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Automatic Activation of Adolescents' Peer-Relational Schemas: Evidence From Priming With Facial Identity

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This study provides experimental evidence for automatic, relationship-specific social information processing in 13-year-old adolescents. Photographs of participants' liked, disliked, and unknown peers were used as primes in an affective priming task with happy and angry facial expression probes and in a hypothetical vignette task. For the affective priming, reaction times were faster for congruent than for incongruent prime – probe pairs when the prime visibility was high and the prime – probe stimulus onset asynchrony was long. In the vignette task, participants attributed more hostility toward the protagonist, experienced more anger, and were more likely to retaliate when the disliked peer served as a prime. It is concluded that peer-relational schemas and related affect are activated automatically upon perception of a peer.

The social information processing (SIP) model (Dodge, 1986; reformulated by Crick & Dodge, 1994), has been one of the most influential theoretical models used to explain the behaviors of children and adolescents. According to the model, children enter social situations with relatively stable knowledge structures, such as social schemas, that guide online processing of situational cues. The online processing involves encoding and interpretation of cues, clarification of goals for the situation, response access, and finally, response decision. The present study was designed to address three issues that have received extensive attention in the literature but have rarely been studied empirically: (a) automaticity, (b) relationship specificity, and (c) emotional aspects of SIP.

The SIP model has been often used as a heuristic to explain the development of adversities in the peer group, such as aggression and rejection by other peers. For instance, several studies have shown that aggressive and rejected children are inclined to interpret intentions of others as hostile (e.g., Dodge, 1980; Dodge, Murphy, & Buchsbaum, 1984) and generate aggressive problem-solving strategies (Dorsch & Keane, 1994). Most of SIP is proposed to take place in an automatic fashion; that is, it cannot be inhibited. However, although Crick and Dodge (1994, p. 79) acknowledged the importance of incorporating "techniques for assessing automatic processes (using measures such as response time and assessment of priming effects)" to study social behaviors, research testing the SIP model has mainly relied on reflective measures and has thus not tested the automaticity assumption (Orobio de Castro, 2004; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Usually, hypothetical vignettes are presented to children, followed by questions assessing different SIP steps. Although some studies have aimed at differentiating automatic versus more reflective information processing by instructing children to respond immediately or after waiting for a while prior to giving the response (Orobio de Castro, Bosch, Veerman, & Koops, 2003; Rabiner, Lenhart, & Lochman, 1990), studies actually tapping online processing are practically nonexistent.

Second, the authors of the SIP model stressed the importance of considering social context when studying social cognitions (see Crick & Dodge, 1994). For instance, Feldman and Dodge (1987) found that differences between low- and high-status children with regard to SIP were evident only in a teasing situation,

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providing support for the Person × Situation approach. However, with some exceptions, most of the earlier studies did not explicitly focus on studying contextual effects. More recent studies have demonstrated the role of the dyadic context in social-cognitive evaluations and behaviors (e.g., Card & Hodges, 2007; Hubbard, Dodge, Cillessen, Coie, & Schwartz, 2001; Ray & Cohen, 1997). For instance, Hubbard et al. (2001) showed that boys in mutually aggressive dyads attributed more hostility to each other than boys in randomly selected dyads. Burgess, Wojslawowicz, Rubin, Rose-Krasnor, and Booth-LaForce (2006) found that SIP was different in the friendship context as compared with other interaction partners. A conceivable explanation is that over time children have not only developed a general representation of their age-mates (Rudolph, Hammen, & Burge, 1995; Salmivalli, Ojanen, Haanpää, & Peets, 2005) but also representations specific to each peer and relationship.

The notion of relationship specificity is captured by mental structures called relational schemas, which ''include images of self and others, along with a script for an expected pattern of interaction, derived through generalization from repeated similar interpersonal experiences'' (Baldwin, 1992, p. 462). When children interact with different peers, peer-relational schemas are likely to be activated, influencing SIP. Moreover, not only social cognitions but also behaviors vary across different dyadic contexts. For instance, Card and Hodges (2007) demonstrated that although victimization occurs within friendship dyads, it is not as common as victimization in relationships characterized by mutual dislike (6.8% vs. 35%, respectively). Clear relationship effects on social cognitions can be found in middle childhood and adolescence: Social information is processed differently depending on the relationship partner (Peets, Hodges, Kikas, & Salmivalli, 2007). This supports the notion (Harter, Waters, & Whitesell, 1998) that the general view of peers develops during childhood and gets more fine-grained with age and experience. In contrast, younger children are not yet sensitive to different contexts. For instance, McDowell, Parke, and Spitzer (2002) found no context (i.e., whether they were with their mother, father, or a peer) effects on kindergarten children's goals and strategies.

Belongingness to the peer group also becomes increasingly important during middle childhood and early adolescence. Rejection by peers is associated with adjustment problems (for a review, see Parker & Asher, 1987), and it tends to be extremely stable (e.g., Coie, 1990), even when the child's behaviors change. The rejected status of a child is likely to be maintained through social-cognitive processes that are congruent with the affect felt toward him or her. For instance, the child's positive behavior might be attributed to unstable causes and negative behavior to stable dispositions (Hymel, 1986). Even if the original reasons for disliking the child (such as aggressiveness) do not exist any more, representations of the child and affect felt toward him or her by other peers might persist. It is likely that such affect-congruent social cognitions become automatized over the course of time and increase the likelihood of maintaining the rejected status of a child.

Third, although Crick and Dodge (1994) regarded emotions as an integral part of SIP, Lemerise and Arsenio (2000) integrated emotional processes into the SIP model more explicitly and thoroughly by suggesting that both experienced and perceived emotions influence interpretation of social information. This argument is supported by empirical findings. Negative emotional feelings induce or exacerbate attribution of hostility (Dodge & Somberg, 1987; Orobio de Castro, Slot, Bosch, Koops, & Veerman, 2003) and increase the likelihood of making more stereotypic judgments and relying on simple heuristic cues (Bodenhausen, Sheppard, & Kramer, 1994). Furthermore, others' emotional expressions influence SIP. For example, children attribute more hostile intent to angry provocateurs than to sad or happy provocateurs in hypothetical social situations (Lemerise, Gregory, & Fredstrom, 2005). Lemerise and Arsenio also suggested that the affective nature of the relationship with a peer (e.g., pleasure associated with a liked peer vs. anger associated with a hostile peer) influences SIP. For instance, children interpret the actions of their peers they personally like and dislike differently. Liked peers are perceived as less hostile than disliked peers (Peets, Hodges, & Salmivalli, 2008), and they are also held less responsible for their negative behaviors (Hymel, 1986). As relational schemas include cognitive as well as affective components (Baldwin, 1992), it could be expected that the activation of a particular relational schema triggers not only specific cognitions but also relationship-congruent affect. Moreover, when children have relationship histories with their peers, and especially when strong negative emotions are present (e.g., in the case of disliked peers), children tend to rely heavily on already established representations of these peers rather than on situational cues (e.g., Crick & Dodge, 1994). Given that emotional processes influence physiology and behavior automatically and rapidly (within hundreds of ms; Adolphs, 2002), it is surprising that experimental studies tapping relationship-specific affective processing in children and adolescents are nearly nonexistent.

Taken together, there is evidence that relationship-specific schemas of peers exist by early adolescence. There has been systematic interest in the role of such schemas in the processing of social information (e.g., Dodge & Rabiner, 2004), their automatic activation (Crick & Dodge, 1994), and their affective nature (Lemerise & Arsenio, 2000), but these phenomena have rarely been examined empirically. However, in the priming literature, automatic processing of affective and social information has been widely studied in adults. In typical affective priming experiments, participants' task is to categorize the affective valence (pleasant vs. unpleasant) of a probe stimulus preceded with a prime stimulus with congruent or incongruent valence. The valence of a probe stimulus is recognized faster if it is preceded by a prime stimulus of the same valence (for a review, see Klauer & Musch, 2003). The phenomenon has been demonstrated using a variety of primes, such as affective visual scenes (Hermans, De Houwer, & Eelen, 1994, Experiment 1) and facial expressions (Carroll & Young, 2005), and it is assumed to be highly automatic. Accordingly, we reasoned that a similar paradigm would be advantageous for studying automatic activation of adolescents' affective peer-relational schemas.

Three lines of evidence from studies with adults suggest that *facial identity primes* would activate affective, relationship-specific schemas in adolescents. First, influential models of face recognition (Bruce & Young, 1986; Haxby, Hoffman, & Gobbini, 2000) posit that when the face of a specific person is perceived, the person- and identity-related information is automatically retrieved from long-term memory to facilitate social interaction with the person. Second, functional brain imaging studies have shown that viewing faces of close friends and family members is associated with modulation of neural responses in areas which mediate episodic memory, representation of mental states of others, and emotional responses (Gobbini, Leibenluft, Santiago, & Haxby, 2004; Leibenluft, Gobbini, Harrison, & Haxby, 2004). As relational schemas consist of information about relationship-specific cognitions and emotions stored in long-term memory, the aforementioned data can also be interpreted as activation of relational schemas. Third, it has been argued that perception of names or faces of personally significant versus unimportant persons results in relationship-specific priming effects. In a study by Baldwin, Carrell, and Lopez (1990, Experiment 2), Catholic and non-Catholic students first read a sexual passage after which they were primed with an angry picture of either an unknown professor or the Pope and subsequently filled in a self-concept questionnaire. The Catholic participants who were primed with the Pope rated their self-concept as lower than those primed with the professor, thereby suggesting a relationship-specific priming effect. Similarly, Banse (1999) demonstrated that masked names and pictures of friends and romantic partners led to a more positive evaluation of subsequently presented Chinese ideographs. In a follow-up study, Banse (2001) showed that a brief presentation of the names and faces of the participants' relationship partner and Saddam Hussein (Experiment 1) or Charlie Chaplin and Hussein (Experiment 2) sped up the categorization of probe words with congruent (pleasant vs. unpleasant) affective valence. Importantly, the prime faces were intrinsically neutral as they all had neutral facial expressions. However, the participants had associated the intrinsically neutral faces of Chaplin and Hussein with pleasant and unpleasant affective reactions, respectively, via learning. Consequently, Banse (1999, 2001) argued that presentation of the pictures elicited respective affective reactions that produced the priming effects.

Taken together, there is evidence to suggest that the perception of a face of a familiar (liked or disliked) person with a neutral facial expression can elicit relationship-specific affective and cognitive changes—at least in adult participants. However, as participants of the aforementioned studies were probably not personally familiar with the persons depicted in the prime stimuli (i.e., the Pope, Hussein, or Chaplin), it can be questioned whether the stimuli used by Baldwin et al. (1990) and Banse (2001) actually primed *relational* schemas. It is indeed likely that none of the participants had ever personally met, for instance, Chaplin or Hussein, but still they would evaluate the picture of Chaplin as more pleasant. This raises the question whether such primes can be implemented to study relational schemas or whether they just tap the reputation-based knowledge of the prime stimuli.

The Current Study

In the current study, we employed the priming paradigm to assess whether adolescents' peer-relational schemas would be automatically activated when perceiving a familiar peer and whether there would be an effect on subsequent SIP. We selected pictures of children's peers to serve as primes for two reasons. First, peers can be considered highly salient figures for individuals during middle childhood and adolescence (e.g., Larson & Verma, 1999).

Second, unlike names, faces provide unambiguous and rapidly accessible information about identity (Haxby et al., 2000). We chose adolescents as our participants because previous studies have found that early adolescents discriminate between different relationship contexts (e.g., Peets et al., 2007; Peets et al., 2008), whereas younger children do not (McDowell et al., 2002). In addition, participants of the present study had interacted with most of their classmates for more than 5 years. Thus, they had spent enough time interacting with different peers to form relationship-specific representations of them.

Our study implemented four methodological advances over the previous research on relationship priming. First, to assure that participants were familiar with both ''unpleasant'' and ''pleasant'' primes, we used pictures (digital photographs) of participants' disliked and liked classmates as primes. Second, we wanted to ensure that we were actually priming *peer-relational* schemas. Therefore, instead of using primes that might be classified as pleasant or unpleasant by *all* participants (e.g., using the ''most liked'' and ''most disliked'' children as primes), we selected unpleasant and pleasant primes by means of individual nominations for disliking and liking. Third, by manipulating the prime display duration and prime – probe stimulus onset asynchrony (SOA), we aimed at determining whether the relationship-specific affective information is extracted from faces pre- or postattentively. Preattentive affective processing (e.g., Bargh, 1997) would involve priming effects with short (< 50 ms) masked presentation (Baldwin et al., 1990) that does not allow detailed semantic or perceptual identification of the stimulus, whereas postattentive processing (Storbeck, Robinson, & McCourt, 2006) would involve priming effects with longer stimulus presentations (> 150 ms) and SOAs (> 300 ms; Calvo & Nummenmaa, 2007; Hermans, De Houwer, & Eelen, 2001). In Experiments 1 and 2, we used happy (congruent with liked primes) and angry (congruent with disliked primes) facial expression probes. We chose angry facial expressions, instead of other negative expressions such as fear, to represent probes congruent with disliked primes as our previously collected, unpublished data indicate that children have greater expectations of anger toward disliked than liked or neutral peers. If an affective component of peer-relational schemas was automatically activated upon face perception, faster choice reaction times (RTs) for congruent (i.e., disliked peer/angry expression and liked peer/happy expression) than incongruent (i.e., disliked peer/happy expression and liked peer/angry expression) prime – probe pairs could be expected.

Fourth, we wanted to assess whether the affective priming effects would be also evident with regard to SIP. As a complementary methodological approach, pictures of participants' liked and disliked peers were presented as primes before hypothetical provocation and rebuff vignettes. The vignettes were followed by questions tapping three aspects of SIP: attributions of hostility, experience of anger, and likelihood of retaliation. As Peets et al. (2007) demonstrated that hostile attributions and behavioral strategies were highly relationship specific by using a reflective measure, we were interested in examining whether similar target-specific cognitions would be triggered automatically. On the basis of the assumption that liked and disliked primes activate respective relational schemas automatically, we expected that when displaying disliked peers as primes, adolescents would attribute more hostility, experience more anger, and would be more likely to retaliate toward a hypothetical peer.

Experiment 1

In Experiment 1, participants' task was to categorize facial expressions (angry/happy) of probe pictures. Before the probe displays, pictures of faces of participants' disliked and liked classmates were presented. Pictures of same-age peers whom participants did not know were used as neutral primes. This resulted in incongruent (disliked/happy and liked/angry), neutral (neutral/angry and neutral/happy), and congruent (disliked/angry and liked/happy) prime – probe pairs. To manipulate the information available for visual processing of the pictures and to test whether relational schemas are activated by preattentive processing of the primes, we used brief (50 ms) structurally masked (low visibility) or unmasked (high visibility) presentations (see Breitmeyer & Ogmen, 2000) of the primes and assessed both costs and benefits resulting from prime – probe pairs with congruent and incongruent affective valence.

Method

Participants

Twenty-four 6th-grade children (12 girls, mean age = 13 years) participated in the experiment. The participants were randomly selected from a larger sample of 238 children (109 girls, mean age = 13 years) who were involved in a longitudinal study on peer relations in Turku, a midsized town (175,000 inhabitants) in southwest Finland. As the Finnish population is ethnically and socioeconomically diverse rather homogeneous, information about family background was not asked. In Turku, the households with school-aged children consist of entrepreneurs (4.6%), people in upper white-collar positions (20%), lower white-collar positions (27.6%), blue-collar positions (32.3%), and others (16.9%). About 94% of people in the area are of Finnish origin. All the participating children received parental permission to take part in the experiments. We examined whether the participants in Experiment 1 differed from the rest of the subjects who did not participate in any of the three experiments ($N = 180$) on peer-nominated social (rejection) and behavioral (withdrawal, aggression) reputation scores. No significant differences were found ($t \leq 1.80$). In addition, 216 children (108 girls, mean age = 13 years) recruited from among the adolescents involved in the longitudinal study on peer relations posed for the stimulus photographs used in the three experiments. All participants were compensated with a movie ticket.

Apparatus and Stimuli

The stimuli were presented with a 1.2 Ghz Toshiba Portégé computer on a 12-in. screen. Presentation computer software (Neurobehavioral Systems) controlled stimulus presentation and response collection. Response accuracy and latency were collected through key presses with a Cedrus RB-834 response pad. The initial fixation marker was a white cross (diameter 1°). The prime pictures were black-and-white photographs representing the classmates whom participants had nominated as their liked and disliked peers or photographs of unknown same-age peers. Two pictures from each category were used for each participant. The probe stimuli consisted of 28 black-and-white photographs of angry (14) and happy (14) facial expressions posed by different actors (7 male and 7 female) selected from a well-known standardized stimulus set of facial expressions (Ekman & Friesen, 1976). Both the prime and the probe displays measured $7 \times 16°$ of visual angle and were presented at the center of the screen. All stimuli were presented against a black background.

Procedure

Identifying peers used as primes. For each participant, liked and disliked peers were identified by means of a standard sociometric procedure (e.g., Coie, Dodge, & Coppotelli, 1982) approximately 1 month prior to the experiment. Participants were given a sheet with all the names of their same-sex classmates and were asked to nominate up to three same-sex peers they liked the most and the least. Self-nominations were not allowed. For each participant, two nominated disliked and two liked peers were chosen as primes. All the adolescents who were selected to participate in the experiments had nominated at least two peers they liked and two peers they disliked. If a participant had nominated three liked or disliked peers, we selected the two prime peers randomly. In addition, for each participant, pictures of two same-age, same-sex peers outside the adolescent's own school (from a different part of the town) were randomly selected to serve as neutral (unknown) primes.

Prime pictures. The prime pictures depicting children with neutral facial expressions were photographed approximately 1 month before the experiments. The photographs were taken at a distance of 1 m, and a special viewfinder was used to center children's nose tips at the center of the image. At least three photographs were taken of each child and four independent judges selected the photograph with the most neutral expression to be later used in the experiment. Finally, the selected photographs were converted to grayscale and cropped to include only the face area of the posers and to conform to the size ($7 \times 16°$) of the probe pictures.

Controlling for the facial attractiveness of the primes. Studies have consistently demonstrated that children perceive attractive peers as more likable and less mean than unattractive peers (e.g., Dion, 1973; Langlois & Cookie, 1978). Thus, any potential priming effect in this study could also be attributed to facial attractiveness instead of relational schemas. To control for this possible confound, a separate sample of 55 adolescents (mean age 13 years, 29 girls) rated the facial attractiveness of the prime pictures used in the three experiments using a scale ranging from 1 (*unattractive*) to 5 (*attractive*). Ratings were conducted with paper-and-pencil questionnaires that contained 3×4 cm black-and-white prints of the prime faces presented in random order. Participants rated only same-sex faces. To ensure that participants did not rate any familiar faces, participants in the rating study were selected from different schools than the participants of the priming experiments. Additionally, participants were explicitly instructed not to rate the faces of children they thought they might know. Subsequently, a mean attractiveness rating was computed for each face. The mean attractiveness ratings for faces serving as disliked, unknown, and liked primes were subjected to a one-way independent samples analysis of variance (ANOVA). The main effect of prime type was not statistically significant, $F = 0.16$ (mean attractiveness rating across categories = 2.33), demonstrating that there were essentially no between-category differences in the facial attractiveness of the prime stimuli.

Experimental sessions and design. Participants were tested individually in a quiet room at their school with a transportable stimulus presentation and response-gathering system by the first author and a trained undergraduate research assistant. Before a testing session, participants were told that they would be presented a sequence of two pictures of faces on each trial. They were instructed to fixate at the center of the screen throughout the trials, ignore the first picture (the prime), and to concentrate on categorizing, as fast as possible, the facial expression of the second picture (the probe) as angry or happy. Before the experiment, participants were shown examples of angry and happy facial expressions and presented with 10 practice trials.

Figure 1a shows the sequence of events on each trial. A trial started with a presentation of the central fixation cross for 500 ms. Next, the prime picture (a disliked, neutral, or liked peer) was displayed for 50 ms, followed by a 50-ms display of a structural grayscale mask (low visibility) or a blank screen (high visibility), depending on the type of the trial. Finally, the picture depicting angry or happy facial expression was displayed until the participant pressed the response button. The response buttons (i.e., left vs. right button for angry vs. happy expressions) were counterbalanced across participants. Each participant performed two blocks of the task, each consisting of 28 trials of each type in random order totaling 168 trials per block and a grand total of 336 trials. A short break was held between the two blocks. After the experiment, participants were asked to nominate up to three peers they liked and disliked the most in order to control for the stability of the relationship schemas (i.e., liking vs. disliking) and asked whether they knew the adolescents serving as neutral (unknown) primes. The experimental conditions were thus combined into 2 (visibility: low vs. high) $\times$ 3 (prime–probe congruency: incongruent vs. neutral vs. congruent) fully within-subjects design.

Results

To verify the stability of the relationship schemas, we assessed the congruency of peer nominations collected 1 month before and immediately after the experiment by examining whether children nominated the same targets among their liked and disliked peers. On average, the stability was high (79%). We

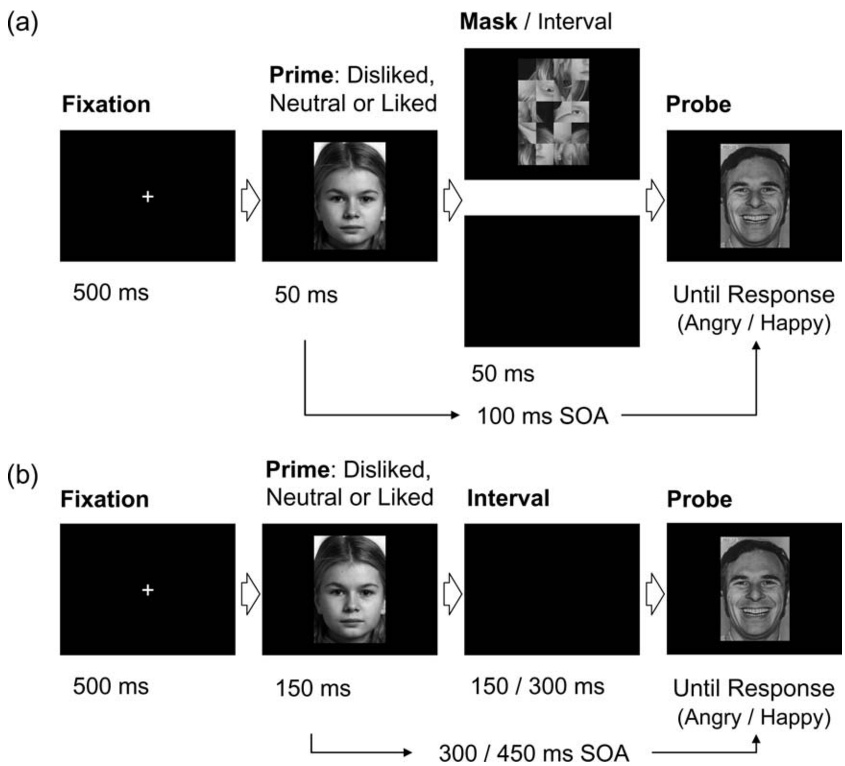

Figure 1. Sequence of events on a trial in Experiments 1a and 2b.
Note. SOA = stimulus onset asynchrony. Facial expression probes from Ekman and Friesen (1976). Copyright 1976 by P. Ekman and W. V. Friesen.

also compared whether nominations for liking versus disliking were equally stable by repeated measures *t* tests and found that the stability was slightly higher for liking (88%) than for disliking (70%) peers, $t(23) = 2.10$, $p < .05$. On average, participants made 6% errors (i.e., categorized the probe picture wrongly) in the expression categorization task. RT data from correct responses were collapsed across the blocks. Anticipations (RTs < 80 ms), and retardations (RTs 2.5 *SD* above individual mean) were excluded from the data analysis according to the suggestions by Ratcliff (1993). These accounted for 4% of the trials. Next, participant-wise mean RTs were calculated for each Visibility × Prime – Probe Congruency condition. These data with pooled 95% confidence intervals (see Masson & Loftus, 2003) are presented in Figure 2. The mean RTs were subjected to a 2 (visibility: low vs. high) × 3 (prime – probe congruency: incongruent vs. neutral vs. congruent) repeated measures ANOVA. The results demonstrated a main effect of visibility, $F(1, 24) = 7.30$, $p < .05$, $\eta^2_p = .23$, and prime – probe congruency, $F(1, 24) = 3.24$, $p < .05$, $\eta^2_p = .12$. Moreover, the Visibility × Prime – Probe Congruency interaction proved significant, $F(2, 24) = 3.13$, $p < .05$, $\eta^2_p = .12$. RTs were faster in the low visibility condition (834 vs. 840 ms, respectively). Additionally, planned comparisons (corrected for multiple comparisons) revealed that for the high-visibility condition, both incongruent, $F(1, 24) = 6.21$, $p < .05$, $\eta^2_p = .21$, and congruent, $F(1, 24) = 9.00$, $p < .05$, $\eta^2_p = .27$, probes were categorized more slowly than neutral probes. However, none of the comparisons reached significance ($F < 1$) in the low-visibility condition. Also, to control for potential gender moderation effects, we repeated the ANOVAs in this and all subsequent experiments with gender as a between-groups factor and verified that gender did not interact with the priming effects in any of the experiments.

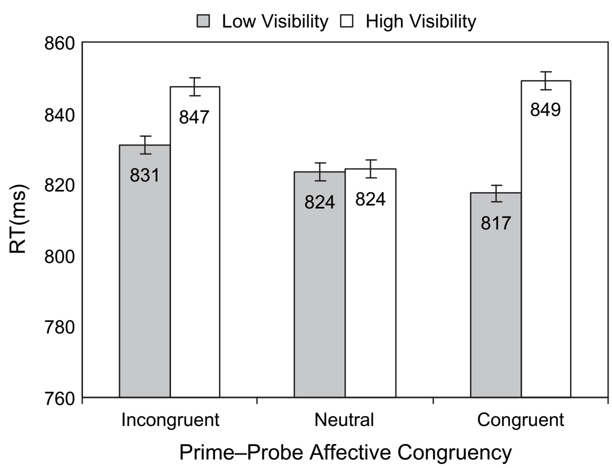

Figure 2. Mean response latencies (ms) with pooled 95% confidence intervals as a function of prime visibility and prime – probe affective congruency in Experiment 1.

Discussion

In line with previous research using affective pictorial primes and probes (Hermans, Spruyt, De Houwer, & Eelen, 2003, Experiment 1), no affective priming effect was found for the low-visibility condition. In contrast, the data for the high-visibility condition suggest that the relational schemas might have been activated by the primes. However, the results did not show the traditional affective priming effect. Instead, longer RTs were demonstrated after congruent as well as incongruent prime – probe pairs (i.e., after emotional primes) as compared to the probes preceded by neutral primes. This somewhat surprising finding becomes understandable if we consider the processing stream of face perception in more detail. The widely accepted models of face recognition (Bruce & Young, 1986; Haxby et al., 2000) assume that structural encoding of faces, which is necessary for identity recognition is undertaken prior to the retrieval of knowledge related to that person. The emotional reactions potentially arising from the stimulus faces in the current experiment were contingent on the recognition of the *identity* of the face: Across the different prime categories, the stimuli had equally neutral expressions and were rated as equally attractive; thus, they could be considered as *intrinsically neutral* stimuli. However, each participant saw faces of peers that they considered as pleasant and unpleasant due to their relationship history with the persons depicted in the stimuli. Consequently, it is likely that both the facial identity recognition and the *subsequent* retrieval of the affective information (i.e., relational schemas) attached to the perceived individual could not be undertaken during the short 100-ms period between the prime and the probe stimulus demanding response. This argument is supported by the fact that facial identity priming is usually demonstrated at much longer SOAs (up to 700 ms; see Bruce & Valentine, 1986) than affective priming (around 300 ms; see Hermans et al., 2001). In the current experiment, it is likely the participants were able to *detect* the liked and disliked primes as familiar (i.e., either pleasant or unpleasant) but could not undertake the more elaborate *discrimination* of the stimulus identity as liked or disliked. Subsequently, both liked and disliked primes resulted in interference and led to slower responses in both congruent and incongruent priming conditions as compared to the neutral priming condition. This is also in line with the model of postattentional affective processing by Storbeck et al. (2006), which suggests that the features of any object must first be integrated, and the object itself identified prior to affective analysis. In other words, postattentional affective priming would first involve the facial identity recognition, which would subsequently be followed by the affective analysis of the target face.

Experiment 2

If the affective priming effect is contingent on the recognition of the facial identity, it could be expected that affective priming would be manifested if the duration of the prime display was longer. We conducted Experiment 2 to test this hypothesis. We increased the prime display duration to 150 ms and replaced the stimulus visibility manipulation with a SOA (300 vs. 450 ms) manipulation. The selection of the SOAs was based on the SOAs used in the facial identity priming paradigms (Bruce & Valentine, 1986) as well as recent findings with the affective priming paradigm that have demonstrated that, though affective priming is automatic, affective processing is postattentive (Calvo & Nummenmaa, 2007). If the priming effect would only be contingent on the resources available for the visual processing of the prime, we expected that priming effects would be manifested at both SOAs. However, if the priming would be contingent on facial identity recognition and subsequent activation of affective relational schemas, priming effects were expected to emerge only at the 450-ms SOA.

Method

Participants

Thirty 6th-grade adolescents (10 girls, mean age = 13 years) not participating in Experiment 1 served as participants subjects and were compensated with a movie ticket. All the participants were randomly chosen from the same participant pool as those in Experiment 1. Of the 31 adolescents originally participating in the study, one had to be removed from the data analysis due to a chance-level performance (56% correct) in the expression recognition task. With regard to measures of rejection, withdrawal, and aggression, there were no differences between the children who participated in Experiment 2 and those who did not participate in any of the three experiments ($N = 180$, $t \leq 1.26$).

Apparatus, Stimuli, Experimental Design, and Procedure

Apparatus, stimuli, experimental design, and procedure were similar to those in Experiment 1, with three exceptions. First, the prime display duration was increased to 150 ms. Second, instead of the structural mask, a blank screen was presented after the primes on all trials. Third, two different prime–probe SOAs (300 vs. 450 ms) were used (see Figure 1b for events in trials). This resulted in a 2 (SOA: 300 vs. 450 ms) × 3 (prime–probe congruency: incongruent vs. neutral vs. congruent) fully within-subjects design.

Results

Again, the average stability of the affect felt toward the peers was high (73%), and it was slightly higher for liked (81%) than for disliked (65%) peers, $t(29) = 2.40$, $p < .05$. There were no differences in the facial attractiveness of the disliked, unknown, and liked prime stimuli, $F = 1.40$. The mean attractiveness rating across categories was 2.32. Mean RTs (an average of 7% errors and 2.5% of anticipations and retardations omitted) for the different SOA × Prime–Probe congruencies are presented in Figure 3. The mean RTs were analyzed with a 2 (SOA: 300 vs. 450 ms) × 3 (prime–probe congruency: incongruent vs. neutral vs. congruent) repeated measures ANOVA. The main effect for SOA reached significance, $F(1, 29) = 40.55$, $p < .05$, $\eta^2_p = .58$, demonstrating the classic foreperiod effect (see Niemi & Näätänen, 1981). RTs were faster for 450-ms than for 300-ms SOAs (794 vs. 833 ms, respectively). Although the main effect of

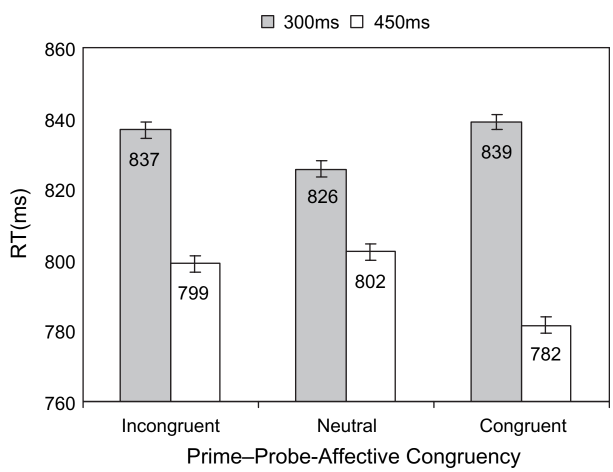

Figure 3. Mean response latencies (ms) with pooled 95% confidence intervals as a function of stimulus onset asynchrony and prime–probe affective congruency in Experiment 2.

prime – probe congruency did not reach significance, $F = 1.26$, the SOA $\times$ Prime – Probe Congruency interaction was significant, $F(2, 58) = 3.85$, $p < .05$, $\eta_p^2 = .12$. Multiple comparisons revealed that this interaction resulted from the fact that at the 450-ms SOA, congruent probes were categorized faster than neutral, $F(1, 29) = 6.57$, $p < .05$, $\eta_p^2 = .19$, and incongruent, $F(1, 29) = 4.75$, $p < .05$, $\eta_p^2 = .30$, probes (RTs = 781, 802, and 798 ms, respectively). However, neutral probes were not categorized faster than the incongruent probes, $F < 1$. There were no differences in RTs between congruent, neutral, and incongruent probes at the 300 ms SOA, $F < 1$.

As the congruency variable was pooled across liked and disliked primes, we also wanted to analyze whether the liked and disliked primes would produce equally strong priming effects. For that purpose, we compared the priming scores for happy (i.e., $RT_{disliked-happy} - RT_{liked-happy}$) and angry ($RT_{liked\text{-}angry} - RT_{disliked-angry}$) facial expressions with each other on the 450-ms SOA condition. Both priming scores were positive (22 vs. 12.50 ms) showing that disliked primes facilitated recognition of angry expressions and liked primes facilitated recognition of happy expressions, but there was no statistically significant difference between the priming scores for happy versus angry expressions, $t < 1$. This suggests that disliked and liked primes speeded up the categorization of congruent facial expressions to an equal extent.

Discussion

The main finding of Experiment 2 was that an affective priming effect was demonstrated when the prime – probe SOA was 450 ms. RTs were faster for congruent (disliked/angry or liked/happy) than for neutral or incongruent prime – probe pairs. This implies that the affective component of relational schemas is activated automatically—albeit not very rapidly—upon perception of a familiar peer. The results suggest that the activation of peer-relational affective information resulting from face perception is contingent on postattentional recognition of facial identity. The SOA manipulation revealed that the priming effect was crucially dependent on the total processing time and not the prime display time. Namely, the prime display time was similar (150 ms) for both SOAs, but the affective priming effect only emerged when the prime – probe SOA was 450 ms. Accordingly, presenting a face for 150 ms was definitely enough for identity recognition, but the affective priming effect took approximately 450 ms to occur. The time course of the observed priming effect was longer than what is typically observed in affective priming studies. The maximal affective priming effects are usually observed at 150 – 300 ms SOAs (see Hermans et al., 2001), although recently Carroll and Young (2005) demonstrated affective priming effects for facial expressions at SOAs of 250 and 750 ms. However, facial identity priming effects are typically manifested at 700-ms SOA (Bruce & Valentine, 1986). As the occurrence of the priming effects in the current studies would require recognition of the facial identity of the depicted person, it is understandable that the time course of the observed priming effect resembles that of facial identity priming.

Experiment 3

Experiments 1 and 2 relied on priming facial expression recognition with faces of participants' peers. Although Experiment 2 demonstrated that relationship-specific affective reactions can be automatically elicited by a brief presentation of liked and disliked peers' faces, it remains open whether activation of relational schemas would influence other aspects of online SIP, such as interpretation of ambiguous situational cues, feelings of anger, or likelihood of retaliation. As outlined in the Introduction, SIP is usually studied by using hypothetical vignettes and asking questions which tap different steps of SIP. It has, however, been questioned (Orobio de Castro, 2004) whether such measures capture the automaticity of SIP.

To test the automaticity assumption, Experiment 3 implemented a computerized hypothetical vignette task with a priming manipulation. According to Crick and Dodge (1994), the way children handle peer provocation and rebuff situations is especially critical for their social adjustment in the peer group. Participants were thus presented, on the computer screen, with short vignettes (two or three sentences) describing either provocation or rebuff by a hypothetical anonymous same-sex protagonist. The protagonist's behavior had always a negative consequence for the participant, but the intent of the protagonist was displayed as ambiguous. The vignettes were followed by questions measuring attributions of hostility, experience of anger, and willingness to retaliate. Based on two assumptions—(a) relational schemas are activated automatically and (b) relational schemas affect the way adolescents process social information about the particular peer—we expected that after perceiving the disliked primes, participants would attribute more hostility, experience more anger, and be more likely to retaliate against the protagonist in the vignette.

Method

Participants

Thirty 6th-grade adolescents (10 girls, mean age = 13 years) participated in the experiment. The participants were randomly chosen from the same participant pool used in Experiments 1 and 2. All the participating children had parental permission to take part in the experiments. Again, no significant difference was found between the participants and the rest of the sample who did not participate in any of the three experiments ($N = 180$) on peer-nominated rejection, withdrawal, and aggression scores ($t \leq 0.97$).

Apparatus and Stimuli

Apparatus and prime stimuli were similar to those used in Experiments 1 and 2. Vignettes were presented on the computer screen, with 1 vignette occupying the screen at a time. Altogether 24 vignettes were used describing social interactions in which the participant was provoked (12 vignettes; e.g., "Pretend that you are playing soccer with other boys/girls. You turn away from the other players for a while, and suddenly somebody kicks the ball to your back. It hurts very much") or rebuffed (12 vignettes, e.g., "Pretend that you are in your classroom and you hear two boys/girls talking about a bike trip taking place next weekend. You would also like to join them. You go over and ask them if you could go to the trip as well. One of the boys/girls says 'No!'") by a hypothetical same-sex peer (protagonist).

Each vignette was followed by three questions that appeared on the screen one at a time: (a) Did the protagonist intend to harm you? (*attribution of hostility*; b) Would you be angry at him/her? (*experience of anger*) and (c) Would you do something to get even? (*retaliation*). A white response scale line measuring 16° of visual angle was presented below each question and horizontally centered on the screen. Verbal labels for the extreme values (*not at all* vs. definitely) of the response scale were presented at the corresponding ends of the response scale. Otherwise, the scale range was arbitrary to the participants. In terms of response recording, the scale actually ranged from −250 (*not at all*) to +250 (*definitely*). A red vertical line served as a cursor for answering the questions. It measured 3°, was centered vertically on the response scale, and could be moved along the response scale with the mouse. All stimuli were presented against a black background.

Procedure and Design

To identify the peers used as primes, we followed the same procedure as in Experiments 1 and 2. Testing was conducted at schools similarly to the previous experiments. Participants were told that the study concerned decision making in various social situations. They were told that they were going to see a series of short texts describing social interactions with peers, followed by questions about their own reactions to the situations. They were also informed that they would see some pictures of faces during the experiment, but it was stressed that the pictures were completely irrelevant to the actual experiment. Participants were instructed to fixate at the center of the screen at the beginning of the trials, ignore the picture of the face, and to read the subsequent vignette carefully and respond to the questions using the mouse. Figure 4 shows the sequence of events for each trial. A trial started with a presentation of the central fixation cross for 500 ms. Next, the prime picture (disliked, neutral, or liked peer) was displayed for 150 ms, followed by a 300-ms display of a blank screen, resulting in a SOA of 450 ms. Next, a vignette was presented on the screen until the participant double-clicked the mouse button, indicating that he or she had finished reading the vignette. After each vignette, the questions regarding attribution of hostility, experience of anger, and likelihood of retaliation were presented in a random order. Each question was presented on a separate display, and participants responded using the mouse to move the line cursor along the response scale. Before the experiment, participants were presented with four practice trials, followed by a single experimental block consisting of four trials of each type (Prime Type × Vignette Type) in random order totaling 24 trials, with the same three questions asked after each trial. The experimental factors were combined to a 3 (prime type: disliked vs. neutral vs. liked) × 2 (vignette type: provocation vs. rebuff) × 3 (question type: attribution of hostility vs. experience of anger vs. retaliation) fully within-subjects design.

Results

The average stability of the affect felt toward the peers was high (75%), and it was slightly higher for liked (79%) than for disliked (71%) peers, $t(29) = 2.50$, $p < .05$. The mean attractiveness rating for prime faces was 2.44, and there were no between-category differences in the perceived attractiveness of the disliked, neutral, and liked primes, $F = 0.5$. Subject-wise mean response scores (see Table 1) were computed for each condition in the vignette task. The scores were subjected to a 3 (prime type: disliked vs. neutral vs. liked) × 2 (vignette type: provocation vs. rebuff) × 3 (question type: attribution of hostility vs.

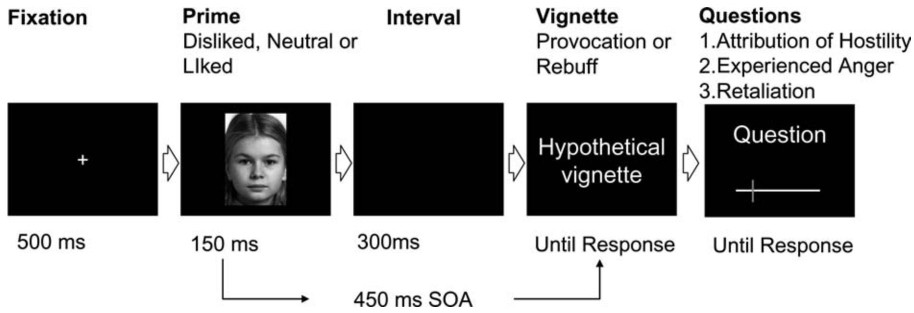

Figure 4. Sequence of events on a trial in Experiment 3.
Note. SOA = stimulus onset asynchrony.

experience of anger vs. retaliation) repeated measures ANOVA. This yielded significant main effects of prime type, $F(2, 58) = 3.38$, $p < .05$, $\eta_p^2 = .12$, and vignette type, $F(1, 29) = 4.02$, $p < .05$, $\eta_p^2 = .12$, as well as a Vignette Type × Question Type interaction, $F(2, 58) = 9.14$, $p < .05$, $\eta_p^2 = .24$. Multiple comparisons for the prime type showed that when compared to disliked, $F(1, 29) = 4.84$, $p < .05$, $\eta_p^2 = .14$, and neutral, $F(1, 29) = 4.54$, $p < .05$, $\eta_p^2 = .14$, primes, the liked primes resulted in less attributions of hostility, experience of anger, and retaliative responses. However, differences between disliked and neutral primes were nonsignificant, $F < 1$.

Planned comparisons for the Vignette Type × Question Type interaction demonstrated that for provocation vignettes, mean experience of anger was higher than attributions of hostility, $F(1, 29) = 10.74$, $p < .05$, $\eta_p^2 = .27$, and retaliation, $F(1, 29) = 37.99$, $p < .05$, $\eta_p^2 = .57$, and that mean attributions of hostility were higher than mean retaliation, $F(1, 29) = 4.84$, $p < .05$, $\eta_p^2 = .14$. For the rebuff vignettes, mean attributions of hostility were higher than experience of anger, $F(1, 29) = 5.23$, $p < .05$, $\eta_p^2 = .15$, and retaliation, $F(1, 29) = 44.84$, $p < .05$, $\eta_p^2 = .61$. Moreover, mean experience of anger was higher than mean retaliation, $F(1, 29) = 39.83$, $p < .05$, $\eta_p^2 = .58$. In addition, it was found that when compared to rebuff vignettes, provocation vignettes resulted in greater experience of anger, $F(1, 29) = 12.99$, $p < .05$, $\eta_p^2 = .31$, and retaliation, $F(1, 29) = 4.20$, $p < .05$, $\eta_p^2 = .13$, but no differences were found for attributions of hostility, $F < 1$.

Discussion

The results of Experiment 3 demonstrated that the automatic activation of relational schemas also had an effect on how adolescents processed social information other than facial expressions (cf. Experiment 2). In the case of disliked and neutral primes, participants attributed more hostility to the hypothetical peer, experienced more anger, and were more willing to retaliate as compared to liked primes. The results showed that nonretaliation was more common than retaliation across different priming conditions, suggesting that getting back at someone (even toward the disliked peer) might be infrequent. Still, we should be cautious when making such a claim as we did not have behavioral measures to assess retaliation (i.e.,

Table 1
Means and Standard Errors of Responses as a Function Prime Type, Vignette Type, and Question Type

	Disliked		Neutral		Liked	
	M	*SE*	*M*	*SE*	*M*	*SE*
Provocation vignettes						
Attributions of hostility	−4.43	17.13	−9.73	17.93	−11.90	15.87
Experience of anger	28.53	16.69	29.94	17.05	2.15	14.92
Retaliation	−62.19	17.73	−46.27	20.17	−71.62	15.65
Rebuff vignettes						
Attributions of hostility	−2.09	13.73	−3.51	14.71	−8.10	15.46
Experience of anger	−12.67	17.11	−22.66	16.16	−32.73	15.49
Retaliation	−71.08	16.73	−71.51	15.87	−95.87	13.32

Note. Ratings were provided on a scale that ranged from −250 (*not at all*) to +250 (*definitely*).

whether the participants actually retaliated against the peer) and associations between SIP steps and social behaviors are not necessarily very strong (for reviews, see Orobio de Castro et al., 2002; Yoon, Hughes, Gaur, & Thompson, 1999). Also, stronger retaliatory responses might have emerged if the sample had consisted of highly rejected or aggressive adolescents.

Overall, Experiment 3 corroborates our previous findings that relational schemas are automatically activated upon perception of a familiar peer. Additionally, as participants showed greater experience of anger for trials primed with disliked versus liked peers, the results provide additional support for our argument (Experiment 2) that perceiving a face of a familiar peer exerts an influence on subsequently arising affective reactions. Moreover, these findings also elaborate the results obtained in Experiment 2 in two ways. First, they show that the relationship-specific priming effects are not restricted to the affective domain but that activation of relationship schemas also influences interpretation of situational cues (intentionality) as well as response decision (likelihood of retaliation), which are two of the core components of the SIP model (Crick & Dodge, 1994). Second, the data suggest that the priming effects are relatively long lasting. Whereas a single trial in Experiments 1 and 2 lasted for less than 1 s, the average trial duration in Experiment 3 was 17.5 s. This underlines the importance of relationship schemas in guiding social behavior—although the schemas can be activated rapidly (in around 450 ms) they influence the social behavior at least for tens of seconds. It must, however, be noted that as the delay between the prime and the response was much longer in Experiment 3 than in Experiments 1 and 2, it is likely that participants had engaged in more reflective processing (see Orobio de Castro, 2004) in Experiment 3 when responding. Nevertheless, we argue that the priming effects have interacted with this reflective processing in automatic fashion, as the primes were presented only briefly and were irrelevant to the vignette task.

General Discussion

We conducted three experiments to study automatic relationship-specific SIP. In Experiments 1 and 2, we primed angry versus happy facial expression recognition with the facial identity of liked, neutral, and disliked peers to examine whether the affective component of peer-relational schemas would be automatically activated. In Experiment 3, we presented similar identity primes before hypothetical provocation and rebuff vignettes in order to investigate whether automatic activation of peer-relational schemas would influence SIP. The affective priming effect found in Experiment 2 showed that when the prime and probe stimuli were congruent in terms of their affective valence, the categorization of facial expressions was faster when the stimulus display duration and prime – probe SOA were long (150 and 450 ms, respectively). In case of the short display duration (50 ms), presentation of both liked and disliked peers as primes slowed the categorization of the subsequent facial expression when the primes were masked with a blank screen. When structural masking was applied, no priming effects were manifested. Together Experiments 1 and 2 demonstrate that relationship-specific affective reactions are activated by the mere perception of a familiar face, if sufficient time is given between the presentation of the facial identity and the demanded response. This suggests that children do hold different views of different peers and that different affective reactions are associated with different individuals.

In addition, Experiment 3 demonstrated that automatically activated relationship-specific schemas influenced social-cognitive evaluations of hypothetical peers. More specifically, when the disliked peer served as a prime, participants attributed more hostility to the protagonist in the vignette, experienced more anger, and were more likely to retaliate. These findings have important implications for the (a) automaticity, (b) relationship specificity, and (c) emotional aspects of SIP. We will next address these issues in more detail.

Automaticity of SIP

An important question is whether the peer-relational schemas were activated automatically in the current experiments. Traditionally, automatic processes are assumed to be (a) fast and efficient (b) unintentional, and (c) unconscious (for review, see Moors & De Houwer, 2006). At the short display duration (Experiment 1), disliked and liked but not neutral primes resulted in interference only when masked with a blank screen. At first, this might seem to contradict the first assumption of automatic processing. However, this finding probably reflects latency due to the hierarchy of face recognition processes, that is, the fact that identity recognition precedes affective evaluation as discussed above. For the priming effects to occur, facial identity encoding must be undertaken prior to retrieving the peer-related affective associations from the long-term memory. Although this process can take up to 450 ms to accomplish, it might still be undertaken in automatic fashion. This argument is corroborated by the fact that the data seem to fulfill other criteria for automatic processing. First, the priming effects were unintentional in the sense that they occurred even though the prime faces were task irrelevant, and participants were instructed to ignore the prime face and concentrate on categorizing the facial expression of the probes or reading the vignettes and responding the subsequent questions. Second, automatic versus conscious (or volitional) priming results in different patterns of RTs. Posner and Snyder (1975) have demonstrated that automatic aspects of priming will produce facilitation for related targets with no inhibition for unrelated targets, whereas conscious anticipatory effects will produce facilitation for related *and* inhibition for unrelated targets. As the 450-ms SOA condition of Experiment 2 demonstrated facilitation without inhibition ($RT_{congruent} < RT_{neutral} = RT_{incongruent}$), we consider the priming effect to result from the automatic activation of the peer-relational schemas.

So far, although SIP in children and adolescents has been assumed to be highly automatic (Crick & Dodge, 1994), and priming has been often mentioned as a necessary method to study online SIP (e.g., Burks, Laird, Dodge, Pettit, & Bates, 1999; Crick & Dodge, 1994), empirical research on the issue is almost nonexistent. Thus, considering that our existing knowledge about SIP originates mainly from the studies using reflective measures (e.g., questions presented after vignettes), the present study adds valuable information by providing direct evidence for the automatic retrieval of relationship-specific information.

Relationship Specificity of SIP

In line with other recent studies showing relationship specificity in SIP (Burgess et al., 2006; Peets et al., 2007; Peets et al., 2008), our results suggest that adolescents have different representations of peers that, once activated, affect subsequent information processing. Although SIP patterns were initially regarded as trait-like characteristics (Crick & Dodge, 1994), there is growing evidence that information processing is much less rigid and is influenced by the target peer's reputation and the relationship between the child and the target peer (Dodge, 1980; Hymel, 1986; Peets et al., 2007). In addition, relationship information has been described as being organized in a hierarchical way (e.g., Bretherton, 1990), with children having a general working model of peers, or general peer beliefs (Rabiner, Keane, & McKinnon-Lewis, 1993; Rudolph et al., 1995; Salmivalli et al., 2005), as well as more specific relational schemas, or knowledge structures containing information specific to different peers and relationships with them. When children first meet an unfamiliar peer, they tend to rely on their general peer beliefs developed from past experiences within family and among peers. However, these beliefs can change as a result of the interactions children have with those peers (Rabiner et al., 1993). Thus, although some children and adolescents tend to have a generalized view of others as hostile, it does not necessarily mean that they could not have a positive experience with some peers and develop a positive view of those peers.

Affective Components of Relational Schemas

The results of the present study show that the affective nature of the relationship (i.e., liking vs. disliking a peer) is an important aspect of peer-relational schemas and thus support the notion by Lemerise and Arsenio (2000) that emotional information associated with different peers influences SIP. Specifically, the data suggest that the emotions associated with certain disliked or liked peers are prone to be activated automatically in social situations and will promote affect-congruent cognitions and, subsequently, behaviors. Given that emotions occur rapidly and involuntarily, we argue that these affect-congruent modulations in social cognitions and behavior are crucial for maintaining already-established relationships. It should be pointed out that although the representation of a disliked peer might also capture emotions such as disgust, fear, and sadness, anger was chosen as a probe most congruent with the negative prime in the present study. It is indeed likely that adolescents dislike some peers because they are *afraid* of them rather than feel anger toward them. In addition, as reasons for dislike become more heterogeneous with age (see Hayes, Gershman, & Halteman, 1996), anger might not be the core emotion felt toward the disliked peer. Whether the same effect would be obtained by using probes with different facial expressions should be empirically tested. This would enable more fine-grained analysis of the organization of the affective peer-relational schemas. In addition, our results suggest that the sociometric nomination procedure used widely in the research on peer relations is a valid method to be used to differentiate between the peers whom children have positive and negative representations of. As aggression is one of the main reasons during middle childhood and early adolescence why someone is disliked, it could be argued that differences between liked and disliked peers might be just a function of their general behavioral reputation. However, studies have shown that even when the aggressiveness of the target peers has been taken into account, affective nature of the relationship has still an effect on social-cognitive processes (Peets et al., 2007).

Moreover, research using reflective measures has shown that preadolescents' evaluations of different peers are congruent with their affect felt toward those peers (Peets et al., 2008). For example, in the case of disliked peers, they make more hostile attributions, expect less relational and instrumental outcomes for aggression, and have higher self-efficacy beliefs for aggression, with the opposite being true for liked peers. Experiment 3 further demonstrated that affect-congruent social-cognitive evaluations are automatic. We should point out, however, that we did not find different priming effects for disliked versus unknown peers. This was not totally unexpected. Studies in adults have demonstrated that unfamiliar individuals with prototypical neutral facial expressions are evaluated as mildly unpleasant instead of neutral (Lee, Kang, Park, Kim, & An, 2007). Accordingly, such unpleasantness of the neutral faces of strangers probably explains why the disliked and neutral primes result in similar effects in Experiments 2 and 3. In addition, it has been shown that general beliefs about unfamiliar peers are not associated with beliefs about familiar peers (Rabiner et al., 1993), suggesting that actual experiences within the peer group can shape children's initial beliefs. Thus, future research could test whether negative attitudes toward unknown peers become more negative or positive over time as a result of children's interactions with these peers. Moreover, as our results imply that adolescents might, in general, have more hostile than prosocial beliefs of strangers, future priming studies manipulating the facial expression (happy vs. neutral vs. angry) of the liked, neutral, and disliked peer primes should be conducted to assess how situational factors can modulate the effect of these beliefs on SIP.

Online SIP is assumed to affect which behavioral response is enacted in a given situation (the "sixth step" in the SIP model). Consequently, the practical significance of the current results is that the automatic activation of relationship-specific information could automatically trigger certain behavioral patterns concordant with this information. Experiment 3 showed that although there were differences between disliked and liked primes with regard to retaliation, adolescents were more likely to be nonretaliative than retaliative toward the hypothetical peer across different priming conditions. It is in accordance with a study by Peets et al. (2008), who also demonstrated that although it was common for preadolescents to hold different social-cognitive evaluations of their liked and disliked peers, self-reported aggression even toward disliked peers was rather infrequent. Thus, whether social cognitions translate into aggressive behavior might be dependent on the characteristics of the individual and/or the interaction partner. For instance, it may be that only aggressive individuals act on their aggression-encouraging cognitions toward the peers who are physically weak and rejected by other peers. It is possible that if we had studied, for instance, extremely aggressive children, their responses would have been more retaliatory than nonretaliatory in nature.

Our results confirm that affect is a core component of relationships: Children are inclined to be negatively biased toward their enemies and positively biased toward their friends (Parker & Gamm, 2003; Peets et al., 2007). However, one should note that in our experiments, the relationship primes were chosen on the basis of *unilateral* nominations. Mutual friendships and antipathies are relationships that have much more personal meaning and relevance to children than relationships characterized by unilateral positive or negative affect. It is thus likely that the magnitude of the priming effects would have been larger if we had selected targets characterized by mutual disliking or liking. Previous studies (e.g., Card & Hodges, 2007) have indeed shown that children are more likely to be recipients of aggression by mutual antipathies than by friends or peers characterized by unilateral dislike and that mutual dislike serves as a context in which negative experiences have the most detrimental effect on children's adjustment.

Although aggression is, to a great extent, relationship specific, there are individuals who have tendencies to be more aggressive across relationships (Coie et al., 1999; Peets et al., 2008). Future studies could examine whether automatic processing is different, for instance, for aggressive versus nonaggressive individuals. It is possible that due to their aversive experiences in the peer group, especially rejected-aggressive children and adolescents have hostility schemas, which are activated in the case of unknown peers. Over time, SIP might become less affected by situational cues and more influenced by the activation of already existing (relationship-specific) representations of peers. Burks et al. (1999, p. 803) have suggested that "the more ambiguous the environmental information, the more the individual has to rely on the chronically accessible construct, and, thus, the resulting representation is composed predominantly of information from the knowledge base." Consequently, automatic processes might serve as key factors explaining stability of the peer reputation and its resistance to change. For instance, when a child dislikes someone, he or she is prone to process the information about this peer so that it would be congruent with the negative affect felt toward the peer. When other members of the group (i.e., classmates) share this negative view, social-cognitive processes consistent with the representation might be even less likely to change. For instance, a study by Hymel (1986) demonstrated that negative behaviors by disliked peers were attributed to more stable causes than negative behaviors by liked peers. Thus, although the behavior of a rejected child could be modified, other peers might still interpret the new behavior in light of existing representations and respective social-cognitive processes. It could be expected that differentiated social-cognitive evaluations are even more stable when the classroom structure remains the same over time (which is often the case in Finnish schools).

Participants of our experiments were early adolescents. Although reasons for liking and disliking someone become more abstract and diverse when children get older (see Hayes et al., 1996), affect-congruent social cognitions are also present in older adolescents (see Hymel, 1986). Previous studies that had failed to find such effects among young children (e.g., McDowell et al., 2002) have utilized the traditional, reflective measures. Priming studies would provide an alternative way to examine whether relationship-specific schemas of peers start to emerge already early on but cannot yet be reflected upon.

Finally, our findings offer one possible explanation why relationship effects have been found to account for just as much of the variance in children's dyadic aggression as actor or target effects (Coie et al., 1999). Namely, our study suggests that the affective person-related information is also activated automatically upon perceiving a familiar individual and that the activated information guides both affective and SIP. Future research could examine whether there are also individual differences in terms of how automated this processing is. Although in the current study we used an affective priming technique, we would expect priming effects to be evident regardless of the specific priming method. Taken together, the current findings thus encourage further research on the relationship specificity and automaticity of social behaviors and on the mechanisms explaining it.

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