The Impact of Bodily Behaviors of Sales Representatives on Charisma Evaluations by Consumers: A Time-Series Perspective

By Udo Wagner* and Sandra Pauser

Significant resources are spent each year on sales forces and the means by which to enhance their effectiveness during a sales interaction or presentation. Specifically, studies point to the importance of charismatic nonverbal cues (for example, facial expressions, gestures) in impression formation. However, these behaviors are mainly perceived in an unconscious manner, making behavior measurement a difficult task. Moreover, existing research is dominated by post-exposure measures and neglects customers' processing of impressions over time. This research addresses the outlined gaps and introduces continuous measurement of sales presentations based on different data sources. First, we provide novel insights by applying high-precision coding of 141 nonverbal behaviors of 22 videotaped sales presentations using body actions and posture coding procedures. Second, this study uses an innovative approach to capture customer impressions of sales representatives' charisma in real-time by means of a program analyzer, which allows evaluative measurements while concurrently being exposed to sales presentations. This time-series evaluation approach contributes to the understanding of impression formation and allows for linking nonverbal sales behaviors to customers' evaluations over the course of time. Findings from a large sample experimental study (n = 663) show that negative opinions are formed somewhat faster than positive ones. In addition, body movements (e.g., head/trunk/leg/knee movements, arm actions) driving these impressions are the same for the first few seconds and for longer periods.

Udo Wagner is Professor of Marketing at Modul University of Vienna, Am Kahlenberg 1, 1190 Vienna, Austria; Phone: +43-1-4277-38011; E-Mail: udo.wagner@univie.ac.at.
* Corresponding author

Sandra Pauser holds an Endowed Professorship in Marketing Management at Lauder Business School, Hofzeile 18–20, 1190 Vienna, Austria, E-Mail: sandra.pauser@lbs.ac.at.

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1. Introduction

In 1967, Watzlawick and colleagues published their seminal contributions on human communication and stated some tentative axioms. Most importantly they ascertained the impossibility of not communicating, i.e., "one cannot not communicate". Since then, the importance of nonverbal behavior is well accepted amongst a broad audience. In social psychology, Mehrabian (1969) and Argyle (1975) contributed substantially to bodily communication and the marketing literature heavily borrows from this stream of research. Otherwise, however, nonverbal communication appears to be an under researched area for marketing academia, despite the fact that it plays an essential role in personal selling and advertising. Of course, there are notable exceptions: Leigh and Summers (2002) affirm that nonverbal cues account for the majority of overall communication and yield favorable customer evaluations of sales presentations. As its first research question, this paper intends to shorten the aforementioned gap and deals with the analysis of nonverbal cues (such as body movements, gestures) emitted during sales presentations.

Whereas personal communication is inherently dynamic, existing research on the receiver's side is dominated by post-exposure measures and thus neglects respondents' processing of impressions over time. By capturing customers' evaluations over time (using real-time response measurement by means of a program analyzer [1]) we aim to fill this gap, since it allows an analysis of customers' reactions to specific time slots (such as initial impressions) or occurrences of specific body movements. Steward et al. (1987) explain this lack of research by the fact that nonverbal messages are difficult to measure (in the course of time) since they are perceived in a predominantly unconscious manner. When considering the sender, research mainly focuses on manual coding by binarily capturing the presence or the absence of a nonverbal behavior (Clark and Greatbatch 2011; Harrigan et al. 1985), which neither allows temporal variations nor specific time-series to be analyzed. Thus, as its second research question this paper captures customers' temporal evaluations of videotaped sales presentations (i.e., elevator pitches). The term "elevator pitch" is a metaphorical term. It refers to a brief presentation (typically lasting no longer than an elevator ride) where one individual must present and persuade the other with a message motivating the latter to continue the meeting after the elevator arrives. As a success measure this study employs salespersons' charisma (continuous response measurement recorded by means of a program analyzer), since this quality is ascribed to successful salespeople who master their nonverbal communication behaviors well (Fatt 1998). Specifically, charisma is defined as "the ability to captivate and inspire others" by modulating nonverbal communication behaviors (Heide 2013, p. 305). In other words, charismatic individuals show nonverbal expressiveness, which yields favorable perceptions and contributes positively to impression formation (Riggio and Friedman 1986). In recent years, research contributed to relating this valuable construct to positive outcomes in multiple disciplines. Charisma assessments are formed immediately during a sales interaction, which in turn, can influence sales performance and customer satisfaction (Ambady et al. 2006).

We used the Body Action and Posture (BAP) classification scheme developed by Dael et al. (2012) for measuring bodily behavior. This classification system builds upon a time-aligned micro description of body movement on an anatomical level (different articulations of body parts), a form level (direction and orientation of movement), and a functional level (communicative and self-regulatory functions). Thus, it comprises twelve main classifications of body movements with 141 variables and high-precision coding (25 observations per second) (Kipp 2000) (subsection 3.2.2 provides further details). This exhaustive coding procedure allows an analysis of individual time-series and therewith indicates the employed bodily behaviors of the salesperson per time stamp. In other words, the salesperson's nonverbal cues can be analyzed over time rather than in isolation (i.e., as aggregated mean values).

When analyzing a sales interaction, its duration might be of considerable importance. In this research we are primarily interested in primacy effects since initial impressions are essential for a successful sales presentation (Ambady and Rosenthal 1993). It is common wisdom that initiation plays an important role because "you never get a second chance to make a first impression". Prior research demonstrates that nonverbal cues are particularly vital in the formation of (first) impressions (Ambady and Rosenthal 1993), also in a sales context (Ambady et al. 2006). As its further contribution, this research provides (i) an indication about transferability of this concept for sales presentations in the form of elevator pitches; (ii) an estimation about the time it takes to form first impressions; (iii) an investigation whether the impact of bodily behaviors on evaluations of salespeople depend on the duration of the considered time interval; and (iv) some practical guidelines on ways to enhance sales performance.

The next section provides the conceptual framework of this study and gives a brief review of the most relevant literature. Section 3 reports on a comprehensive empirical research project: first, 22 sales presentations are videotaped, and the presenters' nonverbal behaviors are coded; subsequently subjects evaluated these elevator pitches, and finally, both data sets are analyzed. Section 4 concludes this paper and provides specific recommendations for salespeople.

2. Conceptual considerations

Conceptually, this research builds on the salesperson-customer interaction framework by Williams et al. (1990). This framework is rooted in social psychology and "focuses on communication as the essence of the interaction" (p. 29). This framework, in turn, draws on Mehrabian's (1969) work, which states that the recipient forms an initial impression based on the sender's nonverbal cues and therewith considers the interaction as a stimulus-response model. This one-way interaction regards the salesperson as the sender and the customer serves as the recipient. As its main extension, we incorporate a time-series perspective in a static model.

Fig. 1 depicts our conceptual model in a graphical format, which is discussed in detail below.

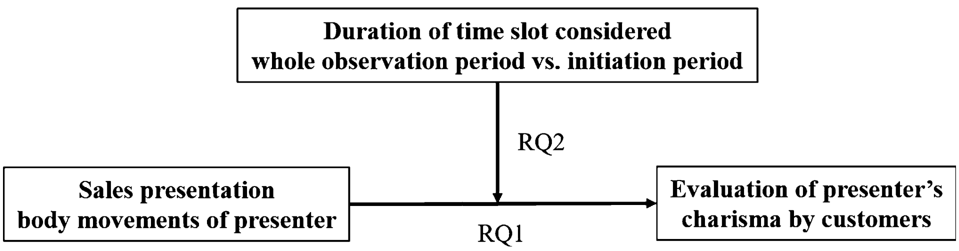

Fig. 1: Conceptual model

We propose charisma as a conceptual anchor and success variable in this model and build upon the findings of Garcia (1995) and Bass (1997) who both point to a strong link between a salesperson's charisma and effective selling. In previous times, scholars reserved the term for a type of leadership seen as extraordinary and thus linked to great personalities only (Beyer 1999). Nowadays, it is known among scholars that charisma is learnable (Towler 2003) and it yields performance outcomes in multiple research fields (Kirkpatrick and Locke 1996). The current context adopts the view of Bolkan and Goodboy (2014) and defines charisma as the ability to modulate dynamic communication behaviors during interpersonal interactions that inspire others.

2.1. Relationship between nonverbal behaviors of sales/company representatives and customers' charisma evaluations

Research on nonverbal behavior has evolved as an important field of study in psychological research (Babad et al. 2004; Ekman and Friesen 1972), as well as the literature of personal selling (Leigh and Summers 2002). The literature points to a variety of reasons to highlight the importance of nonverbal behavior: "its irrepressible nature, its links to emotion, its accessibility to observers, its uniqueness, and its speed" (Babad et al. 2004, p. 4; DePaulo 1992).

Quite recently, further studies indicate the importance of nonverbal cues since they affect attitudes toward salespeople and their sales performance (Ambady et al. 2006). Moreover, research indicates that individuals who are more charismatic are capable of displaying enhanced nonverbal behavior (for example, animated facial expressions) and thus yield more favorable impressions than individuals who do not display such expressiveness. Specifically, the former individuals are rated as more likable, effective, and confident (Riggio and Friedman 1986). Thus, charismatic salespeople possess the capability of articulating themselves through enhanced and dynamically employed nonverbal behaviors (such as eye contact and body movements). According to the traditional view and the etymology of the word "charisma", i.e., gift of grace, these behaviors might be innate, but according to more recent research these behaviors might also be learnable to a certain extent (Pauser and Wagner 2018). In summary, this quality is ascribed to successful sales representatives who have mastered their nonverbal communication behaviors in an appealing manner (Fatt 1998; Pauser and Wagner 2019).

With respect to more specific bodily movements, Mignault and Chaudhuri (2003) point, for example, to the importance of head movements by associating a raised head as a display of pride and happiness. In a sales context, head nods, which are defined as "ubiquitous accompaniments of speech" (Krauss et al. 1996), are an indication of agreement with the prospect (Peterson 2005). In line with this view, Mehrabian (1969) found that a head turn to a face-to-face position reflects positive feelings and elicits enhanced ratings. Furthermore, high rates of head and hand movements and decreasing levels of trunk-swivel movements are associated with the persuasiveness of the presenter. Also, relatively high rates of leg and foot movements are reported to be linked to more dominant and truthful presenters (Mehrabian and Williams 1969). Moreover, findings suggest that leg and foot movements are used more frequently in cases in which the status of the communicator is higher and used less frequently by deceitful communicators (Mehrabian and Williams 1969). Besides, Harrigan et al. (1985, p. 106) noted that individuals "who were rated less favorably were more likely to have their arms in an asymmetrical position, to be turned somewhat away from the patient, and to sit in upright or backward leaning postures with legs crossed knee on knee". Moreover, direct visual contact is of considerable importance, but little is known about bodily behaviors such as head/trunk/arm movement or posture (Leigh and Summers 2002).

In sum, prior studies point to the importance of studying nonverbal communication; however, they also notice lack of an objective and reliable means of coding these cues over time (DePaulo 1992) during a sales presentation. Research across different fields of study is dominated by manual binary coding of the presence or absence of a certain behavior (Clark and Greatbatch 2011; Harrigan et al. 1985) without considering its variations over time. As a consequence, only the frequencies of specific nonverbal cues were considered (such as the number of head movements per video-clip) as described by Ambady and Rosenthal (1993), which neglects the concurrent appearance of different behaviors over time. Thus, the goal of this study was to allow for an analysis over time of a variety of nonverbal sales behaviors. Furthermore, prior research considers isolated body movements by focusing on only one aspect, for instance gesturing style. Consequently, following DePaulo's (1992) call for more research on specific nonverbal cues to employ during sales presentations, we frame our first research question as follows:

RQ1: Which specific body movements of sales representatives influence their charismatic appearance as evaluated by customers in the course of time?

2.2. Primacy effects of impression formation induced by nonverbal behaviors in sales research

The power of first impressions has been extensively recorded in social psychology literature. Whether applied to job applicants or negotiation outcomes, the predictive power of the initial impression can be considered a critical human skill (Ambady and Rosenthal 1993) that is highly accurate (Curhan and Pentland 2007). "Thin slices" are defined as very brief observations made by individuals when forming an initial impression. "The way people move, talk, and gesture – their facial expressions, posture, and speech – all contribute to the formation of impressions about them" (Ambady and Rosenthal 1992,

p. 256). "The importance of a first impression cannot be overestimated. [...] First impressions are also essential in the realm of consumer decision making" (Ambady et al. 2006). In their meta-analytic review of 38 studies on the accuracy of predictions from "thin slices", Ambady and Rosenthal (1992, p. 263) show that "accuracy does not increase with longer exposures". In more detail, judgments from "thin slices" under 30 seconds of exposure are as accurate as judgments from longer observations of up to five minutes. These findings hold across a broad range of industries such as employment interviews (Curhan and Pentland 2007), competency ratings in clinical research (Blanck et al. 1986), or personality judgments of strangers (Borkenau et al. 2004).

According to Hall et al. (2015, p. 94), "thin-slice research shed light on the interactive influence of intuitive and deliberative accuracy on the person perception process in personal selling". However, research on perception accuracy shows that accurate judgements from thin slices are also possible in the absence of personal interaction (i.e., for example by considering static images) (Ambady et al. 2006). Besides, these judgements can be based on the presence of observable cues, in particular nonverbal behavior (Ambady and Rosenthal 1993). Two decades ago, scholars began to point to the "evidence on the predictive power of judgments made on the basis of thin slices" of nonverbal behavior (Babad et al. 2004, p. 4; Ambady et al. 2000). Besides, scholars state that these judgements "appear to be more of an automatic than a controlled process" (Ambady et al. 2006, p. 7). Nonverbal cues, for example, gestures, facial expressions, and/or tone of voice convey more information content than verbal scripts (Ambady et al. 2006). This evidence was confirmed by Curhand and Pentland (2007), who found that thin slices of conversational dynamics, such as enhanced body language, and voice characteristics can predict negotiation outcomes.

Whereas there are substantial indications on the relevance of expressive behavior in the formation of favorable initial impressions (Ambady and Rosenthal 1993), this paper pushes one step further in asking whether the same nonverbal cues which govern the evaluation process when considering the entire sales presentation are also operating during the initiation period (i.e., thin slice/first impression). To the best of the authors' knowledge, literature comparing nonverbal cues during the initiation period and the sales presentation is scarce to date. Naylor (2007, p. 165) found that "initial nonverbal cues-based judgments influence subsequent judgments of a target's actions". However, Naylor's (2007) study only considers static images without inspecting time-series or data in the course of time. Therefore, the second research question is formulated as follows:

RQ2: Do body movements or their impact on sales representatives' charisma evaluations differ between the initiation period and the subsequent short period of the sales presentation?

In order to operationalize *RQ2* we need to get an estimate for the length of the initiation period and, therefore pose the auxiliary research question:

RQ2a: How long does it take to form a first impression of a sales representative by observing her/his nonverbal behavior?

3. Empirical study

3.1. Design, data collection procedure, and sample

3.1.1. Stimuli – Elevator pitches

The empirical study used a between-subject design and employed elevator pitches from 22 different companies as stimuli.

Elevator pitches are brief sales presentations outlining an idea for a product, service or project [2]. The videotaped pitches, lasting approximately 60 seconds, show (non-student) company founders/start-up salespeople presenting their respective products/services. The presenter's age ranged from 22 to 65 years, and 41 % were females. Salespeople were recorded from the same camera angle (medium-full shot) against a white background from the customer's perspective (one-sided selling encounter/customer silent) and were dressed in a dark suit and a white shirt to control for other potential effects (see *Fig. 2* for an example). Presenters were not allowed to use any aids, such as slides or physical representations of their products. Elevator pitches covered a broad range of industries, including consultancy, smartphone and mobile applications, services for medicine, health, and sports, hardware solutions, entertainment, gaming, smart-home solutions, and the automotive industry. The typical elevator pitch consisted of an introduction of the respective presenter and start-up company followed by a problem statement and an offered solution. Finally, personal contacts were provided, such as a company website or other means of contact to engage lead generation. All presenters were very experienced and comfortable with the task such that videotaping their presentations did not exert detrimental effects on their bodily behaviors.

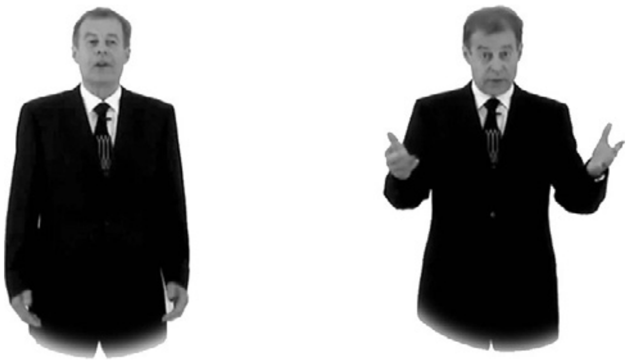

Fig. 2: Nonverbal communication: Elevator pitch, illustrative example

3.1.2. Evaluations of elevator pitches

Subsequently, a sample of 663 customers (with 63 % females with ages ranging from 18 to 49 years) was randomly assigned to one of the 22 videos (resulting in about 30 respondents per video) and was asked to evaluate salespersons' charisma since prior research points to the importance of this construct in a personal selling context (Pauser et al. 2018). To assure that the construct under investigation (i.e., charisma) was well understood, respondents provided word associations of charismatic individuals. This procedure also aimed to safeguard against potential ambiguity of the expression of charisma.

As an innovative feature, this research utilizes real-time response measurements of charisma by means of a program analyzer. The program analyzer was originally developed in 1937 by Lazarsfeld and Stanton to record people's moment-to-moment reactions to radio programs (Levy 2006). Over time, various improvements and refinements, such as devices in which participants push buttons, turn dials, or move a slider, have emerged. The latter is applied in the current research in the form of a slider. This hand-held device allows study participants to indicate the degree of agreement or disagreement (i.e., evaluations) at the moment of exposure. For each time frame an observation is recorded, which allows customers' evaluations to be traced to certain nonverbal sales behaviors of the presenter in the context of this study [3]. Nowadays, this audience measurement instrument has been used in research to test ads and commercials (see Wagner et al. 2016). This approach offers various advantages over existing methods (such as the use of self-report scales) since it allows for observations of spontaneous temporal variations over time to be made. Thus, changes in attitudes or any other form of response can be traced back to changes in the respective stimuli (Maier et al. 2007) and does not require direct questioning of subjects about their (conscious) perceptions.

Before their evaluation task, respondents were familiarized with the slider of the program analyzer and the respective scale anchors (0 = not at all charismatic, 10 = very charismatic). As mentioned, before the evaluation task, word associations of charismatic individuals were provided by respondents. One of the authors demonstrated how to use the device to the participants. Specifically, it was highlighted that the slider can be moved up and down on the respective scale from 0 to 10 while watching the elevator pitch. Importantly, study participants could test the device and were instructed to position the slider at the midpoint (middle position at the scale point 5, where they felt a slight hitch) before undertaking the evaluation task. A trained researcher operated the measurement device and assured its functionality. The program analyzer allowed concurrent evaluative measures (two observations per second) while being exposed to sales presentation for the whole observation period of the elevator pitch.

3.2. Preliminary analysis

Fig. 1 highlights that three types of information constituting the pillars of our model: body movements of the presenters, respondents' evaluation of the presenters' charisma, and the duration of the period of analysis (whole observation vs. initiation period). The preliminary analysis first concentrates on charisma evaluations. Sub-section 3.2.1 starts with reporting descriptives and considerations about the validity of the measurement; then a comparative static analysis substantiates the plausibility of distinguishing between the whole observation vs. the initiation period; subsequently, we turn toward *RQ2a* and estimate the length of the initiation period. Sub-section 3.2.2 focuses on body movements; first, nonverbal behaviors conceptually included in the BAP coding system, which were not observed in this study, are screened out; next the data is aggregated over time to adjust for the granularity applied for charisma evaluations and seven composites of related body movements are built to facilitate econometric investigations; finally, we provide descriptives of these composites.

3.2.1. Analysis of charisma

Average charisma evaluations
The program analyzer recorded continuous response assessments of the presenter's charisma while concurrently viewing the elevator pitch. Most respondents did not find it difficult to use the program analyzer. Nevertheless, several trajectories showed constant or erratic patterns (switching between extremes on the slider from 0 to 10) and required data cleansing resulting in a final sample consisting of 620 respondents. Column 2 of *Tab. 1* presents charisma evaluations averaged over respondents and the whole observation period. Rows of *Tab. 1* corresponded to the 22 elevator pitches and were arranged with increasing charisma evaluations.

Most of these evaluations were below the scale midpoint of 5. This distribution might be a consequence of the initial word associations (cf. sub-section 3.1.2) that study participants provided when imagining notably charismatic individuals in order to explain charisma to participants. Compared with highly charismatic individuals, the typical sales representative might have performed less favorably (i.e., a priming effect). On the one hand, this is in line with the traditional concept of charisma (i.e., attributed to extraordinary individuals only), on the other hand, relative differences of evaluations suffice for the current investigation. One-way ANOVA endorses such a variety of the different presentation styles as observed charisma varies statistically significantly across elevator pitches (i.e., $F_{21, 598} = 3.71$, $p < 0.01$).

Validity of measurement
Charisma is a complex construct which is considered when using self-assessment measurement. Therefore, data collection also included the well-established charisma scale by Khatri et al. (2001) comprising nine items and

Elevator pitch	Average charisma evaluation [1]	Break of slope point		
		$\hat{\bar{T}}^{(i.)}$ [2]	$Var_j\left(\hat{T}^{(ij)}\right)$	Based on % sample [3]
1	3.09	11.5	55.5	76
2	3.26	15.5	68	57
3	3.33	16	45	55
4	3.42	16	51.5	64
5	3.43	16	47.25	55
6	3.51	13.5	46	52
7	3.54	13.5	37	64
8	3.70	16	67.75	63
9	3.73	10.5	29	66
10	3.88	12.5	24.75	45
11	3.96	17.5	40	74
12	4.14	11	26.25	42
13	4.15	11.5	51.5	52
14	4.15	15	59.5	73
15	4.17	15.5	51.75	43
16	4.43	15	55.25	52
17	4.59	18	48.5	46
18	4.66	17.5	48	54
19	4.70	17	61.75	56
20	4.88	14	65.5	46
21	5.03	16.5	56	62
22	5.16	18	65.5	57
Whole sample	4.04	15	52.4	57

Notes:
[1] 11-point scale (0 – 10), program analyzer.
[2] Seconds.
[3] Percentage of respondents who evaluated the respective elevator pitch and whose trajectories could be used for estimating a break of slope point.

Tab. 1: Charisma measurement – Preliminary analysis

7-point Likert response scales. Psychometric properties were established at the elevator pitch level and were satisfactory: Cronbach's α were above 0.83 for all 22 elevator pitches. Pearson correlation between individual level charisma measured by self-assessment (Khatri's et al. 2001 scale) and through the program analyzer (evaluations averaged over the observation period) amounts to 0.85 with $p < 0.001$, which corroborates measurement validity.

Comparative static analysis of charisma evaluations

We examined individual trajectories of charisma evaluations over time searching for respective regularities and ultimately identified two patterns:

(i) respondents' assessments stabilized over time and

(ii) respondents' heterogeneity resulted in three levels of overall evaluations – upper, medium, lower (cf. *Fig. 4*).

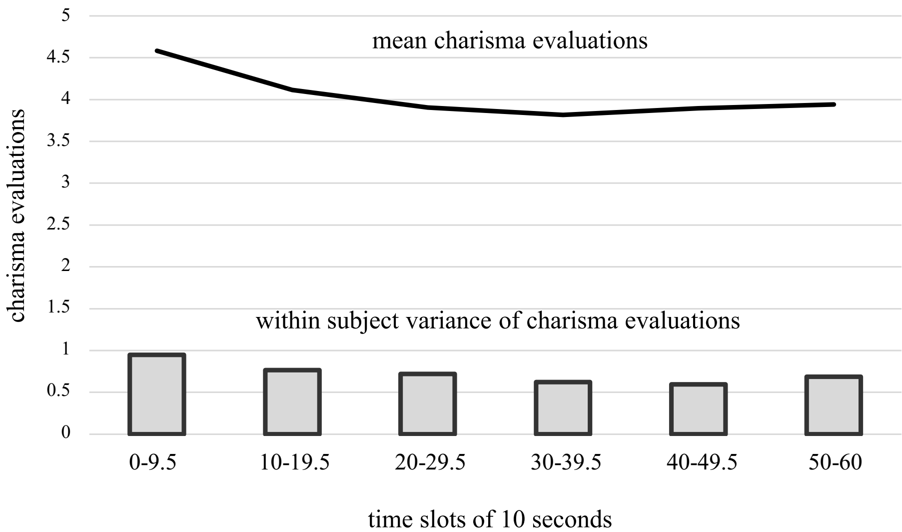

Fig. 3: Mean charisma evaluations and within subject variance of charisma evaluations averaged across respondents and elevator pitches (for time slots of 10 seconds each)

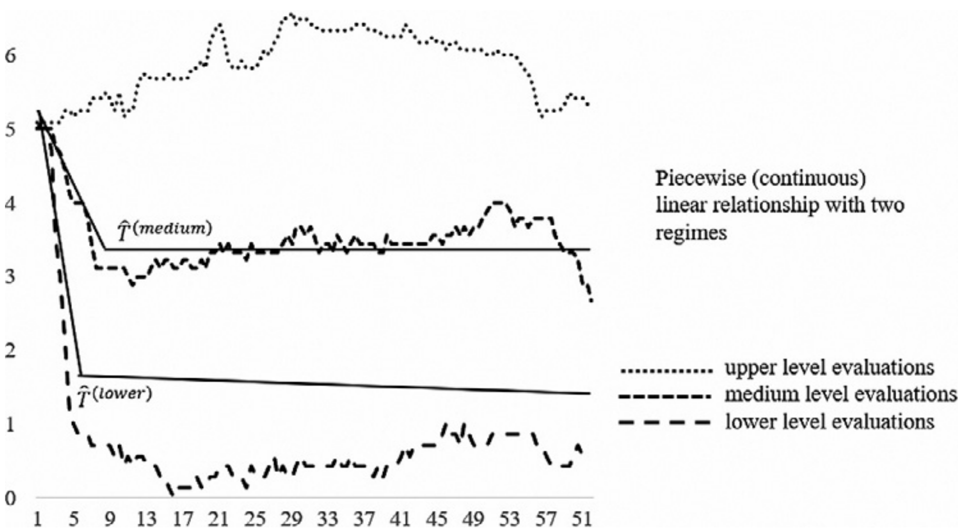

Fig. 4: Three sample trajectories and econometric determination of their break of slope points: $\hat{T}^{(medium)} = 7.5$, $\hat{T}^{(lower)} = 5.2$, ($\hat{T}^{(upper)} = 35.3$ was not accepted as reliable estimate)

Ad (i). We conducted a comparative static comparison for prespecified time intervals ($0 \leq t \leq 9.5; 10 \leq t \leq 19.5$; ...) for average charisma evaluations and average within subject variance of charisma evaluations; in both cases averaging was done over respondents and elevator pitches. *Fig. 3* visualizes stabilization over time, i.e., average evaluations are slightly decreasing over time and somewhat faster at the beginning of the trajectories. This pattern is even more pronounced for within subject variance: there is a gradual decrease from 0.95 (first 10 seconds) to 0.59 (seconds 40–49,5) which is particularly pronounced after the first 10 seconds.

Ad (ii). Not surprisingly, respondents assessed elevator pitches as differently appealing. A cluster analysis segmented subjects into one of three segments according to their evaluation of trajectories. The three-cluster solution was satisfactory from a substantive point of view (about 25 % of the sample was classified as upper level, 36 % as medium level, and 39 % as lower level surveyors) and a statistical perspective (i.e., goodness of fit). *Fig. 4* provides a graphic representation of evaluation trajectories (aggregated over respondents belonging to the same cluster) for a typical elevator pitch [4].

In summary, despite heterogeneity (between subject) concerning average evaluations, their fluctuations (within subject) seem to decrease and stabilize over time, a finding that provides the first indication that indeed, thin slices forming first impressions might also be operating under these circumstances.

Investigation of RQ2a – time series analysis

Progressing one step further, a more elaborate analysis tries to determine how long it takes on average to form a first impression of the present sales presentations. Therefore, we postulated a piecewise linear relationship with two regimes:

$$y_{itj} = \begin{cases} \beta_{10}^{(ij)} + \beta_{11}^{(ij)} t & for\ t \leq T^{(ij)} \\ \beta_{20}^{(ij)} + \beta_{21}^{(ij)} t & for\ t > T^{(ij)} \end{cases}$$

$$\beta_{10}^{(ij)} + \beta_{11}^{(ij)} T^{(ij)} = \beta_{20}^{(ij)} + \beta_{21}^{(ij)} T^{(ij)} \quad \forall i,j$$

with

y_{itj} – *charisma evaluations*; i – *elevator pitch*; t – *time*; j – *respondent*

$\beta_{10}^{(ij)}, \beta_{20}^{(ij)}$ *intercept for first and second regime* $\forall i$

$\beta_{11}^{(ij)}, \beta_{21}^{(ij)}$ slope for first and second regime $\forall i$

Nonlinear regression analysis estimated the break of slope point $T^{(ij)}$ and the parameters $\beta_{10}^{(ij)}, \beta_{11}^{(ij)}, \beta_{20}^{(ij)}, \beta_{21}^{(ij)}$ at the individual, respondent level *j*. This rather simple functional relationship was chosen because it allows for exact calibration of the break of slope points, which is of focal importance in this context. This makes the piecewise linear functional form superior to more complex functional relationships (e.g., polynomial, logarithmic).

Trajectories presented in *Fig. 4* seem to imply rather remanent evaluation patterns. As a consequence, the evaluations' starting point (i.e., 5) would be of considerable importance. Keep in mind, however, that these trajectories have been aggregated over respondents belonging to the same cluster and this aggregation smoothened individual fluctuations. As outlined in subsection 3.1.2, one of the authors familiarized respondents with the program analyzer and characterized this starting point as a *neutral evaluation* (which was also emphasized physically by the slight hitch at the scale point 5). On the one hand, we concede that assessment of neutrality might thus have been primed by the initial word associations of charismatic individuals. On the other hand, the program analyzer's slider could be moved very easily and individual trajectories differed from those in *Fig. 4* and showed more volatile patterns switching freely between scale points (extreme cases even had to be excluded from the sample). Counter measures to reduce the potential impact of the starting point might discard the first seconds from the analysis (which would somewhat contradict the analysis of initial thin slices) or would require respondents to start from a randomly chosen scale point (which would be difficult to execute in the field with the technical equipment at hand and would require a greater sample). We, therefore, note this issue as an agenda for further research and gratefully acknowledge the editor's advice into this direction.

Fig. 4 also includes such piecewise linear functional approximations for lower and medium level evaluations for demonstrational purpose. It further outlines that break of slope points could not be determined satisfactorily in all cases (cf. upper-level evaluations in *Fig. 4*). We only accepted estimates of $\hat{T}^{(ij)}$ as reliable if the corresponding analysis passed the following requirements: (a) face validity of $\hat{T}^{(ij)}$ with respect to the graphical inspection of the trajectory, (b) $\hat{T}^{(ij)}$ should be smaller than 30 seconds and statistically significant (for a type I error of 5 %), (c) the precision of the estimate should be acceptable (i.e., the range of the 95 % confidence interval should be smaller than $\hat{T}^{(ij)}$), (d) the slope of the linear relationship after the break of slope point should be small (i.e., $|\hat{\beta}_{21}^{(ij)}| \leq 0.1$) implying that evaluations have been stabilized already, and (e) the fit of the model should be sufficient (i.e., $R^2 > 0.45$). Column 3 of *Tab. 1* reports the mean (per elevator pitch, averaged over respondents) of the estimated break of slope point $\bar{\hat{T}}^{(i.)}$, which passed these conditions; column 4 yields the corresponding variance (over respondents), and column 5 shows the percentages of respondents whose trajectories qualified for this calibration (as an example: for pitch 1, 22 trajectories out of 29 were used, 76 %).

When interpreting the results, we first emphasize that it was possible to achieve a reliable estimate in 57 % of the cases. Given the rather strict requirements outlined above, this percentage might be taken as lower boundary for affirmative support of the existence of thin slices in this context. In response to *RQ2a* we note that thin slices lasted about 15 seconds on average. Second, a more detailed analysis (results are not shown in this paper) revealed that this support was greater for lower-level evaluations (i.e., lower-level cluster from above); in this case, a reliable estimate could be achieved for about 80 % of the respondents, and moreover, they established their impressions somewhat faster, after about 12 seconds. This result is in accordance with results in the literature (Baumeister et al. 2001). Third, it was shown that it takes from 5 to 30 seconds to form the initial impression of a salesperson (*RQ2a*).

3.2.2. Analysis of body movements

Data screening

After visual inspection, it was obvious that sales representatives' nonverbal cues differed substantially during their presentation; for example, they showed different degrees of animated bodily expressions, eye contact, hand gestures, and/or leg/knee movements during their presentations. To substantiate this claim, we coded these gestures and body movements and thereby employed the "body action and posture coding system" (BAP) suggested by Dael et al. (2012) [5]. With assistance of the Anvil video annotation software (Kipp 2000), two trained observers independently coded nonverbal behavior as manifested in the elevator pitches. While raw data is essentially binary (1 = the presence of a body action or posture, 0 = its absence in a given time frame), it is very fine grained, viz. 25 observations per second, extreme slow motion. Coders had to consider frame by frame. According to Dael et al. (2012, p. 97), the BAP coding scheme allows "the time-aligned micro description of body movement on an anatomical level (different articulations of body parts), a form level (direction and orientation of movement), and a functional level (communicative and self-regulatory functions)". In more detail, movements of the neck, trunk, upper and lower arms, and lower limbs are recorded; thus, the coding scheme can be applied from head to knee and includes gaze. In comparison to other coding schemes, the BAP is very detailed with a high coding reliability and precision (Dael et al. 2012). Moreover, this system combines various existing schemes into one unified classification (such as emblems, illustrators, and manipulators as defined by Ekman and Friesen (1972) and body posture and body action units as differentiated by Harrigan et al. (2005). The BAP classifies 141 behavioral variables into 12 categories: (i) head orientation, (ii) head action, (iii) head posture, (iv) trunk orientation, (v) trunk action, (vi) trunk posture, (vii) arm action, (viii) arm posture, (ix) whole body posture, (x) gaze, (xi) action functions, and (xii) other (Dael et al. 2012) [6].

Data aggregation

To match the timing of the evaluations of both, the program analyzer (viz. two observation per seconds) and the Body Action and Posture coding scheme, we first aggregated BAP data over half a second (resulting in percentage of occurrence of particular variable within this particular half a second). Out of the 141 BAP variables, only 38 received nonzero values in the present case. Thus, we removed several nonverbal variables due to non-occurrence and made use of the sequential approach by Dael et al. (2012). For example, several variables were pooled (e.g., we combined the following variables "lateral head turn toward a left position" and "lateral head tilt toward a left position" in addition to "lateral head turn toward a right position" and "lateral head tilt toward a right position" into a behavioral category labeled "lateral head turn/tilt". We built composites of several of these variables based on conceptual affinity or statistical concordance (over time). As a result, the analysis focused on several aspects: (1) head movement (lateral head turn and tilt); (2) trunk movement (orientation, action); (3) trunk lean (forward/backward, left/right); (4) arm action (left/right/asymmetrical; illustrator, manipulator) [7]; (5) arm posture (left hand in pocket/one arm holds other in front/symmetrical or asymmetrical arm posture, cf. *Fig. 2* for illustrations); (6) action function (emblem/beat/deictic) [8]; and (7) leg movement/knee bend. Arm actions refer to movements of either one or both arms, whereas arm posture refers to a resting position of one or both arms (for example, arms at side). To the contrary, action functions refer to body actions such as emblems, beat, and deictic as defined by Ekman and Friesen (1972).

Composites of nonverbal behavioral variables	Over whole elevator pitch		Over first 15 seconds of elevator pitch	
	mean [(1)]	cv [(2)]	mean [(1)]	cv [(2)]
Head movement	0.15	1.61	0.16	0.25
Trunk movement	0.50	0.08	0.50	0.00
Trunk lean	0.12	1.46	0.14	0.25
Arm action	0.33	0.77	0.33	0.34
Arm posture	0.24	0.90	0.23	0.41
Action function	0.03	3.32	0.02	0.23
Leg/knee movement	0.15	1.51	0.18	0.46

Notes: [(1)] percentage of occurrence, [(2)] coefficient of variation.

Tab. 2: Descriptive measures (calculated over whole time period/first 15 seconds) for nonverbal behavioral variables

Descriptives

Tab. 2 (columns 2, 3) presents descriptive measures of the nonverbal behavioral variables in accordance with *RQ1*. According to this table, respective mean trunk movements occurred most frequently (cf. large mean, column 2) at the same time, however, these movements remained relatively monotonic across presenters and time (cf. small coefficient of variation, column 3). The two types of arm movements (action and posture) occurred quite frequently, but the action function exhibited substantial variability. This finding is in accordance with Pauser et al. (2018) who found that arm gestures and positions are particularly relevant in a personal selling context.

The right part of *Tab. 2* (columns 4, 5) presents the same analysis performed over the thin slice period (assumed to be 15 seconds as determined before). When examining means, the results for the two different time frames correspond fairly well to each other. It appears plausible that there was more variance within the longer observation period (as induced by coefficients of variation, columns 3 vs. 5). These findings also provide affirmative support of the existence of thin slices in this context.

A further analysis revealed relatively small correlations between these nonverbal behavioral variables with one exception (arm action versus arm posture) in the absolute values of Pearson's correlation coefficients that were lower than 0.2.

3.3. Analysis of relationship between bodily behaviors and charisma evaluations

3.3.1. Analysis over whole observation period (RQ1)

Body movements were recorded for each elevator pitch over time, but they do not vary over respondents who evaluated the same presentation. Synchronizing data thus requires determination of average charisma evaluations (over respondents). We argue that elevator pitches operated as contextual variable for these assessments and propose a multilevel model:

Times series (t) of body movements and charisma evaluations averaged over respondents represent level 1 data, elevator pitches (i) level 2 data. In addition, we allow for random response coefficients for all variables (but will reduce model complexity in a stepwise manner employing Likelihood ratio tests [9]). Accounting for dynamic effects, the piecewise linear relationship established in sub-section 3.2.1 is included, but this time, the break of slope point T is fixed and set to 15 seconds. This component is also supposed to address potential autocorrelation effects.

Therefore, we postulated the following model [10]:

$$y_{it.} = \gamma_{i0} + \sum_{k=1}^{7} \gamma_{ik} x_{itk} + \gamma_{i8} t + \gamma_{i9} D(t - T)$$

$$\gamma_{ik} = \bar{\gamma}_k + v_{ik}$$

$$E(v_{ik}) = 0 \ \ \forall i,k$$

$$Cov(v_{ik_1}, v_{ik_2}) = \begin{cases} \sigma_k^2 & if\, k_1 = k_2 = k \\ 0 & if\, k_1 \neq k_2 \end{cases}$$

$$D = \begin{cases} 0 & if\, t \leq T \\ 1 & if\, t > T \end{cases}$$

$0 \leq t \leq 60$ *whole observation period*,

$0 \leq t \leq 15$ *thin slices period* [11]

with

x_{itk}: (composite) body movement k displayed by presenter i at time t

$y_{it.}$: charisma evaluation for presenter i at time t averaged over respondents

γ_{ik}: response parameter for (composite) body movement and trend variables varying across i

$\bar{\gamma}_k$: fixed effects

v_{ik}: random error.

Based on a Likelihood Ratio-test the random component for trunk movement was dropped. We point to the small coefficient of variation of this variable (cf. *Tab. 2*, column 3). Similarly, the random component for arm posture was excluded without changing *LL* significantly (Δ_1 = 1.16). A further simplification (dropping the random component of action function), however, would have resulted in a significant decrease (Δ_1 = 7.56) [12]. *Tab. 3* presents estimates for the resulting model.

The significant fixed effect of the intercept reflects the fact that evaluations started at the neutral level of the slider (i.e., at 5). Its significant random effect indicates different levels of observed charisma per elevator pitch.

Regressor variables	Estimates	Test statistic	*p*-level
Fixed effects:			
Intercept	5.11	$F_{1,\,168.63} = 4151.24$	< 0.01
Head movement	0.03	$F_{1,\,15.96} = 0.46$	0.51
Trunk movement	-0.31	$F_{1,\,2439.00} = 6.70$	0.01
Trunk lean	0.07	$F_{1,\,8.88} = 0.50$	0.50
Arm action	-0.12	$F_{1,\,18.93} = 1.65$	0.21
Arm posture	-0.08	$F_{1,\,1501.66} = 1.80$	0.18
Action function	0.06	$F_{1,\,8.40} = 0.27$	0.62
Leg/knee movement	-0.02	$F_{1,\,16.14} = 0.02$	0.90
Trend before break of slope	-0.03	$F_{1,\,21.98} = 50.02$	< 0.01
Trend after break of slope	0.03	$F_{1,\,21.97} = 37.11$	< 0.01
Random effects:			
Variance (Residuals)	0.04	*Wald* $z = 35.12$	< 0.01
Variance (Intercept)	0.04	*Wald* $z = 2.61$	< 0.01
Variance (Head movement)	0.03	*Wald* $z = 2.07$	0.04
Variance (Trunk lean)	0.14	*Wald* $z = 1.69$	0.09
Variance (Arm action)	0.11	*Wald* $z = 2.13$	0.03
Variance (Action function)	0.09	*Wald* $z = 1.31$	0.19
Variance (Leg/knee movement)	0.20	*Wald* $z = 2.35$	0.02
Variance (Trend before break of slope)	0.0005	*Wald* $z = 3.25$	< 0.01
Variance (Trend after break of slope)	0.0006	*Wald* $z = 3.24$	< 0.01

Notes: Estimates for the hierarchical model over whole time frame.
Dependent variable: charisma evaluation (averaged over respondents per elevator pitch).
Level 1: time-series, level 2: elevator pitch.
Information criterion: LL_0 = -387.32, when dropping random effect of action function: LL_1 = -379.76, when including random effect of arm posture: LL_2 = -388.48, and when dropping random effects of all nonverbal behavioral variables: LL_3 = -202.00.
The critical value of a χ^2-distribution with one degree of freedom amounts to 3.84 ($p < 0.05$) and 6.63 ($p < 0.01$).

Tab. 3: Influence of presenters' nonverbal behavior on perceived charisma of presenters – time-series analysis, whole time period

The significant fixed effects of the two trend components corroborate the previous results (*RQ2a*). On average, charisma evaluations slightly decrease for the first 15 seconds (by $\hat{\hat{\gamma}}_8$ = -0.03 per half second) and stabilize afterwards (i.e., $\hat{\hat{\gamma}}_8 + \hat{\hat{\gamma}}_9 \approx 0$). The significant random effects of these two components permit differences at the elevator pitch level. For an illustration, we refer to *Tab. 4* ('Trend/whole period' columns on the right) [13]. Whereas the more common situation refers to this decay-stabilization ($\hat{\gamma}_{i8} < 0$, $\hat{\gamma}_{i9} > 0$) pattern (e.g., elevator pitches #1, #3, #5, #6, #7, #10, #11, #14), either a rise-stabilization ($\hat{\gamma}_{i8} > 0$, $\hat{\gamma}_{i9} < 0$) pattern (#16, #17, #19, #20, #21, #22) or neither of the two was found. As an observation, we note that decay-stabilization seems to be more likely for lower, rise-stabilization for higher evaluated presentations (cf. *Tab. 1*). This appears plausible because all evaluations started at the midpoint (i.e., 5; cf. *Fig. 4*).

The fixed effect of trunk movement is negative ($\hat{\hat{\gamma}}_2$ = -0.31) and significant indicating a detrimental impact of such a nonverbal behavior on charisma throughout which is in accordance with expectations outlined in Section 2. Surprisingly, arm posture and action function are not relevant in this analysis.

The other body movements, head movement, trunk lean, arm action, and leg/knee movement are shown to be significant drivers of charisma, but their influence does not manifest consistently. *Tab. 4* (whole period columns) elaborates this point.

Interpretation

Whereas head movement significantly and positively influences charisma evaluations for elevator pitch #3 and #8, it has the opposite effect for #9, #11, and #20, and shows no significant effects on the other presentations. After reflecting on these results, a further analysis of the videos suggests that a head turned sideways (#11) might have caused a negative evaluation. Turning the head sideways might imply insecurity while presenting a good or a service. This behavior signals low attention to the conversational partner. We conducted similar checking for the other nonverbal behaviors and found that an upright (#5)/swivel (#7) trunk lean might be perceived as positive/negative, whereas symmetrical arm actions (#3, #6, #17) were perceived as positive and asymmetric actions (#1, #12) as negative. Usually, leg/knee movement are interpreted as a signal of nervousness (#5, #9) unless shifting of body weight is synchronized with shifting of emphasis concerning the content of presentation (#14). As an illustrative example (#11), a sideways head turn combined with a trunk movement and a hectic arm gesticulation yields negative charisma evaluations, whereas, positive evaluations (#5) can be achieved by an upright trunk position, employing symmetrical arm gesturing and a relaxed arm posture.

As a consequence, head movement, trunk movement and lean, arm action, and leg/knee movement are of particular relevance (which is also consistent when looking at the *p*-levels of their fixed/random effects, *Tab. 3*). As an aside, two of the presenters whose nonverbal behavior was found to be not influential (#10 and #15) achieved

Elevator pitch	Head movement		Trunk lean		Arm action		Action function		Leg/knee movement		Trend before (1)		Trend after (2)
	Whole period	Thin slices period	Whole period	Thin slices period	Whole period	Thin slices period	Whole period	Thin slices period	Whole period	Thin slices period	Whole period	Thin slices period	Whole period
1					⊟	⊟					⊟	⊟	⊞
2											⊟		
3	⊞				⊞						⊟		+
4								-				-	
5			⊞	⊞					⊟	⊟	⊟	⊟	⊞
6			⊟		⊞					+	⊟	⊟	⊞
7			⊟	⊟						+	⊟	⊟	⊞
8	⊞		⊞	+									
9	-								⊟	⊟		⊟	
10											⊟	⊟	⊞
11	⊟	⊟		+							⊟	⊟	⊞
12					⊟		⊞					⊞	
13		+											
14									+		-		⊞
15												⊟	
16				⊞							⊞		⊟
17				⊟	⊞						⊞	+	⊟
18												+	
19		+									+	⊞	-
20	⊟		-						+		⊞	⊞	⊟
21						⊞					⊞	⊞	⊟
22											⊞	⊞	⊟

Notes: "+, -" cells indicate positive, negative significant influences of nonverbal behavioral variables;
⊞, ⊟ indicate 0.05 level of significance, +, – indicate 0.10 level of significance
Grey shaded cells indicate coherence of results for whole and thin slices period.
(1) $t \leq T$ (2) $t > T$.

Tab. 4: Estimated effects of nonverbal behavior per elevator pitch for whole time period (60 seconds) vs. thin slices period (first 15 seconds)

average charisma evaluations, and as a reverse conclusion, nonverbal actions might indeed polarize, which provides further evidence for the relevance of *RQ1*. We emphasize the preliminary nature of these observations and urge further research to explore and elaborate on these issues in more detail.

3.3.2. Analysis over thin slices period (RQ2)

The investigation proceeds again by using a multilevel model for the thin slices period but incorporates two simplifications. The lack of variation for trunk movement (cf. *Tab. 2*, column 5) prevents from including this variable and the trend component after break of slope does not apply in this situation. Rather than optimizing the fit of the model, we strive to make the analyses for both periods comparable to a large extent and thus, do not change other specifications [14]. *Tab. 5* presents the results.

The results coincide with *Tab. 3* to a great extent, in particular, with respect to significant estimates: for the fixed effects intercept [15], trend, and all random effects. *Tab. 4* (thin slices columns) further substantiates this finding by exhibiting signs of significant response parameter at the elevator pitch level. If these predictions were significant for both periods, respective signs are the same (gray-shaded entries in *Tab. 4*).

Interpretation

Trunk lean seems to possess a somewhat more pronounced impact during the thin slices period as highlighted by the magnitude of its random component and the six significant estimates at the elevator pitch level. A forward lean is associated with the demonstration of interest and thus with enhanced charisma ratings, whereas a lean toward the side is mostly evaluated negatively since it seems to demonstrate insecurity. An explanation for the results is evident in prior research in other disciplines. Higher rapport between interaction partners (i.e., physicians and patients) was reported to be present when interaction partners tended to be closer in terms of proximity, faced the counterpart, leaned forward, and had an open arm and leg posture (Harrigan et al. 1985). Moreover, decreasing levels of trunk lean and higher rates of head and hand movements were associated with persuasiveness of the presenter (Mehrabian and Williams 1969).

Note, that nonverbal behavioral variables were based on (objective) elevator pitch data, but evaluations by means of program analyzer were based on (subjective) respondents' data. By aggregating evaluations over the sample of respondents (per elevator pitch), we neglected heterogeneity (some subjects might be influenced differently by nonverbal behavioral variables; for example, some might like symmetrical arm action, or some might prefer

Regressor variables	Estimates	Test statistic	*p*-level
Fixed effects:			
Intercept	4.91	$F_{1, 65.70}$ = 6652.24	< 0.01
Head movement	0.07	$F_{1, 13.32}$ = 1.44	0.25
Trunk lean	0.20	$F_{1, 14.13}$ = 1.38	0.26
Arm action	-0.08	$F_{1, 26.19}$ = 0.38	0.55
Arm posture	0.11	$F_{1, 307.38}$ = 1.36	0.24
Action function	-0.29	$F_{1, 4.83}$ = 1.15	0.33
Leg/knee movement	-0.17	$F_{1, 15.11}$ = 2.10	0.17
Trend before break of slope	-0.03	$F_{1, 21.82}$ = 37.90	< 0.01
Random effects:			
Variance (Residuals)	0.02	*Wald z* = 16.74	< 0.01
Variance (Intercept)	0.03	*Wald z* = 2.65	< 0.01
Variance (Head movement)	0.04	*Wald z* = 1.57	0.12
Variance (Trunk lean)	0.42	*Wald z* = 2.29	0.02
Variance (Arm action)	0.20	*Wald z* = 2.41	0.02
Variance (Action function)	0.23	*Wald z* = 1.02	0.31
Variance (Leg/knee movement)	0.15	*Wald z* = 2.18	0.03
Variance (Trend before break of slope)	0.0005	*Wald z* = 3.22	< 0.01

Notes: Estimates for the hierarchical model over the thin slices frame.
Dependent variable: charisma evaluation (averaged over respondents per elevator pitch).
Level 1: time-series, level 2: elevator pitch.
Information criterion: LL_0 = -427.14, when dropping random effect of action function: LL_1 = -419.26, when including random effect of arm posture: LL_2 = -428.06, and when dropping random effects of all nonverbal behavioral variables: LL_3 = -285.50.
Not sufficient variance of trunk movement for estimation.

Tab. 5: Influence of presenters' nonverbal behavior on perceived charisma of presenters – time-series analysis, thin slices

asymmetrical arm action). By aggregating over respondents, this information could have been discarded. This finding might explain that some of these nonverbal behavioral variables (i.e., arm posture and arm function) did not turn out to be significant in the time-series analysis over the whole elevator pitch.

4. Conclusion

4.1. Discussion of results

In summary, this study investigates nonverbal behaviors of salespeople, in particular during their sales presentations, by automatically measuring customer responses by means of a program analyzer. As the main contribution to this field, this paper analyzes nonverbal behaviors as a whole rather than as isolated behavior (for example by focusing on certain aspects, such as gesturing). This time-series analysis remained largely unexplored so far. To date, sales research has focused mainly on post-exposure measures, such as multi-item scales, to study customers' impressions. Nevertheless, post-exposure measurements might not always provide insights into specific nonverbal variables that contribute most to positive evaluations, especially in the personal selling domain. In addition, primacy and recency effects might bias the evaluation (Balasubramania 1990).

For decades, sales research has tried to determine characteristics and behaviors that drive sales performance. This study introduced continuous measurement of initial impressions in a sales context and therewith attempts to provide preliminary insights on forming initial impressions of the salesperson. It provides novel insights by investigating sales presentations over the course of time and therefore allows measurement of the respondents' reaction to specific time slots (such as initial impression) or occurrences of specific body movements. Methodologically, this research applied high-precision coding of nonverbal cues in videotaped sales presentations (elevator pitches) by making use of the BAP coding procedure, which allowed an objective analysis of nonverbal communication behaviors with a high granularity and precision to be performed.

In line with earlier investigations in personal selling and marketing (Leigh and Summers 2002), in this study, we provide further evidence for the importance of nonverbal communication during sales presentations. Moreover, this study directly addresses a gap in the literature that is highlighted, for example, by DePaulo (1992), in which little is known about specific nonverbal sales behaviors to use during salesperson presentations.

Tab. 6 recaps the most important results which have been supported by statistical analysis.

Answers to *RQ1*: There is an inherent negative effect of trunk movement on charisma evaluations common to all elevator pitches. According to *Tab. 2* trunk movement is substantial (i.e., recorded in 50 % of the time) but its variability is low (and even nonexistent within the first 15 seconds). Trunk movement might signal self-consciousness. In contrast, trunk swivel (i.e., rotation) implies discomfort, tension, and unwillingness to interact. There are significant effects for head movement, trunk lean, arm action and leg/knee movement. Arm actions are executed quite frequently (i.e., in about 33 % of the time), the other body movements occur somewhat less frequently (in about 15 % of the time). Symmetric arm actions induce positive but asymmetric arm actions negative evalua-

Research question	Answers					
RQ1: Which specific body movements of sales representatives influence their charismatic appearance as evaluated by customers in the course of time?	**Body movements**	**Whole pitch**	**First 15 seconds**	**Positive impact observed for**	**Negative impact observed for**	**Recommendation for sales people**
	Head movement	+, –		Persuasiveness of presenter	Head sideways implies insecurity, low attention	Full-face (rather than sideway) head movements
	Trunk movement	–			Trunk swivel implies discomfort, tension, and unwillingness to interact	Avoid trunk swivel
	Trunk lean	+, –	+, –	Upright trunk lean, forward lean demonstrates interest	Swivel trunk lean, lean towards the side demonstrates insecurity	Upright position
	Arm action	+, –	+, –	Symmetric arm actions	Asymmetric arm actions	Open arm posture/actions, symmetrical gesturing
	Leg/knee movement	+, –	+, –	Synchronized shifting of body weight with emphasis on content	Signal of nervousness	Avoid leg/knee movements
RQ2: Do body movements or their impact on sales representatives' charisma evaluations differ between the initiation period and the subsequent short period of the sales presentation?	Only small differences have been observed First impressions are important, do not start a presentation by placing the arms at side (next to the torso)					
RQ2a: How long does it take to form a first impression of a sales representative by observing her/his nonverbal behavior?	About 15 seconds (reliable estimates for about 57% of the cases) Negative impressions are more readily and formed faster than positive impressions					

Notes: +, – Estimate of random effect significant; this implies that the effect varies over pitches; there are presenters for whom a significant positive/negative effect of the respective body movement has been detected.
– Estimate of fixed effect significant and negative; this implies a common negative effect for all presenters.

Tab 6: Takeaways and qualitative interpretation of most important results supported by statistical analysis

tions. The audience rewards head movements when executed such that the full face remains visible but penalizes sideway head movements. Similarly, an upright, forward directed trunk lean demonstrates interest to the audience but swivel trunk lean insecurity. Finally, leg/knee movement bears the potential to signal nervousness to the audience unless such a movement evokes the impression that it emphasizes content.

Answers to *RQ2* and *RQ2a*: We achieved a valid estimate of the duration of the initiation period, i.e., 15 seconds, in the majority of cases. Negative impressions are more readily and formed somewhat faster than positive impressions. Only small differences have been observed between the impact of body movements on sales representatives' charisma evaluations for the initiation and the whole observation period.

4.2. Practical implications

Our findings, in turn, deliver various implications for sales representatives, coaches, and managers. We provide sales managers with specific guidance on ways to enhance sales performance (cf. right column of *Tab. 6*). It is suggested that salespeople should be made aware of the important effects of their nonverbal behavior during the initial encounter. Thus, we propose that these behaviors should be taught to salespeople in addition to existing training modules. Role-playing and video analytic reviews could facilitate training. We emphasize that the first impression is of importance and can be enhanced by employing a set of nonverbal cues. First, an initial sales encounter should not start by placing the arms at side (i.e., next to the torso). This posture neither contributes to a favorable rating nor yields a good first impression. Rather open arm postures and actions and a symmetrical gesturing style should be used instead. Second, upright trunk lean is positively associated with a salesperson's charisma, but swivel trunk lean is viewed negatively. Full-face head movements and symmetric arm actions presumably yield higher customer ratings, but sideway head movements, asymmetrical arm actions, and leg/knee movements lower ratings.

Moreover, this study provides novel insights about the time it takes to form an initial impression and emphasizes that negative impressions are more readily identifiable and formed somewhat faster than positive impressions. We aim to point out that training initial impressions is of importance.

In addition, we demonstrate that a program analyzer represents a reliable device for sales research. Since this device allows temporal variations to be analyzed, and therewith provides various advantages, further research might focus on the investigation characteristics (such as voice, gender, age or personality traits) and/or facial expressions of sales representatives. Additional use cases might include an evaluation of sales presentations during video conferencing or sales negotiations.

4.3. Limitations

Besides the theoretical, managerial and methodological contributions, this experimental study is subject to limitations. A dynamic recording of the evaluations might also have allowed for a more detailed identification of the causes for changes in the particular stimuli (i.e., sales presentations). A more sophisticated methodological approach might incorporate respondents' heterogeneity or some lag structure of behavioral variables to account for response latency. Alternative to the use of a slider, a dial might be used to allow different start positions of the program analyzer in future studies. We point, however, to the explanatory character of this study. Moreover, we urge further research to enhance the level of control by incorporating a sales script or consider success measures of personal selling other than charisma (e.g., attitude toward the presenter or the company). An investigation of nonverbal cues of the customers (also in different cultures) might be of importance to study since research on interaction patterns of a sales dyad is scarce to date.

Notes

[1] A program analyzer equipped with a slider or dial enables the user to continuously evaluate a target object on a given scale (subsection 3.2.1 provides further details).

[2] The choice of elevator pitches as stimuli for our study is consistent with our conceptual model presented in *Fig. 1*. By doing so, we leave investigations of interaction patterns between sales representatives and customers as subject for future research.

[3] Subjects reported instantaneous reactions to the sales presentations. As detailed in subsection 2.1, humans build evaluations of nonverbal behaviors instantaneously and unconsciously to a large extent. Moreover, Lazersfeld and Stanton highlighted the program analyzer's potential to measure moment-to-moment reactions (Levy 2006). We concede, however, that we do not claim that nonverbal behavior is measured exclusively (e.g., voice characteristics or verbal content might also play a minor role).

[4] When starting their evaluations, respondents had to adjust the slider of the program analyzer in the neutral position (i.e., at the scale point 5; cf. sub-section 3.1.2). Therefore, evaluations of the first seconds were biased toward 5, which could also be confirmed when looking at *Fig. 4*.

[5] We note that averages of these nonverbal behavioral variables have also been used in earlier research by Pauser et al. (2018).

[6] The manual by Dael et al. (2012) offers detailed descriptions of the coded variables.

[7] Illustrator: "conversational action that supports accompanying speech" (Dael et al. 2012, p. 107); Manipulator: "an action in which one part of the body manipulates another body part" (Dael et al. 2012, p. 108). Examples include hand-to-hand movements.

[8] Emblem: "a symbolic and conventionalized body action with a culturally defined fixed form-meaning relationship "; Beat: "repetitive action that accentuates points in time, illustrating structural or rhythmic aspects of co-occurring speech"; Deictic: "referential action indicating a real or abstract object, person, event, or location in space" (Dael et al. 2012, p. 107).

[9] Hierarchical models are also discussed in the literature under the heading "random coefficient models" (see Hildreth and Houck 1968 or Swamy 1970). Usually, model building starts by including a random intercept in a linear model and proceeds by adding random slopes for regressors in a stepwise manner (forward selection). This process continues as long as the goodness of fit measure '-2 log Likelihood' (abbreviated as LL in the sequel) increases significantly (by checking $\Delta_{df} = LL_2 - LL_1$ (distributed χ^2_{df}) against a χ^2-distribution, a procedure which is known as Likelihood ratio test; model 2 is nested within model 1 and df > 0 is the difference between the number of parameters of model 1 and model 2). Alternatively, one might start with a model with all parameters being random and decreasing complexity in a stepwise manner (backward selection). Consistent with this concept, a maximum likelihood estimation is used to calibrate the model's parameters.

[10] If coefficients of all regressors were assumed random, a separate equation disturbance could not be distinguished from the intercept disturbance and was therefore omitted. If only a smaller number of coefficients was postulated as random, then a disturbance term ε_{ij} and its variance σ_r^2 were considered.

[11] As an aside, we remind that time granularity is half a second.

[12] We also explored various specifications of the parameters' covariance structure or dropping other random components of regressor variables but did not succeed in a better fit.

[13] In multilevel models all random components are also estimated for the whole domain of level 2 variable (i.e., elevator pitches). Entries in *Tab. 4* tag directions of significant parameters.

[14] In fact, however, dropping/including the random component for action function/arm posture would not have resulted in a different model selection.

[15] The difference between 5.11 and 4.91 occurs because trunk movement was not included for thin slices; average trunk movement amounts to 0.50, cf. *Tab. 2*, its effect was estimated to be -0.31 and, therefore, $5.11 - 0.31 \times 0.50 = 4.96$ which is close to 4.91.

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