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Measuring Individual Differences in Responses to Date-Rape Vignettes Using Latent Variable Models

Antover P. Tuliao[1], Lesa Hoffman[2], and Dennis E. McChargue[1]*

[1]Department of Psychology, University of Nebraska-Lincoln, Lincoln, Nebraska
[2]Schiefelbusch Institute for Life Span Studies, University of Kansas, Lawrence, Kansas

Vignette methodology can be a flexible and powerful way to examine individual differences in response to dangerous real-life scenarios. However, most studies underutilize the usefulness of such methodology by analyzing only one outcome, which limits the ability to track event-related changes (e.g., vacillation in risk perception). The current study was designed to illustrate the dynamic influence of risk perception on exit point from a date-rape vignette. Our primary goal was to provide an illustrative example of how to use latent variable models for vignette methodology, including latent growth curve modeling with piecewise slopes, as well as latent variable measurement models. Through the combination of a step-by-step exposition in this text and corresponding model syntax available electronically, we detail an alternative statistical "blueprint" to enhance future violence research efforts using vignette methodology. Aggr. Behav. 43:60–73, 2017.

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INTRODUCTION

Vignette methodologies are a useful way to examine individual responses to situations that are otherwise difficult, expensive, or unethical to reproduce, such as experiencing or perpetrating sexual aggression. Respondents to research vignettes are typically asked to either assume the role of the perpetrator/potential perpetrator, the victim/potential victim, or a third-person observer. Vignette respondents are thus situated directly in relevant contexts when making decisions or expressing their beliefs, rather than doing so in a vacuum. Vignettes also serve to make sensitive questions seem less personally threatening by creating distance from potentially difficult topics, thereby lessening socially desirable responses (Finch, 1987; Hughes & Huby, 2002; Sleed, Durrheim, Kriel, Solomon, & Baxter, 2002). Although rape and date-rape vignettes have increased ecological validity compared to closed-ended questionnaires, they must incorporate realistic contextual dynamics to be maximally useful in further understanding and mitigating sexual aggression (Rinehart & Yeater, 2011; Testa & Livingston, 1999).

The need for rape and date-rape vignettes to incorporate more realistic contextual dynamics is made more salient given the contemporary aggression models' emphasis on the person–environment interaction. For instance, social-cognitive information-processing models (e.g., Anderson & Bushman, 2002; Slotter & Finkel, 2011) suggest that encoding and interpretation of environmental stimuli influence the generation and selection of social goals, cognitive scripts, and behavior. However, the context in which aggression unfolds is not static; rather, the social environment continuously changes depending on the actions taken by both the perpetrator and victim. Furthermore, the perpetrator's and the victim's actions are influenced by a continuous interpretation and evaluation of the appropriateness of the behavior to the social context. Hence, moment-by-moment changes in social cues could change information processing and subsequent behavior. We argue, therefore, that methodologies designed to

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*Correspondence to: Dennis E. McChargue, Department of Psychology, University of Nebraska-Lincoln, 238 Burnett Hall, Lincoln, NE 68588-0308. E-mail:dmcchargue2@unl.edu

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effectively study date-rape dynamics need to approximate not only the person–environment interaction, but also the dynamism inherent in events leading to aggression.

The rape and date-rape vignettes found in previous research have used multiple formats. The most common one presents respondents with written stories that begin innocuously (such as meeting in a bar), followed by intimate activities (e.g., consensual kissing and petting) that frequently escalate to some form of verbal and/or physical coercion that precedes eventual forcible sexual intercourse or assault (e.g., Angelone, Mitchell, & Lucente, 2012; Davis et al., 2012; Flowe, Stewart, Sleath, & Palmer, 2011; Hannon, Hall, Nash, Formati, & Hopson, 2000; Maurer & Robinson, 2008; Messman-Moore & Brown, 2006). Alternatively, the story may have a more vague and undetermined ending (e.g., Testa, Livingston, & Collins, 2000), or the vignette may be presented via audio or video recordings instead of as a written story (e.g., Gross, Bennet, Sloan, Marx, & Juergens, 2001; Loh, Orchowski, Gidycz, & Elizaga, 2007).

In addition to variation in presentation and content, there is considerable variability in how independent or predictor variables are manipulated or measured within these vignettes. Many studies have manipulated specific elements within the story, such as clothing, intoxication level, relationship, intimacy, and gender of the perpetrator and victim (Hannon et al., 2000; Maurer & Robinson, 2008; Messman-Moore & Brown, 2006). Other studies have manipulated elements outside the story. For instance, in a study of the effect of alcohol intoxication on sexual assault perpetration or victimization, participants were first assigned to an alcohol, no-alcohol, or placebo condition, and then asked to read similar vignettes (Davis et al., 2012; Gross et al., 2001; Loiselle & Fuqua, 2007; Testa et al., 2000). Variables that cannot be manipulated tend to be included as measured covariates, such as ethnicity, prior sexual assault or victimization, misogynistic attitudes, or attitudes towards rape (e.g., Koo, Stephens, Lindgren, & George, 2012; Marx, Gross, & Adams, 1999; Schneider, Mori, Lambert, & Wong, 2009).

Although there is heterogeneity in how rape and date-rape vignette studies measure dependent variables, these studies can be categorized into two types. In the first, participants provide responses only *after* reading the vignette (e.g., Koo et al., 2012). These dependent variables may include (but are not limited to) intent to sexually aggress, potential for sexual victimization, risk perception, perception of sexual intent, sexual arousal, perceptions of culpability or blameworthiness, and other perceptions about the perpetrator and victim (e.g., Davis et al., 2012; Hannon et al., 2000; Loh et al., 2007; Maurer & Robinson, 2008). In the second, a measure of response latency is used, in which the participants listening to an audio-recorded vignette (Gross et al., 2001) or reading a vignette (e.g., Flowe et al., 2011; Messman-Moore & Brown, 2006) are asked at what point they would stop the social interaction. In general, participants who stay in the scenario longer then have higher dependent variable scores, indicating greater risk or susceptibility to victimization or perpetration. Notably, the dependent variable as measured by either of these methods yields only one outcome per person, generally on a semi-continuous scale. Consequently, the most commonly employed statistical analysis is general linear modeling, such as analysis of variance (e.g., Factorial ANOVA and Multivariate ANOVA) and linear regression (e.g., hierarchical regression or path analysis).

While these single outcome measures collected at the end of a rape or date-rape vignette can be valuable, they are unable to track event-related changes in risk perception as the situation escalates from innocuous flirting to sexual aggression. For instance, a victim's risk perception may vacillate or fluctuate as a result of events occurring within the scenario (e.g., decrease when the perpetrator apologizes and increase when the perpetrator engages in coercive behavior). Similarly, respondents' perceptions of the female character's sexual receptivity or intent may vary after she engages in consensual kissing or after adamantly refusing the male character's sexual advances. Hence, designs in which outcomes are collected only after the end of the vignette may be limited in their capacity to mirror the reality and dynamism of social interactions (Hughes & Huby, 2002). Moreover, any improvement resulting from using multiple measures during the vignette can only be realized by employing methods of statistical analysis that are able to accurately represent individual reactions to these event-specific dynamics.

In this paper, we demonstrate an alternative way of measuring and analyzing individual differences in responses to rape or date-rape scenario vignettes. First, we describe our example date-rape vignette in which multiple measurements were collected throughout the scenario after specific events. This, we argue, is a significant improvement over single-outcome vignette designs given its capacity to track dynamic changes as events unfold. Second, we show how conventional methods of analyzing single vignettes outcomes can be expanded in order to better capture and explore individual differences in risk perception. As we demonstrated, individual differences in participant responses to vignette events can be captured via *latent variables* in structural equation modeling (SEM; Jöreskog, 1970). Equivalently, individual differences can be captured via *random effects* in multilevel modeling (MLM, also known as hierarchical linear models or general linear mixed models; Laird & Ware, 1982). Because latent variables and random effects are statistically equivalent entities, both the SEM and MLM frameworks provide a robust yet flexible means by which to examine individual changes in risk perception across the vignette events, as well predictors and outcomes thereof, as described shortly.

ILLUSTRATIVE EXAMPLE

Our example date-rape vignette was created by adapting the instruments developed by Marx et al. (1999) (Gross et al., 2001). Similar to other date-rape vignettes, the scenario used in the present example began with flirtation and consensual kissing, which was followed by unwanted touching and petting, verbal coercion, physical coercion, and ended in rape. We expanded from this format by adding several instances in which the male perpetrator apologized, as well as instances in which the female victim set boundaries by suggesting alternatives to what the perpetrator wants (e.g., to kiss without petting). Table I provides a description of each of the 18 events presented in the vignette (labeled E01–E18). We instructed each participant to imagine herself as the woman in the scenario. Utilizing a web-based program, each event was presented consecutively to the participants on a

TABLE I. Summary of the Events in the Date-Rape Vignette Scenario

		P1	P2	P3	P4	P5	P6	P7	P8
E01	Inside the apartment, the woman invites the man to sit on the couch.	Flirtation							
E02	Man asks if he could sit closer, woman agrees.								
E03	Small talk about classes. Woman offers coffee.								
E04	Woman apologizes for being behaving awkwardly in the bar. Man tells the woman he enjoyed spending time with her.								
E05	Woman reciprocates. Consensual kissing.		Inappropriate touching						
E06	Man starts touching woman's breasts. Woman politely turns down man's advances.			Apology					
E07	Woman again refuses attempts to touch her breasts. Man apologizes and promises not to do it again. Resumption of consensual kissing.				Verbal coercion				
E08	Woman rebukes man for touching her buttocks. Man apologizes and woman accepts apology. Resumption of consensual kissing.								
E09	Man resumes touching woman inappropriately. Woman tells him she is not ready for this kind of intimacy. Man confronts her if she really likes him.					Setting boundaries			
E10	Woman accedes to the man's advances, with the man's assurance that he will stop if the woman tells him to.								
E11	Resumption of consensual kissing.						Verbal coercion		
E12	Man reaches underneath woman's skirt. She rebukes him. Man threatens to end the relationship.							Verbal to physical coercion	
E13	Woman stops man from removing her underwear. Tells him she does not want sex. Man accuses the woman the she would not have let him go this far if she did not want to have sex.								
E14	Man accuses woman of being a tease. Woman tries to repair the relationship. Asks the man to go back to kissing.								Physical coercion to rape
E15	Man again reaches underneath woman's skirt and forcefully removes her underwear.								
E16	Man threatens woman with violence. Woman asks man to stop.								
E17	Woman fights off perpetrator.								
E18	Sexual intercourse ensues. Woman accuses man of rape afterwards.								

Note. E01–E18 denotes the 18 events; P1–P8, thematic phases 1–8.

computer screen one at a time in the same order. After reading each event, participants pressed a “Next” button, which prompted them to answer two questions to be used as outcome measures: *Would you stop the social interaction at this point?* (Yes/No; subsequently labeled as *stopping point*), and *How comfortable are you with the situation?* (as measured on a five-point scale from 1 = Very Uncomfortable to 5 = Very Comfortable, subsequently labeled as *comfort*). Although the stopping point question was no longer presented after participants answered “Yes,” all participants were asked to read and provide their comfort level for all 18 events even if they answered “Yes” in any one of the stopping point questions. Supplementary Table S1 provides the correlation between comfort scores at each event and the stopping point scores.

Our example data were derived from an exploratory cross-cultural study examining sexual aggression and victimization in the context of alcohol use. Our current sample includes 407 women who received course credit for participation; 233 women (57%) were from a public university in the United States, whereas 174 women (43%) were from a public university in the Philippines (in which instruction occurs in English). All participants received the same vignette task in English. Participants from the Philippines were bilingual (speaking both Filipino and English) and the medium of instruction in the university is in English, eliminating the need to translate the instruments. This grouping variable of sample origin served as a predictor in the models to follow. Although the choice of the participants’ country of origin as a predictor is primarily for illustrative purposes, prior research suggests that sexual norms, sexual attitudes, and the prevalence of sexual violence against women varies significantly internationally (e.g., Johnson, Ollus, & Nevalla, 2008), such that we expected differences between groups. For instance, reports of lifetime sexual aggression victimization among Filipino women was 6% (Johnson et al., 2008), whereas 18% of US women reported having been raped within their lifetime (Tjaden & Thoennes, 2000). To our knowledge, there are no prior studies explicitly comparing US and Filipino women in terms of risk perception or recognition. A multiple-group analysis (metric, scalar, and residual invariance tests) performed beforehand suggested that only factor loadings for events 13 and 15, and intercept for event 10 were non-invariant, indicating general measurement equivalence across countries. We note that instead of utilizing participant characteristics such as country of origin as predictors, the vignette task can also be modified by changing elements within the story and using these manipulations as independent variables instead.

The collection of multiple outcomes throughout the vignette was motivated by qualitative studies suggesting that the progression of risk perception from consensual sexual activities to date rape may not be strictly monotonic (Rinehart & Yeater, 2011; Testa & Livingston, 1999). That is, women’s reports of sexual victimization included multiple push-and-pull or approach–avoid interactions involving resistance followed by a change in behavior in one or both parties. This could have led to a continuation of the sexual interaction, an end of the sexual interaction, or to an escalation with more coercive tactics. In addition, a myriad of contextual and person variables could have influenced individual changes in risk perception across the vignette events, such as the type of resistance the woman employs (e.g., verbal vs. physical), the man’s misinterpretation of sexual intent, or the perception of token resistance, or a man’s apology. Although some studies using date-rape vignettes have incorporated these approach–avoid dynamics (e.g., Marx et al., 1999), their effects on the resulting trajectories of individual outcomes have not been closely investigated. In following sections, we first present the descriptive statistics of the date-rape vignette previously described and analyze its resulting data using the conventional models in this literature (i.e., general linear models). We then demonstrate two alternative uses of latent variable modeling by which individual responses to these dynamics can be modeled informatively: first using latent growth curve modeling with piecewise slopes, and second using measurement modeling with latent factors. For brevity, the equations for each model to be presented and interpreted below are made available in a separate Supplemental Material, which can be downloaded at [http://www.lesahoffman.com/Research/MLM.html].

Latent growth curve models with piecewise slopes can be used to capture change during discrete epochs of time, such as before or after an intervention or critical event. In the present example, we use the 18 vignette events to define change within each of eight thematic phases (labeled as P, as shown in Table I): (P1) flirting, (P2) inappropriate touching, (P3) man’s apology, (P4) verbal coercion, (P5) woman’s setting boundaries, (P6) verbal coercion, (P7) verbal to physical coercion, and (P8) physical coercion to rape. Although unconventional, our use of growth models in this way is appropriate given that all events were presented in the same order to each participant. Figure 1 (solid lines) presents the mean and variance in comfort by event, revealing dynamic patterns that would not otherwise be captured when collecting only a single outcome at the end of the vignette (e.g., Flowe et al., 2011; Gross et al., 2001; Messman-Moore & Brown, 2006). As shown, both the mean and variance of comfort increased when

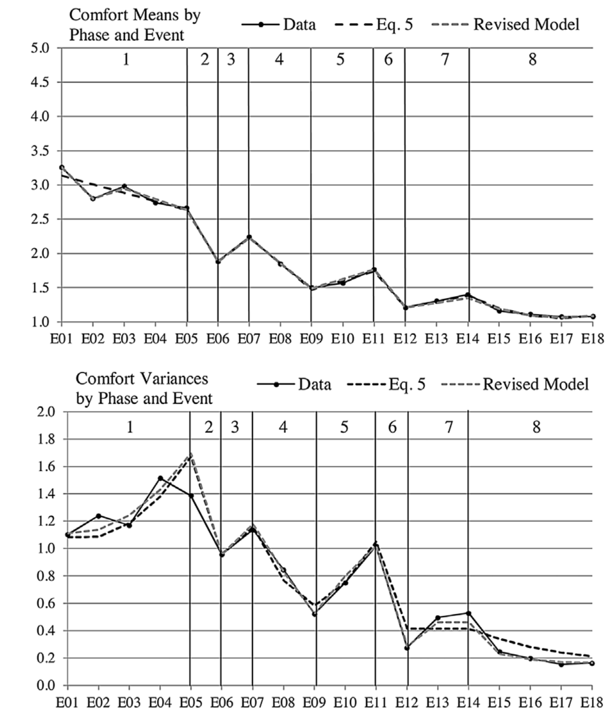

Fig. 1. Observed and model-predicted means (top) and variances (bottom) across the 18 vignette events (E01–E18) capturing 8 thematic phases (P1–P8). Note: Eq. 5 refers to the unconditional piecewise random slopes model and to Eq. 5 in the Supplemental Material. Revised Model refers to the revised unconditional piecewise model and to Equation 6 in the Supplemental Material.

the man apologized and when the woman set boundaries (phases 3, 5, and 7), but the mean and variance in comfort decreased when the man touches the woman inappropriately (phase 2) or engaged in verbal and physical coercion (phases 4, 6, and 8). These discontinuities in change will be explored using latent growth curve models with piecewise slopes, as presented shortly.

Conventional Ways of Analyzing Responses to Date-Rape Vignettes

As a contrast to the multivariate models that follow, we first illustrate how single outcome measures would typically be analyzed. Specifically, as in Flowe et al. (2011) and Messman-Moore and Brown (2006), we asked participants at what event they would stop the social interaction (1–18), such that the later stopping points indicate higher her susceptibility to victimization. A Between-Groups ANOVA (see Supplementary Material, Equation 1) revealed significant mean differences in these stopping points between samples, $F\ (1, 405) = 18.36$, $P < .001$. Women in the US sample ($M = 5.77$, $SD = 3.29$) showed significantly later stopping points by 1.67 than women in the Philippines sample ($M = 4.10$, $SD = 4.58$).

Similarly, we could have analyzed participants' reported comfort at the end of the vignette (e.g., Koo et al., 2012), although in this case there was little variability in comfort at the last event after rape ensued (E18). Instead, for the sake of illustration, we analyzed differences in comfort after the first unwanted touching of the female's breasts (E06). A Between-Groups ANOVA again revealed significant mean differences between samples, $F\ (1, 400) = 60.04$, $P < .001$. Women in the US sample ($M = 2.20$, $SD = .97$) again showed less risk perception via greater comfort by .72 on average than women in the Philippines sample ($M = 1.48$, $SD = .84$).

As discussed earlier, designs in which only single outcomes are measured (and their corresponding univariate between-group analyses) are limited in that they cannot capture any changes that may occur as the situation escalates from innocuous flirting to sexual aggression. But if multiple responses are collected throughout the vignette, a Univariate Repeated-Measures (RM) ANOVA can be used to examine mean differences in comfort across the vignette events. Furthermore, this model can be expanded to include group differences between the US and Philippines samples (as shown in the Supplementary Material, Equation 2).

The RM ANOVA results indicated that there was a significant marginal main effect for sample (i.e., averaging across the 18 events), $F\ (1, 405) = 42.85$, $P < .001$, such that women in the US sample reported significantly greater comfort than women in the Philippines sample. There was also a significant marginal main effect of event, $F\ (17, 6{,}767) = 499.62$, $P < .001$, indicating mean differences across the 18 events (averaging across samples). Finally, there was a significant omnibus event by sample interaction, $F\ (17, 6{,}767) = 68.09$, $P < .001$. Although we could pursue pairwise follow-up tests across the 36 event- and sample-specific means in an attempt to describe the differential patterns of change between samples, we believe it will be more informative to directly model sample-specific changes across the eight thematic phases.

Summary. Thus far, we have reviewed conventional methods of analyzing outcomes of date-rape vignettes, including Between-Groups ANOVA for single outcomes and Univariate RM ANOVA for multiple outcomes. Although both analyses detected significant mean differences between the US and Philippines samples, we have yet to examine individual differences in changes in comfort in response to any event-specific dynamics. Unfortunately, Univariate RM ANOVA has several limitations that preclude its usefulness for this purpose, which can be overcome by using multilevel modeling (MLM) or structural equation modeling (SEM) instead. One problem is that RM ANOVA—as estimated via least squares—uses listwise deletion for persons with any missing outcomes. In contrast, by using maximum likelihood (ML) estimation, MLM and SEM allow persons with incomplete outcomes to be included assuming those outcomes are *missing at random* (i.e., conditionally random after controlling for the person's predictors and other outcomes; Enders, 2010). Another problem is that the Univariate RM ANOVA model presumes that the only unexplained source of individual differences is in the mean across events (known as random intercept variance). Fortunately, additional sources of individual differences—such as variability in response to the vignette phases—can easily be included as individual random effects in MLM or as additional latent variables in SEM.

Latent Growth Curve Models With Piecewise Slopes

To capture the comfort dynamic in the events of a date-rape vignette, we first describe the changes in reported comfort across the eight thematic phases via *piecewise slopes* (i.e., a *spline* model). For convenience, our subsequent discussion utilizes conventional MLM procedures. Although the text that follows is specific to MLM, a more general treatment of latent growth curve models with piecewise slopes can be found in Hoffman (2015, ch. 6).

Given the positively skewed comfort outcome, all models were estimated with robust maximum likelihood (MLR) in Mplus 7.2 (Muthén & Muthén, Muthén & Muthén, 19981998–2012). To help facilitate more frequent use of these powerful multivariate designs and their corresponding analytic techniques, Mplus syntax and output for all reported growth curve models is available in the Supplementary Material, as well as syntax and output for SAS and SPSS using maximum likelihood.

Unconditional piecewise slopes models. Following conventional MLM procedures, the first step in modeling change in comfort across the vignette events was to estimate an empty means, random intercept model (i.e., an intercept-only model with no predictors; see Supplementary Material, Equation 3). The estimated mean comfort across events (i.e., fixed intercept) of 1.87 indicated relatively low absolute levels of comfort (as measured from 1–5). The purpose for this model is to provide a baseline for assessing improvements to model fit and to estimate an intraclass correlation (ICC) for how much of the total variability is due to between-person mean differences. Here, the ICC = .23 indicated that 23% of the comfort variance was due to between-person mean differences, whereas 77% was due to within-person variation across the 18 events.

Next, to capture the comfort dynamics across the 18 events, an unconditional piecewise slopes model with fixed slopes was estimated (see Supplementary Material, Equation 4). Table II shows how discrete slope variables were created to represent each thematic phase (P1–P8). We also found that a quadratic slope for phase 8 significantly improved the model (as prompted by the decelerating pattern of means in Fig. 1). Thus far, all individual slopes are defined only by a fixed slope, such that this model predicted common rates of change across individuals. Within this model, each fixed slope was significantly different than zero as evaluated by a Wald test (i.e., by comparing the ratio of its estimate to its standard error to a z-distribution). These results indicated significant rates of average change during each phase as predicted.

The unconditional fixed piecewise slopes model just discussed predicts only one source of individual variability due to constant mean differences over time via the random intercept. Fortunately, we can expand the model to allow individual deviations from the fixed (common) slopes for each person, known as random slopes. We can then test for the presence of these between-person slope differences by estimating a random variance for each slope (and their covariances with the random intercept). Given the use of MLR

TABLE II. Coding of Piecewise Slopes for Phases 1–8 for Use in Latent Growth Curve Modeling

	E01	E02	E03	E04	E05	E06	E07	E08	E09	E10	E11	E12	E13	E14	E15	E16	E17	E18
Phase 1	0	1	2	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Phase 2	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
Phase 3	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Phase 4	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	2
Phase 5	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	2
Phase 6	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
Phase 7	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2
Phase 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	4

Note. E01–E18 denote occasions 1–18. Observed values are predictor values in an MLM or fixed loadings in SEM.

estimation, the presence of this individual variability is tested by comparing the relative fit of the resulting random slopes model to the fixed slopes model using a re-scaled likelihood ratio test (LRT: see Supplementary Material, Equation 5). After iteratively adding random slope variances for each phase in sequential models, the model with random linear slopes for individual differences in change during all phases except phase 7 fit significantly better than the model with only fixed (common) slopes for all phases, $-2\Delta LL = 2{,}417$, $df = 35$, $P < .001$. The unconditional slopes model including these random linear slopes (as well as the previous fixed quadratic slope for phase 8) is shown in Supplementary Material, Equation 5.

Before interpreting these results, however, we need to assess the *absolute* fit of our current model. Tests of absolute model fit are only possible for balanced data, such as in the present example in which participants were measured for the same 18 events (i.e., although there may have been missing responses, no intermediate occasions occurred). We test absolute fit by using the same LRT process to compare against the fit of a "perfect" model—in which all the means, variances, and covariances across the 18 events are estimated separately (i.e., a saturated means, unstructured variance model in MLM terms; see Hoffman, 2015). In addition to the aforementioned χ^2 test of absolute model fit, other indices that reflect the discrepancy between the estimated model and the perfect model include the Standardized root mean square residual (SRMR; in which values <.08 are desirable), as well as the Root mean square error of approximation (RMSEA) point estimate (in which values <.08 are desirable) and its 95% confidence interval and test close fit (that RMSEA <.05). Furthermore, fit indices that reflect the *improvement* in fit relative to a more parsimonious "null" model (i.e., separate means and variances per occasion but no covariances) include the Comparative fit index (CFI) and the Tucker-lewis index (TLI), in which values >.95 are desirable for both. Our unconditional piecewise random slopes model did not achieve conventionally good absolute model fit, $\chi^2 = 667.28$, $df = 142$, $P < .001$; RMSEA = .10, RMSEA 95%CI = .09–.10, close fit $P < .001$; CFI = .86; TLI = .85; SRMR = .14. Statistical models often do not achieve adequate fit on the first pass, which then requires one to look for sources of misfit, as we now illustrate for these data.

The misfit of the model with respect to the means and variances is illustrated in Figure 1, which plots those from the perfect model (i.e., the original data) against the predicted quantities from the unconditional piecewise random slopes model. Examination of local misfit—the discrepancy between the model-predicted and observed means, variances, and covariances—suggested strategies for improving model fit. As shown in the top of Figure 1, because the E02 mean was lower than predicted, we added a fixed effect to allow an increment to the E02 intercept (see Supplementary Material, Equation 6), which significantly improved model fit, $-2\Delta LL = 83.0$, $df = 1$, $P < .001$. A review of the predicted versus observed variances also showed that several residual variances were over-estimated by the common residual variance across events, including E09, E12, and E15–E18. In response, we allowed a separate residual variance for those events, which also significantly improved model fit, $-2\Delta LL = 21.5$, $df = 1$, $P < .001$. Finally, the covariance between E13 and E14 was greater than predicted by the random intercept only (given that phase 7 did not have a random slope by which to predict differential correlation over time), as was the covariance between E10 and E11 in phase 5. As such, allowing these residual covariances significantly improved model fit, $-2\Delta LL = 37.2$, $df = 2$, $P < .001$. The resulting revised model—whose predictions are shown in Figure 1—achieved acceptable absolute model fit by all indices except the χ^2 against the perfect model, $\chi^2 = 291.14$, $df = 138$, $P < .001$; RMSEA = .05, RMSEA 95%CI = .04–.06, close fit $P = .32$; CFI = .96; TLI = .95; SRMR = .06.

Table III presents the results from the revised random piecewise slopes model. Figure 1 shows the revised-model-predicted means and variances as well as those from the original outcomes. As shown, mean comfort decreased linearly and significantly when the couple was flirting (phase 1) and when the man engaged in inappropriate touching or verbal and physical coercion (phases 2, 4, 6). Mean comfort also increased linearly and significantly when the man apologized or the woman set boundaries (phases 3 and 5) and after the man's transgression (phase 7). In phase 8, the initial linear rate of decline became less negative by twice the quadratic fixed effect of .03 per event (i.e., indicating a decelerating decline).

In addition to testing the degree to which each phase's average slope is significantly different than zero as shown in Table III, one can examine how average rates of change differ across phases by requesting additional tests for differences between fixed effects (e.g., using NEW in Mplus, ESTIMATE in SAS, or TEST in SPSS). For instance, the slope during phase 2 was significantly more negative than the slope during phase 1 by $-.60$ ($SE = .05$, $P < .001$). This difference suggests that the rate of decrease in comfort experienced after the first unwanted touch was significantly greater than the rate of decrease in comfort observed in the flirting phase.

The unconditional random slopes model is an important baseline given that it includes all possible individual differences to be accounted for by further

TABLE III. Revised Equation 5 Results: Fixed Effects, Random Effects Variances, 95% Random Effects Confidence Intervals (CI), and Random Effect Correlations for the Unconditional Piecewise Slopes Model

Correlations	Int	P1	P2	P3	P4	P5	P6	P7	P8	P8^2
Intercept (Int)	1									
Phase 1 (P1)	−.03	1								
Phase 2 (P2)	**−.68**	**−.39**	1							
Phase 3 (P3)	**.33**	.03	−.26	1						
Phase 4 (P4)	**−.57**	**−.42**	**.70**	**−.66**	1					
Phase 5 (P5)	**.32**	**.27**	**−.28**	**.45**	**−.64**	1				
Phase 6 (P6)	**−.50**	**−.45**	**.32**	**−.42**	**.61**	−.77	1			
Phase 7 (P7)	—	—	—	—	—	—	—	—		
Phase 8 (P8)	**−.24**	**−.35**	.04	−.19	.09	**−.31**	**.43**	—	1	
Phase 8^2 (P8^2)	—	—	—	—	—	—	—	—	—	—
Fixed effect	**3.26**	**−.16**	**−.75**	**.35**	**−.37**	**.14**	**−.55**	**.07**	**−.19**	**.03**
Standard error	.05	.01	.04	.04	.02	.02	.04	.01	.02	.01
Random variance	.87	.04	.30	.10	.11	.06	.42	—	.01	—
Standard error	.06	.01	.05	.05	.01	.01	.06	—	.00	—
95% Lower CI	1.43	−.55	−1.82	−.28	−1.02	−.34	−1.82	—	−.37	—
95% Upper CI	5.09	.24	.31	.97	.27	.62	.72	—	−.00	—

Note. —, indicates non-estimated random effect variances and corresponding correlations and CIs. Bold values indicate $P < .05$.

individual predictors. To help describe the extent of the predicted individual slope variability more concretely, we calculate 95% random effects confidence interval for each random effect, as shown in Equation 1:

$$\text{Random effect 95\%CI} = \text{fixed effect} \pm 1.96 \times \sqrt{\text{Random Variance}} \tag{1}$$

which conveys the predicted range of the individual random effects, as presented in Table III. For instance, given an average intercept of 3.26 and a random intercept variance of 0.87, individual comfort means at the start of phase 1 were predicted to range from 1.44 to 5.09. This prediction illustrates the substantial variability in comfort level at the beginning of the scenario. The finding that the upper CI exceeds the range of the scale (from 1 to 5) illustrates the assumption of symmetry around the fixed effect. Individual changes in comfort during the flirting and consensually kissing interaction (phase 1) were expected to range from −.55 to .24, indicating that not all women were predicted to decrease in comfort during phase 1.

In addition to examining the extent of individual variability, we can examine the correlations among the random effects, which characterize the extent to which there were relations among sources of individual differences, as illustrated at the top of Table III. More specifically, the random intercept for greater predicted comfort at the start of phase 1 was negatively related to the random slope for rate of change in comfort in phase 2. This result indicates that women who were more comfortable at the start of the sexual interaction showed greater risk perception—via a greater decline in comfort—when the perpetrator first engages in inappropriate or unwanted touching. Similarly, a significant positive correlation between the individual random intercept and individual phase 3 slope suggests that women who were more comfortable at the start of the interaction were more amenable to a perpetrator's apology (i.e., showed a greater increase in comfort during phase 3). These analyses highlight the wealth of information across eight distinct sources of individual variation with respect to level and change in comfort during the vignette. It also belies the use of a single summary measure (e.g., a mean across all 18 events), which would be likely to obscure meaningful individual variability.

Conditional piecewise slopes models. The initial estimates of individual variability with respect to comfort level responses are a necessary precursor for further evaluations of the degree to which these individual differences relate to other participant variables. To illustrate, Supplementary Material, Equation 7 shows a *conditional* latent growth curve model with piecewise slopes—now including a predictor of sample (US or Philippines) and an additional outcome of stopping point (i.e., the event at which the participant reported she would discontinue the interaction).

This conditional model is also illustrated in Figure 2 via traditional SEM diagram conventions of indicating observed variables in squares, latent variables (i.e., individual random effects) in ovals, regressions by single-headed arrows, and covariances by double-headed arrows. For clarity the observed comfort outcomes are not shown in Figure 2, but their loadings

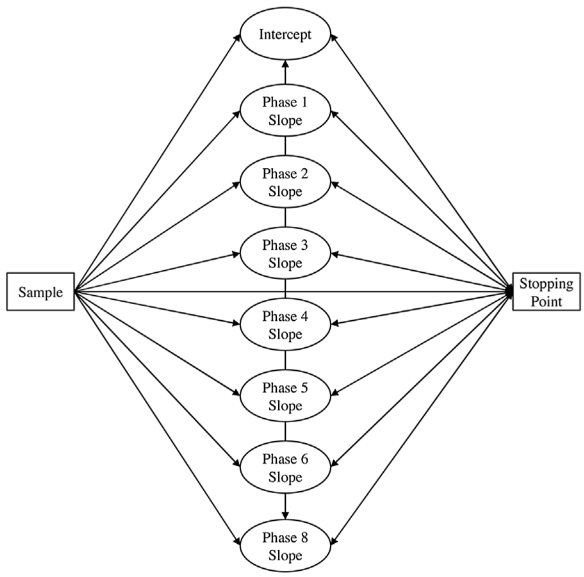

Fig. 2. Conditional latent growth curve model using piecewise slopes.

onto the latent factors would be fixed at the values shown in Table II. In addition to residual variances for each comfort outcome, residual covariances would be shown for E10–E11 ($Est = .07$, $SE = .20$) and E13–E14 ($Est = .12$, $SE = .20$), as well as a fixed decline in the predicted mean for E02 ($Est = -.300$, $SE = .030$). Note that Figure 2 omits latent variables for the linear slope for phase 7 and the quadratic slope for phase 8, given that no random effects variances (individual differences) were estimated for these components of the event trajectory.

Model fit was acceptable by all indices except the χ^2 against the perfect model, $\chi^2 = 329.90$, $df = 158$, $P < .001$; RMSEA = .05, RMSEA 95%CI = .04–.06 and close fit $P = .35$; CFI = .96; TLI = .95; SRMR = .06. Results are shown in Table IV. With respect to fixed effect differences between samples, these results suggest that, at the start of phase 1 when the woman invited the man into her apartment (the intercept), women in the Philippines sample reported significantly lower comfort than women in the US sample. Comfort declined significantly in both samples as the couple engaged in consensual kissing and flirting (phase 1) and after the first unwanted touching (phase 2). However, compared to the women in the US sample, women in the Philippines sample had a significantly more negative decline in comfort during phase 1, but a significantly less negative decline in comfort during phase 2. After the man apologized (phase 3), comfort for both samples increased similarly and significantly.

Sample differences were observed as the scenario escalated towards verbal and physical coercion. When the perpetrator engaged in verbal coercion (phase 4), comfort declined significantly in both samples; the rate of decline was significantly less negative in the Philippines sample than the US sample. Although comfort for both samples increased significantly as the woman set boundaries (phase 5), this rate of increase was significantly less positive in the Philippines

TABLE IV. Results for the Conditional Piecewise Slopes Model: Sample Differences and Random Effect Correlations

Correlations	Int	P1	P2	P3	P4	P5	P6	P8	SP
Intercept (Int)	1								
Phase 1 (P1)	**−.19**	1							
Phase 2 (P2)	**−.61**	**−.28**	1						
Phase 3 (P3)	**.31**	−.00	−.24	1					
Phase 4 (P4)	**−.48**	**−.32**	**.61**	**−.68**	1				
Phase 5 (P5)	**.25**	**.20**	−.19	.44	**−.61**	1			
Phase 6 (P6)	**−.40**	**−.36**	.14	**−.41**	**.52**	**−.76**	1		
Phase 8 (P8)	**−.25**	**−.35**	.03	−.19	.09	**−.31**	**.46**	1	
Stopping point (SP)	**.63**	.10	**−.20**	−.00	**−.28**	**.29**	**−.47**	**−.43**	1
R^2 for sample	.15	.12	.26	.01	.21	.06	.17	.00	.04
Fixed effects									
US sample									
Estimate	**3.57**	**−.10**	**−.99**	**.38**	**−.50**	**.19**	**−.79**	**−.19**	**5.77**
Standard error	.06	.02	.05	.05	.03	.03	.06	.02	.22
Philippines sample									
Estimate	**2.85**	**−.23**	**−.43**	**.31**	**−.20**	**.07**	**−.24**	**−.19**	**4.10**
Standard error	.07	.02	.06	.05	.03	.02	.05	.02	.35
Sample difference									
Estimate	**−.73**	**−.14**	**.56**	**−.07**	**.31**	**−.12**	**.54**	**.01**	**−1.67**
Standard error	.10	.03	.08	.07	.04	.04	.08	.01	.41

Note. Bold values indicate $P < .05$.

sample. Comfort then declined significantly in both samples when the perpetrator again engaged in verbal coercion by threatening to end the relationship (phase 6), but the decline was significantly less negative in the Philippines sample than in the US participants. Comfort increased slightly but significantly during the verbal and physical coercion phase (shared linear slope for phase 7 = .07, $SE = .01$). As the interaction escalated to rape (phase 8), women in both samples showed similar and significantly linear declines in comfort along with a common rate of deceleration (shared quadratic slope for phase 8 = .03, $SE = .01$). Finally, as reported before (using a BG ANOVA), participants' stopping point was significantly earlier in the Philippines sample than in the US sample.

Also shown in Table IV are the correlations among the random effects for comfort and stopping point after controlling for sample differences (which accounted for 0–17% of the variance of each source of individual differences). The patterns of relations among the comfort random effects (i.e., the comfort latent variables in Fig. 2) are largely similar to those in Table III (before controlling for sample). Staying longer in the scenario (i.e., greater threat insensitivity) was associated with significantly higher comfort at the beginning of phase 1 (the intercept) as well as more negative rates of decline in comfort when the man engaged in inappropriate touching or verbal and physical coercion (phases 2, 4, 6, and 8). Later stopping points were also associated with significantly greater rates of increase in comfort during phase 5 (when the woman set boundaries). Stopping point was not related to rates of decline when flirting in phase 1 or rates of increase when setting boundaries after the first instance of inappropriate behavior.

Summary. The previous analyses illustrated how models that allowed individual piecewise slopes—either via random effects as estimated using multilevel modeling or via latent variables via structural equation modeling—can be used to capture dynamic, approach–avoid factors that created individual changes in risk susceptibility and associated variables. We found that eight sources of individual differences were present when examining individual changes across eight thematic phases; six of these were related to participant sample, and six were associated with individual vignette stopping points. These piecewise random slope models represent one modeling strategy based on a common event order, but individual differences may also be organized in ways that do not correspond monotonically to event order. Accordingly, we now present an alternative, complementary strategy of how individual differences in multivariate measures of comfort can be operationalized through latent variable measurement models.

Using Latent Trait Models to Analyze Responses to Date-Rape Vignettes

Latent variables (i.e., latent factors, latent traits, or random effects) are unobserved individual differences that are indicated by covariance among observed variables, such as item responses. Our current application of latent variable models was inspired by Hedeker, Mermelstein, and Flay (2006), who used adolescents' daily reports of cigarette consumption in intensive longitudinal data to indicate a latent variable of smoking behavior. Unlike the random effects from the previous models that were explicitly defined by piecewise change across events, in the models that follow, we treat each comfort outcome as an item that indicates one or more latent variables that measure multiple dimensions of risk perception of date-rape victimization. Robust maximum likelihood within Mplus v. 7.2 was again used to estimate all models; syntax and output for the reported models are available in the electronic appendix.

Measurement models. The first goal is to ascertain whether the 18 comfort outcomes (events) are best accounted for by one or multiple latent factors (each of which was identified by constraining the factor variance to 1 and the factor mean to 0). The choice of a three-factor structure was set a priori, and we predicted that the events would cluster around three themes: Consensual sexual activities, ambiguous events (i.e., events including push-and-pull dynamics discussed earlier), and sexually coercive events. We utilized conventional strategies within confirmatory factor analysis of assessing model fit and improvement thereof (e.g., Brown, 2006), including examination of global and local fit, as well as effect size of the factor loadings. The three-factor measurement model we ultimately selected is described below and presented using SEM notation in the Supplementary Material, Equation 8.

Our initial three-factor model achieved marginal fit, $\chi^2 = 472.17$, $df = 125$, $P < .001$; RMSEA = .08, RMSEA 95%CI = .08–.09, close fit $P < .001$; CFI = .91; TLI = .89; SRMR = .05. However, given that the vignette unfolds over time, it is likely that events closer in time will be more associated than those farther in time. Therefore, we examined separate residual covariances among adjacent events (e.g., E01 with E02, E02 with E03, E03 with E04, etc.). Dropping nonsignificant residual covariances and constraining the other residual covariances to be equal (when possible to do so without hurting fit) helped reduce the number of estimated parameters. This approach resulted in a common residual covariance for E01–E02, E02–E03, E10–E11, and E13–E14, and a second common residual covariance (of smaller size) for E05–E06, E07–E08, E12–E13, and E16–17. The revised

TABLE V. Structural Model Results: Latent Factor Correlations and Sample Differences

Latent factor correlations	F1	F2	F3	SP
Factor 1: Consensual events (F1)	1			
Factor 2: Ambiguous events (F2)	**.61**	1		
Factor 3: Coercive events (F3)	**.35**	**.63**	1	
Stopping point (SP)	**.63**	**.57**	**.37**	1
R^2 from sample	.27	.03	.04	.04
Sample difference	**−1.24**	**−.37**	**.40**	**−1.67**
Standard error	.13	.11	.09	.41

Note. Bold values indicate $P < .05$.

three-factor model achieved adequate fit by all indices except the χ^2 against the perfect model, $\chi^2 = 253.90$, $df = 123$, $P < .001$; RMSEA = .05, RMSEA 95%CI = .04–.06, close fit $P = .41$; CFI = .97; TLI = .96; SRMR = .04.

Structural models. Similar to the previous conditional latent growth curve model (i.e., as shown in Fig. 2), we then examined how these latent factors related to stopping point and to the extent to which the latent factor means differed by sample. This conditional model, which can be considered a structural equation model, also achieved adequate fit by all indices except the χ^2 against the perfect model, $\chi^2 = 322.65$, $df = 153$, $P < .001$; RMSEA = .05, RMSEA 95%CI = .04–.06, close fit $P = .32$; CFI = .96; TLI = .95; SRMR = .04.

Table V presents the correlations of stopping point each latent factor. Table VI provides the measurement model parameters, including unstandardized and standardized factor loadings for the comfort-related factors. The individual differences captured by each latent factor can be gleaned from the events by which it is indicated. Factor 1 represents individual differences in comfort level or risk perception in response to flirting and (mostly) consensual sexual interaction, including consensual kissing (events E01–E08, E11). Factor 2 represents individual differences in response to ambiguous events (events E06–E12, E14) when the couple in the vignette is in active negotiation (i.e., when the man persistently made sexual advances and the woman dissuaded the behavior). Although E13 conceptually was also an ambiguous event, it did not load significantly on Factor 2 and was not included. Finally, Factor 3 represents individual differences in response to coercive events (Events E09 and E12–E18), which is when the perpetrator utilized coercive tactics and the victim vehemently resisted these sexual advances.

Sample mean differences in these latent factors are reported in Table V. The Philippines sample was significantly lower in Factors 1 and 2, suggesting that women in the Philippines sample had greater risk perception during flirting and consensual sexual interaction and during ambiguous events than women in the US sample. However, this pattern reversed during coercive events (Factor 3), for which women in the Philippines sample had significantly higher factor scores than women in the US sample. As found previously, women in the Philippines sample stopped the interaction significantly earlier on average than women in the US sample.

Finally, we examined the correlations among the latent factors and with stopping point. Correlations

TABLE VI. Measurement Model Results: Latent Factor Loadings, Standard Errors (SE), and Standardized Loadings

	Factor 1			Factor 2			Factor 3				
Factor model parameters	λ_1	SE	STD	λ_2	SE	STD	λ_3	SE	STD	Intercept	R^2
E01	.62	.04	.70							3.59	.48
E02	.80	.04	.84							3.23	.71
E03	.76	.04	.82							3.38	.68
E04	1.01	.04	.96							3.28	.91
E05	1.00	.04	.93							3.20	.86
E06	.42	.04	.51	.41	.05	.43				2.17	.71
E07	.50	.05	.55	.41	.05	.39				2.57	.71
E08	.23	.04	.29	.59	.05	.66				2.06	.75
E09				.57	.04	.79	.11	.04	.15	1.57	.79
E10				.74	.05	.86				1.69	.75
E11	.12	.03	.14	.73	.05	.73				1.94	.68
E12				.23	.03	.45	.26	.05	.50	1.20	.72
E13							.44	.06	.63	1.23	.40
E14				.21	.04	.29	.35	.05	.49	1.37	.48
E15							.46	.06	.94	1.08	.88
E16							.32	.07	.73	1.06	.53
E17							.30	.07	.77	1.03	.59
E18							.22	.06	.56	1.04	.32

among the latent factors ranged from $r = .35$ to .62. These results further support the existence of three distinct factors (i.e., correlations $\sim$1 would have been expected if the comfort outcomes indicated a single trait instead). All three factors were significantly and positively correlated with stopping point, although Factor 3 had a weaker correlation. The extent to which each factor could predict stopping point uniquely was then examined in a model in which regressions were substituted for the covariances. In that model, higher Factor 1 and Factor 2 latent scores both predicted staying longer in the scenario (i.e., greater comfort during flirting and consensual sexual interaction and during ambiguous events predicted greater threat insensitivity). However, Factor 3 latent scores (i.e., comfort during coercive events) were not uniquely predictive of stopping point.

Summary. These latent variable measurement models specified that the 18 event-specific comfort reports were indicators of three underlying latent traits—multiple dimensions of risk perception. The finding that three separate latent variables were necessary to describe the covariance among comfort reports did not support the notion of a single trait of risk perception. Indeed, the three latent variables also showed differential relationships with sample and with vignette stopping point. Analogously, our previous piecewise slopes models required eight sources of individual differences to describe level and change in comfort across eight thematic phases. Together, the results of these models strongly suggested that a single measure of comfort (e.g., a mean across events) is likely to be overly simplistic and ultimately uninformative.

GENERAL DISCUSSION

The goal of the current work was to illustrate two novel ways of representing sources of individual differences in analyzing date-rape vignette data. In more conventional uses of date-rape vignettes, the outcome variable of interest is often measured at one occasion, typically at the end. We have argued conceptually and empirically why such single measurements are likely to be insufficient as measures of individual differences. In particular, single outcomes cannot detect changes in individual responses as the scenario progresses from innocuous sexual interaction to sexual assault. To overcome this limitation, it is necessary to measure outcomes at multiple relevant events throughout the vignette as well as to employ statistical models by which multiple dimensions of individual differences can be operationalized. To that end, the present article demonstrated two types of models suitable for capturing individual differences that reflect the approach–avoid dynamics embedded in a date-rape vignette.

First, we presented latent growth curve models in which individual changes during the distinct phases of the vignette could be represented via piecewise random slopes within either multilevel modeling or structural equation modeling. We showed that the latter more readily allows these individual slopes to relate to other outcomes. Although our results suggested declines in comfort as the scenario escalated towards sexual aggression, the piecewise slopes also revealed an increase in the participants' reported comfort (i.e., a decrease in risk perception) when the perpetrator apologized or when the victim set boundaries. In addition to tracking changes in comfort as the date-rape scenario progressed, we were able to investigate sample-related differences in these changes and how these individual differences predicted stopping point of the vignette. Second, we presented a nontraditional use of latent variable measurement models, wherein comfort responses at each event of the date-rape vignette served as indicators of underlying latent traits. Results indicated three latent dimensions of risk perception, each of which was differentially related to sample and to stopping point for the vignette.

The models outlined in this paper can be expanded in a multitude of ways to further investigate the intricacies of responses to date-rape scenarios. For instance, although this paper focused on perceptions from the point of view of the victim, these models can also be utilized to understand individual differences from the perspective of perpetration. Furthermore, future research can investigate dependent variables other than comfort level, such as perception of token resistance (Marx, Gross, & Juergens, 1997), perception of sexual interest (for risk of perpetration), or perception of the potential perpetrator or anticipation of positive or negative consequences (for risk of victimization; Testa et al., 2000).

Much of the research on date-rape victimization and perpetration has emphasized the interaction of victim or perpetrator characteristics and situational variables (e.g., Abbey, McAuslan, Zawacki, Clinton, & Buck, 2001; Loh et al., 2007). We argue that the methodology presented in this paper can be more informative than single-measurement designs, particularly in monitoring changes across events. For example, future research can investigate how situation- or victim-related variables (e.g., the victim's physical resistance, forceful verbal resistance, or non-forceful verbal resistance; Leclerc, Wortley, & Smallbone, 2010; Ullman, 1997) interact with perpetrator characteristics (e.g., belief in token resistance or attitudes towards date-rape) to predict the perpetration or the perception of the woman's sexual receptivity as the social interaction progresses. More generally, the models outlined in this paper can help understand how the changes in the trajectory of dependent variables as the situation progresses are influenced by many kinds of predictor variables. Finally, because recent models of aggression such as the I^3 model (Slotter & Finkel, 2011) or the general aggression model (Anderson & Bushman, 2002) emphasize the person–situation interaction, the models presented here can be applied to other types of aggressive behavior than date-rape.

Despite our inclusion of approach-avoid interpersonal dynamics and measurements at multiple time points across a date-rape scenario, our proposed vignette methodology and analytical techniques may not fully model the intricacies involved in real life sexual assault perpetration. That is, the unfolding of the events in real life may not necessarily escalate in a sequential manner, such that events may occur in a random fashion (e.g., physical coercion followed by verbal coercion instead of the other way around as we proposed), or events may be repeated over time (e.g., multiple verbal coercions over time). Future research can investigate how such modifications impact the trajectories of the dependent variable across the date-rape vignette. As long as the vignette is constructed in an ordered manner (i.e., one event followed by another) and follows a monotonic trajectory, the analytic strategy we suggested (MLM and SEM) can still apply. However, in other vignette constructions (e.g., if random events are presented), our analytic strategy may not be applicable. Furthermore, scenarios may change depending on the actors' prior choices (i.e., the potential victim can utilize physical resistance rather than verbal refusal depending on the perpetrator's behavior, or the perpetrator's victimization strategy may change depending on the female's behavior) which could lead to multiple bifurcation in the events across time (e.g., a participant's response at event 05 could lead to either event 06a or event 06b, and response at event 06a can lead to either event 07a or event 07b, so on). In these cases, nonlinear methods and analysis such as fractal analysis may be more applicable (e.g., Gottman, Murray, Swanson, Tyson, & Swanson, 2002; Pincus & Guastello, 2005).

Caution is also needed when adding or unconstraining residual covariances in the SEM analysis, which is typically discouraged in SEM unless there are justifiable reasons in doing so (e.g., Brown, 2006; Ullman, 2006). In the present case, we added residual covariances between contiguous events, given the likelihood that responses to events closer to each other in time are expected to be more correlated than in events farther apart. The use of such covariance structures is also commonplace in longitudinal data, where correlations are typically found to decrease with increasing distance between occasions (Littell, Pendergast, & Natarajan, 2000). In our SEM, we also allowed unequal residual variances of events 09, 12, and 15–18. In the MLM analogue of the analysis, by default all item or event residual variances across each phase are held equal. Upon examining this constraint empirically, we found that it was untenable, and thus we allowed unequal residual variances (as is the default in CFA models in which each item has a separate residual variance). We argue that these modifications to our residual variances and covariances are theoretically and empirically defensible, but future research utilizing this methodology needs to be mindful of these as potential limitations.

In addition, measurement equivalence needs to be considered when comparing two different countries or cultures. In our analysis, using country as a predictor was purely for convenience, that is, to show readers how predictor variables can be included in the model. However, in conducting tests of measurement invariance across these groups (beginning from a configural model, to a metric, scalar, and residual model), we found evidence for non-invariance in events 13 and 15, further suggesting that the US and the Philippines sample might be interpreting these events differently. In other words, the model is only generalizable or interpretable only as far as accounting for measurement group differences in these events.

In conclusion, we anticipate that the current work (as well as the syntax in the supplementary material) will help researchers in designing and analyzing the outcomes of studies using date-rape vignettes, as well as studies employing vignette methodology in other research areas. In so doing, we hope these opportunities to explore and refine sources of individual differences will inform the literature on date-rape and sexual aggression as a whole.

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