΩ** με την συμμετοχή του παιδιού μου στην έρευνα:

* Ονοματεπώνυμο Γονιού:
Υπογραφή Γονιού:	

ΕΝΤΥΠΟ ΣΥΓΚΑΤΑΘΕΣΗΣ ΜΑΘΗΤΩΝ
για συμμετοχή σε πρόγραμμα έρευνας

Σύντομος Τίτλος του Προγράμματος στο οποίο καλείστε να συμμετάσχετε

Κατανόηση κοινωνικών καταστάσεων μέσω διηγηματικού κειμένου.

Καλείστε να συμμετάσχετε σε ένα ερευνητικό πρόγραμμα, το οποίο σκοπό έχει να εξετάσει την κατανόηση κοινωνικών καταστάσεων, μέσω κειμένων. Για τους σκοπούς της πιο πάνω έρευνας θα κληθείτε να διαβάσετε σύντομα κείμενα και να απαντήσετε σε ερωτήσεις. Επίσης, θα σας ζητηθεί να συμπληρώσετε διάφορα σύντομα ερωτηματολόγια. Θα σας δοθούν οδηγίες σε απλή γλώσσα σχετικά με το τι θα ζητηθεί από εσάς, εάν συμφωνήσετε να συμμετάσχετε στο πρόγραμμα.

Η έρευνα θα διεξαχθεί σε δυο μέρη. Το πρώτο μέρος της έρευνας θα διαρκέσει περίπου 40 λεπτά και θα αποτελείται κυρίως από συμπλήρωση ερωτηματολογίων. Το δεύτερο μέρος, θα διαρκέσει περίπου 40 λεπτά και θα αποτελείται από ανάγνωση κειμένων.

Με το τέλος της διαδικασίας, θα σας εξηγηθεί τι ελπίζουμε να μάθουμε από το πρόγραμμα και το επιστημονικό όφελος της έρευνας.

Η όλη διαδικασία της έρευνας διέπεται από **πλήρη εμπιστευτικότητα** και σε καμία περίπτωση δεν θα χρησιμοποιηθούν προσωπικά σας δεδομένα. Επίσης, είστε ελεύθεροι να αποσύρετε οποιαδήποτε στιγμή εσείς επιθυμείτε την συγκατάθεση για την συμμετοχή σας στο πρόγραμμα.

Δηλώνω ότι συμφωνώ με τα πιο πάνω:

Όνομα & Επίθετο:	Ημερ. Γέννησης:
Υπογραφή:		Ημερομηνία:	

Appendix B

The Reactive-Proactive Questionnaire (RPQ)

Υπάρχουν στιγμές που όλοι μας θυμώνουμε, ή κάνουμε πράγματα που δεν έπρεπε να κάνουμε. Δίπλα από κάθε συμπεριφορά υπάρχουν τρεις επιλογές. Βαθμολόγησε την κάθε ερώτηση κυκλώνοντας είτε το 0 (ποτέ), το 1 (μερικές φορές), ή το 2 (συχνά). Δεν χρειάζεται να σκέφτεσαι τις ερωτήσεις πολύ. Γράψε την πρώτη σου αντίδραση. Βεβαιώσου ότι απάντησες σε όλες τις ερωτήσεις.

	Πόσο συχνά ... ;	Ποτέ	Μερικές φορές	Συχνά
1.	Φώναξες σε κάποιους γιατί σε εκνεύρισαν.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	Τσακώθηκες με κάποιον για να αποδείξεις τον εαυτό σου στους άλλους.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	Αντέδρασες θυμωμένα όταν κάποιιοι άλλοι σε προκάλεσαν.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	Πήρες πράγματα από άλλα άτομα ή συμμαθητές σου.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	Θύμωσες γιατί ένιωσες ότι δεν ήσουν ικανοποιημένος/η ή απογοητευμένος/η με κάτι.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	Κατάστρεψες κάτι για πλάκα.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	Είχες ξεσπάσματα συμπεριφοράς ή νεύρα.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	Κατέστρεψες πράγματα γιατί ένιωσες πολύ θυμωμένος/η ή έξαλλος/η.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	Τσακώθηκες με άλλη ομάδα μαθητών («Κλίκα») για να αποδείξεις την μαγκιά σου .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	Πλήγωσες άλλους για να κερδίσεις σε ένα παιχνίδι.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.	Θυμώνεις ή χάνεις τον έλεγχο όταν δεν γίνεται το δικό σου.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12.	Χρησιμοποίησες τη φυσική σου δύναμη για να κάνεις τους άλλους να κάνουν αυτό που εσύ θέλεις.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.	Θύμωσες ή ένιωσες ότι χάνεις τον έλεγχο όταν έχασες σε ένα παιχνίδι.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14.	Θύμωσες όταν σε απειλούσαν κάποιιοι άλλοι.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.	Χρησιμοποίησες τη φυσική σου δύναμη για να πάρεις λεφτά ή άλλα πράγματα από άλλους.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.	Αισθάνθηκες καλύτερα μετά που χτύπησες ή φώναξες σε κάποιον/α.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.	Απειλήσες και εκφόβισες κάποιον ότι θα του κάνεις κακό.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.	Έκανες αισχρά τηλεφωνήματα για πλάκα.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.	Χτύπησες κάποιους για να υπερασπιστείς τον εαυτό σου.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20.	Έκανες κάποιους να εναντιωθούν προς κάποιο άλλον.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.	Μετέφερες όπλο ή μαχαίρι ή άλλου είδους αντικείμενο για να χρησιμοποιήσεις σε έναν καυγά.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22.	Θύμωσες ή χτύπησες κάποιους γιατί σε πείραζαν.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23.	Φώναξες για να εξαναγκάσεις κάποιους να κάνουν κάτι για σένα.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Achenbach System of Empirically Based Assessment - Youth Self Report

Παρακάτω υπάρχει ένας κατάλογος με συμπεριφορές παιδιών. Δίπλα από κάθε συμπεριφορά υπάρχουν τρεις επιλογές. Αφού σκεφτείς τη συμπεριφορά σου **όπως είναι τώρα ή τους τελευταίους 6 μήνες** κύκλωσε ένα μόνο αριθμό για κάθε ερώτηση με βάση τις παρακάτω οδηγίες:

καθόλου, κύκλωσε τον αριθμό **0**.

- Αν η συμπεριφορά σου **ταιριάζει κάπως ή μερικές φορές**, κύκλωσε τον αριθμό **1**.
- Αν η συμπεριφορά σου **ταιριάζει πολύ ή πολύ συχνά**, κύκλωσε τον αριθμό **2**.

Οι απαντήσεις σου είναι εμπιστευτικές. Είναι σημαντικό να απαντήσεις με ειλικρίνεια!

	Καθόλου/ Δεν ταιριάζει	Κάπως ή μερικές φορές	Πολύ ή πολύ συχνά
1. Συμπεριφέρομαι πολύ ανώριμα για την ηλικία μου	0	1	2
2. Πίνω αλκοόλ χωρίς την άδεια των γονιών μου	0	1	2
3. Είμαι πνεύμα αντιλογίας	0	1	2
4. Δεν καταφέρνω να τελειώσω κάτι που αρχίζω	0	1	2
5. Υπάρχουν πολύ λίγα πράγματα που με ευχαριστούν	0	1	2
6. Αγαπώ τα ζώα	0	1	2
7. Καυχίμαι, περηφανεύομαι	0	1	2
8. Δεν μπορώ να συγκεντρωθώ, δεν προσηλώνω την προσοχή μου για πολλή ώρα	0	1	2
9. Δεν μπορώ να βγάλω από το μυαλό μου ορισμένες σκέψεις, έμμονες ιδέες	0	1	2
10. Δεν μπορώ να σταθώ ακίνητος, είναι ανήσυχος, υπερκινητικός	0	1	2
11. Είμαι υπερβολικά εξαρτημένος από τους μεγάλους	0	1	2
12. Νιώθω μοναξιά	0	1	2
13. Νιώθω σύγχυση, σαν να είμαι χαμένος	0	1	2
14. Κλαίω πολύ	0	1	2
15. Είμαι πολύ ελκρινής	0	1	2
16. Είμαι σκληρός και μοχθηρός με τους άλλους	0	1	2
17. Ονειροπολώ πολύ	0	1	2
18. Προσπαθώ επιτηδες να τραυματιστώ ή να σκοτωθώ	0	1	2
19. Ζητώ πολλή προσοχή από τους άλλους	0	1	2
20. Καταστρέφω τα πράγματά μου	0	1	2
21. Καταστρέφω πράγματα που ανήκουν σε άλλους	0	1	2
22. Είμαι ανυπάκουος στους γονείς μου	0	1	2
23. Είμαι ανυπάκουος στο σχολείο	0	1	2
24. Δεν τρώω όσο καλά θα έπρεπε	0	1	2
25. Δεν τα πάω καλά με τα άλλα παιδιά	0	1	2
26. Δεν αισθάνομαι τύψεις όταν έχω κάνει κάτι που δεν θα έπρεπε	0	1	2
27. Ζηλεύω τους άλλους	0	1	2
28. Παραβαίνω τους κανόνες στο σπίτι, στο σχολείο ή αλλού	0	1	2
29. Φοβάμαι ορισμένα ζώα, καταστάσεις ή μέρη εκτός από το σχολείο	0	1	2
30. Φοβάμαι να πάω σχολείο	0	1	2
31. Φοβάμαι μήπως σκεφθώ ή κάνω κάτι κακό	0	1	2
32. Αισθάνομαι ότι πρέπει να είμαι τέλειος	0	1	2
33. Αισθάνομαι ότι κανείς δεν με αγαπά	0	1	2
34. Αισθάνομαι ότι οι άλλοι είναι εναντίον μου, ότι με έχουν βάλει στο μάτι	0	1	2
35. Αισθάνομαι ότι δεν αξίζω τίποτα, ότι είμαι κατώτερος	0	1	2
36. Τραυματίζομαι συχνά, παθαίνω εύκολα ατυχήματα	0	1	2
37. Μπλέκω σε πολλούς καυγάδες	0	1	2
38. Με πειράζουν πολύ οι άλλοι	0	1	2
39. Κάνω παρέα με παιδιά που μπλέκουν σε φασαρίες	0	1	2

40. Ακούω ήχους ή φωνές που οι άλλοι νομίζουν ότι δεν υπάρχουν	0	1	2
41. Ενεργώ χωρίς να σκεφθώ πρώτα	0	1	2
42. Προτιμώ να είμαι μόνος μου, παρά με άλλους	0	1	2
43. Λέω ψέματα, κάνω μικροαπάτες	0	1	2
44. Τρώω τα νύχια μου	0	1	2
45. Είμαι νευρικός, τα νεύρα μου είναι τεντωμένα	0	1	2
46. Μέρη του σώματος μου κάνουν νευρικές κινήσεις, συσπάσεις-τινάγματα	0	1	2
47. Βλέπω εφιάλτες	0	1	2
48. Δεν με συμπαθούν τα παιδιά	0	1	2
49. Μπορώ να κάνω ορισμένα πράγματα καλύτερα από τα άλλα παιδιά	0	1	2
50. Έχω πολλούς φόβους, είμαι αγχώδης	0	1	2
51. Αισθάνομαι ζαλάδες	0	1	2
52. Αισθάνομαι υπερβολικά ένοχος	0	1	2
53. Τρώω υπερβολικά	0	1	2
54. Αισθάνομαι υπερβολικά κουρασμένος χωρίς λόγο	0	1	2
55. Είμαι παχύς	0	1	2
56. Έχω σωματικά ενοχλήματα χωρίς γνωστή ιατρική αιτία:			
α. Διάφορους πόνους (εκτός από πονοκεφάλους ή πόνους στην κοιλιά)	0	1	2
β. Πονοκεφάλους	0	1	2
γ. Ναυτία, τάση για εμετό	0	1	2
δ. Προβλήματα με τα μάτια μου (όχι ότι φορώ γυαλιά)	0	1	2
ε. Εξανθήματα ή άλλα δερματικά προβλήματα	0	1	2
στ. Κοιλιακούς πόνους	0	1	2
ζ. Κάνω εμετούς	0	1	2
η. Άλλα	0	1	2
57. Επιτίθεμαι και κτυπώ τους άλλους	0	1	2
58. Τσιμπάω επίμονα το δέρμα μου ή άλλα μέρη του σώματός μου	0	1	2
59. Μπορώ να είμαι πολύ φιλικός	0	1	2
60. Μου αρέσει να δοκιμάζω καινούρια πράγματα	0	1	2
61. Είμαι κακός μαθητής	0	1	2
62. Είμαι αδέξιος, δεν έχω καλό συντονισμό	0	1	2
63. Προτιμώ να κάνω παρέα με μεγαλύτερα παιδιά	0	1	2
64. Προτιμώ να κάνω παρέα με μικρότερα παιδιά	0	1	2
65. Αρνούμαι να μιλήσω στους άλλους	0	1	2
66. Επαναλαμβάνω μερικές πράξεις ξανά και ξανά	0	1	2
67. Κάνω φυγές από το σπίτι	0	1	2
68. Φωνάζω πολύ, ουρλιάζω	0	1	2
69. Είμαι μυστικοπαθής, κρατώ πράγματα μέσα μου	0	1	2
70. Βλέπω πράγματα που οι άλλοι νομίζουν ότι δεν υπάρχουν	0	1	2
71. Δεν είμαι άνετος, ντροπιάζομαι εύκολα, αισθάνομαι εύκολα αμηχανία	0	1	2
72. Βάζω φωτιές	0	1	2
73. Πιάνουν τα χέρια μου, είμαι πολύ επιδέξιος	0	1	2
74. Μου αρέσει να κάνω επίδειξη	0	1	2
75. Είμαι πολύ ντροπαλός ή δειλός	0	1	2
76. Κοιμάμαι λιγότερο από τα άλλα παιδιά	0	1	2

77. Κοιμάμαι περισσότερο από άλλα παιδιά κατά τη διάρκεια της μέρας ή και της νύχτας	0	1	2
78. Είμαι απρόσεκτος, η προσοχή μου διασπάται εύκολα	0	1	2
79. Έχω προβλήματα λόγου	0	1	2
80. Υπερασπίζομαι τα δικαιώματά μου	0	1	2
81. Κλέβω από το σπίτι	0	1	2
82. Κλέβω από άλλα μέρη	0	1	2
83. Μαζεύω πράγματα που μου είναι άχρηστα	0	1	2
84. Κάνω πράγματα που οι άλλοι θεωρούν παράξενα	0	1	2
85. Έχω ιδέες που οι άλλοι θεωρούν παράξενες	0	1	2
86. Είμαι πεισματάρης	0	1	2
87. Η διάθεσή μου και τα συναισθήματά μου αλλάζουν ξαφνικά	0	1	2
88. Μου αρέσει να είμαι με άλλους	0	1	2
89. Είμαι καχύποπτος	0	1	2
90. Βρίζω, λέω βρομόλογα	0	1	2
91. Σκέφτομαι την αυτοκτονία	0	1	2
92. Μου αρέσει να κάνω τους άλλους να γελούν	0	1	2
93. Μιλώ πάρα πολύ	0	1	2
94. Πειράζω πολύ τους άλλους, είμαι πειραχτήρι	0	1	2
95. Αρπάζομαι εύκολα	0	1	2
96. Σκέφτομαι το σεξ πάρα πολύ	0	1	2
97. Απειλώ τους άλλους ότι θα τους κτυπήσω	0	1	2
98. Μου αρέσει να βοηθώ τους άλλους	0	1	2
99. Καπνίζω	0	1	2
100. Δυσκολεύομαι να κοιμηθώ	0	1	2
101. Κάνω σκασιαρχείο ή αδικαιολόγητες απουσίες	0	1	2
102. Δεν έχω πολλή ενέργεια	0	1	2
103. Είμαι δυστυχισμένος, θλιμμένος, μελαγχολικός	0	1	2
104. Κάνω πιο πολλή φασαρία από άλλα παιδιά	0	1	2
105. Κάνω χρήση ουσιών για μη ιατρικούς λόγους (μη συμπεριλάβεις το κάπνισμα ή το αλκοόλ)	0	1	2
106. Μου αρέσει να είμαι σωστός και δίκαιος με τους άλλους	0	1	2
107. Μου αρέσουν τα καλά αστεία	0	1	2
108. Μου αρέσει να κάνω τη ζωή μου εύκολη	0	1	2
109. Προσπαθώ να βοηθώ τους ανθρώπους όσο μπορώ	0	1	2
110. Θα ήθελα να ανήκω στο αντίθετο φύλο	0	1	2
111. Απομονώνομαι στον εαυτό μου, δεν κάνω σχέσεις με άλλους	0	1	2
112. Αγωνιά, είμαι αγχώδης	0	1	2

ΑΙΗΘ

ΠΑΡΑΚΑΛΩ ΔΙΑΒΑΣΤΕ ΚΑΘΕ ΠΕΡΙΣΤΑΤΙΚΟ ΟΠΩΣ ΠΕΡΙΓΡΑΦΕΤΑΙ ΠΙΟ ΚΑΤΩ ΚΑΙ ΠΡΟΣΠΑΘΕΙΣΤΕ ΝΑ ΦΑΝΤΑΣΤΕΙΤΕ ΟΤΙ ΣΥΜΒΑΙΝΕΙ ΣΕ ΕΣΑΣ.

Για κάθε σενάριο:

- Γράψτε έναν σύντομο λόγο για τον οποίο εσείς πιστεύετε ότι συμβαίνει.
- Βαθμολογείστε κατά πόσον το άτομο στην ιστορία ενέργησε εσκεμμένα με αυτό τον τρόπο απέναντί σας.
- Βαθμολογείστε πόσο θυμωμένους θα σας έκανε να νιώθετε
- Βαθμολογείστε πόσο θα κατηγορούσατε το άλλο άτομο.
- Περιγράψτε πως θα ενεργούσατε σε κάθε περίπτωση.

ΠΑΡΑΚΑΛΩ ΜΗΝ ΑΠΑΝΤΗΣΕΤΕ «Δεν Ξέρω» ΑΛΛΑ ΠΡΟΣΠΑΘΕΙΣΤΕ ΝΑ ΠΕΡΙΓΡΑΨΕΤΕ ΤΗΝ ΑΝΤΙΔΡΑΣΗ ΣΑΣ ΣΕ ΚΑΘΕ ΠΕΡΙΣΤΑΣΗ.

1. Κάποιος μπαίνει μπροστά σου στη γραμμή στην υπεραγορά και σου λέει «Βιάζομαι».

A. Ποιος πιστεύεις ότι είναι ο πραγματικός λόγος που μπήκε μπροστά σου στη γραμμή;

B. Πιστεύεις ότι αυτό το άτομο μπήκε μπροστά σου επίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι μπήκε μπροστά σου;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

2. Ένας φίλος σου γλιστρά σε σφουγγαρισμένο δάπεδο και σε ρίχνει και σένα κάτω.

A. Ποιός πιστεύεις ότι είναι ο πραγματικός λόγος που σε έριξε κάτω;

B. Πιστεύεις ότι ο φίλος σου σε έριξε κάτω επίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι σε έριξε κάτω;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

3. Φοιτάς σε ένα νεο σχολείο εδώ και τρεις βδομάδες. Μια μέρα, βλέπεις έναν/μια από τους νέους από τους/τις συμμαθητές/τριες στο δρόμο. Τον/την πλησιάζεις για να του/της πεις «γεια» αλλά εκείνος/η περνά από δίπλα σου χωρίς να σου μιλήσει.

A. Ποιος πιστεύεις ότι είναι ο πραγματικός λόγος που ο/η συμμαθητής πέρασε από δίπλα σου χωρίς να σου μιλήσει;

B. Πιστεύεις ότι ο/η συμμαθητής σου δεν σου μίλησε εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι πέρασε από δίπλα σου χωρίς να σου μιλήσει;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

4. Καθώς περπατάς έξω στη βροχή, ένα αυτοκίνητο στρίβει απότομα για να αποφύγει ένα άλλο, πέφτει μέσα σε μια λακούβα με νερό και σε καταβρέχει.

A. Ποιος πιστεύεις ότι είναι ο πραγματικός λόγος που το αυτοκίνητο σε κατάβρεξε;

B. Πιστεύεις ότι ο οδηγός του αυτοκινήτου σε έβρεξε εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα νιώθατε;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες τον οδηγό για το ότι σε κατάβρεξε;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

5. Έχεις κανονίσει πας σπίτι του/της φίλου/ης σου. Όταν φτάνεις στο σπίτι του/της, η μητέρα του/της σε ενημερώνει ότι δεν είναι μέσα και ότι έχει βγει έξω με φίλους.

A. Ποιος πιστεύεις είναι ο πραγματικός λόγος που το άτομο δεν τήρησε το ραντεβού;

B. Πιστεύεις ότι το άτομο το έκανε εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένιωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι δεν τήρησε το ραντεβού;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

6. Βρίσκεσαι στο λεωφορείο και κάθεσαι στο διάδρομο. Κάποιος μπαίνει στο λεωφορείο στην επόμενη στάση, περπατά καθώς κινείται το λεωφορείο και σου πατά το πόδι σου.

A. Ποιος πιστεύεις είναι ο πραγματικός λόγος που το άτομο πάτησε το πόδι σου;

B. Πιστεύεις ότι το άτομο σε πάτησε εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένιωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι σε πάτησε;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

7. Βρίσκεσαι σε μια καφετέρια με τους φίλους σου, και κάποιοι έφηβοι στο διπλανό τραπέζι βάζουν πολύ δυνατή μουσική στο κινητό τους. Τους ζητάς να την χαμηλώσουν. Μετά από δεκαπέντε λεπτά, ξαναβάζουν τη μουσική πολύ δυνατά.

A. Ποιος πιστεύεις είναι ο πραγματικός λόγος που ξαναδυνάμωσαν τη μουσική;

B. Πιστεύεις ότι ξαναδυνάμωσαν την μουσική εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα τους κατηγορούσες για το ότι ξαναδυνάμωσαν τη μουσική;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

8. Την ώρα που περνάς δίπλα από κάποιος έφηβους στην αυλή του σχολείου, τους ακούς να γελούν.

A. Ποιος πιστεύεις είναι ο πραγματικός λόγος που οι έφηβοι άρχισαν να γελούν μόλις πέρασες από δίπλα τους;

B. Πιστεύεις ότι οι έφηβοι άρχισαν να γελούν εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες τους έφηβους για το ότι άρχισαν να γελούν;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

9. Καθώς περπατάς στον διάδρομο του σχολείου, ένας άλλος μαθητής, ερχόμενος από απέναντι, πετάγεται μπροστά σου και σου κόβει τον δρόμο.

A. Ποιος πιστεύεις είναι ο πραγματικός λόγος ο μαθητής σου έκοψε τον δρόμο;

B. Πιστεύεις ότι σου έκοψε τον δρόμο εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες τον μαθητή για το ότι σου έκοψε τον δρόμο;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

10. Θα συναντούσες έναν φίλο σε μια καφετέρια αλλά αυτός/αυτή δεν έρχεται

A. Ποιος πιστεύεις είναι ο πραγματικός λόγος που σε «έστησε»;

B. Πιστεύεις ότι δεν ήρθε εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες τον φίλο για το ότι δεν ήρθε;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

11. Έχει ώρα που ψάχνεις για κάθισμα στο σινεμά και βρίσκεις ένα λίγα μέτρα παρακάτω. Προχωράς προς την θέση, αλλά κάποιος σε προσπερνά και κάθεται πρώτος.

A. Ποιός πιστεύεις ότι είναι ο πραγματικός λόγος που το άλλο άτομο σου πήρε τη θέση;

B. Πιστεύεις ότι σου πήρε τη θέση εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι σου πήρε την θέση;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

12. Χορεύεις σε ένα κέντρο και κάποιος πέφτει πάνω σου.

A. Ποιός πιστεύεις ότι είναι ο πραγματικός λόγος που ο άλλος έπεσε πάνω σου;

B. Πιστεύεις ότι έπεσε πάνω σου εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι έπεσε πάνω σου;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

13. Τηλεφωνάς σε ένα/μία φίλο/η και αφήνεις μήνυμα στον τηλεφωνητή, ζητώντας του/της να σε πάρει πίσω. Έχει περάσει μια βδομάδα αλλά ακόμα να σου τηλεφωνήσει.

A. Ποιος πιστεύεις ότι είναι ο πραγματικός λόγος που δεν σου τηλεφώνησε;

B. Πιστεύεις ότι ο/η φίλος/η σου δεν σε πήρε πίσω εξεπίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένοιωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες τον/την φίλο/η σου για το ότι δεν σε πήρε τηλέφωνο;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

14. Παρακολουθείς έναν ποδοσφαιρικό αγώνα και πίνεις το ποτό σου. Ξαφνικά η μια ομάδα βάζει γκολ και όλοι γύρω σου αρχίζουν να πανηγυρίζουν. Κάποιος σε σπρώχνει στον ώμο και το ποτό σου χύνεται στα ρούχα σου.

A. Ποιος πιστεύεις ότι είναι ο πραγματικός λόγος που ο άλλος σε έσπρωξε στον ώμο;

B. Πιστεύεις ότι αυτό το άτομο σε έσπρωξε επίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένοιωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι έσπρωξε;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

15. Μια μέρα πριν από ένα ραντεβού εκείνος/η τηλεφωνά και το ακυρώνει. Είναι η τρίτη φορά στη σειρά που αυτό το άτομο έχει ακυρώσει το ραντεβού σας.

A. Ποιος πιστεύεις ότι είναι ο πραγματικός λόγος που το άτομο ακύρωσε το ραντεβού σας;

B. Πιστεύεις ότι αυτό το άτομο ακύρωσε το ραντεβού επίτηδες;

1	2	3	4	5	6
Σίγουρα όχι	Πιθανότατα όχι	Μπορεί όχι	Μπορεί ναι	Πιθανότατα ναι	Σίγουρα ναι

Γ. Πόσο θυμωμένος/η θα ένιωθες;

1	2	3	4	5
Καθόλου Θυμωμένος/η				Πολύ Θυμωμένος/η

Δ. Πόσο θα κατηγορούσες το άτομο για το ότι ακύρωσε το ραντεβού;

1	2	3	4	5
Καθόλου				Πάρα πολύ

E. Πώς θα αντιδρούσες;

Examples of the Mill-Hill Vocabulary Scale (adapted in Greek)

Mill Hill Κλίμακα Λεξιλογίου

ΣΕΤ Α:

Γράψε με λίγα λόγια το νόημα καθεμιάς από τις πιο κάτω λέξεις. Αν δεν ξέρεις το νόημα μιας λέξης, βάλε ένα ερωτηματικό δίπλα της και προχώρα στην επόμενη. Η πρώτη έχει ερμηνευτεί για σένα ως παράδειγμα.

		Βαθμός
1. Σκούφος	Ένα είδος καπέλου	
2. Καρβέλι	
3. Δυστυχισμένος	
4. Φοβισμένος	

ΣΥΝΟΛΙΚΟ ΣΕΤ Α:

(Μέγιστο = 44)

ΣΕΤ Β: ΠΟΛΛΑΠΛΗ ΕΠΙΛΟΓΗ

Σε κάθε ομάδα έξι λέξεων πιο κάτω, μαύρισε προσεχτικά τον κύκλο Ο δίπλα από τη λέξη που είναι η πιο κοντινή στο νόημα με τη λέξη με έντονα γράμματα. Βεβαιώσου ότι μαύρισες έναν κύκλο μόνο. Αν κάνεις λάθος, βάλε ένα Χ πάνω από αυτή την απάντηση και μαύρισε το σωστό κύκλο. Αν δεν ξέρεις την απάντηση, μάντεψε ή προχώρα στην επόμενη ερώτηση. Η πρώτη λέξη έχει ήδη συμπληρωθεί ως παράδειγμα για σένα. Προχώρα από πάνω προς τα κάτω σε όλες τις στήλες.

1. Ντομάτα		2. Ρίχνω		3. Υγρός	
<input type="radio"/> μύγα	<input type="radio"/> ρωγμή	<input type="radio"/> πετώ	<input type="radio"/> πιάνω	<input type="radio"/> απαλός	<input type="radio"/> μπουκάλι
<input type="radio"/> ξύλο	<input type="radio"/> τούβλο	<input type="radio"/> κρύβω	<input type="radio"/> κυλώ	<input type="radio"/> γλυκός	<input type="radio"/> μαντήλι
<input type="radio"/> λαχανικό	<input type="radio"/> βήμα	<input type="radio"/> βουτώ	<input type="radio"/> τραβώ	<input type="radio"/> βρεγμένος	<input type="radio"/> νερό
↓		↓		↓	
4. Ξεκουράζομαι		5. Απάνθρωπος		6. Λαμβάνω	
<input type="radio"/> κλαίω	<input type="radio"/> τραγουδώ	<input type="radio"/> καθαρός	<input type="radio"/> φιλόζωος	<input type="radio"/> περπατώ	<input type="radio"/> δέχομαι
<input type="radio"/> φεύγω	<input type="radio"/> γεύομαι	<input type="radio"/> ωραίος	<input type="radio"/> φτιαχτός	<input type="radio"/> πιστεύω	<input type="radio"/> αδειάζω
<input type="radio"/> υψώνω	<input type="radio"/> αναπαύομαι	<input type="radio"/> εργατικός	<input type="radio"/> άσπλαχνος	<input type="radio"/> πληρώνομαι	<input type="radio"/> οδηγώ

ΣΥΝΟΛΙΚΟ ΣΕΤ Α:

(Μέγιστο = 44)

Ερωτηματολόγιο ΤΕΙQue

Οδηγίες: Παρακάτω υπάρχει ένας κατάλογος με διάφορες δηλώσεις. Παρακαλώ απαντήστε κυκλώνοντας τον αριθμό που δηλώνει πόσο πολύ συμφωνείτε ή διαφωνείτε με την κάθε πρόταση, σε σχέση με τον εαυτό σας. Αν **διαφωνείτε** απόλυτα με μια πρόταση, **κυκλώστε ένα αριθμό κοντά στο 1**. Αν **συμφωνείτε** απόλυτα με μια πρόταση, **κυκλώστε ένα αριθμό κοντά στο 7**. Αν δεν είστε σίγουροι για το αν συμφωνείτε ή διαφωνείτε, κυκλώστε ένα αριθμό κοντά στο 4. Εργαστείτε γρήγορα, αλλά προσεχτικά. Δεν υπάρχουν σωστές ή λανθασμένες απαντήσεις.

1.....2.....3.....4.....5.....6.....7

Διαφωνώ Απόλυτα

Συμφωνώ Απόλυτα

1 2 3 4 5 6 7

Διαφωνώ Απόλυτα

Συμφωνώ Απόλυτα

1. Μου είναι εύκολο να μιλάω για τα συναισθήματα μου σε άλλους ανθρώπους.	1	2	3	4	5	6	7
2. Συχνά δυσκολεύομαι να δω τα πράγματα από την μεριά του άλλου.	1	2	3	4	5	6	7
3. Είμαι άνθρωπος με κίνητρα.	1	2	3	4	5	6	7
4. Δυσκολεύομαι να ελέγξω τα συναισθήματα μου.	1	2	3	4	5	6	7
5. Η ζωή μου δεν είναι ευχάριστη.	1	2	3	4	5	6	7
6. Είμαι κοινωνικός με τους συμμαθητές μου.	1	2	3	4	5	6	7
7. Αλλάζω συχνά γνώμη.	1	2	3	4	5	6	7
8. Δυσκολεύομαι να καταλάβω τι ακριβώς νιώθω.	1	2	3	4	5	6	7
9. Αισθάνομαι καλά με την εμφάνιση μου.	1	2	3	4	5	6	7
10. Δυσκολεύομαι να υπερασπιστώ τα δικαιώματα μου.	1	2	3	4	5	6	7
11. Μπορώ να κάνω τους ανθρώπους να νιώθουν καλύτερα όταν θέλω.	1	2	3	4	5	6	7
12. Κάποιες φορές νιώθω ότι η ζωή μου θα είναι δυσάρεστη.	1	2	3	4	5	6	7
13. Μερικοί παραπονιούνται κάποιες φορές ότι τους μεταχειρίζομαι άσχημα.	1	2	3	4	5	6	7
14. Δυσκολεύομαι να τα καταφέρω όταν αλλάζουν τα πράγματα στη ζωή μου.	1	2	3	4	5	6	7
15. Μπορώ να αντιμετωπίσω το άγχος.	1	2	3	4	5	6	7
16. Δεν ξέρω πως να δείξω στους κοντινούς μου ανθρώπους ότι τους νοιάζομαι.	1	2	3	4	5	6	7
17. Μπορώ να μπω στη θέση του άλλου και να καταλάβω πως νιώθει.	1	2	3	4	5	6	7
18. Δυσκολεύομαι να βρίσκω κίνητρα.	1	2	3	4	5	6	7
19. Μπορώ να ελέγξω το θυμό μου όταν θέλω.	1	2	3	4	5	6	7
20. Είμαι ευτυχισμένος με τη ζωή μου.	1	2	3	4	5	6	7
21. Θα περιέγραφα τον εαυτό μου ως καλό μεσολαβητή.	1	2	3	4	5	6	7
22. Κάποιες φορές μπλέκομαι σε καταστάσεις που θα προτιμούσα να μην είχα εμπλακεί.	1	2	3	4	5	6	7
23. Δίνω μεγάλη προσοχή στα συναισθήματα μου.	1	2	3	4	5	6	7
24. Αισθάνομαι καλά με τον εαυτό μου.	1	2	3	4	5	6	7
25. Συνηθίζω να κάνω πίσω έστω και αν έχω δίκαιο.	1	2	3	4	5	6	7
26. Δεν μπορώ να αλλάξω τον τρόπο που αισθάνονται οι άλλοι.	1	2	3	4	5	6	7
27. Πιστεύω ότι τα πράγματα θα εξελιχθούν καλά στη ζωή μου.	1	2	3	4	5	6	7
28. Κάποιες φορές εύχομαι να είχα καλύτερες σχέσεις με τους γονείς μου.	1	2	3	4	5	6	7
29. Προσαρμόζομαι εύκολα σε καινούριες συνθήκες.	1	2	3	4	5	6	7
30. Προσπαθώ να ελέγγω τη σκέψη μου και να μην ανησυχώ πάρα πολύ για όσα συμβαίνουν γύρω μου.	1	2	3	4	5	6	7

Appendix C

Table 1. Examples of filler and experimental texts (critical sentences appear in italics)

Filler Text	
	<p>Ο Γιάννης βρισκόταν στο περίπτερο της γειτονιάς του, γιατί ήθελε να αγοράσει παγωτό. Καθώς προσπαθούσε να αποφασίσει ποιά ακριβώς παγωτό θα αγόραζε, ένιωσε ένα άγγιγμα στον ώμο του.</p> <p>Γύρισε και είδε τον παλιό του συμμαθητή και διπλανό, τον Κώστα. Ξαφνιάστηκε, γιατί ο Κώστας είχε μετακομίσει σε άλλη πόλη πριν από ένα χρόνο και δεν τον είχε ξαναδεί από τότε.</p> <p>Ο Γιάννης χάρηκε πολύ που τον ξαναείδε και τον ρώτησε πως περνά.</p> <p>Ο Κώστας του εξήγησε με χαρά ότι μόλις μετακόμισε πίσω στην παλιά του γειτονιά. Αμέσως αντάλλαξαν τηλεφώνια και υποσχέθηκαν να ξαναβρεθούν σύντομα.</p>
Consistent Text Versions	
Mild protagonist reaction	
Mild protagonist description	<p>Ο Σωκράτης άνηκε σε μια ερασιτεχνική ομάδα ποδοσφαίρου για εφήβους.</p> <p><i>Ήταν πολύ φιλικός με όλους και γι' αυτό είχε αποκτήσει πολλούς φίλους.</i></p> <p>Έκαναν προπόνηση σχεδόν κάθε απόγευμα, ενώ μερικές φορές προπονούνταν και τα Σαββατοκύριακα.</p> <p>Εκείνο το απόγευμα έπαιζαν ενάντια σε μια άλλη ομάδα εφήβων.</p> <p>Ο αντίπαλος παίχτης κλώτσησε την μπάλα πολύ δυνατά και κτύπησε στο δοκάρι με αποτέλεσμα να κτυπήσει τον Σωκράτη στην κοιλιά.</p> <p>Ο Σωκράτης έπεσε κάτω κρατώντας την κοιλιά του.</p> <p><i>Μετά από ένα λεπτό σηκώθηκε πάνω λέγοντας πως είναι καλά.</i></p>
Hostile Protagonist Reaction	
Hostile protagonist description	<p>Η Δέσποινα ήταν 14 ετών και φοιτούσε στην Γ΄ Γυμνασίου.</p> <p><i>Είχε την τάση να θυμώνει πολύ εύκολα και να αντιδρά με όλους.</i></p> <p>Μια μέρα οι φίλες της κανόνισαν να πάνε σε μια συναυλία και κάλεσαν και τη Δέσποινα.</p> <p>Η Δέσποινα ήθελε πολύ να πάει γιατί θα τραγουδούσε ο αγαπημένος της τραγουδιστής.</p> <p>Σκεφτόταν τι θα φορέσει και αποφάσισε ότι θα έβαζε το καινούριο της φόρεμα.</p> <p>Όταν ανακοίνωσε της μητέρας της ότι θα έβγαινε το βράδυ, η μητέρα της, της είπε ότι δεν μπορεί να ξενυχτήσει γιατί την επόμενη μέρα είχε διαγώνισμα.</p> <p><i>Η Δέσποινα ξέσπασε με φωνές προς τη μητέρα της και έριξε ένα ποτήρι κάτω, σπάζοντας το.</i></p>
Inconsistent Text Versions	
Hostile Protagonist Reaction	
Mild protagonist description	<p>Ο Αντρέας βρισκόταν σε ένα πάρτι γενεθλίων μαζί με τους φίλους του.</p> <p><i>Ο Αντρέας ήταν πάντοτε ήσυχος και συζητούσε ήρεμα με τους φίλους του.</i></p> <p>Ήταν το τέλος της σχολικής χρονιάς και συζητούσαν για την επιλογή προορισμού για την τελευταία εκδρομή.</p> <p>Ο διευθυντής του σχολείου, τους είχε επιτρέψει να επιλέξουν εκείνοι το μέρος για την εκδρομή, αφού ήταν και τελειόφοιτοι.</p> <p>Ο Αντρέας εξέφρασε την άποψη ότι θα πρέπει να πάνε στο βουνό.</p> <p>Ο συμμαθητής του, του απάντησε ότι διαφωνεί και ότι αυτό που λέει δε βγάζει νόημα.</p> <p><i>Ο Αντρέας θύμωσε και έσπρωξε τον συμμαθητή του, ρίχνοντάς τον κάτω.</i></p>
Mild protagonist reaction	
Hostile protagonist description	<p>Η Κατερίνα θα έβγαινε έξω με την φίλη της την Έφη για φαί.</p> <p><i>Είχε την τάση να τσακώνεται συχνά με τις φίλες της και να γίνεται επιθετική με το παραμικρό.</i></p> <p>Εκείνο το βράδυ φόρεσε την καινούρια της μπλούζα, την οποία είχε αγοράσει εκείνο το πρωί.</p> <p>Έφτασε στο εστιατόριο πριν την φίλη της και κάθισε στο τραπέζι.</p> <p>Όταν το γκαρσόνι πλησίασε για την παραγγελία, η Κατερίνα του ζήτησε να έρθει ξανά σε λίγο.</p> <p>Μόλις έφτασε η Έφη, πρόσεξε την καινούρια μπλούζα της Κατερίνας και σχολίασε λέγοντας ότι την “δανείστηκε από τη γιαγιά της”.</p> <p><i>Η Κατερίνα γέλασε με το σχόλιο και ετοιμάστηκε να παραγγείλει.</i></p>

Appendix D

Table 2. Descriptive Statistics and correlations between aggression related measures (N=116).

Measures	1	2	3	4	5	6	7	8
1.Reactive Aggression (RPQ)	-							
2.Proactive Aggression (RPQ)	.67**	-						
3.Composite Blame Mean (AIHQ)	.23*	.31**	-					
4.Composite Ambiguous Mean (AIHQ)	.24**	.28**	.89**	-				
5.Composite Accidental Mean (AIHQ)	.16	.37**	.77**	.52**	-			
6.Composite Ambiguous-Accidental Mean (AIHQ)	.24*	.36**	.96**	.90**	.84**	-		
7.TEI	-.21*	-.25**	-.23*	-.27**	-.10	-.22*	-	
8.Aggressive Behavior (YSR)	.47**	.50**	.13	.18	.14	.18*	-.28**	-
Mean	8.76	1.30	2.99	3.14	2.40	2.77	4.74	8.07
SD	4.10	1.09	.65	.88	.70	.68	.76	5.00

Note. *p < .05; **p < .01.

Table 3. Descriptive statistics and correlations between Reading times, aggression measures and ability related measures (N=116).

	Reading Times				
	Filler Text	Consistent Mild Text	Consistent Hostile Text	Inconsistent Mild/Hostile Text	Inconsistent Hostile/Mild Text
Reactive Aggression (RPQ)	-.10	-.18	-.18	-.17	-.14
Proactive Aggression (RPQ)	-.13	-.20*	-.20*	-.22*	-.13
Composite Ambiguous-Accidental Mean (AIHQ)	-.05	-.04	-.04	-.01	.05
TEI	-.04	.06	.03	.04	-.08
Mill Hill	-.22*	-.15	-.25**	-.18	-.21*
Mean	151.36	150.5	154.61	145.32	162.33
SD	54.19	53.2	55.15	47.36	53.11

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

Table 4. Mean Reading Times for Consistent and Inconsistent texts by Reactive and Proactive Aggression levels (N = 116).

	Consistent Texts		Inconsistent Texts		N
	M	SD	M	SD	
Reactive Aggression					
Lower	159.30	48.83	160.77	46.11	58
Higher	146.68	55.47	147.64	49.73	58
Proactive Aggression					
Lower	161.53	50.92	162.85	48.05	55
Higher	145.29	52.96	146.41	47.37	61
Total	152.99	52.41	154.21	48.20	116

Table 5. Mean Reading times for Mild and Hostile texts by Reactive and Proactive Aggression levels (N = 116).

Consistent Texts					
	Mild Text Reading Times		Hostile Text Reading Times		
	M	SD	M	SD	N
Reactive Aggression					
Lower	155.83	48.20	161.80	52.27	58
Higher	145.15	57.77	147.43	57.44	58
Proactive Aggression					
Lower	158.83	50.30	163.62	54.72	55
Higher	142.96	55.09	146.50	54.71	61
Total	150.49	53.24	154.61	55.15	116

Table 6. Mean Reading Times by Mill Hill performance (N = 116).

Consistent Texts				
	Mild Text Reading Times		Hostile Text Reading Times	
Mill Hill	M	SD	M	SD
Lower	155.67	58.11	165.76	58.63
Higher	145.13	47.60	143.08	49.19
Total	150.49	53.24	154.61	55.15

Table 7. Mean Reading times for Inconsistent Texts by Reactive and Proactive Aggression levels (N = 116).

Inconsistent Texts					
	Mild-Hostile Reading Times		Hostile-Mild Reading Times		
	M	SD	M	SD	N
Reactive Aggression					
Lower	153.03	45.21	168.64	50.93	58
Higher	137.60	48.58	156.02	54.91	58
Proactive Aggression					
Lower	157.28	46.64	168.56	52.28	55
Higher	134.53	45.73	156.72	53.65	61
Total	145.32	37.36	162.33	53.11	116

Table 8. Mean Reading Times for Sentences 2 and 7 by Text Type (N = 116).

	Consistent Mild Text		Consistent Hostile Text		Inconsistent Mild-Hostile Text		Inconsistent Hostile-Mild Text	
	M	SD	M	SD	M	SD	M	SD
Sentence 2	159.39	63.81	164.09	69.99	159.65	65.16	173.30	73.96
Sentence 7	130.93	60.71	130.62	47.65	112.35	41.72	147.13	60.10

Table 9. Mean Reading Times for Sentences 2 & 7 by Composite Ambiguous/Accidental Mean (AIHQ) level and Text Type (N = 116).

Text Type		AIHQ Level					
		Lower		Higher		Total	
		M	SD	M	SD	M	SD
Consistent Mild	Sentence 2	160.14	60.74	158.63	67.38	159.40	63.81
	Sentence 7	139.84	64.43	121.70	55.65	130.93	60.70
	Total	153.91	55.80	146.95	50.70		
Consistent Hostile	Sentence 2	172.55	72.53	155.34	66.78	164.09	69.99
	Sentence 7	130.36	47.95	130.89	47.76	130.62	47.65
	Total	157.23	58.70	151.91	51.60		
Inconsistent Mild-Hostile	Sentence 2	168.74	59.58	150.23	59.39	159.65	65.16
	Sentence 7	111.04	39.55	113.71	44.16	112.35	41.72
	Total	147.93	48.01	142.61	46.94		
Inconsistent Hostile-Mild	Sentence 2	169.81	77.44	176.92	70.68	173.30	73.96
	Sentence 7	149.04	60.69	145.15	59.96	147.13	60.10
	Total	159.27	55.23	165.50	51.11		
N		59		57		116	

Table 10. Mean Reading Times for Sentences 2 & 7 by Reactive Aggression level and Text Type (N = 116).

Text Type		Reactive Aggression					
		Lower		Higher		Total	
		M	SD	M	SD	M	SD
Mild							
Sentence 2		163.28	57.29	155.51	70.02	159.39	63.81
Sentence 7		134.42	55.92	127.44	65.43	130.93	60.70
Hostile							
Sentence 2		168.13	63.10	160.06	76.62	164.09	69.99
Sentence 7		136.80	47.97	124.45	46.93	130.62	47.65
Mild-Hostile							
Sentence 2		176.48	61.42	142.81	64.94	159.65	65.16
Sentence 7		118.88	39.50	105.81	43.17	112.35	41.72
Hostile-Mild							
Sentence 2		186.99	72.37	159.62	73.61	173.30	73.96
Sentence 7		151.78	62.77	142.48	57.48	147.13	60.10
N		58		58		116	

Table 11. Mean Reading times for Sentences 2 & 7 by Proactive Aggression level and Text Type (N = 116).

Text Type	Proactive Aggression				Total	
	Lower		Higher		M	SD
	M	SD	M	SD	M	SD
Mild						
Sentence 2	167.83	59.87	151.79	66.74	159.39	63.81
Sentence 7	141.81	62.02	121.12	58.25	130.93	60.71
Hostile						
Sentence 2	174.99	68.40	154.26	70.51	164.09	69.99
Sentence 7	140.63	46.67	121.60	47.09	130.62	47.65
Mild-Hostile						
Sentence 2	182.41	62.21	139.16	61.24	159.65	65.16
Sentence 7	120.45	41.16	105.04	41.19	112.35	41.72
Hostile-Mild						
Sentence 2	185.73	71.04	162.10	75.32	173.30	73.96
Sentence 7	157.32	66.94	137.94	52.06	147.13	60.10
N	55		61		116	

Table 12. Simple regression analyses predicting Reactive and Proactive Aggression (N=116).

Variable	Reactive Aggression			Proactive Aggression		
	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>B</i>	<i>SE B</i>	β
Trait Emotional Intelligence	-1.12	.49	-.21*	-.36	.13	-.25*
<i>R</i> ²	.04			.06		
<i>F</i>	5.19*			7.57*		

p* < .05. *p* < .01.

Table 13. Simple regression analyses predicting Reactive and Proactive Aggression (N=116).

Variable	Reactive Aggression			Proactive Aggression		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Mill Hill	-0.53	.03	-.14	-.021	.01	-.21*
<i>R</i> ²	.02			.05		
<i>F</i>	2.42			5.37*		

p* < .05. *p* < .01.