RESEARCH DIALOGUE

The 30-Sec Sale: Using Thin-Slice Judgments to Evaluate Sales Effectiveness

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A successful sale depends on a customer's perception of the salesperson's personality, motivations, trustworthiness, and affect. Person perception research has shown that consistent and accurate assessments of these traits can be made based on very brief observations, or "thin slices." Thus, examining impressions based on thin slices offers an effective approach to study how perceptions of salespeople translate into real-world results, such as sales performance and customer satisfaction. The literature on the accuracy of thin-slice judgments is briefly reviewed. Then, 2 studies are presented that investigated the predictive validity of judgments of salespeople based on thin slices of the vocal channel. Participants rated 20-sec audio clips extracted from interviews with a sample of sales managers, on variables gauging interpersonal skills, task-related skills, and anxiety. Results supported the hypothesis that observability of the rated variable is a key determinant in the criterion validity of thin-slice judgments. Implications for the use of thin-slice judgments in salesperson selection and customer satisfaction are discussed.

As anyone who has ever applied for a job or gone on a date could tell you, the importance of a first impression cannot be overestimated. Whereas judgments of others may be formed very quickly and often unwittingly, they may also be consequential and long-lasting. For instance, most job applicants know that dressing the part and a firm handshake are critical to being viewed as competent. Some dating services have capitalized on first impressions, allowing individuals to "date" several people for short periods of time in one evening. They bank on the notion that it will only take a few minutes to realize if there is any potential for a relationship.

First impressions are also essential in the realm of consumer decision making. Salespeople convey their personality, affect, and motivations in the first several seconds of an interaction, perhaps even before any verbal contact, in the way they approach or greet consumers. Consumers make judgments on

the spot, and the nature of the relationship may hinge on these first impressions. Is the salesperson trustworthy? Is he or she too pushy? Is he or she helpful and informative?

These rapidly made, often nonconscious, social judgments undoubtedly influence consumers' affect, behaviors, and decisions. Research in social psychology has shown that social information processing is expectancy driven and that initial impressions strongly influence subsequent expectations and behavior (Jones, 1990). Not only are immediate impressions influential in person perception, interpersonal judgments, and social behavior, but they are also surprisingly accurate. Research on perception accuracy has revealed that under certain circumstances, perceivers are able to make accurate judgments of others from brief observations, even in the absence of any personal interaction. "Thin slices," or observations of behavior less than 5 min long, can yield information about personality traits, internal states, social relations, and interaction motives. This article reviews recent work on thin slices, goes on to present two thin-slice studies of salespeople, and then suggests future

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ways in which these methods can be used in the field of consumer psychology.

THIN SLICES

Person perception research has demonstrated that observers are not only able to make accurate judgments about others, but that accurate judgments can be made even without any personal interaction between the targets and raters (Albright, Kenny, & Malloy, 1988). Furthermore, even impressions based on very brief observations have been found to be predictive or accurate, especially for certain personality traits (Funder, 1987; Kenny & Albright, 1987; Kenny, Albright, Malloy, & Kashy, 1994). It may seem that larger slices provide more information, and thus, should be more reliable. However, social perceivers are able to pick up a wealth of information about others through only brief exposure to their expressive behavior. Therefore, a thin slice is defined as any excerpt of dynamic information less than 5 min long. In this research, it is important that expressive behavior is observed, so static frames, such as photographs, do not qualify as thin slices. Thin slices shown to research participants may be sampled from any available channel of communication, including the face, the body, speech, the voice, transcripts, or combinations of the aforementioned channels. Thin slices preserve most of the dynamic, fluid information, whereas reducing or eliminating information from the ongoing verbal stream, the past history of targets, and the global context in which the behavior is occurring. Thus, thin slices force the observer to focus on nonverbal cues without the influence of the verbal message or information from previous interactions or the broader context of the situation.

The person perception literature has shown that the display and management of emotions and feelings through nonverbal channels play an important role in conveying impressions (e.g., Sommers, Greeno, & Boag, 1989). Cues from facial expressions, gestures, voice, and body movements may reveal aspects of affect and emotions, personality, and behavioral intentions (Ambady, Bernieri, & Richeson, 2000). Judgments based on nonverbal behavior take advantage of some of the unique properties of nonverbal channels in comparison to verbal channels (DePaulo, 1992). First, nonverbal channels are much harder to control than verbal channels, so true feelings or intentions may be "leaked" through nonverbal behaviors. Further, nonverbal behavior is often more accessible to observers than to actors. For instance, people are unaware of how their faces appear or their voices sound to others. This can make it difficult for them to regulate their behavior in an online, instantaneous fashion. Finally, the expression of nonverbal cues is usually quicker than verbal expression. For example, it is easier for people to catch themselves before verbally expressing emotions than preventing those emotions from appearing on their faces. Thus, judgments based on nonverbal behaviors supplement and sometimes provide more accurate information than the verbal message alone.

PREDICTION OF JOB PERFORMANCE

Thin slices have been found to be predictive of performance in a number of domains. For example, judgments of teachers' personality characteristics from thin-slice clips accurately predicted the teachers' end-of-semester ratings by students and principals (Ambady & Rosenthal, 1993). Three 10-sec silent video clips of each of 13 university teachers were rated by nine naïve raters on 15 variables: accepting, active, anxious, attentive, competent, confident, dominant, empathic, enthusiastic, honest, likeable, optimistic, professional, supportive, and warm. Teacher effectiveness was appraised through course evaluations at the end of the semester and was correlated with a composite variable composed of 14 of the ratings (all but anxious). Although the naïve raters were only exposed to a total of 30 sec of each teacher, there was a significant correlation between the composite variable and higher student evaluations. A second study confirmed these results with schoolteachers as targets and the school principal's evaluation as the teacher effectiveness appraisal. Thus, judgments from thin slices showing only nonverbal cues have been correlated to real-world performance appraisals.

Thin slices of the voice channel have also been shown to predict job performance. For example, Hecht and LaFrance (1995) found that thin-slice ratings of enthusiasm, sympathy, confidence, professionalism, and friendliness in telephone operators' voices predicted job performance, as measured by the shortness of their calls. In addition, telephone operators with faster calls were rated as significantly less monotonous and as possessing clearer pronunciation. Likewise, DeGroot and Motowidlo (1999) found that actual performance ratings of managers in a news-publishing company were associated with naïve raters' judgments. Ratings of 10-sec clips of interviews of 22 managers on liking, trust, competence, dominance, persuasiveness, influence, and willingness to help the manager, when combined into a composite, were significantly positively correlated with job performance ratings by their supervisors.

In contrast, a study on the vocal characteristics of direct salespeople found a relation between certain microtraits and actual sales performance, but no relation between thin-slice trait judgments and actual sales performance (Peterson, Cannito, & Brown, 1995). Twenty-one direct salespeople gave audiotaped, scripted sales-pitch introductions, which were five sentences and 64 words long. Speaking rate, average pause duration, loudness variability, and fundamental frequency (the vibration rate of the vocal folds in the throat) were measured and a sample of housewives, who were representative of the target audience, rated the salespeople on questions related to the salespeople's personality characteristics and rated their own receptivity to-

ward the salespeople. The housewives were able to detect differences in speaking rates, but this was not related to differences in their perceptions of the salespeople. In addition, the housewives' judgments of attitude and receptivity were not correlated with sales performance. Although these studies have mixed results, it does appear that very brief slices of nonverbal behavior alone are able to supply raters with enough useful information to predict future job performance, at least sometimes.

Employment interviews are an apparent setting in which first impressions are important. One study looked at the reliability of thin-slice judgments of interviews by naïve raters and found that they were highly correlated with evaluations made by informed interviewers (Prickett, Gada-Jain, & Bernieri, 1999). Individuals participated in mock "initial screening" interviews intended to simulate the kind of on-campus screening interviews conducted by large companies. Actual interviews ranged from 8 to 30 min, after which informed interviewers evaluated personality traits, interpersonal skills, professional competencies, and overall employability. Slices were extracted from each interview, beginning with the interviewee knocking on the door and ending 10 sec after the interviewee took a seat, and shown to naïve observers. Observers provided ratings of employability, competence, intelligence, ambition, trustworthiness, confidence, nervousness, warmth, politeness, likability, and expressiveness. For 9 of the 11 variables, thin-slice judgments correlated significantly with the final evaluation of the actual interviewers. Thus, immediate impressions based on a handshake and brief introduction predicted the outcome of a structured employment interview.

Finally, naïve judges' ratings of thin slices have proven to be successful in predicting outcomes in the health care field. For example, thin slices have accurately predicted patient satisfaction with their doctors (Hall, Roter, & Rand, 1981) and doctor's effectiveness in their referrals of alcoholic patients (Milmoe, Rosenthal, Blane, Chafetz, & Wolf, 1967). One study found that very brief clips of surgeons' voices extracted from physician–patient interactions predicted the malpractice history of general practitioners and surgeons (Ambady, LaPlante, et al., 2002). Twenty-sec thin slices of both the full audio channel and the tone-of-voice channel were rated on a variety of personality traits. Surgeons rated higher on dominance were more likely to have been sued in the past.

Another study examined the relation between thin-slice judgments of physical therapists' behavior and the health outcomes of geriatric patients (Ambady, Koo, Rosenthal, & Winograd, 2002). In this study, ratings of silent video clips were correlated with assessments from the time of admission to 3 months after the time of discharge. Physical therapists' behavior, as rated by naïve judges based on three 20-sec video clips of each patient–therapist interaction, was found to be associated with both short- and long-term improvements in patients' mobility. Therapists' distancing behavior

was strongly correlated with short- and long-term decreases in their clients' physical and cognitive functioning. Distancing was expressed through a pattern of not smiling and looking away from the client. In contrast, facial expressiveness, as revealed through smiling, nodding, and frowning, was associated with both short- and long-term improvements in clients' functioning.

Thin slices can even distinguish between certain skills or attributes required for different types of clinical settings. Using 15-sec thin slices of occupational therapy students, it was found that students who were judged as less nonverbally responsive and more dominant were more effective in a pediatric rehabilitation setting, whereas less friendly students were more effective in a physical rehabilitation setting (Tickle-Degnen, 1998; Tickle-Degen & Puccinelli, 1999). Thus, the relevant personality characteristics or traits, and even the desired magnitude of these traits, may vary even among similar types of jobs or settings.

In summary, thin-slice judgments are demonstrably predictive of performance in a wide variety of arenas. Moreover, various channels, including brief clips of full vocal content, tone of voice, and silent video clips, have all shown to be reliable. More broadly, these studies suggest that our personality is revealed through many different aspects of our behavior. Even small variations in the highly scripted act of meeting an interviewer, shaking a hand, and taking a seat, provide robust clues to personality.

PERCEPTION ACCURACY

There are two ways to measure accuracy in thin-slice judgments. One is consensual accuracy or the agreement among judges (Funder, 1995; Kenny, 1991; Kruglanski, 1989). Some psychological constructs, such as hostility, warmth, pleasantness, politeness, and likability are best defined from the perspective of social perceivers (Ambady et al., 2000). If all customers view a particular salesperson as rude or pushy, then that behavior can be viewed as rude and pushy, regardless of the individual's motivations or internal states. In this example, accuracy is measured by consensus. The second type of accuracy is measured by a specific outcome, such as sales effectiveness. In this case, all customers may view a particular salesperson as unpersuasive, but he or she may still have the highest sales numbers in the district. Both of these criterion measurements have applications in the domain of customer perceptions. The first type can answer questions about impression management and customer satisfaction, whereas the second type can be used to answer questions relating to sales performance.

Perception accuracy, based on consensus, varies depending on both the trait being judged and the type of task. In a meta-analysis of thin-slice judgments, it was discovered that variables that are either highly observable (such as confidence) or highly affective (such as warmth) can be rated with

fairly high reliabilities (Ambady et al., 2000). However, variables that are less observable and affective (such as being analytical) have relatively low mean reliabilities. This is convergent with most recent findings in personality and social psychology, which suggest that judges agree more in their ratings of dimensions such as sociability or extroversion than they do in their ratings of intrapsychic or less visible dimensions, such as intelligence or neuroticism (Funder & Dobroth, 1987; Kenny, Horner, Kashy, & Chu, 1992; Park & Flink, 1989; Park & Judd, 1989).

The accuracy of thin-slice judgments, generally measured in relation to a specific outcome, has also been found to be task-dependent. Most studies have used either video or audio clips from interviews, which tend to display traits related to social behavior. A recent study measured accuracy and consensus for the Big Five personality traits and intelligence based on thin slices of 15 different tasks, ranging from introducing oneself to pantomiming uses for a brick (Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004). Whereas interpersonal traits were equally predicted from all of the tasks, it was found that traits related to cognitive ability were accurately inferred only from certain tasks. For example, intelligence was most strongly correlated with judgments from thin slices of targets reading short phrases aloud and openness to experience was best measured by the pantomime task. Thus, whereas certain traits may not be predicted by the typical thin slices of interviews, thin slices of other tasks may tap into traits that may be considered to be less visible.

Finally, the accuracy of thin-slice judgments also varies by the level of abstraction of the criterion variables. For example, whereas trust may be observed through specific behaviors, such as keeping promises, it may also be gleaned from a more abstract level. Customers can perceive attributes related to trust, such as dependability, and they can also perceive a general overall trust. Thin-slice judgments are generally more accurate for more abstract, macrolevel criteria than microlevel criteria. In this example, the thin-slice methodology will likely be especially useful in studying overall trust in the salesperson–customer relationship.

AUTOMATICITY OF THIN-SLICE JUDGMENTS

What mechanisms underlie thin-slice judgments? According to dual-process models of social cognition, person perception consists of an automatic stage and a controlled stage. Processing in the first stage uses minimal cognitive resources, can co-occur with other tasks, and is not vulnerable to informational load, time pressure, or distracters (Anderson, Krull, & Weiner, 1996; Bargh, 1994; Bargh & Pietromonaco, 1982; Fiske & Neuberg, 1990; Neugberg, 1988; Shiffrin & Schneider, 1977; Srull & Wyer, 1979). In contrast, processing in the second stage is characterized as intentional, conscious, controllable, and effortful (Bargh & Chartrand, 1999).

The initial, automatic stage is likely more relevant to thin-slice judgments. Indeed, several lines of research have supported the automaticity of these judgments (Ambady et al., 2000). First, individuals are often unaware of the behavioral cues used in their intuitive judgments, and are often unable to articulate or control their processing (Smith, Archer, & Costanzo, 1991). Second, cognitive overload, which impairs conscious and controlled processing (Wegner, 1992, 1994), does not affect thin-slice judgments. Ambady and Gray (2002) found that cognitive load did not impede the accuracy of thin-slice judgments of teacher effectiveness or of the relation between opposite sex dyads. Third, increased attention, which has been shown to disrupt automatic processes, also reduced accuracy of thin-slice judgments. Participants who were asked to supply reasons to support their judgments were less accurate than controls or those under cognitive load (Ambady & Gray, 2002). Thus, deliberate and conscious processing interferes with making accurate thin-slice judgments. Finally, the accuracy of thin-slice judgments does not appear to be influenced by effort. Bernieri and Gillis (1994) found that accuracy in judgments was not affected by fatigue or boredom, even after making 50 thin-slice judgments. Accuracy is also not improved by monetary incentives. Participants who were provided an incentive of a $5 prize and a chance to win $100 did not perform better than control participants (Bernieri & Gillis, 1994).

In summary, thin-slice judgments appear to be more of an automatic than a controlled process. Individuals are usually unaware of the cues they use in forming their impressions of others. Thin-slice judgments are not altered by cognitive load, incentives or effort, but are impaired by increased attention and deliberation.

PERSON PERCEPTION IN SALES

The salesperson–customer relationship has been characterized as the "most important element in marketing communications" (Weitz, 1978, p. 501). Just as the nonverbal channel is important in most everyday social interactions, it is also critical in many stages of the sales interaction, from establishing the salesperson–customer relationship (Leigh & Summers, 2002) to negotiating the final price (van Kleef, Drev, & Marstead, 2004). Nonverbal cues communicate intentions, motives, and feelings, but they may also be used in a self-presentational manner. Both salespeople and customers want to convey impressions to maximize their outcomes and achieve particular goals. Salespeople want to convey trustworthiness and friendliness to make a sale. Meanwhile, customers may attempt to hide their desire for a product or feign counterarguments to get a lower price.

Previous research has found that nonverbal cues affect both perceptions of salespeople and sales performance. Leigh and Summers (2002) experimentally manipulated several nonverbal cues in videotaped, role played, buyer–seller

interactions to determine their influences on perception. Participants were professional buyers and were asked to visualize themselves as the purchasing agent in the videotape and provide their impressions. The salesperson altered eye gaze, speech hesitations, gestures, clothing, and posture in the different conditions. It was discovered that steady eye gaze positively affected the believability of the sales presentation, and speech hesitations negatively affected ratings of "interesting" and "persuasive." Thus, this study suggests that microlevel adjustments of nonverbal behavior impact consumers' impressions of salespeople.

The literature on salesperson perception, thus far, indicates that there are several domains in which customers' perceptions of salespeople have a measurable impact on sales effectiveness. Associations have been made between sales effectiveness and personality characteristics, perceptions of affect, perceptions of trust, and specific nonverbal cues (Leigh & Summers, 2002; van Kleef, 2004). However, these links have not been thoroughly explored in real-world settings. The thin-slice methodology lends itself to the study of person perception in the salesperson–customer relationship in less contrived situations than have previously been examined (Leigh & Summers, 2002). Thin slices are especially useful in predicting performance in jobs that require strong interpersonal and affective skills. However, previous research has not yielded evidence for the predictive validity of thin-slice judgments of salespeople. As a demonstration, therefore, we present two studies of salespeople investigating whether thin-slice judgments of vocal cues are reliable predictors of actual sales performance.

The goal of these studies was to examine the relation between judgments of thin slices of vocal cues and a key measure of organizational success: supervisor evaluations. The vocal channel was chosen both for its sensitivity and for the ease of obtaining vocal stimuli from audiotapes. Observer ratings were divided into three dimensions: (a) interpersonal qualities, such as sociability and extroversion; (b) task-related variables, such as intelligence and perseverance; and (c) anxiety. Based on previous research showing that thin-slice judgments are more predictive of interpersonal than noninterpersonal characteristics (Ambady et al., 2000; Funder & Dobroth, 1987; Kenny et al., 1992; Park & Flink, 1989; Park & Judd, 1989), we hypothesized that thin-slice ratings of anxiety and the interpersonally oriented dimension would be positively related to the criterion variable of performance evaluations of sales managers. In contrast, thin-slice ratings of the noninterpersonal, task-related personality dimension were not expected to be strongly related to the criterion variable.

STUDY 1: JUDGMENTS BASED ON SALES MANAGERS' TONE OF VOICE

The sample for this study consisted of 12 regional sales managers in a large American corporation. Thin slices of the tone of voice, but not the semantic content, were created from interviews with the sales managers. Each manager was classified as either "average" or "outstanding" by a task group of upper management based on supervisors' evaluations and actual sales effectiveness. This classification was validated by peer nominations.

Stimulus Preparation

Each sales manager participated in an interview with one male and one female interviewer. Each interviewee was asked the same general questions with additional probing by the interviewers to elicit more information. The interview began with questions about the interviewee's educational and career history. Interviewees were then asked to recount in detail two positive and two negative events from their sales experience to control for the influence of interviewee affect on raters' evaluations. Three 20-sec clips were extracted from each interview (one from the biographical question, one from the recounting of a positive event, and one from the recounting of a negative event) by a research assistant who had no knowledge about the hypotheses or the criterion ratings. These clips were chosen by stopping the tape at a random time after the question had been asked and taking a clip from the first 20-sec of uninterrupted speech. The order of the 3 clips for each sales manager was randomized, and the 36 clips (3 from each of the 12 managers) were assembled and rerecorded onto a master tape in a counterbalanced design. This tape was then content-filtered, a process that removes the high frequencies on which word recognition depends, but preserves the sequence and rhythm of the speech.

Raters and Judgments

Twelve undergraduate students were recruited from the population of a large urban university to rate the 36 clips of the managers. Raters came into the laboratory individually and were greeted by an experimenter, who told them that they would hear short segments of managers' speech and would be asked to rate each clip on 19 traits, on a continuum ranging from 1 (*not at all*) to 9 (*very*). The variables were chosen based on previous research on judgments of tone of voice and relevance to a job as a salesperson (Ambady et al., 2000). These traits were combined into three composite variables based on the intercorrelation matrix (Rosenthal, 1987). The interpersonal composite contained nine variables: collaborative, cooperative, emotional, empathic, enthusiastic, perceptive, understanding, supportive, and warm. The task-oriented composite contained nine variables: achieving, analytical, confident, decisive, directive, influential, persevering, professional, and self-controlled. The final variable, anxious, was analyzed separately.

Raters were provided with a definition of each of the variables (see the Appendix), and they familiarized themselves with these definitions before starting the rating process. Evidence indicates that individuals make more accurate judg-

ments when they have some prior information regarding the dimensions that they are rating (McDonald, 1991). Before the rating session began, raters listened to and rated 10 practice, content-filtered clips to familiarize themselves with the somewhat unnatural sound of the content-filtered speech. Other than these instructions, the raters received no training. Previous research has demonstrated that naïve raters are able to reliably make such ratings without training (Blanck, Rosenthal, & Vannicelli, 1986). Raters were instructed to listen to each segment once and only once. The experimenter then left the room and each rater listened to the audiotaped segments and completed the rating scales. After completing the task, raters were paid, thanked, and debriefed.

Results

The reliabilities of the 12 judges' ratings of the 19 traits were computed by intraclass correlations (Rosenthal, 1987). The reliabilities of the 12 judges' ratings ranged from .44 to .76, with a mean of .63 (see Table 1). The grouping of the traits into the three composites (Interpersonal, Task-Oriented, and Anxious) was consistent with these data. Intercorrelations of the traits within each composite were substantially higher than the between-composite intercorrelations for both interpersonal-orientation and task-orientation (see Table 2).

Predicting the criterion variable.   The three composite variables were correlated with the criterion variable (nominations by upper management as either "outstanding" or

TABLE 1
Reliabilities of Judges' Ratings: Sample of Sales Managers

	Study 1: Content-Filtered Speech		Study 2: Full Speech	
	12 Judges	1 Judge	8 Judges	1 Judge
Achievement-oriented	.55	.09	.50	.12
Analytical	.67	.14	.60	.16
Anxious	.65	.13	.54	.12
Collaborative	.56	.09	.58	.14
Confident	.74	.19	.75	.27
Cooperative	.69	.16	.75	.27
Decisive	.66	.14	.77	.30
Directive	.45	.07	.68	.21
Emotional	.44	.07	.50	.12
Empathic	.66	.14	.70	.22
Enthusiastic	.72	.19	.70	.22
Influential	.66	.14	.59	.15
Persevering	.65	.13	.56	.13
Professional	.71	.18	.67	.20
Self-controlled	.54	.09	.55	.13
Self-perceptive	.57	.10	.49	.11
Supportive	.76	.21	.78	.31
Understanding	.65	.13	.54	.12
Warm	.72	.18	.68	.21
M	.63	.13	.63	.18
Mdn	.65	.13	.67	.21

TABLE 2
Correlations of Trait Variables Between and Within Composites: Sample of Sales Managers

	Study 1: Content-Filtered Speech		Study 2: Full Speech	
	Interpersonal	Task	Interpersonal	Task
Interpersonal	.70	.21	.63	.32
Task	.21	.59	.32	.70
Anxious	.13	−.43	−.02	−.62

TABLE 3
Correlations Between Composite Variables and Superiors' Evaluations: Sample of Sales Managers

	r With Criterion			
	Study 1: Content-Filtered Speech		Study 2: Full Speech	
	r	p	r	p
Interpersonal	.51	.05	.59	.03
Task	−.08	−.40	.22	.25
Anxious	.59	.03	.19	.28

Note.   *p* levels reported here are two-tailed.

"average"). As can be seen in the first and second columns of Table 3, sales managers with higher nominations were rated as significantly higher on interpersonally based traits by the naïve judges, $r(10) = 0.51$, $p = 0.05$. Highly evaluated sales managers were also rated higher on anxiety based on the judges' ratings of their tone of voice than those with lower evaluations, $r(10) = 0.59$, $p < 0.03$. Ratings of the task-orientation traits, on the other hand, were not noticeably correlated with supervisors' evaluations, $r(10) = –0.08$, *ns.*

STUDY 2: JUDGMENTS BASED ON SALES MANAGERS' FULL SPEECH

The results of the previous study demonstrated that naïve raters' judgments of sales managers on interpersonal traits strongly correlate with supervisor nominations. This suggests not only that interpersonal skills are highly important for success as a sales manager but also that the extent to which individuals possess these skills is observable after only a brief exposure. To investigate this effect further, another study was conducted in which judges were presented with both the tone of voice and the original semantic content of the speech. Thus, the objective of this study was to compare directly the criterion validity of judges' ratings based on tone of voice cues to ratings based on the full audio channel. This study was designed to determine whether interpersonal skills and anxiety are still positively correlated to supervisor

nominations when the full audio channel is used in thin-slice judgments.

Method

Twenty-second clips of the full audio channel, with the original speech content remaining, were presented to eight judges, who rated the sales managers on the same 19 personality traits in a method identical to that described earlier.

Results

The reliabilities of the eight judges' ratings of the 19 variables were assessed, again, by intraclass correlations. The reliabilities of the mean of the eight judges' ratings for Study 2 ranged from .49 to .78, with a mean of .63 (see Table 1). The 19 personality traits on which judges rated sales managers were combined to form the same three composite variables as Study 1: interpersonal, task-oriented, and anxiety. As in the first study, the within-composite intercorrelations were substantially higher than the between-composite intercorrelations for both interpersonal and task-orientation composites (see Table 2).

Predicting the criterion variable.   The correlations of the three composite variables with the criterion variable (nominations by upper management) are reported in Table 3. Consistent with Study 1, judges' ratings of sales managers on interpersonal-orientation traits were strongly correlated with supervisor nominations as either "outstanding" or "average," $r(6) = .59$, $p < .03$. There was little relation between ratings of task-orientation traits and supervisor nominations, $r(6) = .22$, *ns.* Likewise, the correlation between judges' ratings of anxiety and supervisor nominations was not significant, $r(6) = .19$, *ns.*

DISCUSSION

The results of these two studies demonstrate that thin slices of the vocal channel can be used to assess sales effectiveness, as measured by supervisor evaluations and actual sales. Whether or not semantic content was included in the thin-slice clips, naïve judges' consensual ratings of interpersonally oriented dimensions of targets' personalities accurately distinguished highly rated sales managers from less highly rated sales managers. Specifically, more highly rated managers were also rated more highly on interpersonal qualities, based on brief audio clips from interview sessions. Remarkably, judges were able to make these distinctions solely on the basis of three 20-sec audio clips.

These results are consistent with previous studies suggesting that the thin-slice methodology is more valuable for evaluating interpersonal skills than noninterpersonal, task-related skills (Funder & Dobroth, 1987; Kenny et al., 1992; Park & Flink, 1989; Park & Judd, 1989). This may be due to the greater observability of information relating to interpersonal skills through nonverbal channels, such as the voice, as compared to task-related skills. However, as Borkenau et al. (2004) demonstrated, varying the task may tap into different traits, such that the task-related skills may be observed in thin slices of activities other than an interview.

Another possible explanation for these findings is that observability did not differentiate raters' ability to judge interpersonal skills in relation to task-related skills, but that the "outstanding" groups simply did not differ from the "average" groups in the extent to which they possessed task-related skills. This would explain the low correlations between ratings of task-related skills and superiors' evaluations. Although there is no empirical support presented here in support of this claim, support does come from a study conducted previously by Kelley and Caplan (1993). In this study, measures of interpersonal and task-related skills were obtained from two samples of engineers: those nominated as "stars" by their managers and peers and those nominated as "average." Interestingly, the researchers found that the only distinguishing difference between the two groups was the stars' interpersonal and affective skills. Specifically, stars were more skilled at developing rapport with coworkers and building extensive, loose networks of reliable problem solvers. Perhaps the same phenomenon was at work in this study. If it were primarily interpersonal skills that differentiated the "outstanding" sales managers from the "average" ones, there would be little correlation between task-related skills and the criterion. This is exactly what we found.

The findings with regard to judges' ratings of managers as anxious are also intriguing. In Study 1, when judges were presented only with tone-of-voice clips, judges' ratings of targets' level of anxiety correlated highly with superiors' evaluations. This finding supports the work by Ambady et al. (2002), who found that anxiety as inferred from the tone of voice was a strong postdictor of the malpractice claims status of primary-care physicians. Thus, surgeons who were judged as more anxious were less likely to be sued than physicians judged to be less anxious. This effect likely occurred because anxiety as inferred from the tone of voice signals concern, an important quality in physicians.

However, this effect was diluted when judges were presented with both the tone of voice and the semantic content of the audiotaped interview. In this condition, judges' ratings of managers' level of anxiety did not correlate nearly as highly with consultants' supervisor evaluations. One possible explanation for this disparity could be that anxiety is more easily observed through "nonverbally pure" channels of communication, that is, through tone, pitch, gestures, and so forth, which are less subject to conscious control (DePaulo, 1992). Thus, anxious sales managers who were attempting to appear poised and confident while being audiotaped may have been

able to manipulate their speech content and thus may have led raters in the full audio condition to believe they were not anxious. It is unlikely, however, that the sales managers were able to control the underlying nonverbal vocal correlates of anxiety, which were revealed to raters in the tone-of-voice condition.

LIMITATIONS AND BOUNDARIES

Although judgments based on thin slices of expressive behavior as short as 1-sec have proven to be surprisingly accurate, there are clear boundary conditions for the use of thin-slice methodology. As discussed earlier, the more observable the traits being judged, the more accurate are the judgments (as in the comparison between interpersonal and task-oriented ratings). Another element to consider is the abstraction level of the construct being judged. Judgments of vague macrovariables, such as the judgment of "warmth," are more accurate than specific microvariables, such as smiles or gaze. One reason for this is that the same specific behavior can mean very different things in different contexts. For example, a smile may indicate warmth, anxiety, or hostility, depending on the context (Ambady & Rosenthal, 1993).

As the two studies presented in this article have demonstrated, the inclusion of verbal content may sometimes have a negative effect on the accuracy of thin-slice judgments. Anxiety ratings were correlated with performance only in the content-filtered condition, but not when the verbal information was available. This finding is convergent with other recent evidence. For example, Grahe and Bernieri (1999) found that thin-slice judgments based on silent video clips were more accurate than judgments based on video clips that included verbal information. Additionally, Peterson, Cannito, and Brown's (1995) study of direct salespeople found that housewives' ratings of audio clips were not related to sales performance. This contradictory finding may be due to the inclusion of the verbal content in the thin-slice clips. In contrast, Berry, Pennebaker, Mueller, and Hiller (1997) found the opposite effect, such that key words in a dyadic conversation communicated more accurate information about competency, dominance, and warmth of the target than did nonverbal cues. Thus, the inclusion of verbal content may sometimes enhance accuracy, although impairing accuracy at other times. This suggests that it is useful to create clips containing different levels of verbal and nonverbal cues, such as the two studies presented here.

FUTURE DIRECTIONS IN SALES AND MARKETING

Clearly, thin slices could be useful in the selection and training of salespeople, especially in relation to interpersonal skills. Building on these findings, it would be beneficial to incorporate the thin-slice methodology to further investigate personality correlates of sales effectiveness. Future research might vary the task, the criteria, the rating variables, and the channel to gain a more comprehensive understanding of the predictors of effective sales. Following Borkenau et al. (2004), thin slices from different types of tasks may tap into different types of traits relevant to sales. For example, the same methodology could be used with real interactions with consumers, instead of staged interviews. In addition to a criterion variable of supervisor ratings, it would be informative to correlate thin-slice judgments with consumer perceptions, customer retention rates, and measures of salesperson–customer relationship quality. Finally, these studies demonstrated the predictive validity of thin slices of the vocal channel for sales effectiveness, but it is also worthwhile to investigate other channels such as the face and body.

Thus far, we have considered sales personnel as the targets in thin-slice judgments. We can also regard the sales personnel as the judges and the consumer as the target. Salespeople must often adapt their strategy based on the type of consumer. Individuals who are better at diagnosing personality traits, affect, and motivations would arguably be better at adapting strategies and perform better. Social perception research has demonstrated that there are individual differences in judgment accuracy. A meta-analysis by Davis and Kraus (1997) found that people who are more intelligent, more cognitively complex, less dogmatic, better adjusted, and more interpersonally oriented tend to be more accurate judges of others. Individual differences in accuracy may vary extensively across judgment tasks and judgment contexts (Ambady et al., 2000; Gesn, Bernieri, Gada-Jain, & Grahe, 1999). In another study, occupational therapy students' performance on a test of nonverbal sensitivity was correlated with supervisor ratings of their clinical fieldwork. Judgment accuracy of facial but not body cues was correlated with supervisor ratings in a psychiatric rehabilitation setting (Tickle-Degnen, 1998). Thus, performance on different measures of person perception can vary by the role and context. Future research might explore what types of thin-slice tasks are good predictors of individual differences in sales effectiveness and strategy adaptation for use in salesperson selection. Furthermore, this perspective could inform training programs.

The thin-slice methodology can also be applied to research in consumer behavior, beyond the salesperson–customer relationship. For example, it may have significant implications in the field of advertising, particularly in radio and television ads. With only a short time to sell a product, first impressions of the actors or models may be vital. Through facial expressions, gestures, tone of voice, and other nonverbal cues, actors may convey more than the verbal script intends.

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APPENDIX
Definitions of Variables

Understanding: Understands the needs of the client

Collaborative: Builds a personal relationship with the client

Supportive: Is interested and engaged in the development of others

Cooperative: Builds and works well with a team

Empathic: Interpersonally sensitive, recognizes and understands the thoughts and feelings of others

Influential: Able to influence others, is persuasive

Directive: Gives orders, monitors performance of others

Achievement-oriented: Wants to achieve, is goal-oriented and energetic

Persevering: Tenacious, takes the initiative

Confident: Sees self as expert, independent

Perceptive: Has insight into own strengths and weaknesses

Professional: Businesslike