Article

Room to Move: On Spatial Constraints and Self-Disclosure During Intimate Conversations

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Abstract

The tendency to disclose information is affected by several factors, including the environment in which a conversation takes place. The study reported investigates the effect of spaciousness impressions on self-disclosure during interviews on intimate lifestyle-related topics comprising substance intake, sexuality, and emotions. To influence perceived spaciousness, desk size (interpersonal space) and room size (architectural space) were manipulated. The results show that room size in particular affects self-disclosing behavior with increases in architectural space positively affecting self-disclosure. However, the effects obtained varied considerably across the different topics, and decreases in interpersonal space hampered self-disclosure on sexuality-related topics. Furthermore, nonverbal measures revealed that readjustments of posture, interpersonal distancing, and refrains from establishing eye contact are used to counteract space intrusions.

Keywords

environmental design, architecture, spaciousness, self-disclosure, affective experience

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Sharing personal information is essential to the development and maintenance of personal and professional relationships. Whether it involves communication between friends, colleagues, or strangers, self-disclosure not only makes relationships interesting and engaging, but it also provides communication partners with the necessary information required to respond to each other's needs. As such, self-disclosure (i.e., the process of communicating personal information to another person; Chelune, 1975; Omarzu, 2000; Strassberg, Roback, D'Antonio, & Gabel, 1977) is likewise essential to communication processes taking place in many service settings in which input from clients or patients is crucial to service providers, as is the case in counseling and health care settings (Cohen & Schwartz, 1997; Hinson & Swanson, 1993). In these settings, clients or patients may be asked to provide information on lifestyle, medical history, and physical or psychological problems, information that enables caregivers to make an accurate diagnosis of the problems involved (Cegala, Gade, Lenzmeier Broz, & McClure, 2004). Although in such cases, patients usually take the initiative to seek help, many nonetheless find it embarrassing or troublesome to share their problems with a "stranger," turning self-disclosure into a negatively laden experience.

Research shows that self-disclosure varies with person and conversation-related factors. For instance, it has been shown that the discloser's state of mind influences the likelihood of sharing personal information (Cunningham, Steinberg, & Grev, 1980; Forgas, 2011; Ignatius & Kokkonen, 2007), with a positive mood increasing the disclosure tendency. In addition, recipient characteristics such as gender, age, and status influence self-disclosure, with disclosure more easily taking place toward women and between people of the same age and status (Chaikin & Derlega, 1974; Cappella, 1981; Collins & Miller, 1994), although with respect to the former, results of a meta-analysis indicate that sex differences in self-disclosure are smaller than expected (Dindia & Allen, 1992). As for interpersonal feelings or emotions: trust, liking, and familiarity positively influence disclosure (Chaikin & Derlega, 1974; Collins & Miller, 1994; Mathews, Derlega, & Morrow, 2006; Rotter, 1980).

Apart from varying with mood, relationship type, and person characteristics, conversation characteristics may also facilitate or hinder self-disclosure. Generally, self-disclosure is more troublesome during conversations reflecting personal, intimate, and hence, potentially embarrassing topics such as personal fears, emotions, self-incriminating information, and sexual behaviors (Altman & Taylor, 1973; Howell & Conway, 1990; Joinson, Paine, Buchanan, & Reips, 2008). For instance, Joinson et al. (2008) showed that self-disclosure decreases with increasing sensitivity of the personal

information involved. Finally, self-disclosure may increase to reciprocate disclosure by the conversation partner, suggesting that individuals may seek equilibrium in terms of disclosure toward one another (Cozby, 1973; Ignatius & Kokkonen, 2007; Morton, 1978).

In addition to such well-established influences, the environment in which conversations take place can also facilitate or hinder disclosure. For instance, various studies indicate that creating more comfortable or pleasurable environments (e.g., through lighting) stimulates self-disclosure, arguably because such environments make individuals feel comfortable and at ease (Chaikin, Derlega, & Miller, 1976; Gifford, 1988; Miwa & Hanyu, 2006). Of particular relevance to the current undertaking, another line of self-disclosure research hints at the importance of experienced spaciousness for stimulating self-disclosure (Okken, van Rompay, & Pruyn, 2012; Sundstrom, 1975). For instance, Okken et al. (2012) showed that increases in room size positively affect self-disclosure intentions and the affective experience. Although research shows that self-reported self-disclosure tendencies can predict actual disclosing behavior (Halpern, 1977; Kahn, Lamb, Champion, Eberle, & Schoen, 2002), it is an open question whether actual (as opposed to intended) self-disclosure is sensitive to spatial constraints. Furthermore, effects of spatial factors may vary across topics, with some topics "requiring" more space to unfold than others. Therefore, this study investigates effects of spaciousness impressions on actual disclosing behaviors and participants' affective experiences during interviews on a variety of lifestyle-related topics.

Spaciousness and Self-Disclosure

Long-standing research findings testify to the importance of the physical environment for self-disclosure (Chaikin et al., 1976; Cohen & Schwartz, 1997; Jourard & Friedman, 1970; Lecomte, Bernstein, & Dumont, 1981; Sundstrom, 1975). For instance, a study by Sundstrom (1975), addressing the effect of room size on stress and self-disclosure, showed that limited space may induce crowding perceptions and as a result may decrease communicative behaviors. Jourard and Friedman (1970) studied the effects of interpersonal distance during interviews. Results of their study showed that when the physical distance between experimenter and participant decreases, so does the extent of self-disclosure. These findings indicate that spatial aspects of an environment influence disclosing behavior, and they suggest that spaciousness impressions (i.e., perceptions of feeling *free* or *confined*) may be triggered by environmental factors pertaining to positioning of

furniture and inhabitants (e.g., interpersonal distance), and by architectural dimensions (i.e., room size). More recently, Okken et al. (2012) studied the effects of room size and interpersonal distance on self-disclosure intentions and affective experiences in experiments involving pictures of a simulated patient consult with a general practitioner. Their results show that room size and desk size influence self-disclosure intentions and positive affect, and that these relationships are mediated by spaciousness perceptions. These findings suggest that increases in physical space may generate psychological space, in turn facilitating self-disclosure and triggering a more positive affective experience.

In line with these findings, research in environmental psychology (see Stamps, 2011) and consumer research (Levav & Zhu, 2009; Meyers-Levy & Zhu, 2007) also testifies to the beneficial effects of experienced spaciousness. For instance, Meyers-Levy and Zhu (2007) showed that a high, as opposed to a low, ceiling (also increasing spaciousness) may activate feelings of freedom, subsequently generating more creative strategies in a problem-solving task. Similarly, Levav and Zhu (2009) investigated the effects of spaciousness in store environments. They showed that narrow shopping aisles activated feelings of confinement and that these negative feelings are counteracted by making more varied product choices (e.g., in western societies viewed as an act/expression of freedom). These combined findings suggest that restrained physical space may indeed invoke feelings of limited psychological space (cf. Okken et al., 2012), a proposition also in line with recent embodiment research showing that spatial properties influence people's reasoning about abstract, mental concepts (IJzerman & Semin, 2010). A central assumption underlying current research holds that spatial constraints in counseling or health settings likewise generate a freedom-seeking tendency and, hence, a refusal to comply with behavioral norms (e.g., "reactance"). In the context of a consult or interview, such a refusal should transpire in a lowered willingness to disclose personal information.

In sum, we argue that architectural and interior-design–related interventions (i.e., increases in room size or volume and interpersonal distance, respectively) may increase experienced spaciousness and feelings of freedom, in turn leading to more self-disclosure. Conversely, limiting spaciousness may elicit feelings of restraint, in turn leading to a refusal to disclose information. Hence,

Hypothesis 1a (H1a): Increases in room size induce feelings of spaciousness, thereby generating more self-disclosure.

Hypothesis 1b (H1b): Increases in interpersonal distance induce feelings of spaciousness, thereby generating more self-disclosure.

In addition to the contents of self-disclosure (i.e., *what* do people say?), of equal importance is the affective state or the experienced ease of self-disclosure (i.e., *how* do participants experience the self-disclosure process?). As suggested by the foregoing, spaciousness perceptions are positively linked to the affective experience and perceived ease of self-disclosure. Hence,

Hypothesis 2a (H2a): Increases in room size positively influence the affective experience and perceived ease of self-disclosure.

Hypothesis 2b (H2b): Increases in interpersonal distance positively influence the affective experience and perceived ease of self-disclosure.

As discussed, ease of self-disclosure varies across topics and self-disclosure is particularly awkward during conversations on personal or intimate topics. In the health care or counseling context, topics of interest include physical or psychological health and health-related behaviors including substance intake and sexuality. Conceivably, for some topics (e.g., disclosure reflecting sexual behaviors), the physical presence of another person is potentially more threatening or awkward than for others (e.g., disclosure with respect to alcohol or drug intake) (cf. Howell & Conway, 1990; Joinson et al., 2008; Wiederman & Sansone, 1999). Hence, for explorative and practical purposes (i.e., in health care and counseling settings, a large variety of topics may take center stage), a variety of topics were included to assess the relative importance of the spaciousness manipulations.

To test the hypotheses outlined and additional research questions, interview sessions on student lifestyle were arranged in two rooms that were identical apart from their measurements (i.e., room size), and desk selection (i.e., a small or large desk; interpersonal distance). This resulted in a 2 (room size: small vs. large) × 2 (interpersonal distance: small vs. large) between-subjects design.

Method

Participants

A total of 86 participants (38 male, 48 female) were included in the study. Their mean age was 21.8 years (SD = 2.33). Participants were recruited by

approaching passers-by on the campus of a Dutch university with the request to take part in a short interview concerning student lifestyle that was part of a large survey conducted by the university. All participants were students enrolled in various (under)graduate programs at the university.

Procedure

The participants were randomly assigned to one of the four conditions. Upon arrival in the building, they were asked to wait in the waiting area. After reading and signing a consent form for video recording of their interview, they were invited to enter the room. As research suggests that self-disclosure more easily takes place toward women and between people of the same age and status (Chaikin & Derlega, 1974; Cappella, 1981; Collins & Miller, 1994), a female master's student at the university served as the interviewer. She was not informed of the purpose of the experiment and all students who knew her were excluded from participation. The participants were interviewed according to a script, which was rehearsed by the interviewer in the weeks before the experiment. The interviewer was already present in the room and started the video recording before the participant entered the room. After entrance, the interviewer introduced herself and invited the participant to sit down in the chair, after which she proceeded with the interview. Upon completion of the interview, a short questionnaire was administered (measuring spaciousness perceptions, affective experience, and perceived ease of self-disclosure), during which the participant was left alone in the room. After turning in the questionnaires, participants were thanked for their participation and dismissed.

Independent Variables

The experiment took place on the campus of the university. To manipulate room size, two—otherwise identical—rooms of different sizes were used (see Figure 1 for impressions of the four experimental conditions). The small room was 16.1 m^2 (2.80 wide × 5.75 deep) and the large room was 19.78 m^2 (4.30 wide × 4.60 deep). Interpersonal distance was manipulated by varying the desk size. The interpersonal distance was 80 cm for the small-sized desk and 160 cm for the large-sized desk. A video camera was openly displayed in the corner of the room to record the interview. Lighting conditions in both rooms were measured at several different points inside the room in terms of luminance (small room: $M = 643$ lx, range = 597-676 lx vs. large room: $M = 669$ lx, range = 590-677) and spectral distribution (small

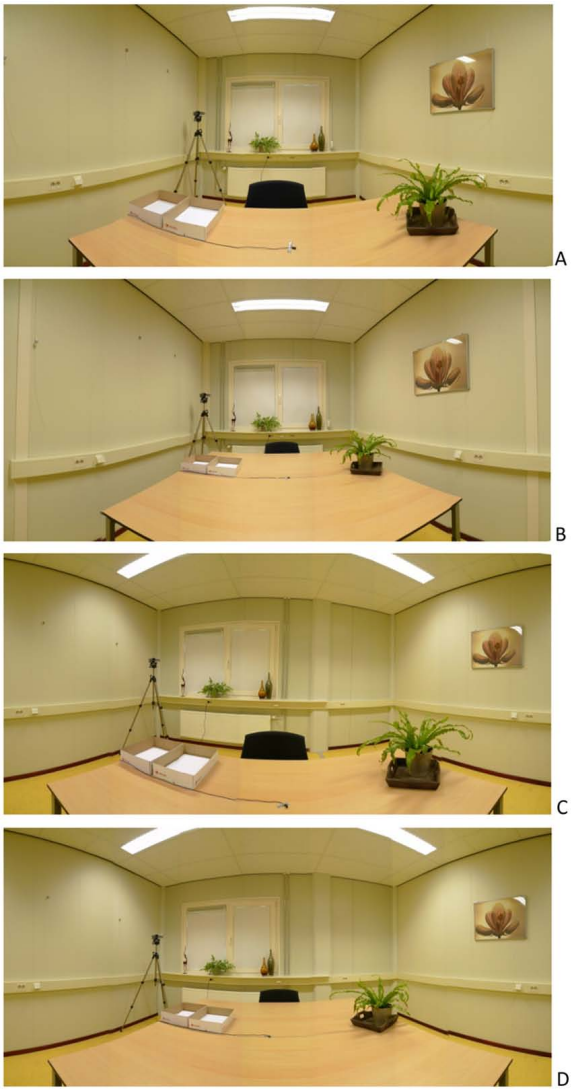

Figure 1. Wide-angle photographs of the four conditions.
Note: Desk size is small for Photos A and C and large for Photos B and D. Room size is small for Photos A and B and large for Photos C and D.

room: $M = 2862$ K, range = 2849-2870 K vs. large room: $M = 2856$ K, range = 2852-2869 K). These differences are negligible (Kaufman, 1981). Identical decorative items were used in both rooms and their position did not change during the experiment.

Questionnaire

Perceived spaciousness. Perceived spaciousness was measured using the items: "I feel constricted inside this room," "I feel confined inside this room," "I have sufficient freedom of movement inside this room," and "I would easily feel suffocated inside this room" ($\alpha = .84$).

Perceived ease of self-disclosure. Perceived ease of self-disclosure was measured with the items: "I felt inhibited from speaking inside this room," "Inside this room I felt able to speak freely," "I felt uncomfortable in sharing personal information inside this room," and "It was hard for me to talk about myself inside this room" ($\alpha = .83$).

Affective experience. To measure participants' affective experience, an affect-measure was used comprising the items: "Inside this room, I feel at ease," "Inside this room, I feel unhappy," "I feel uncomfortable inside this room," and "This room gives me a pleasant feeling" ($\alpha = .84$).

All questions were measured on 5-point Likert-type rating scales.

Self-Disclosure Measures

Self-disclosure was measured by analyzing the answers to the questions asked during the interview. A variety of sensitive or intimate topics were selected showing an obvious match with the lifestyle-theme of the interview. Furthermore, the topic list for the interviews was based on previous research distinguishing between disclosed information in terms of sensitivity (Altman & Taylor, 1973; Howell, & Conway, 1990; Joinson et al., 2008). The topics included: "substance use" (i.e., alcohol and drug intake), "sexuality" (i.e., attitudes about sex and mass media), and "emotions" (i.e., fear, insecurity, and loneliness).

Substance use. Respondents were asked to describe a regular night out with their friends in terms of alcohol consumption and drug usage.

Sexuality. Respondents were asked to voice their opinion about displayed nudity and sexual behavior in the media and to reflect on whether the media has an impact on their own sexual values and behaviors.

Emotions. Respondents were asked to describe situations in which they felt insecure, scared, and lonely.

There were five measures for self-disclosure, derived from previous studies (Joinson, 2001; Omarzu, 2000). As an objective measure, word count and duration (in seconds) were measured. In addition, to gain more information about the qualitative aspects of self-disclosure, completeness (i.e., whether the participant gives a full answer to the question), self-reference (i.e., whether the participant relates the answer to him or herself), and intimacy (how intimate is the given answer) were assessed. To measure these qualitative aspects, recorded answers to the interview questions were scored on 5-point rating scales. To determine the reliability of the ratings, a second coder re-coded a subset of the data independently using the same scales. The second coder was a behavioral scientist who was unaware of the purpose of the study. Most importantly, however, the camera was positioned so as to ensure that the raters would be blind to the conditions. The intercoder reliability (Cohen's κ) varied from .70 to 1.00 indicating high intercoder reliability.

Nonverbal Behavior

To obtain additional data on spaciousness-related behaviors, nonverbal behavior was coded. The measures included "openness of posture," "direction of bodily posture," "leaning on the table," "establishing eye contact," and "bodily symptoms of distress." Again, two independent coders viewed the recorded interview sessions and rated participants' nonverbal behaviors using 5-point rating scales (Cohen's κ again varied from .70 to 1.00, indicating high intercoder reliability).

Results

Results were analyzed for gender and age using ANOVA, but as none proved significant there will be no further discussion of these variables ($p > .10$ for all self-disclosure measures). A MANOVA was conducted, with room size and desk size as independent variables and the self-disclosure measures, perceived spaciousness, perceived ease of self-disclosure, affective experience, and the nonverbal behavior measures as dependent variables. The analysis yielded a significant multivariate effect of room size, $F(13, 72) = 2.33$, $p = .014$, partial $\eta^2 = .29$. Likewise, the multivariate effect of desk size was significant, $F(13, 72) = 3.33$, $p = .001$, partial $\eta^2 = .39$. In addition, the multivariate effect of the interaction between room size and desk size reached significance, $F(13, 72) = 2.00$, $p = .037$, partial $\eta^2 = .26$. Having established these effects, next the ANOVAs (comprising the same independent and dependent variables) are presented.

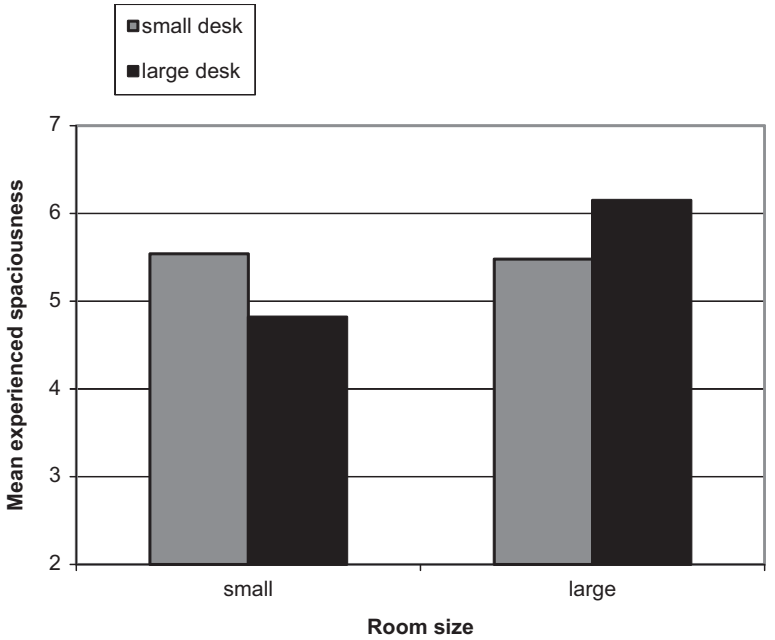

Figure 2. Interaction between room size and desk size for perceived spaciousness.

Perceived Spaciousness

Room size had an effect on perceived spaciousness, $F(1, 84) = 6{,}60$, $p = .012$, partial $\eta^2 = .07$. As expected, perceived spaciousness scores for the large room ($M = 5.81$, $SD = .17$) were higher than for the small room ($M = 5.19$, $SD = .17$), indicating that participants experienced more spaciousness in the large room than in the small room. No main effect was found for desk size, $F < 1$, *ns*.

An interaction was obtained between desk size and room size, $F(1, 82) = 9.03$, $p = .004$, partial $\eta^2 = .10$ (see Figure 2). Further analysis of the simple main effects showed that for the large desk size, there was a significant difference in perceived spaciousness for the different room sizes (small room size $M = 4.82$, $SD = .23$ vs. large room size $M = 6.15$, $SD = .24$); $F(1, 82) = 16.15$, $p < .000$, partial $\eta^2 = .17$), indicating that participants experienced the condition with the larger desk size as more spacious in the large room, as compared with the small room. In the small-desk condition, this difference did not reach significance (small room $M = 5.54$, $SD = .22$ vs. large room $M = 5.48$, $SD = .23$; $F < 1$, *ns*).

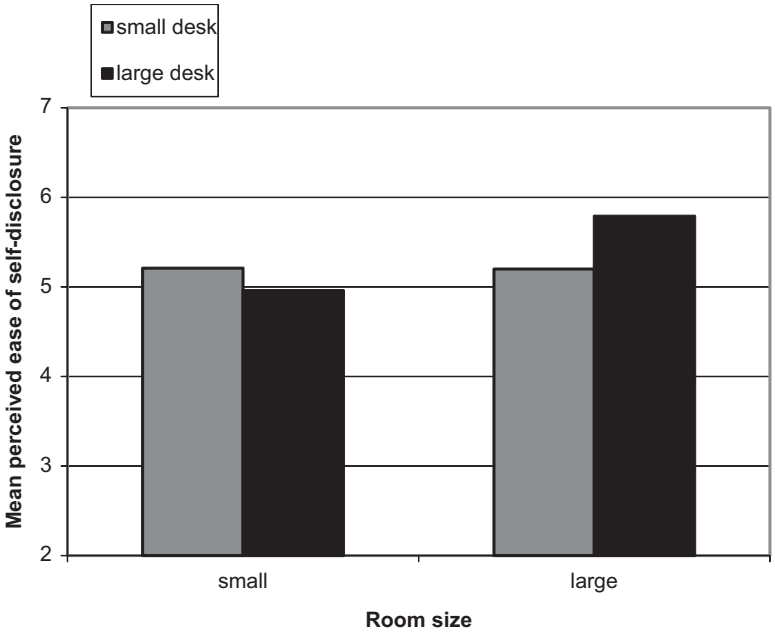

Figure 3. Interaction between room size and desk size for the perceived ease of self-disclosure.

Affective Experience

Perceived ease of self-disclosure. Room size had a significant effect on perceived ease of self-disclosure, $F(1, 84) = 4.23$, $p = .042$, partial $\eta^2 = .05$. The large room yielded higher scores for ease of self-disclosure ($M = 5.01$, $SD = .14$) in comparison with the small room ($M = 5.50$, $SD = .15$). No main effect was found for desk size, $F < 1$, *ns*. The interaction between desk size and room size was also significant, $F(1, 82) = 4.36$; $p = .040$, partial $\eta^2 = .05$ (see Figure 3). Further analysis of the simple main effects showed that the positive effect of room size on self-disclosure was significant only in the large-desk condition (small room M = 4.96, SD = .20 vs. large room M = 5.79, SD = .21; F(1, 82) = 8.4, p = .005, partial $\eta^2 = .09$). In the small-desk condition, the effect of room size was not significant (small room $M = 5.21$, $SD = .20$ vs. large room $M = 5.20$, $SD = .20$; $F < 1$, *ns*).

Affective experience. Room size had significant effect on affective experience, $F(1, 84) = 4.78$, $p = .032$, partial $\eta^2 = .05$. The large room triggered a more positive affect ($M = 5.21$, $SD = .16$) than the small room ($M = 4.73$,

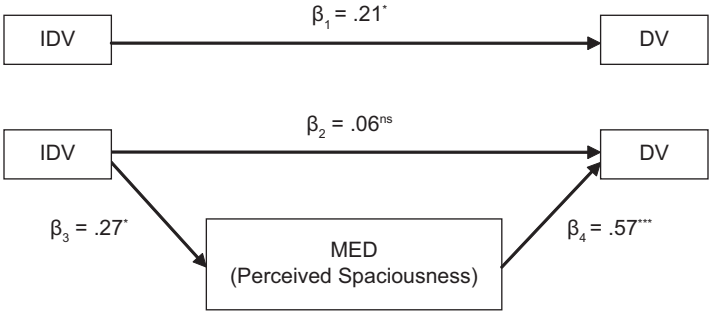

Figure 4. Mediation model, with room size or the room size × desk size interaction as the independent variable (IDV), perceived spaciousness as the mediator (MED), perceived ease of self-disclosure, affect, and self-disclosure as dependent variable (VD).
*$p < .05$. **$p < .01$. ***$p < .001$.

SD = .15). For desk size and the room size × desk size interaction no significant effects were obtained, $F < 1$.

Mediation analyses, following the procedure outlined by Baron and Kenny (1986), were performed to examine whether the effects of room size and the room size × desk size interaction on perceived ease of self-disclosure and affective experience are mediated by perceived spaciousness (see Figure 4). Starting with ease of self-disclosure, the effects of room size on perceived ease of self-disclosure (β = .21, $p = .047$) and on perceived spaciousness (mediator) were significant (β = .27, $p = .012$), as was the effect of perceived spaciousness on perceived ease of self-disclosure (β = .59, $p < .000$). When room size and perceived spaciousness were included in the model, the effect of room size on perceived ease of self-disclosure became nonsignificant (β = .06, $p = .541$), whereas the effect of perceived spaciousness on perceived ease of self-disclosure remained significant (β = .57, $p < .000$). Results of a Sobel test show that the indirect effect is significant (Sobel $z = 2.40$, $p = .008$). To test whether the main effect of room size on affective experience is mediated by spaciousness, similar analyses were conducted (see Table 2). Taken together, these analyses confirm that people feel more at ease self-disclosing personal information *and* experience more positive affect in the large setting *because* it inspires spaciousness perceptions.

Self-Disclosure

No overall effects on the self-disclosure measures surfaced across the different topics, suggesting that the effects of the space manipulations varied

depending on the topic of conversation. Hence, separate analyses were conducted for each of the three topics: substance use, sexuality, and emotions.

Substance use. Room size had an effect on word count for the questions related to substance use, $F(1, 83) = 5.30$, $p = .024$, partial $\eta^2 = .06$. The number of words used to answer the substance-use questions was lower in the small room as compared with the large room. No effects surfaced on the other self-disclosure measures (see Table 1).

Sexuality. Desk size had an effect on word count for the questions related to sexuality, $F(1, 83) = 4.46$, $p = .038$, partial $\eta^2 = .05$. The number of words used was higher in the large-desk condition compared with the small-desk condition. Also, desk size had a marginal effect on the duration of the answer, $F(1, 83) = 2.91$, $p = .092$, partial $\eta^2 = .03$. Participants' answers took more time in the large-desk setting compared with the small-desk setting. Desk size had an effect on self-reference for the sexuality questions, $F(1, 83) = 5.19$, $p = .025$, partial $\eta^2 = .06$. Participants' answers were more self-related, and less other-related, at the large desk compared with the small desk.

Emotions. Room size had a marginal effect on intimacy for the questions related to emotions, $F(1, 84) = 4.75$, $p = .020$, partial $\eta^2 = .05$. Answers were more intimate in the large room, as compared with the small room.

Mediation. To test whether the effects obtained for self-disclosure were mediated by spaciousness, mediation analyses were conducted (see Table 2). No overall mediating effects of perceived spaciousness were found. However, for the emotion questions, a significant mediation was found for the intimacy of the given answer. The effects of room size on intimacy ($\beta = .22$, $p = .035$) and on perceived spaciousness ($\beta = .20$, $p = .048$) were significant, as was the effect of perceived spaciousness on intimacy ($\beta = .51$, $p = <.000$). When room size and perceived spaciousness were included in the model, the effect of room size on intimacy became nonsignificant ($\beta = .13$, $p = .180$), whereas the effect of perceived spaciousness on intimacy remained significant ($\beta = .49$, $p < .000$). Results of a Sobel test show that the indirect effect is significant (Sobel $z = 2.21$, $p = .018$). In other words, respondents disclosed more intimate information in the large room *because* they perceive the room as more spacious.

Nonverbal Behavior

Room size had an effect on direction of bodily posture, $F(1, 84) = 5.27$, $p = .024$, partial $\eta^2 = .06$. Participants leaned more forward in the large room ($M = 1.93$, $SD = .03$) than in the small room ($M = 2.05$, $SD = .03$). Moreover, room size had an effect on openness of posture, $F(1, 84) = 5.56$, $p = .021$,

Table 1. Means (Standard Deviation) for All Measures of Self-Disclosure.

	Room size		Desk size		Room × Desk Interaction			
					Small room		Large room	
	Small room	Large room	Small desk	Large desk	Small desk	Large desk	Small desk	Large desk
Substance use								
Word count	26.02* (3.13)	35.91* (2.95)	30.50 (3.02)	31.46 (3.13)	34.96 (4.17)	36.91 (4.26)	26.05 (4.36)	26.00 (4.59)
Duration	12.75 (1.28)	15.61 (1.21)	14.07 (1.22)	14.29 (1.27)	15.70 (1.69)	15.52 (1.73)	12.45 (1.77)	13.05 (1.86)
Completeness	4.96 (0.03)	4.93 (0.04)	4.92 (0.03)	4.96 (0.03)	4.94 (0.05)	4.98 (0.05)	4.91 (0.05)	4.95 (.05)
Self-reference	3.05 (0.19)	3.39 (0.20)	3.11 (0.19)	3.33 (0.19)	2.94 (0.26)	3.16 (0.27)	3.29 (0.27)	3.50 (.28)
Intimacy	1.74 (0.04)	1.66 (0.04)	1.74 (0.04)	1.67 (0.04)	1.78 (0.06)	1.70 (0.06)	1.69 (0.06)	1.63 (.06)
Sexuality								
Word count	37.98 (2.86)	38.31 (3.04)	33.78* (2.86)	42.48* (2.96)	33.70 (4.00)	42.26 (4.01)	33.89 (4.19)	42.74 (4.40)
Duration	13.96 (1.23)	14.81 (1.31)	12.85 (1.23)	15.87 (1.28)	12.68 (1.72)	15.24 (1.76)	13.03 (1.80)	16.60 (1.89)
Completeness	4.93 (0.03)	4.96 (0.03)	4.92 (0.03)	4.97 (0.03)	4.88 (0.04)	4.97 (0.04)	4.95 (0.05)	4.97 (0.05)
Self-reference	4.29 (0.10)	4.50 (0.10)	4.18* (0.10)	4.52* (0.10)	4.53 (0.14)	4.05 (0.14)	4.52 (0.14)	4.49 (0.15)
Intimacy	1.79 (0.03)	1.83 (0.03)	1.81 (0.03)	1.81 (0.03)	1.75 (0.04)	1.82 (0.04)	1.86 (0.04)	1.80 (0.04)
Emotions								
Word count	56.34 (5.57)	62.70 (5.31)	56.85 (5.38)	62.18 (5.50)	57.09 (7.43)	68.32 (7.60)	56.62 (7.77)	56.05 (7.97)
Duration	25.34 (1.99)	23.54 (2.09)	24.89 (2.02)	23.97 (2.06)	25.72 (2.78)	24.93 (2.85)	24.07 (2.91)	23.00 (2.99)
Completeness	4.96 (0.03)	4.96 (0.03)	4.94 (0.03)	4.98 (0.03)	4.94 (0.04)	4.98 (0.04)	4.95 (0.04)	4.98 (0.04)
Self-reference	4.80 (0.07)	4.74 (0.08)	4.81 (0.07)	4.74 (0.07)	4.83 (0.10)	4.77 (0.10)	4.79 (0.10)	4.70 (0.10)
Intimacy	3.21* (0.13)	2.73* (0.14)	2.20 (0.05)	2.20 (0.06)	2.15 (0.07)	2.23 (0.08)	2.24 (0.08)	2.15 (0.08)

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. Regression Results for Mediation Analyses.

			Direct effects		Indirect effects						
IDV	MED	DV	β_1	t_1	β_2	t_2	β_3	t_3	β_4	t_4	Sobel z
Room size	Perceived spaciousness	Self-disclosure intimacy (emotion-related questions)	.22	2.12*	.13	1.35	.51	5.51***	.49	5.12***	2.21**
Room size	Perceived spaciousness	Perceived ease of self-disclosure	.21	2.00*	.06	.06	.59	6.69***	.57	6.25***	2.40**
Interaction (Room × Desk)	Perceived spaciousness	Perceived ease of self-disclosure	.25	2.38*	.12	1.29	.59	6.69***	.56	6.21***	2.15*
Room size	Perceived spaciousness	Effect	.23	2.19*	.05	.59	.70	8.86***	.68	8.34***	2.47**

Note: IDV = independent variable; MED = mediator; DV = dependent variable.
*$p < .05$. ** $p < .01$. *** $p < .001$.

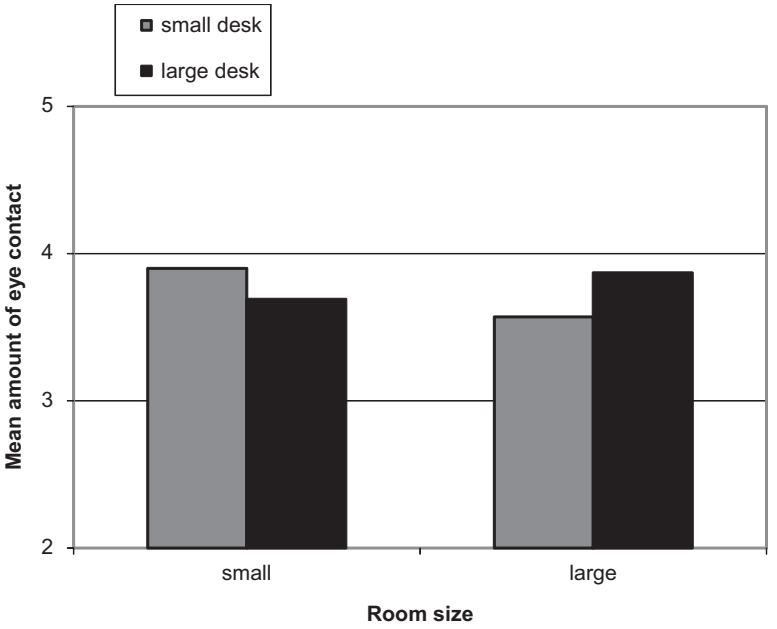

Figure 5. Interaction between room size and desk size for the amount of eye contact.

partial $\eta^2 = .06$. Participants displayed a more open posture in the large room ($M = 3.84$, $SD = .09$) than in the small room ($M = 3.51$, $SD = .09$).

Desk size affected the extent to which participants leaned on the table, $F(1, 84) = 40.02$, $p < .000$, partial $\eta^2 = .32$. Participants leaned more on the table when seated at a large desk ($M = 2.61$, $SD = .12$) compared with a small desk ($M = 1.53$, $SD = .12$).

An interaction between room size and desk size was obtained for establishing eye contact, $F(1, 81) = 6.33$ $p = .01$, partial $\eta^2 = .07$ (see Figure 5). Further analysis of the simple main effects showed that the positive effect of room size on eye contact was only significant in the large-room condition (small desk $M = 3.57$, $SD = .10$ vs. large desk $M = 3.87$, $SD = .10$; $F(1, 81) = 4.09$, $p = .04$, partial $\eta^2 = .05$). In the small-room condition, no significant difference was found for the effect of desk size (small desk $M = 3.90$, $SD = .10$ vs. large desk $M = 3.69$, $SD = .10$; $F(1, 81) = 2.32$, $p = .132$).

Discussion

The results presented confirm the importance of spaciousness manipulations with respect to the affective experience and the ease of self-disclosure. Desk size and room size in particular were found to impact spaciousness perceptions. Contrary to expectations, however, the effect of spaciousness did not transpire in the small-desk setting. A possible explanation is that the small interpersonal distance directs the focus toward the interviewer and away from the architectural design of the room. In line with this notion, Albert and Dabbs (1970) showed that at a small interpersonal distance, people generally pay more attention to the physical appearance of the speaker than to the spoken message itself. Thus, because the physical closeness of another person can pose a threat to peoples' personal space (Sommer, 2007), this may create "tunnel vision" that makes factors such as the conversation and the environment much less relevant than the physical appearance and behaviors of the conversational partner (cf. Easterbrook, 1959; Friedman & Förster, 2010).

In sum, the room size and interpersonal distance manipulations had an impact on the affective experience and the ease with which participants self-disclose. Subsequent mediation analyses confirmed that spaciousness perceptions are at the basis of these effects. However, for the actual self-disclosure measures, the results paint a much less coherent picture; the effects varied considerably across the topics and relatively few effects were obtained. It thus appears that reported ease of self-disclosure and actual disclosing behavior might paint a different picture or that enhanced ease of self-disclosure and accompanying positive affect do not necessarily translate into more objective measures such as duration and word count. Nonetheless, several findings merit further attention and suggest interesting avenues for follow-up research.

First, the results clearly stress the importance of taking into account the topic of conversation when studying self-disclosure as a function of the environmental setting. Most notably, in response to questions about substance use and emotions, room size was of primary importance, but when answering questions related to sexuality, desk size (i.e., interpersonal distance) appeared to be the critical factor. Arguably, when discussing activities involving a strong physical component, the physical closeness of another human being becomes salient and poses a greater threat, redirecting the focus toward this other person and away from environmental aspects such as room size (Easterbrook, 1959; Friedman & Förster, 2010; Sommer, 2007). In addition, research indicates that discussing sexuality remains a personal,

often taboo, topic that induces anxiety and embarrassment, especially in counseling settings (Joinson et al., 2008; Wiederman & Sansone, 1999).

Furthermore, the results suggest that depending on topic, different aspects of self-disclosure take center stage. For the substance-use questions, for instance, word count was affected by room size with more words being spoken in the large setting. A possible explanation holds that when discussing alcohol and drug intake, bragging may be involved (Jung, 2001; Martin & Leary, 2001) and that respondents talk more extensively about their intake behaviors in a less restrictive (i.e., more spacious) environment. For sexuality, however, effects of desk size on word count, duration of the answer, and self-reference surfaced. As mentioned previously, discussing sexual issues with an unknown person is very sensitive and likely influenced by the spaciousness of the situation (Joinson et al., 2008; Wiederman & Sansone, 1999). In addition to giving a more extensive answer, using more self-references can indicate an increased ease to discuss this taboo topic, whereas using more other-references may be considered an indication of avoidance. Finally, for the emotion questions, the intimacy of participants' responses was affected (with less intimate answers characterizing the small environment). This is likely due to the fact that a small environment and the sharing of negative emotional experiences invoke feelings of intimacy (Howell & Conway, 1990). This caused respondents in the small environment to limit the amount of intimate information and answer in more general terms to prevent the situation from getting too intimate or, as suggested by Levav and Zhu (2009), to regain their freedom.

Although such explanations are admittedly speculative, these results *do* show that measuring self-disclosing behavior with a single measure or failing to consider the conversational context may lead one to miss out on potentially interesting effects. Of course, the set of measures used in this research is far from exhaustive, and in other settings, different or additional measures may turn out to be of relevance. For instance, "level of detail" may be a relevant measure in conversations on therapy loyalty or occurrences of physical complaints, but also in eyewitness reports (a context in which self-disclosure is also of primary importance).

The effects observed for nonverbal behaviors further suggest that manipulations of interpersonal distance may evoke readjustments (e.g., leaning forward) to restore appropriate spacing between conversation partners. Interestingly, room size also affected nonverbal behaviors (i.e., leaning forward and alterations of posture). The reported results suggest that a larger room (i.e., the presence of more overall space) is an invitation to use or claim more space by leaning further forward and by adopting a more open

bodily posture. In addition, participants established more eye contact in the large room, likewise suggesting an increased willingness to interact.

In the current study, a female master student conducted the interviews; a deliberate choice as research shows that disclosure more easily takes place toward women and between people of similar age or status (Chaikin & Derlega, 1974; Cappella, 1981; Collins & Miller, 1994). In line with earlier research (Dindia & Allen, 1992), no effects were found for gender and age in this study. However, this should not obscure the fact that interviewer characteristics may affect self-disclosure tendencies. For instance, in health settings, differences in expertise and authority between patient and physician may withhold patients from freely disclosing personal information, as suggested by recent studies showing that environmental preferences and displayed behaviors are influenced by the presence of a threatening person (Wyer & Calvini, 2011). In addition, participants in the study described were all students and thus relatively young; participants of older age are perhaps more sensitive to characteristics such as gender of their conversation partner. In addition, the used rooms were existing rooms on the campus of the university. Besides the difference in square footage, the settings used also varied to some extent in terms of proportion, with the small room being more rectangular shaped than the large room. We did not examine whether the proportions of the room influenced the effects obtained. However, considering the findings of Daves and Swaffer (1971), future research should examine the effects of room proportion on affective and behavioral outcomes. In addition, although the results presented in this article indicate that relative differences in room size and desk size affect affective and behavioral outcomes, they do not warrant any conclusions regarding absolute room size.

As for practical implications, the differences in effects per topic call for adopting a flexible environment (i.e., extendible desks) that can be easily altered to fit the needs of a large variation of conversations. To influence room size, room dividers may be used, when resorting to another (smaller or larger) room is not an option. Furthermore, room layout and positioning of other furniture pieces can influence the amount of space available and in turn possibly influence self-disclosing behavior. Of interest in this context are the results of Stamps and Krishnan (2006), which show that spatial density (i.e., the number of objects present in a limited space) can also influence spaciousness perceptions and thus perhaps also self-disclosure, with the more furnished room invoking more spaciousness than the empty room. In addition, research indicates that depending on the type of objects (e.g., professional vs. decorative objects), environmental settings and their inhabitants may come across as more or less home-like or professional (Verhoeven, van

Rompay, & Pruyn, 2007), a factor that may likewise influence self-disclosure (Gifford, 1988; Miwa & Hanyu, 2006).

Furthermore, the results reported per topic indicate that the function of the room should be taken into account when designing and furnishing a room. Although room size was most important with respect to substance use and emotions, sexual self-disclosure was clearly affected by interpersonal distance, a clear indication that a relational or sex therapist might best keep in mind the importance of interpersonal distance when deciding on room layout and furniture selection. In light of this notion, of interest is the finding that alterations of posture (e.g., leaning on the table) may be used to adjust interpersonal distance. Clearly, this is something that physicians and counselors should be aware of, especially when discussing more intimate topics for which a large interpersonal distance is desirable.

Finally, in addition to objectively manipulating available space, room atmospherics (which allow for easy and flexible adjustments) can also be used to create illusions of a larger or smaller room and, hence, may in turn influence self-disclosure. In line with this suggestion, Gifford (1988) and Miwa and Hanyu (2006) showed that lighting conditions can affect disclosure tendencies. In light of the findings presented in this article, of particular interest are effects of atmospheric variables such as lighting and color that have been shown to affect spaciousness perceptions (Stamps, 2011). Arguably, bright colors or lighting conditions may foster the impression of a spacious environment, thereby promoting self-disclosure. Awaiting future research addressing these and other variables, the results of the present study confirm the importance of a neglected environmental variable with respect to a key facet of interpersonal behavior.

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