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The Syntax of Defection and Cooperation: The Effects of the Implicit Sentences *Nice Act* Versus *Act Nice* on Behavior Change

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Abstract

The syntactic organization of incidentally presented word pairs may affect behavior by providing actors with implicit propositions about how to behave. In Experiment 1, participants who had already played turns of a mixed-motive game were less cooperative after an explicit propositional suggestion that they *had been nice* in prior turns but were more cooperative after the suggestion that they *should be nice* in upcoming turns. In three subsequent experiments, implicit priming with the phrase *nice act* produced greater levels of defection, implying that actors responded to the implicit suggestion that they *had been sufficiently nice* already. In contrast, *act nice* produced greater levels of cooperation, implying that actors responded to the implicit suggestion that *they should try to be nicer* in upcoming turns. These effects occurred outside of awareness and disappeared when the interval between the words was long and when behavior was measured after a delay.

Keywords

language, social cognition, goals, negotiations, social interaction

A fundamental psychological question concerns how thoughts are structured within a quickly unfolding and diverse train of words and images—William James's "stream of consciousness." In his memorable novel *Ulysses*, James Joyce portrays characters' raw inner experience not as a flawless, coherent narrative but rather as an apparently random arrangement of words and feelings that readers rarely witness outside of their own minds (Albarracín, Noguchi, & Earl, 2006). Despite this characterization of thought as largely haphazard and fragmented (Marcus, 2008), evidence suggests that people do commonly maintain a coherent (see Bickle, 2003) and purposive (Klinger, 1999) inner voice (see also Girbau, 2007; Heavey & Hurlburt, 2008) and are predisposed to process sequences of words (e.g., sentences or phrases) in ways that construct meanings that cannot be extracted from the individual words (e.g., Madden & Zwaan, 2003; Murphy, 1990; for a review of narrative processing, see Zwaan & Radvansky, 1998). Imposing such a syntactic structure on words in the stream of consciousness may have important behavioral implications that social psychologists have thus far ignored.

One possible way that fragmented thoughts could create coherent behavior (in the context of the English language, at least) is a process by which implicit moment-by-moment reading of the verbal contents of working memory (Estes & Jones, 2009) leads to emerging propositions based on the specific order of those contents. These activated propositions would have the potential, at least, to prime or otherwise influence overt behavior and action. Consider a common social interaction in which the actor can maximize either personal gains or social gains. For example, in a prisoners' dilemma type of game, players can easily maximize their personal gains by either cooperating or defecting. Defecting can increase personal gains if the other player cooperates but is devastating if the other player also defects. In this context, a player who is making decisions while monitoring thoughts could potentially think, "I have been sufficiently patient in this interaction and conclude that I must now defect." Nonetheless, a more likely and much shorter production such as *nice act* may be all that goes through the mind of the actor. Then, a critical question can be raised: How easy is it to integrate into behavior an implicit thought composed merely of two words such as *nice act* or *act nice*?

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Word Order Effects on Behavior

Given that *act* can be either a noun or a verb and *nice* either an adjective or an implicit adverb (*nicely*), the *order* of these words should influence behavior if the thinker automatically imposes an order-based syntactic rule on the word pairs. Will the effects of such apparently purposeless word arrangements be the same as the effects of a more explicit proposition stating that an actor has been sufficiently cooperative in an ongoing interaction? Much as compliments and favorable evaluations of a past behavior can signal that one has satisfied a social goal (Deci, Koestner, & Ryan, 1999), such as being cooperative, the proposition *nice act* could automatically trigger defection.

Despite large amounts of research observing the effects of single words on behavior (Bargh, Chen, & Burrows, 1996) and some evidence of context effects on priming (Diiksterhuis, 2010; Galisnky & Glucksberg, 2000), there has been no research directly addressed to the possibility of influencing behavior by *incidentally* priming *sequences* of words in contexts unrelated to the behavior. The presentation of an incidental word pair such as *nice act* may be sufficient for the perceiver to form an implicit sentence (*Nice act*; equivalent to the tacit-subject/tacit-verb sentence, *It was a nice act.*). For example, even though *nice* and *act* may lack the explicit form of a sentence, an implicit integrated concept or proposition may be formed if the order of the words is syntactically compatible with the proposition *nice act*. Indeed, the tendency to treat an ordered-word pair as an implicit integrated concept or proposition may be a fundamental part of language processing. Recently, lexical-decision priming has been found for interrelated prime/target pairs, in which the words can be integrated into a single concept, which is facilitated by brief (500 ms) intervals in between words (e.g., *horse doctor*) (Estes & Jones, 2009). Moreover, behavioral and electrophysiological studies of language perception have also suggested that at least some aspects of syntactic processing in adults are highly rapid and automatic (Fischler & Bloom, 1980; McDonald, 2008; Pulvermüller, Shtyrov, Hasting, & Carlyon, 2008).

In this article, we hypothesized that people incidentally presented with the word pair *nice act* may be automatically biased to defection, whereas people presented with the opposite-order pair *act nice* (a different implicit sentence with an imperative form for the tacit subject *you*) may not. The underlying principle involves syntactic rules of the English language that prescribe specific orders for parts of speech and allow order to be a marker of what words mean. For example, these rules help to define an ambiguous noun/verb word preceded by an adjective as a descriptive statement (e.g., in the case of *nice act*, *act* is defined as the noun *action* by its position relative to the adjective), but the same word followed by an adjective as an imperative proposition (e.g., in the case of *act nice*, *act* is a verb and *nice* an adverb, which in English is often replaced by an adjective).

Syntactic markers of order can be expected to have effects on behavior just as other grammatical markers do. Reading sentences with the perfective as opposed to the imperfective verb aspect (e.g., "The boy walked to the store" as opposed to "The boy was walking to the store") leads to choosing pictures that show completed as opposed to ongoing events (Madden & Zwaan, 2003; for a review, see Zwaan & Radvansky, 1998). Perhaps more impressively, describing one's past actions in the imperfective as opposed to the perfective verb aspect (e.g., "I was solving anagrams" as opposed to "I solved anagrams") increases the likelihood of repeating the action in a new context (Hart & Albarracín, 2009). Therefore, the order of incidentally presented word pairs may also differentially influence behavior due to automated responses to propositions such as *nice act* or *act nice*. As people learn to balance cooperation and exploitation early in life (Eisenberg & Strayer, 1987), these proposition-behavior associations are likely to be well rehearsed and to fire outside of conscious awareness (for similar arguments, see Bargh et al., 1996). Nonetheless, brief intervals between *nice* and *act* may be required for perceivers to automatically parse the two words as a simple declarative (*nice act*) or imperative (*act nice*) sentence (see Estes & Jones, 2009).

Semantic Priming Versus Goal Activation

Although a word pair like *nice act* may influence behavior directly (Zwaan & Radvansky, 1998), word pairs could also activate a goal that in turn influences future behavior (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001). Whether a word activates goals or concepts is always an empirical question, but in the case of parsing propositions, conceptual priming seems more likely. That is, if implicit reading is bounded by the contents of working memory (Estes & Jones, 2009), then reading would be impaired if the effects of a particular sequence were long lasting. Importantly, the distinction between direct behavioral effects and goal-mediated effects allows for different predictions about the role of a temporal delay between the words and the behavior opportunity. If the effects of the word pair are goal mediated, a delay precluding goal satisfaction should strengthen them (i.e., Bargh et al., 2001; Hart & Albarracín, 2009). If the effects of the word pair on behavior are direct, however, a delay should weaken them (Bargh et al., 2001; Hart & Albarracín, 2009). These patterns of the effects of delay are explained in relation to the Zeigarnik effect, which should take place for goal priming but not for conceptual priming (Bargh et al., 2001). These alternate possibilities are important to understand the process underlying the hypothesized increases in defection/cooperation following the presentation of *nice act* or *act nice*.

Experiment 1: Explicit Propositions

The first study was designed to confirm, in the context of an ostensible mixed-motive dilemma game, that believing that one has been sufficiently pleasant in the interaction triggers greater defection than believing that one should try to be pleasant. Although these predictions are intuitive, there is actually no data confirming the predicted direction of the effects of these propositions. Participants were first given opportunities

to play and then received propositional suggestions before another game started.

Participants and Design

Participants were 145 students enrolled in the study in exchange for credit in a psychology class. They were assigned to one of the three cells in the design, including reading a proposition indicating (a) that they *had been nice*, (b) that they *had been sufficiently nice*, or (c) that they should *try to be nice* in the following set of games.

Procedure

Although in reality participants were not playing with another individual, they were told that they would be playing a game with another participant who had been paired with them in the computer network. Participants first played five trials, then read the propositions comprising our experimental manipulation, and last played five additional trials. Participants learned that on each of the five turns of the game, each player must choose Strategy A or B, based on which points would be allocated. Strategy A was always cooperative and Strategy B was always competitive. Participants received a score of 0 each time they chose to cooperate and 1 each time they chose to defect.

After the first set of five game turns, participants were told that the computer would then proceed to the second set of turns and received some subtle propositional suggestions on their behavior. Specifically, they read that after the first phase other participants in their situation normally feel that they (a) *have been nice* to the other player, (b) *have been sufficiently nice* to the other player, or (c) *should try to be nice* to the other player. At the end of the study, we measured mood (being excited, nervous, happy, and sad) and awareness of behavior change on scales from 1 (*not at all*) to 5 (*extremely*). In addition, we assessed awareness of the experimental hypothesis using open-ended procedures. All details of the experimental procedures are available online at http://spp.sagepub.com/supplemental.

Results and Discussion

Behavior. We first obtained the proportion of defections over all five iterations before and after the proposition-reading task and then subtracted the initial score from the later one as a measure of change. A positive number for this change score indicates an increase in defection, a zero indicates no change, and a negative number indicates an increase in cooperation.[1] We then verified that participants assigned to the different conditions were similar in their level of cooperation at baseline. Consistent with successful random assignment, the mean baseline proportion of defection (M proportion = 0.55, SD = 0.30) did not differ across conditions, $F(2, 142) = 1.17$, *ns.* As expected, the propositions participants read changed their behavior relative to the baseline, $F(2, 142) = 3.17$, $p = .05$. Participants who received the suggestion that they *had been nice* or *sufficiently nice* in the prior game ($M = .04$, $SD = .24$ and $M = .08$, $SD = .33$) were more likely to shift towards defecting than participants who received the suggestion to *try to be nice* ($M = -0.07$, $SD = .32$). This difference was confirmed by a significant contrast between the *try to be nice* condition and the other two conditions, $t(142) = 2.43$, $p = .02$. The conditions in which participants were told that they either *had been nice* or *had been sufficiently nice* did not differ between each other, $t(144) = 0.66$, *ns*. When compared with a zero standard, the *try to be nice* condition showed a significant increase in cooperation, $t(144) = 2.54$, $p = .01$, whereas the you *have been nice/sufficiently nice* condition showed an increase in defection, $t(144) = 2.39$, $p = .02$.[2] These findings essentially supported our predictions of the direction of the effect of each suggestion.

Experiment 2: *Nice Act* Word Sequence Versus Control Sequences

To determine if the results of an explicit proposition of *having been nice* in a social interaction would be replicated by incidentally priming a word sequence, Experiment 2 included a procedure to incidentally prime *nice act* (or synonym pairs) after a series of five turns of the mixed-motive game used in Experiment 1. The primes were presented in the context of a letter-detection task. Using funnel-debriefing procedures, it was found that no participant could guess the connection between this task and the subsequent defection measure. In addition to *nice act*, we included two control sequences, one in which *nice* appeared but was followed by a neutral word and a second in which *act* followed a neutral word. Thus, this study can rule out a potential effect of the position of only one of the two words, such as the possibility of a primacy effect of *nice*. As in Experiment 1, defection changes in response to the primes were measured during a second series of game turns.

Method

Participants and procedures. Participants were 71 undergraduate students who enrolled in the study in exchange for class credit. They were randomly assigned to one of three priming conditions with the following word sequences: (a) *nice act*, (b) *nice* (neutral word), and (c) (neutral word) *act*.[3] Over a series of letter-detection trials, participants were primed with various different pairs denoting *nice act*, *nice* followed by a neutral word such as *aunt*, and *act* preceded by a control word such as *name*. The task was to press the spacebar whenever a word began with one of two letters. In the critical conditions, the letter targets were *n* and *a*. Hence, when *nice* and *act* (or *name* and *aunt*) were presented, participants pressed the spacebar and the next word was presented immediately. A detailed description appears in Online Materials.

Results and Discussion

The baseline score of cooperative behavior did not differ across conditions, $F(2, 68) = 1.47$, *ns*, which justified analyzing

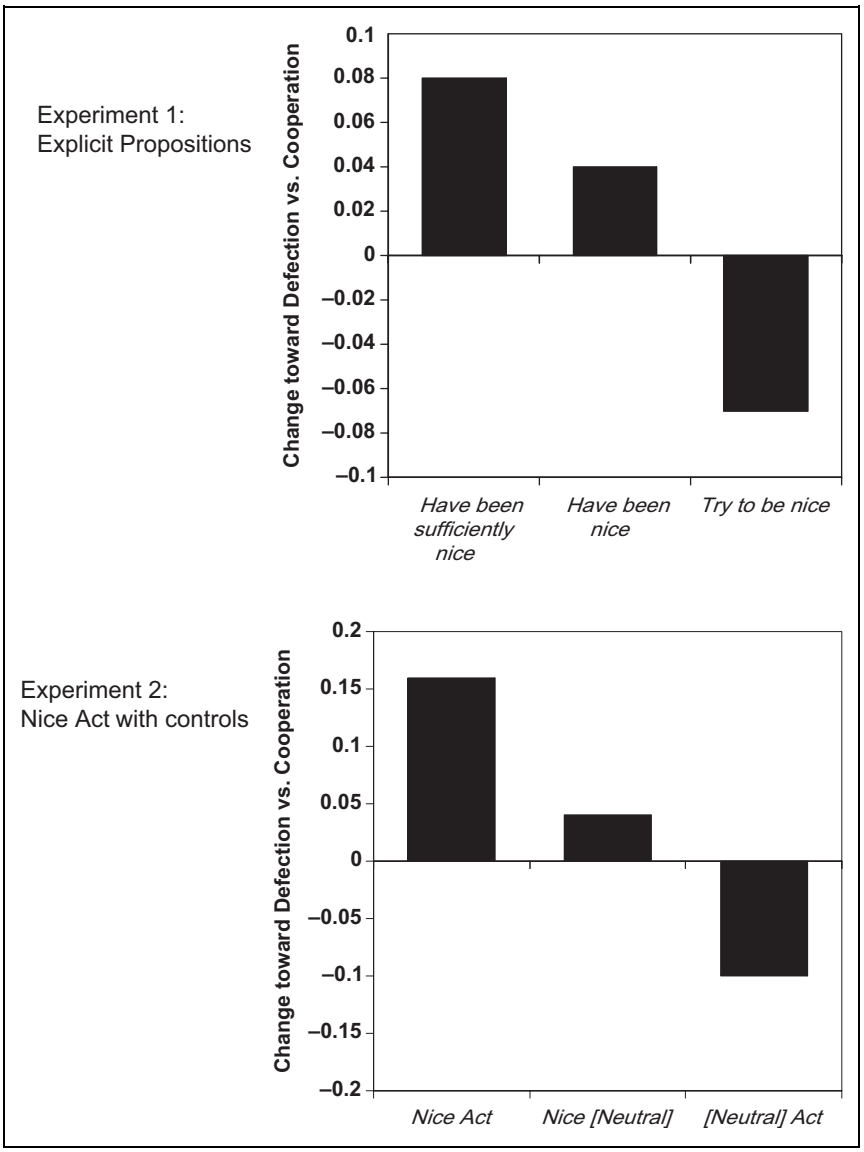

Figure 1. Results From Experiments 1 and 2

change towards defection/cooperation.[4] As expected, there were significant differences in behavior change between the *nice act* ($M = .16$, $SD = .39$), (neutral word) *act* ($M = -.10$, $SD = .26$), and *nice* (neutral word) ($M = .04$, $SD = .25$) conditions, $F(2, 68) = 3.68$, $p = .03$. The change in the *nice act* conditions was significantly stronger than the change in the other two conditions combined (*M*s = .16 vs. -0.03), $t(68) = 2.69$, $p = .01$. Moreover, when compared with a zero standard, the *nice act* condition showed a significant increase in defection, $t(70) = 4$, $p < .001$, and the *nice* (neutral word) condition showed no change, $t(70) = 1$, *ns*. Unexpectedly, the (neutral word) *act* condition showed a significant *decrease* in defection, $t(70) = -2.5$, $p = .01$. The change in the *nice* (neutral word) condition did not differ from the change in the (neutral word) *act* condition, $t(68) = 1.31$, *ns* (see Figure 1).

This study thus found powerful effects of word sequences. Importantly, the effects of word order are due to the sequence of a particular combination of words rather than the mere serial position of an individual word. Of note, there was a significant increase in cooperation observed for the (neutral word) *act* condition. Prior research on decisions under uncertainty in mixed-motive dilemmas suggests that a lack of information about the decisions of the other players can increase cooperation (van Dijk, Wit, Wilke, & Budescu, 2004). Apparently, people who lack information about others' behavior assume that others will cooperate and themselves cooperate with the others (Biel & Gärling, 1995). Cooperation also increases in later than earlier turns of a game, perhaps because of an implicit *first come, first served* norm (Au & Budescu, 1999; Budescu & Au, 2002; Budescu, Au, & Chen, 1997; Rapoport, Budescu, & Suleiman, 1993). In our (neutral word) *act* condition, being primed with the word *act* increased the likelihood of observing these patterns even over a relatively small set of game turns (a total of 10). Future studies may investigate if primed general-action

tendencies increase tendencies towards a default cooperative pattern, a possible mechanism for the effects of the (neutral word) *act* primes. Even though we had no particular expectations for the absolute level of change in this condition, the serendipitous finding may be worthy of further consideration.

Experiment 3: *Act Nice* Versus Control Sequences and the Effects of Temporal Delay and Words Between Primes

Our next experiment was designed to confirm that, contrary to the increase in defection in a *nice act* condition, an *act nice* condition can increase cooperation. Moreover, this study further examined the process underlying the observed effects. The distinction between direct behavioral effects and goal-mediated effects allows for different predictions about the role of a temporal delay between the words and the behavior opportunity. The effects of delay are important to diagnose if the effect of the prime is goal mediated or instead activates behavior directly. When a goal is involved, a delay in executing a desired behavior can strengthen the goal and thus amplify the effect of an experimental manipulation. In contrast, when behavior is activated directly, a delay produces decay in the effects of the manipulation and can occasionally produce a small reversal because the prior concepts are inhibited if a delay-inducing task is performed (Hart & Albarracín, 2009). That is, if the delay-inducing task we used presents a clear goal to participants, concepts that are not related to the alternate goal may be inhibited (see Hart & Albarracín, 2009). Priming was incidental as in Experiment 2, and in that experiment, there was no evidence of demand effects for the priming or the other manipulations, with no participants suspecting there was any relation between the letter-search task and the game.

This experiment also provided a preliminary test of the effects of disrupting the proposition participants implicitly parse. Specifically, a third condition used the same procedures as Experiment 2 but introduced an additional word between the two word primes. Both the longer time interval between the two words and semantic/syntactic disruption of the proposition suggest that these conditions should not show any effects of the word pairs.

Method

Participants and procedures. Participants were 248 undergraduate students who enrolled in the study in exchange for class credit. They were randomly assigned to one of the cells of a 3 (Primes: *Nice Act*, Control Word Pair, *Act Nice*) × 3 (Condition: Words Together Without a Delay Before Behavior, Words Together With a Delay Before Behavior, Words Separated by Other Words Without Delay) factorial design. All participants were primed using the word *presentation* and letter-target detection paradigm of Experiment 2 (for details, see Online Materials). Following the priming, one third of the participants completed the second set of mixed-motive dilemma turns, whereas another third completed a 5-minute filler task designed to introduce a short delay before the second set of turns. The filler task consisted of drawing a family tree (e.g., Hart & Albarracín, 2009). The other third of the participants received the primes without a delay, but this time the primes were separated by interspersed words. Specifically, *act nice* and *nice act* were separated by one or two words such as *market* and *day*.

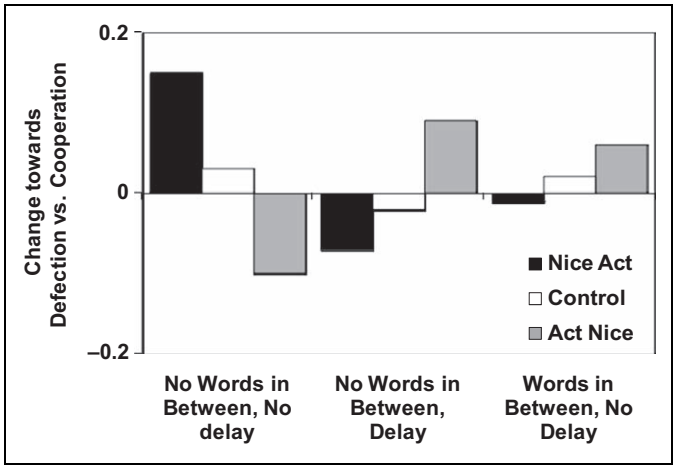

Figure 2. Results From Experiment 3

Results and Discussion

We analyzed change in defection as a function of prime and delay using analysis of variance. This analysis revealed a significant interaction between prime and condition, $F(2, 239) = 3.67$, $p = .006$, with no significant main effects of either prime or condition, $F < 1$ in both cases. The means corresponding to this interaction appear in Figure 2. A decomposition of the interaction suggested that the primes had no significant effect in either the delay condition, $F(2, 239) = 1.78$, *ns*, or the no-delay/words-in-between condition, $F(2, 239) = 0.22$, *ns*. However, the primes did have an effect in the no-delay/no-words-in-between condition, $F(2, 239) = 5.33$, $p < .001$, which led to further examining differences in those cells. In the no-delay/no-words-in-between conditions, planned contrasts indicated more change toward defection in the *nice act* condition than the control and the *act nice* conditions, $t(239) = 2.81$, $p = .005$. Also in the no-delay/no-words-in-between conditions, cooperation in the *act nice* condition increased more than cooperation in the *nice act* and the control condition, $t(239) = 2.87$, $p = .004$. Finally, in the no-delay conditions, the *nice act* and the *act nice* conditions both showed significant change, $t(239) = 8.07$ and -5.26, both $p < .001$ vs. a zero standard. These findings supplement the conclusions from Experiments 1 and 2 by showing that *act nice* increased cooperation not only relative to *nice act* but also relative to a baseline.

Overall, these findings make two important points. First, as the effect disappeared after a delay, one can conclude that the behavior effects we observed were due to conceptual rather than goal priming. In addition, the introduction of a word in between the two word primes also eliminated the effects,

suggesting that immediacy was probably a requirement for participants to parse the proposition implied by the word primes. Nonetheless, the introduction of a word in between the two primes could have changed the proposition meaning itself rather than impeding the proposition parsing. Therefore, Experiment 4 used a more precise manipulation by varying the time interval between the two word primes (Estes & Jones, 2009).

Experiment 4: Effects of Interprime Stimulus Onset Asynchrony (SOA) on Priming of Behavior

In the last two experiments, *act nice* and *nice act* were shown to exert the expected effects. A critical aspect, however, was that the word presentation paradigm we used allowed for the second word in the pair to be immediately presented after the first. For example, participants exposed to *nice* were instructed to press the space bar if the letter *n* or *a* appeared on the word. Pressing the spacebar in turn activated the immediate presentation of the word *act*. In the work conducted by Estes and Jones (2009), parsing the words as a meaningful unit was facilitated when the SOA was 500 ms but not when it was 2,000 ms. Effects of this important potential moderator were directly examined in Experiment 4. If the effects of the word pairs on behavior are due to automatically parsing an implicit sentence, the effect should be greater at 500 ms than 2,000 ms. Again, priming was incidental and there was no evidence of demand effects (see Online Materials).

Method

Participants and procedures. Participants were 71 undergraduate students who enrolled in the study in exchange for credit. The design as a 2 (Primes: *Nice Act* Versus Control Word Pair) × 2 (SOA: 500 ms Versus 2,000 ms) factorial design.

Following the first set of turns of the game, participants were told that the study concerned language processing and, in particular, how readers identify what letters compose a word. This time we created conditions in which the word pairs would be processed together, providing a stringent test of the effect of the SOA. Participants learned that words would be presented in pairs, with one word being presented first and the other following after an interval. Once the second word appeared, participants were told to indicate whether a target letter was present in either of the two words by using the options 1 (*no*) or 2 (*yes*). For example, SHIRT and PLACE contain the letter *S* (in SHIRT), whereas BLANK and PLACE do not contain the letter *S*. If participants received those two pairs, they were to respond *yes* to the first but *no* to the second. The word pairs used in this study appear in Table 1, with the critical experimental and control pairs in bold. Each pair was separated from the other pair by the question in which participants reported whether *S* appeared in the word pair. Within each pair, the SOA was manipulated to be either 500 ms or 2,000 ms. Participants were told that, to obtain the reliability of responses, each word pair could be presented multiple times. Each pair was presented twice to ensure repeated exposure to the critical experimental and control pairs. The dependent measure was changes in defection as in the prior experiments.

Table 1. Word Pairs Used in Experiment 4

Experimental Condition		Control Condition	
drink	*eat*	*drink*	*eat*
copper	*wine*	*copper*	*wine*
girl	*sings*	*girl*	*sings*
monkey	*dog*	*monkey*	*dog*
pub	*stick*	*pub*	*stick*
nice	***Act***	***nice***	***aunt***
staple	*pencil*	*staple*	*pencil*
run	*flower*	*run*	*flower*
good	***behave***	***good***	***bank***
school	*factory*	*school*	*factory*
bake	*white*	*bake*	*white*
gentle	***done***	***gentle***	***done***

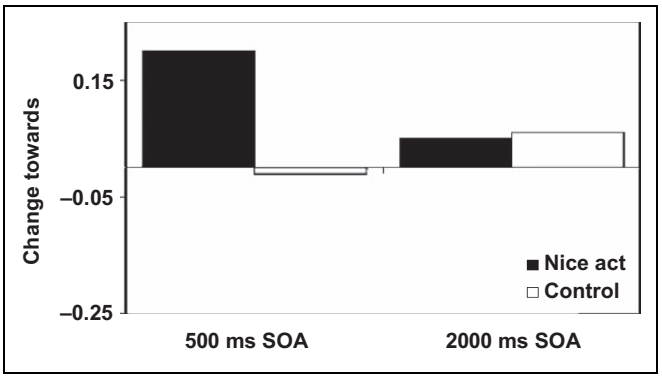

Figure 3. Results From Experiment 4

Results and Discussion

We analyzed change in defection as a function of word pair and SOA. As expected based on Estes and Jones's (2009) study, there was a significant interaction between the two factors, $F(1, 67) = 4.02$, $p = .05$. This interaction is depicted in Figure 3 and suggested that a 500 ms SOA was necessary for the effect of the word pair, $t(67) = 2.64$, $p = .01$. When the SOA was 2,000 ms, however, the effect of the word pair disappeared, $t(67) = -0.08$, *ns*.

General Discussion

Defection and cooperation are fundamental behaviors in many social interactions. Therefore, ideas in propositional form should naturally influence these behaviors in the course of interpersonal relationships such as those developed in a mixed-motive dilemma. What is perhaps more surprising is that these propositions can be formed from incidentally presented fragments that conform to a propositional form. Merely seeing the words *nice* and *act* in a sequence was sufficient for these word pairs to influence behavior in the same way as being

told that one prior behavior was *nice* or *sufficiently nice*. But the effects of implicit propositions go beyond a mere demonstration of the phenomenon to suggesting that the contents of working memory undergo a form of scanning similar to that observed in reading. Syntactic effects (at least the simplest ones relating word order to syntactic role) are automatic and influence behavior in the absence of any goal to connect the dots, so to speak, that become activated in a haphazard temporal stream. It is particularly important to have shown that these effects occur when the stimuli are presented in brief succession and that they last for brief periods. Brief duration seems highly adaptive in this case, as this parsing capacity is quickly free to make sense of newer syntactic arrangements of stimuli. Of note, these sequences may have similar effects even if some of the stimuli are images, such as when words and pictures flow through people's mind. Future research should continue to investigate these fascinating processes.

The present studies were also important in showing that implicitly elicited syntactic structures can alter social behavior. Previous studies have documented the tendency for people to automatically assign syntactic structure to word sequences (e.g., Murphy, 1990) and react to violations in either syntactic structure or semantic coherence by trying to restructure the sentence, come up with new schemas, and/or regress to earlier parts of a text while reading (e.g., Frazier & Rayner, 1982; see Rayner, Chace, Slattery, & Ashby, 2006, for a review). Nevertheless, there has been no prior demonstration of how the order of word pairs alters the important social outcomes of cooperation and defection. This demonstration should perhaps be followed by examining other effects of language, syntax, and thought in the sort of high uncertainty conditions we studied, where participants had no contact with the other player nor were they given information of the behavior of their opponents. Similar uncertain conditions may yield other effects as well. For example, as much as players act consistently with the proposition that they were sufficiently nice, other word pairs may imply that they have been insufficiently nice. Such conditions may result in more cooperation than defection and may further crystallize our understanding of linguistic mental representations in the domain of social behavior.

Finally, this research supports the notion that people possess a capacity to translate sequentially flowing random material into linguistic propositions that orient their behavior. Linguistic propositions emerge when relatively random material in the stream of consciousness is ordered in a way syntactically compatible with a given proposition. As people possess an abstract, hierarchical syntactic system (Chomsky, 1959) with which to process haphazard linguistic material, a match between the order of incidental words and a meaningful proposition can automatically translate those stimuli into action. Spontaneous, internally generated thought is likely to operate in the same way, and so future research should explore how syntax influences not only behavior but also spontaneous thoughts as these implicit propositions are formed.

Notes

1. No monetary incentives were used in the study, as there was no true game with another participant. However, qualitative participant comments during a funnel debriefing procedure indicated that participants were engaged and interested in the game.
2. All paired comparisons with a 0 standard used the overall error term from ANOVA. This procedure is more consistent with the spirit of using factorial designs analyzed with ANOVA and does not change any of our conclusions.
3. We considered including a no-prime control. However, such a control is not appropriate because the task itself may change the behavior in the game. Thus, we selected neutral-prime controls as opposed to no-text controls.
4. Additional analyses were conducted to determine if there were temporal shifts over the turns or trials. Here and in the remaining experiments, there were significant effects of trial such that choices were more cooperative later than earlier in a set of runs. These findings are consistent with prior reports that cooperation increases later in a game, perhaps because of an implicit *first come, first served* norm (Au & Budescu, 1999; Budescu & Au, 2002; Rapoport et al., 1993). However, as our manipulations were conducted before the second block, these turn-level findings do not receive further coverage in the article.

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