While the field of verbal and nonverbal congruent and incongruent communication has gained increasing interest in recent years, research in this area regarding children has received considerably less attention. This article presents diverse patterns of children's verbal and nonverbal interrelationships of congruent–incongruent communication. The study used a mixed multivariate design to analyze parent–child interactions (n = 160) in structured joint game sequences, filmed in their homes. The findings explain children's incongruent communication patterns (ICP) and reveal the effects of social and situational factors, including child's and parent's gender, socioeconomic status, and task difficulty. The study expands the theoretical and methodological research regarding ICP. The proposed model provides composite theoretical perspectives regarding children's congruence–incongruence interconnections of verbal and nonverbal communication.

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The main objective of this study was to examine verbal and nonverbal communication modes and their interrelationships. The aim was to explore the link between these two modes of communication and how they are manifested in children's communication during task-oriented parent–child interactions. Most previous studies in this area have examined children's communication modes separately, focusing on either their verbal or nonverbal communication. In this article, we argue that examining the two forms of communication, and the link between them, can provide new holistic insights into the study of children's communication. This presents a broad and complex picture of the verbal and nonverbal messages that children transmit to their parents.

The theoretical framework of this study draws on an integrated communication approach (Buck & VanLear, 2002; Jones & LeBaron, 2002) based on the assumption that verbal and nonverbal communication modes are displayed in most face-to-face interactions. These modes are defined in terms of interacting streams of symbolic, spontaneous communication, and “pseudospontaneous” displays. These intertwining threads comprise the infrastructure of human communication.
Verbal communication involves symbolic and intended messages and uses learned and socially shared signal systems of propositional information that are transmitted via symbols. Nonverbal communication contains both spontaneous and pseudospontaneous messages. Spontaneous communication is defined as the nonintentional communication of an emotional–motivational state based on biologically shared nonpropositional systems. Pseudospontaneous communication involves intentional and strategic manipulated nonverbal messages, which are displayed with the intention of sending a specific message or proposition that can be false (Buck & VanLear, 2002).

The two communication modes (verbal–nonverbal) have expressive and receptive aspects, which interact with and modify one another. Based on the developmental interactionist theory (Buck & VanLear, 2002), however, the spontaneous nonverbal stream may gain primacy. Although some studies of the relative primacy of verbal versus nonverbal informational perception have produced inconsistent and complex conclusions (Berry, Pennebaker, Mueller, & Hiller, 1997; Grahe & Bernieri, 1999; Mehrabian, 1981), most have agreed that nonverbal communication gains preference (Ekman, 1997b; Grahe & Bernieri, 1999; Hale & Stiff, 1990; Noller, 1985; O’Sullivan, Ekman, Friesen, & Scherer, 1985; Walther, Loh, & Granka, 2005).

Contemporary reliance theories state that the argument for nonverbal primacy is a key element in distinguishing between primary and secondary sources of information in interpersonal contexts (Burgoon et al., 2002). This idea is explained based on evolutionary perspectives (Boone & Buck, 2003) and is supported by recent research indicating that nonverbal communication gains primacy because the reception process of nonverbal cues is faster than the analysis of verbal messages (Lamy, Salti, & Bar-Haim, 2009).

Advanced research has examined the relationship between verbal and nonverbal communication modes as an integrated expression (Burgoon, 2006; Burgoon & White, 1997; Ekman, 1997a; McNeill, Cassell, & McCullough, 1994; Streeck & Knapp, 1992). This concept, which has been defined as the principle of interactivity, provides a new avenue to explore this interrelationship (Buck & VanLear, 2002; Jones & LeBaron, 2002). Recent updated research interest has referred to complex examinations of verbal and nonverbal interrelationships in terms of congruent and incongruent communication patterns (Grebelsky-Lichtman, 2010; Grebelsky-Lichtman, 2014; Schultz, Tulviste, & Konstabel, 2012).

**Congruent and incongruent patterns of verbal and nonverbal communication**

*Congruent* communication is conceptualized as a relationship of identity or similarity between verbal and nonverbal modes, in which the overall message is coherent and the verbal and nonverbal messages are mutually enhancing. *Incongruent* communication is conceptualized as a relationship of discrepancy and contradiction between verbal and nonverbal messages (Bugental, Kaswan, & Love, 1970; Lunger & Wurf, 1999; O’Sullivan et al., 1985).
This study further examines congruence and incongruence patterns in children's communication along the dimension of cooperative behavior. Recent theoretical perspective in game theory has suggested that communication patterns characterized by “sending accuracy” (i.e., the exactness with which an individual communicates messages) are associated with cooperative behavior (Boone & Buck, 2003). This can be correlated with congruent communication. Cooperative behavior is defined as children's reactions that prolong mutual interaction and includes expressions of agreement, esteem, and satisfaction. Noncooperative behavior is defined as children's reactions that interrupt the interaction and includes behavior that interferes with attempts to be perceived as effective, desirable, and appreciated, as well as expressions of blame, rejection, refusal, disagreement, complaint, and derision (Brown & Levinson, 1987; Bublitz, 1988; Goffman, 1979; Grice, 1975; Labov & Fanshel, 1977; Weizman, 2008; Wilson, Roberts, Rack, & Delaney, 2009).

Based on this dimension, this study analyzed children's diverse congruent and incongruent communication patterns along two axes: verbal–nonverbal communication modes and cooperative–noncooperative behavior. Table 1 presents all of the types of children's congruence and incongruence and provides descriptions and examples thereof. As Figure 1 shows, these patterns are divided into constructive categories and inhibitory categories, each of which contains both congruent as well as incongruent communication patterns.

The constructive categories include supportive congruence (when a child expresses both verbal and nonverbal cooperative messages) and adaptive incongruence (when a child expresses noncooperative verbal messages and cooperative nonverbal messages). The inhibitory cooperation categories include challenging congruence (when a child expresses both verbal and nonverbal noncooperative messages) and

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example</th>
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<tbody>
<tr>
<td>Supportive congruence</td>
<td>Congruence where both channels expressed cooperation</td>
<td>“Let’s draw an airplane.” The child looks at the parent and facilitates the mutual play task</td>
</tr>
<tr>
<td>Challenging congruence</td>
<td>Congruence where both channels expressed noncooperation</td>
<td>“You do not know how to draw it well.” The child moves the parent's hand away from the joint game</td>
</tr>
<tr>
<td>Leakage-type incongruence</td>
<td>Incongruence, where both verbal cooperation and nonverbal noncooperation are displayed</td>
<td>“We are drawing great.” The child takes over the game and does not allow the parent to play</td>
</tr>
<tr>
<td>Adaptive incongruence</td>
<td>Incongruence, where both verbal noncooperation and nonverbal cooperation are displayed</td>
<td>“You are turning the knobs too fast.” The child speaks pleasantly and cooperates with the parent to perform the mutual task</td>
</tr>
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**Hypotheses concerning children’s incongruent patterns (ICP)**

Developmental theories have suggested that incongruent communication patterns (ICP) and their interpretation as such start in children aged between 5 and 8 (Bugental, Kaswan, Love, & April, 1971; Bugental et al., 1970). There is also empirical evidence that children manifest few behaviors that involve incongruence, dissimulation, or manipulative usage of the various channels of communication (Bateson, 1972; Jussim, Soffin, Brown, Ley, & Kohlepp, 1992; Lunger & Wurf, 1999; Swann, Stein-Seroussi, & McNulty, 1992).

This study, which analyzed children at 4 years, follows the above-mentioned studies by hypothesizing that children’s behavior would tend toward congruence. Studies have found a positive correlation between the age of children and their ability to display ICP and deceptive mixed messages (Saarni, 1979). Specifically, young children evince less ability to display incongruent cues than older children, who can exhibit ICP much more readily. Given that young children tend to cooperate with their parents in keeping with their interactional role and the mutual task (Blum-Kulka, 1997),
we anticipate more incidences of supportive congruence than challenging congruence in the children’s behavior (Pomerantz, 1984). Based on developmental theories and findings from earlier research, the following hypothesis was formulated:

H1: Children’s behavior will tend more toward supportive congruence than to displays of ICP and challenging congruence.

The cognitive theoretical explanation for ICP is grounded in action assembly theory (AAT), which explains the formulation and production of verbal and nonverbal messages (Greene, 2007). Based on AAT, children’s ICP would result from difficulty with assembling and integrating verbal and nonverbal procedural records; these are defined as long-term memory units that contain three types of information: action features, outcome, and situation. The lack of an overarching integration of relevant action features may cause the overall communication to convey conflicting meanings. Incongruence, or problems of assembly, represents a child’s communicative behavior in which the outcome expression lacks coherence or appears disjointed and may result in reduced quality of performance. Children’s ICP is significant because it harms their communication abilities and affects the way they are perceived. Specifically, incongruence is associated with less positive impressions and may lead to the child’s knowledge or competence being questioned (Greene, 2007).

AAT attributes great importance to situational factors. Previous studies have argued that situation-specific aspects of parent–child interaction tasks may influence children’s communication (Ginsburg, Grover, Cord, & Ialongo, 2006). However, there is a gap in the literature regarding children’s ICP and task difficulty, which the current study aims to fill. Examining interactions with different levels of difficulty makes it possible to observe children’s communication patterns that would not have otherwise occurred. In particular, high levels of difficulty may create frustration and, consequently, tend to produce nonverbal leakage and ICP (Babad, Bernieri, & Rosenthal, 1989; DePaulo & Bell, 1996; Ekman, 1997b; Lessin & Jacob, 1984; Zuckerman et al., 1981).

Children then use patterns of verbal and nonverbal communication to cope with these challenging situations. The resulting outcome would be reflected in the child’s assembly difficulties of ICP and challenging congruence patterns. Based on AAT and findings from previous research, the following hypothesis was advanced:

H2: Children’s communication during free play will be characterized by supportive congruence, while difficult tasks will be characterized by ICP and challenging congruence.

Social learning theories provide another theoretical explanation for ICP among children (Block, 1983; Huston, 1983), suggesting that children observe their parents, model them, and adopt the observed patterns of behavior (Bandura, 1986; Michner, DeLamater, & Schwartz, 1986; Mischel, 1968). Therefore, according to social learning theory, ICP among children is derived from children’s imitation of parents’ incongruent behaviors. The children imitate and acquire patterns of communication that
have discrepancies or contradictions between messages that are conveyed verbally and those conveyed nonverbally. These environmental factors of parenting communication style and their correlation with children's communication patterns, which are emphasized by social learning theories, have been found to be moderated by biological reactivity (Belsky & Beaver, 2011). Recent evidence indicates that children's dopamine-related genes act as a differential susceptibility factor that interacts with the rearing environment (Bakermans-Kranenburg & Van Ijzendoorn, 2011).

This study expands ICP explanations by analyzing children's communication patterns with their parents (Adams, Kuebly, Boyle, & Fivush, 1995; Barratt, 1995; Davidson & Snow, 1996; Richards & Gallaway, 1994). Previous studies have argued that mothers' communication with their children was more ambiguous than that of fathers (Barton & Tomasello, 1994; Grebelsky-Lichtman, 2014; Neill, 1991; Neill & Caswell, 1996; Noller, 1985) and that mothers offer more verbal support than challenge (Blum-Kulka, 1997; Gottman & Kattz, 1997). In accordance with findings from previous studies, and the social learning theory, the following hypothesis was presented:

H3: Children's communication with mothers will be characterized by ICP and supportive congruence, whereas their communication with fathers will be characterized by challenging congruence.

Emotional theoretical perspectives explain that ICP among children results from a failure to give full legitimacy to children's problematic emotions (statements such as, “In our family, we love one another …,” “You mustn't be angry …,” “Big children aren’t jealous …”). Indeed, parents do not always validate those emotions among their children that they feel are “not positive” (Benziman & Marodes, 1997), which can lead to ICP in children's behavior (Argyle, Alkema, & Gilmour, 1972; Graves & Robinson, 1976; Walker, 1997). Although children may not verbally express problematic emotions such as fear or stress, those feelings will leak out through nonverbal communication modes.

Recent studies have found that boys' patterns of communication are influenced by the social stereotype that boys have more disciplinary problems than girls (Chick, Heilman-Houser, & Hunter, 2002; Fox, 2011; Knapp & Hall, 2010; Lytton & Romney, 1991; Madrid & Katz, 2011; Nichols, 2011). Some studies have observed that incongruent behavior is often expressed in interactions with children who have disciplinary or other problems (Bugental et al., 1970, 1971; Irby & Brown, 2011). Additionally, girls' communication demonstrated greater “sending abilities” than that of boys (Buck, 1975). In keeping with findings from previous studies, the following hypothesis was proposed:

H4: Boys' communication will be characterized by ICP and patterns of challenging congruence, whereas girls will show supportive congruence.

A further theoretical explanation for ICP among children draws on processes of socialization (Eisenberg, Wolchik, Hernandez, & Pasternack, 1985). Western societies strongly emphasize verbal communication during socialization. From a young age,
children are taught to express themselves verbally and to use words to convey messages to their environment. Generally, agents of socialization do not systematically teach nonverbal communication (Neill, 1991). This means that differences in socioeconomic status (SES) tend to be played out in verbal communication, both in relation to verbal and learning abilities and in relation to patterns of control and authority (Bornstein & Bradley, 2003; Dickinson & Snow, 1987). Studies in this area have noted a high incidence of supportive communication among high-SES families, particularly in their verbal communication (Blum-Kulka, 1997; Hasan, 1992; Snow, 1994; Snow & Dickinson, 1990). With regard to low-SES families, Lee, Brooks-Gunn, McLanahan, Notterman, and Garfinkel (2013) reported, based on the family stress model, that downturns in macroeconomic conditions are strongly and directly correlated to harsh maternal parenting and challenging communication patterns.

This study expands the literature by examining SES and children's congruent–incongruent communication patterns during parent–child interactions. Studies have shown that high-SES children display greater verbal facilities, which could be translated into supportive communication patterns (Lieven, 1994; Quay & Blaney, 1992; Rogers & Sawyers, 1990; Thorndike, 1962). In keeping with the findings from previous studies, it was hypothesized that:

H5: High-SES children will be characterized by supportive congruence, whereas low-SES children will be characterized by challenging congruence.

Method
Participants
The study included 160 interactions consisting of one child and his/her mother or father. In order to enrich theory and methodology in the context of gender differences regarding complex communication patterns, an equal number of boys and girls participated in the study. The average age of the children was 4.2 (range: 3.9–4.6), an age at which children demonstrate verbal and nonverbal communication skills, a range of play skills, the ability to plan ahead, the capacity for representational thinking and imagination, social cognition, and motor skills (Fasulo, Liberti, & Pontecorvo, 2002). First-born children were excluded, as studies have shown that first-born children's patterns of communication differ from those of their subsequent siblings (Berglund, Eriksson, & Westerlund, 2005; Suitor & Pillemer, 2007).

This study analyzed children's interactions with both mothers and fathers (Barratt, 1995; Richards & Gallaway, 1994) with the aim of attaining a comprehensive picture of the array of children’s patterns of communication during parent–child interaction. The mothers ranged in age from 29 to 45 and the fathers from 31 to 53 ($M = 33.2, SD = 2.1; M = 37.5, SD = 3.5$, respectively).

The families were recruited through preschools. Contact was initiated with families that included children who, according to their teachers, had no developmental, cognitive, communicative, or motor problems. Each family completed a demographic questionnaire designed to characterize the participants (Bornstein & Bradley, 2003;
The high-SES families were characterized by two parents with at least a university education, above-average income, above-average number of rooms in the home, and residence in at least an upper middle class neighborhood. The low-SES families were characterized by two parents with no more than a 12th grade education, below-average income, below-average number of rooms in the home, and residence in a disadvantaged neighborhood.

**Procedures and research sites**

Child–mother and child–father interactions were observed and videotaped in the family’s home. Participants were told that they were participating in a study of how parents and children play together. We met twice with each family. On the first occasion, we videoed an interaction between the child and one of his/her parents; on the second occasion, we videoed an interaction between the child and the other parent. In order to neutralize a potential order effect, mothers were observed first in half of the sessions and fathers were observed first in the other half. To examine the effect of parental interaction order (i.e., whether the mother or father was observed first), we conducted two analyses of covariance (ANOVAs), one for each dependent variable. In each ANOVA, we included the main effects of order and the independent variables (child’s gender, parent’s gender, SES, and task difficulty) and interactions between order and each of the independent variables. The results did not indicate a main effect for order on congruent patterns, $F(1, 306) = 1.70$, ns, nor on incongruent patterns, $F(1, 306) = 0.16$, ns. In addition, no interaction effect for order was found.

All of the interactions involved cooperative play with an *Etch A Sketch* drawing screen (Ginsburg et al., 2006). The *Etch A Sketch* toy has two knobs, one on each side, that can be turned in order to create lineographic images; one knob draws only vertical lines and the other draws only horizontal lines. The toy is suitable for the cognitive, motor, and social skills of a normal 4-year-old child. The parent and the child were given one *Etch A Sketch* board, and instructed to play together, with each assigned one of the two controls. Although all of the participants were familiar with *Etch A Sketch*, none had ever used it in such a mutual cooperative game structure. This game structure requires the parent and child to work as a team if they are to succeed and creates a situation in which the successful completion of the task relies on cooperation. The parent–child interactions started with free play, followed by a series of three assigned tasks that were designed to increase in complexity.

**Instrumentation and coding system**

Children’s communication in the interactions was coded based on the videos filmed in the families’ homes for the nonverbal communication and their dialogue transcriptions for the verbal communication. The transcription system used conversation analysis as a methodology for transcribing verbal communication (Couper-Kuhlen, 1999; Psathas & Anderson, 1990; Stivers & Sidnell, 2012). Two undergraduate research assistants, who each received approximately 7 hours of training, transcribed the interactions. Two other undergraduate research assistants, each of whom received
approximately 14 hours of training, coded the children’s verbal and nonverbal communications. The two types of interactions that were coded were (a) the free play and (b) the execution of the most difficult task.

**Coding procedures: Verbal communication**

The coding of verbal communication and the categories of analysis was based on discourse analysis (Blum-Kulka, 2003; Brown & Levinson, 1987; Bublitz, 1988; Weizman, 2008). The dialogue transcriptions were first divided into utterances, which are the basic units of semantic content (Stiles, 1992). Utterances as units of analysis preserve the meanings conveyed in the dialogue. An utterance may be smaller than a turn, which may include several utterances. This study deals with spoken language, which is characterized by many shortcuts, especially within family conversations. Therefore, while some utterances may appear to be lacking or incomplete, they stand on their own and derive their meaning from the flow of the interaction. For instance, a child’s utterance such as “enough” stands on its own, meaning “stop turning your knob.” The following example illustrates the division into utterances:

Father: Would you like to draw that ruler?
Child: Yes¹, but its impossible², let’s carry on³, come on⁴, now you do it to here⁵, I made the letter B⁶.

In this example, the child’s discourse is divided into six utterances. The speech act expressed for each utterance was specified (Searle, 1979). Speech acts with a cooperative value include agreement, encouragement, appreciation, and expressions of satisfaction. Speech acts with a noncooperative value include blame, rejection, refusal, disagreement, complaint, derision, warning, and threat. Speech acts such as guidance, questions, and instructions were defined as having cooperative or noncooperative value, depending on the context.

Intercoder reliability was calculated on 10% of the 160 interactions, which were randomly selected and coded separately by two different coders. Guetzkow’s (1950) Unitizing formula was used for the division of the interactions into utterances ($u = .04$). Interrater reliability was examined using Scott’s $\pi$ (Craig, 1981; Scott, 1955). We assessed reliabilities in each of the coding types: children’s cooperative and noncooperative patterns in verbal communication (.93); and verbal cooperative and noncooperative strategies (based on speech act; .92).

**Coding procedures: Nonverbal communication**

The coding of nonverbal communication was based on functional theory (Bavelas, 1994) to analyze gestures and postures. A gesture is a form of nonverbal communication in which visible bodily actions communicate particular messages, either in place of or parallel to words (Rowe & Goldin-Meadow, 2009). Gestures include movement of the hands, face, or other parts of the body (Ekman & Friesen, 1969; Schultz et al., 2012). Posture refers to an intentionally or habitually assumed position that the human body can take (Afifi, 2007; Knapp & Hall, 2010).
Operationally, the coding of nonverbal gestures and postures was based on established coding schemes for observed nonverbal communication, classification, and analysis (Ekman & Friesen, 1969; Kestenberg, Loman, Lewis, & Sossin, 1996). Gestures that express nonverbal cooperation include nodding, positive physical contact, guidance, and moving hands in a circular motion. Gestures that express nonverbal noncooperation include the “no” head shake, finger-pointing representing a warning or a threat, negative physical contact, a closed fist, cutting hand movements, and touching external objects or the body. Postures that express noncooperation include enclosing, descending, and retreating, whereas postures that express cooperation include spreading, ascending, and advancing.

We calculated intercoder reliability using Scott’s \( \pi \). We assessed reliabilities in each one of the coding types: children’s cooperative and noncooperative patterns in nonverbal communication (.91); and nonverbal cooperative and noncooperative strategies (based on gestures and postures; .89).

**Study design**

The study used a mixed multivariable and multifactorial design that contained two “between-subject” variables (child’s gender and SES) and two “within-subject” variables (parent’s gender and task difficulty). Parent’s gender constitutes a within-subject variable in the design based on the interdependence between the parents, who react to the same child in the collaborative activity.

The dependent variables (children’s congruence–incongruence patterns) constitute four communication indices constructed from within four coding types: cooperative and noncooperative patterns of the verbal utterance, the speech act of the verbal utterance, cooperative and noncooperative patterns of the nonverbal equivalent of the utterance, and the nonverbal expression that accompanied the verbal equivalent of the utterance.

**Constructing variables of congruence and incongruence**

We constructed the congruence and incongruence variables by comparing each verbal utterance to its nonverbal counterpart. We used the communication expressions to produce indices to analyze the integrative pattern of children’s verbal and nonverbal communication that emerged. *Congruence* was coded when both the communication forms contained either cooperative or noncooperative behavior. *Incongruence* was coded when one of the channels contained cooperative behavior and its counterpart contained noncooperative behavior. We used this model to characterize four types of children’s congruence and incongruence (see Figure 1).

A multivariate analysis of variance (MANOVA) for repeated measures was conducted to examine children’s congruent and incongruent communication patterns in relation to the study variables: child’s gender, parent’s gender, SES, and task difficulty. Figure 2 presents the congruence versus incongruence communication patterns. The means represent the integrated verbal utterances and nonverbal expressions within a fixed 10-minute time frame. We also conducted a repeated measures ANOVA for
Figure 2 Congruence versus incongruence communication patterns. Note: Figures 2(a–d) illustrate incongruent versus congruent patterns: (a) Free play and difficult task. (b) Sons and daughters. (c) Toward fathers and mothers. (d) High and low socioeconomic status (SES). Shown are mean values +/− SD. Asterisk denotes *p < .05; **p < .001.

The results of the study indicated that every parent–child interaction contained patterns of both congruence and incongruence among children. As hypothesized in H1, congruence patterns were significantly dominant in the children’s behavior [congruence: $M = 35.9$ (69%), $SD = 13.1$; incongruence: $M = 15.3$ (31%), $SD = 7.1$; $\chi^2(1) = 733.9$, $p < .0001$]. The most common pattern of congruence was supportive congruence, $M = 24.3$ (65%), $SD = 5.2$, followed by challenging congruence, $M = 11.7$ (35%), $SD = 4.6$; $\chi^2(1) = 1542.9$, $p < .0001$. These findings are compatible with H1 and with normative social expectations from children in parent–child interactions. Nonetheless, the rate of challenging congruence was higher than anticipated, characterizing more than one third of the children’s congruence communication patterns.
The findings that contradicted H1 concerned ICP. Children's ICP was more common than expected. As noted above, approximately 30% of the messages that the children conveyed were characterized as incongruent. Leakage-type incongruence (characterized by verbal cooperation and nonverbal noncooperation) was significantly more prevalent, $M = 8.95$ (55%), $SD = 2.1$, than adaptive incongruence, $M = 6.3$ (45%), $SD = 3.4$; $\chi^2(1) = 853.6$, $p < .0001$.

An example of the leakage-type pattern is a child who conveyed a verbal message of cooperation and an orientation toward mutual play, while also conveying a nonverbal message of noncooperation. For instance, the child in Figure 3 is expressing a cooperative verbal message by saying to his mother, “We are drawing a house. We’ll put the door here.” However, his nonverbal behavior is noncooperative; he is playing with both knobs, turning his back to his mother and preventing her from joining in. The child is rebuffing the mother’s attempts to join in the game, which ends with the child conveying a communication pattern of challenging congruent, expressing both verbal and nonverbal noncooperative messages.

An important linkage was found between ICP in the child’s behavior and ICP in the parent’s behavior. When a parent’s behavior with his or her child was incongruent, the child’s behavior toward that parent was also incongruent. In other words, incongruence among children may actually be modeling of their parents. In one particular parent–child interaction, the parent displayed leakage-type incongruence. The parent nonverbally took over the joint task and used both knobs, while conveying a cooperative verbal message, saying to the child: “Look how well we’re doing.” The child responded in a similarly incongruent manner: He was nonverbally noncooperative, rolling around on the sofa while answering his parent in a cooperative manner, saying, “We’re doing brilliantly.”

Adaptive incongruence involves verbal noncooperation and nonverbal cooperation. In one case, a father suggested, “Let’s draw an airplane. Shall we start with its body?” The child verbally rejected the parent’s offer, and replied, “No, let’s start with the wings,” while expressing nonverbal cooperation with the mutual task.
Congruence–Incongruence patterns and level of difficulty
As predicted in H2 (see Figure 2a), there was a significant main effect for task difficulty and congruence patterns, multivariate $F(1, 144) = 2.23, p < .05, \eta^2 = .18$. Specifically, challenging congruence was more pronounced in complex tasks ($M = 13.7, SD = 9.3$) than in free play ($M = 9.5, SD = 4.9$), $F(1, 144) = 7.04, p < .002, \eta^2 = .24$. It appears that when the children did not have to struggle with a difficult task, there was a higher incidence of both verbal and nonverbal cooperative behavior expressing supportive congruence patterns, ($M = 27.4, SD = 12.3$ vs. $M = 21.4, SD = 11.2$), $F(1, 144) = 5.87, p < .006, \eta^2 = .23$.

Furthermore, ICP showed a main effect for level of difficulty, multivariate $F(1, 144) = 3.82, p < .03, \eta^2 = .21$. Incongruent behavior (Figure 2a) was more typical in complex tasks ($M = 16.9, SD = 7.9$) than in free play ($M = 13.2, SD = 9.6$). These results confirm H2. ICP was primarily expressed in adaptive incongruence, which was found more often in complex tasks ($M = 7.1, SD = 4.1$) than in free play ($M = 5.5, SD = 3.4$), $F(1, 144) = 10.49, p < .0003, \eta^2 = .31$. In contrast to H2, however, leakage incongruence was more common in free play ($M = 10.6, SD = 7.0$) than when carrying out complex tasks ($M = 7.3, SD = 4.3$), $F(1, 144) = 3.06, p < .05, \eta^2 = .19$.

Analyses of the relationship between ICP and task difficulty repeatedly revealed two significant interactions: one between parent’s gender and the level of task difficulty, and another between SES and task difficulty.

With regard to parent’s gender, task difficulty discriminated between the children’s behavior with their mothers and their fathers, multivariate $F(1, 144) = 4.28, p < .02, \eta^2 = .23$. Scheffé’s post hoc tests indicated that children interacting with their mothers displayed a greater range of behaviors when carrying out complex tasks ($M = 17.8, SD = 6.6$) than in free play ($M = 12.4, SD = 7.9$), whereas their behavior with fathers remained largely consistent. For example, when a mother was very achievement-oriented, the child would sometimes assume a calming and comforting role. As Figure 4 show, one mother said to her daughter during a difficult task, “It

Figure 4  Child’s verbal and nonverbal challenging congruence.
isn’t very good. It’s not like in the picture,” to which her daughter answered, “It’s absolutely fine,” while making a comforting nonverbal gesture. In another instance, a father was dissatisfied with the outcome and his son said, “Let’s pretend we don’t have that line,” while displaying nonverbal cooperation.

The results were similar for SES and task difficulty, multivariate $F(1, 144) = 4.75, p < .03, \eta^2 = .21$. Scheffé’s post hoc tests indicated that low-SES children showed consistent behavior across all tasks. High-SES children demonstrated greater task orientation, which was expressed through differentiation across complex tasks ($M = 42.0, SD = 11.3$) and free play ($M = 38.7, SD = 14.4$).

**Congruence–incongruence patterns and child’s gender**

In keeping with H3, ICP was found to be more common among boys than girls (see Figure 2b), multivariate $F(1, 144) = 6.79, p < .01, \eta^2 = .26$ (boys: $M = 17.8, SD = 7.9$; vs. girls: $M = 12.8, SD = 5.9$). Specifically, boys expressed more leakage-type incongruent behavior than girls, $F(1, 144) = 7.83, p < .008, \eta^2 = .34$.

As predicted in H3, there were significant differences between boys and girls in terms of congruent behavior, multivariate $F(1, 144) = 4.31, p < .04, \eta^2 = .24$. Specifically, patterns of challenging congruence were found to be more prevalent for boys ($M = 13.8, SD = 8.4$) than girls ($M = 9.5, SD = 6.3$), $F(1, 144) = 2.64, p < .05, \eta^2 = .19$. Interestingly, none of the girls expressed extreme noncooperation during the mutual interaction with their parents. Girls expressed noncooperative behaviors by complaining and disagreeing within the rules. Boys, on the other hand, tended to express an extreme noncooperation that changed the rules of the interactions and created new rules; they made statements such as, “I don’t want to play this game. Let’s play something else.”

For instance, the father in Figure 5 is asking his son, “What would you like us to draw?” The child replies, “I’ll bring my cards,” while nonverbally standing up and bringing another game to play instead of the *Etch A Sketch*. The father admonishes his child, saying, “We’re in the middle of a game. Now’s not the time for cards.” However,
the child carries on with his own agenda, saying to his father, “I’ve got a card that’s worth a lot.” In another interaction, a boy brought a ball and said to his mother, “I’ve got an excellent idea, let’s play with this.”

**Congruence–Incongruence and parent’s gender**

In contrast to H4, children’s behavior with their fathers reflected greater congruence between verbal and nonverbal communication than behavior with their mothers (see Figure 2c), multivariate $F(1, 144) = 3.59, p < .05, \eta^2 = .19$. Specifically, the analysis for supportive congruence revealed a significant effect, $F(1, 144) = 3.06, p < .05, \eta^2 = .17$. In negating H4, supportive congruent (verbal and nonverbal cooperation) was more characteristic of children’s interactions with fathers ($M = 25.9, SD = 11.8$) than mothers ($M = 21.7, SD = 11.9$). For example, a boy’s cooperative comment toward his father, such as “We are doing great,” would be accompanied by a smile and a positive touch.

An unexpected finding was that challenging congruence, which was characterized by noncooperative verbal and nonverbal messages, was more prevalent in children’s interactions with mothers ($M = 14.2, SD = 7.7$) than with fathers ($M = 10.1, SD = 7.4$), $F(1, 144) = 3.06, p < .05, \eta^2 = .18$, and children behaved toward their mothers in a more outspoken and strident manner. They expressed extreme noncooperation; for instance, one child said to his mother, “You are stupid,” and accompanied the statement with a disrespectful hand gesture.

MANOVA for repeated measures also revealed significantly different ICP for children with their mothers and fathers. In contrast to H4, incongruence was more characteristic of children’s behavior with their mothers ($M = 16.4, SD = 7.3$) than with their fathers ($M = 13.1, SD = 6.9$); see Figure 2c. In particular, the most characteristic ICP with mothers was of the leakage-type pattern, $F(1, 144) = 3.42, p < .04, \eta^2 = .23$. In this type of incongruence, the children presented verbal cooperation while nonverbally expressing noncooperation. For example, the child in one interaction during free play was cooperating verbally while nonverbally displaying noncooperation, controlling the game and preventing his mother from joining in with him:

**Child:** “We’re drawing a crocodile. Mummy, that’s its tail.”  
**Mother:** “Yes.”  
**Child:** “And that’s its face.”  
**Mother:** “Maybe I’ll help you?”  
**Child:** “It’s a crocodile.”  
**Mother:** “It’s an interesting crocodile. Maybe I’ll have one knob and you’ll have the other? We’ll make nice shapes.”  
**Child:** “I think that’s its mouth. Its mouth is really interesting.”

Nevertheless, adaptive incongruence, $F(1, 144) = 3.79, p < .05, \eta^2 = .19$, which was characterized by verbal noncooperation and nonverbal cooperation, was more common among children’s interactions with their fathers ($M = 7.6, SD = 3.9$) than with their mothers ($M = 5.8, SD = 3.6$).
Interaction effect of child’s gender and parent’s gender
Congruent behavior was more common in the same-gender dyad, multivariate $F(1, 144) = 3.10, p < .05, \eta^2 = .16$. However, ICP was more common in the different-gender dyad, multivariate $F(1, 144) = 3.14, p < .05, \eta^2 = .18$. Scheffé’s post hoc tests indicated that different-gender dyads exhibited more ICP (boys–mothers: $M = 20.1$, $SD = 7.7$ vs. girls–fathers: $M = 12.2$, $SD = 6.4$) than same-gender interactions (boys–fathers: $M = 15.5$, $SD = 6.1$ vs. girls–mothers: $M = 10.0$, $SD = 4.3$).

An exception to this rule was found in relation to adaptive incongruence (verbal noncooperation and nonverbal cooperation), which was more common among same-gender dyads, $F(1, 144) = 3.85, p < .03, \eta^2 = .25$.

Congruence–incongruence patterns and SES
In contrast to H5, high-SES children exhibited greater overall ICP than low-SES children, who expressed more congruence messages to their parents during the interactions, multivariate $F(1, 144) = 4.89, p < .03, \eta^2 = .26$ (see Figure 2). In particular, leakage-type incongruence was more prevalent among high-SES children ($M = 11.3$, $SD = 6.9$) than among their low-SES counterparts ($M = 6.6$, $SD = 4.2$), $F(1, 144) = 8.09, p < .007, \eta^2 = .38$. Unexpectedly, adaptive incongruence was more prevalent among low-SES children ($M = 6.7$, $SD = 3.7$) than high-SES children ($M = 5.9$, $SD = 3.8$), $F(1, 144) = 5.56, p < .02, \eta^2 = .33$.

However, as predicted in H5, challenging congruence was more common among low-SES children, while supportive congruence was more prevalent among high-SES children, $F(1, 144) = 7.72, p < .008, \eta^2 = .35$.

Interaction effect of SES and parent’s gender
The findings indicated parallels between children’s behavior with high-SES fathers and low-SES mothers, on the one hand, and with high-SES mothers and low-SES fathers, on the other. There was a significant interaction effect between parent’s gender and SES level in terms of challenging congruent behavior, $F(1, 144) = 5.22, p < .02, \eta^2 = .26$. Scheffé’s post hoc tests indicated that children with high-SES fathers and children with low-SES mothers had the highest levels of noncooperative verbal and nonverbal patterns. Surprisingly, those parents were more supportive and focused more on solidarity than on task orientation.

Interaction effect of SES and child’s gender
A significant interaction was found between SES and child’s gender regarding patterns of congruence, multivariate $F(1, 144) = 33.2, p < .0001, \eta^2 = .41$. Scheffé’s post hoc tests indicated a larger gap between low-SES boys and girls than between high-SES boys and girls. This interaction effect was also found in relation to supportive congruence, $F(1, 144) = 174, p < .0001, \eta^2 = .45$, and to challenging congruence, $F(1, 144) = 256, p < .0001, \eta^2 = .47$. High- and low-SES boys expressed more challenging congruence than girls. However, the gap between boys and girls was smaller among high-SES children (high-SES boys: $M = 13.1$, $SD = 7.3$ vs. girls: $M = 10.6$, $SD = 6.5$).
This finding indicated that daughters of high-SES parents behaved in a manner similar to that of boys. By contrast, the gap between boys and girls was larger among low-SES children (low-SES boys: $M = 14.8$, $SD = 9.5$ vs. girls: $M = 8.4$, $SD = 5.9$). Notably, low-SES girls expressed this pattern less frequently than other children; they were the least challenging and noncooperative.

The same significant interaction was found for ICP, multivariate $F(1, 144) = 118$, $p < .0001$, $\eta^2 = .43$. Scheffé’s post hoc tests indicated that, for both SES levels, boys were more likely to express ICP, although the gap between boys and girls was larger among children of low SES (boys: $M = 16.5$, $SD = 6.4$ vs. girls: $M = 9.8$, $SD = 5.0$) than it was between high-SES boys and girls (boys: $M = 19.0$, $SD = 9.1$ vs. girls: $M = 15.2$, $SD = 6.2$).

With regard to leakage-type incongruence, there was a significant interaction between SES and child’s gender, $F(1, 144) = 108.84$, $p < .0001$, $\eta^2 = .42$. Scheffé’s post hoc tests indicated that the difference between boys and girls was more significant for low-SES children (boys: $M = 9.1$, $SD = 4.6$ vs. girls: $M = 4.1$, $SD = 2.8$) than for their high-SES counterparts (boys: $M = 12.5$, $SD = 8.2$ vs. girls: $M = 10.0$, $SD = 5.0$). Notably, the behavior of daughters of low SES was quite distinct, because they expressed this pattern less frequently than other children.

For adaptive incongruence, a significant interaction was found between SES and child’s gender, $F(1, 144) = 137$, $p < .0001$, $\eta^2 = .44$. Scheffé’s post hoc tests indicated that adaptive congruence was more common among high-SES girls ($M = 7.2$, $SD = 3.5$) than among high-SES boys ($M = 4.6$, $SD = 3.2$). For low-SES children, however, this behavior was more characteristic of boys ($M = 7.6$, $SD = 3.9$) than girls ($M = 6.1$, $SD = 3.4$). This interaction effect parallels the interaction that revealed resembled behavior among children toward high-SES mothers and low-SES fathers and toward high-SES fathers and low-SES mothers.

**Discussion**

The main objective of this study was to present patterns of children’s verbal and nonverbal communication in parent–child interactions. Communication patterns were conceptualized in terms of congruence and incongruence. We predicted, and subsequently established, that examining both modes of communication and exploring the relationship between them reveals a comprehensive picture of the messages that children convey to their parents. These findings reinforce the integrative communication approach (Buck & VanLear, 2002; Jones & LeBaron, 2002) and strengthen the case for holistically studying both channels of communication and their interrelations.

The analysis of congruent and incongruent patterns produced some unexpected findings that enrich the field of children’s communication. As hypothesized, children’s interactions with their parents were generally characterized by verbal and nonverbal congruence, especially supportive congruence. Contrary to our expectations, children tended to display extreme noncooperation in the form of verbal and nonverbal challenging congruent behavior toward their parents.
A surprising finding regarding ICP was that there was a significant amount of incongruence in children’s communication by 4 years of age. This important finding offered a complex communication model based on an emerging integration of theoretical perspectives. The model expands the theoretical framework of ICP and indicates a complex puzzle in terms of the relationships among different communication modes.

From a developmental theoretical perspective, this finding suggests that, even at a young age, children exhibit complex patterns of communication in which verbal messages contradict nonverbal ones. This study has contributed to the ICP explanation, suggesting that children as young as 4 have this developmental communicative ability and are able to exhibit communicative competence of a multichannel expression containing both verbal and nonverbal behavior. They present symbolic communication through verbal intentional propositional information, and spontaneous communication through nonverbal emotional expression as well as pseudospontaneous, manipulated nonverbal propositional information (Buck & VanLear, 2002).

ICP among children is influenced by social and situational factors. These novel findings underline the importance of these variables and their crucial role in explaining children’s communication. Based on AAT (Greene, 2007), we can conclude that children’s verbal and nonverbal communication modes are situation-sensitive. In a situation of mutual dependency, such as a parent–child dyad, children’s behavior tends to be extreme and display challenging congruence as the task becomes more difficult and complex. The nature of the situation influences the children’s joint interactions with their parents. These findings support our hypothesis regarding task difficulty, as well as previous research in the field (Cohen, 1977; Ekman & Friesen, 1969; Ginsburg et al., 2006).

Situations that required children to cope with difficulty brought out behaviors that were less prominent in free play. From an AAT perspective, the complex task also produced ICP and difficulties performing the task through mutual cooperation. The end result of the assembly process—the output representation—is that the entire configuration of action features is a cooperation-inhibiting ICP.

AAT could also explain this ICP by pointing to multiple-goal situations. Complex tasks require significant effort on the part of the child. When children concentrated more on the task, they paid less attention to managing their cooperative relationships with their parents. During difficult task situations, the nonverbal communication ultimately produced leakage-type incongruence (DePaulo, 1992; Lunger & Wurf, 1999). On the other hand, unstructured tasks and free play, which fostered congruent and cooperation-inducing patterns of communication, provided the children with greater autonomy, which was expressed through supportive congruent patterns.

Children expressed adaptive incongruence during complex tasks. They expressed verbal noncooperation regarding the difficulty of the task, their failure to complete it, or their parent having taken over the joint task. However, they also exhibited nonverbal cooperation, which reflected the children’s desire for support, and an emotional need from their parents. In this regard, ICP can be explained in terms of AAT and
the communicative burden that characterizes children's behavior as they are asked to carry out increasingly difficult tasks. This finding sheds light on the role that nonverbal behavior plays in children's emotional communication and reflects an external manifestation of their internal state, which is spontaneous, nonpropositional, and mainly nonintentional (Buck & VanLear, 2002).

In line with social learning theory, ICP among children can be explained as a consequence of children imitating their parents. This expands on similar trends reported in other studies (Bandura, 1986; Block, 1983). Parents' ICP served as a model for imitation for young children, who learned that they can say one thing but behave differently. This study noted that although this imitation involves acquiring a relatively complex model of communication, young children are already able to convey ICP.

Children in this study behaved differently with each of their parents. Contrary to expectations, children exhibited more supportive congruence and adaptive incongruence with their fathers. In other words, their behavior with their fathers was more oriented toward cooperation, especially in their nonverbal communication. This unexpected finding showed that children more frequently expressed noncooperative behaviors toward the parent who supported them more and upon whom they were more focused (Barratt, 1995; Grebelsky-Lichtman, 2014; Henderson, 1990; Richards & Gallaway, 1994).

This finding raises the question of whether supportive parental communication leads to children's cooperation, or vice versa. It also raises questions about the relationship between the behavior of parents and of their children, particularly the extent to which this relation between parenting communication style and children's communicative outcome is moderated by genetic influence. This highlights the essential concept of nature versus nurture in parent–child interactions (Bakermans-Kranenburg & Van Ijzendoorn, 2011; Belsky & Beaver, 2011; Gove & Carpenter, 1982).

Children's congruent and incongruent communication patterns were more cooperative in same-gender parent–child dyads than in different-gender dyads. This finding is supported by developmental theories that stress the importance of gender ascription at a young age (Johnson & Roopnarine, 1983; Lamb, 1986; Langlois & Downs, 1980; Lytton & Romney, 1991; Maccoby, 1990; Power, 1981). This ascription is related to the child's need to be similar to the parent of the same gender and acquire his or her behaviors as gender-typical.

The differing patterns of congruence and incongruence among boys and girls are supported by social gender stereotypes. Feminist theories have discussed the effect that gender has on the communication patterns of young children (Chodorow, 2002; Irby & Brown, 2011). Recent studies have argued that communicative differences reflect social differences between boys and girls (Fox, 2011; Ochs, 1992). In this regard, the children in this study acted in accordance with gender stereotypical expectations. Boys exhibited more challenging congruence and leakage-type incongruence than girls, which relates to the stereotype of boys as having more disciplinary problems than girls (Chick et al., 2002; Knapp & Hall, 2010; Lytton & Romney, 1991), whereas girls demonstrated more supportive congruence than boys.
An important finding was that none of the girls in any of the interactions broke the rules. Those who did act in a noncooperative manner did so within the framework with which they were presented. They protested, resisted, and expressed disagreement, but always within the rules that had been laid down for them. In contrast, some boys challenged the interaction in a way that changed the rules of the game and created new rules, or even a new game. This finding reinforces feminist theories that rules are generally set by men (Chodorow, 2002; De Beauvoir, 1961).

However, the fact that the gap between high-SES boys and girls was smaller than that between low-SES boys and girls—such that the behavior of high-SES girls was more similar to that of high-SES boys, both in terms of challenging congruence and ICP—could indicate a future trend toward gender changes. One possible explanation could be derived from a change in the behavior of high-SES mothers, who can act as strong role models for their daughters, which may be notable in the daughters’ behavior.

Contrary to our hypothesis, high-SES children exhibited more ICP (especially leakage-type: verbal cooperation and nonverbal noncooperation) than low-SES children. Low-SES children conveyed clearer and unequivocal messages, particularly through patterns of challenging congruence (i.e., behavior with verbal and nonverbal noncooperation). This finding can be explained in terms of parental modeling from social acquisition theories (Dickinson & Snow, 1987).

The emotional perspective provides another explanation for ICP (Benziman & Marodes, 1997; Ekman, 1997a). ICP among high-SES children can be explained in terms of the gap between what the children feel and what they say. These children may internalize social norms based on the principle of refraining from crudely issuing negative evaluations of other people. Messages that children try to conceal verbally tend to “leak out” through their nonverbal communication.

Based on nonverbal primacy (Ekman, 1997b; Grahe & Bernieri, 1999; Hale & Stiff, 1990; Noller, 1985; O’Sullivan et al., 1985; Walther et al., 2005), this leakage-type behavior may lead to dominance of their nonverbal cues. The ICP of high-SES children may reflect the gap between their high verbal competence and their unawareness of their nonverbal communication. Therefore, the overall message is characterized by incongruence between the channels of communication.

The behavior of high- and low-SES children was also differentially affected by the difficulty of the task. High-SES children exhibited more differential behavior when carrying out the complex task than during free play. This implies that they attributed greater importance to the differences between the situations in a way that reflects stronger task orientation and a greater need for achievement. McClelland, Atkinson, Clark, and Lowell (1953) defined the need for achievement as a matter of success while striving for a standard of excellence.

The need to achieve is cognitively associated with affective situations and is acquired at an early age, mostly nonverbally. Parents have a profound impact on how this need develops in their children (Parsons, Adler, & Kaczala, 1982). Studies have shown that children with a strong need for achievement are more independent in
their thoughts and actions, more motivated to study, make a greater effort to attain goals, and display greater personal responsibility and persistence than children who are weakly achievement-oriented (Herman, 1972; Rosenthal & Jacobson, 1968).

Given this need among high-SES children, their ICP can be explained in terms of AAT. The importance that high-SES children attribute to their success at the task creates a cognitive load and assembly difficulties that produce a message in which the verbal and nonverbal channels contradict one another.

In conclusion, the model proposed here offers a conceptualization of children’s integrative communication patterns that are involved in mutual parent–child interactions. The model offers methodological and theoretical implications in order to develop a holistic profile of the children’s interrelations of verbal and nonverbal communications, and to provide insights into diverse patterns of congruity–incongruity in children’s communication and their value for assessing patterns of cooperation in parent–child interactions.

**Limitations and additional avenues for future research**

This study was designed under rigorous conditions and involved strict selection of participants. While this method helped reveal the impact of the study’s main variables, it may limit the generalizability of the results. Future research in this area should examine those patterns of congruence and incongruence among children that contain other criteria for selection of participants and diverse conditions. Future studies could also examine parents’ reactions to the diverse communication patterns of ICP among children. Such studies would expand the literature on the relative primacy of nonverbal versus verbal information. The proposed model may also offer avenues for future research in a variety of interpersonal communication situations.

Another avenue for research concerns the proposed model’s implications regarding parents’ awareness of the connections between their child’s verbal and nonverbal communication. The present model suggests that parents can improve their communication skills and enhance their children’s cooperation by increasing their awareness of their children’s integrated communication modes while interacting with them. This awareness could contribute to the children’s development and the quality of the parent–child relationship. It could help parents reduce children’s ICP and assembly problems, which may enhance their communication competence. Parent–child interaction can be further enriched by the theoretical and methodological implications of comparatively analyzing patterns of congruence and incongruence in children’s verbal and nonverbal communication.

**References**


Children’s Congruent–Incongruent Communication

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