ROLE-PLAYED INTERPERSONAL INTERACTION: ECOLOGICAL VALIDITY AND CARDIOVASCULAR REACTIVITY

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ABSTRACT
Conflictual role-play scenarios have been used to model brief interpersonal interaction and to elicit cardiovascular reactivity in the laboratory. Here we discuss data suggesting that role-played interactions constitute an ecologically valid laboratory task that may improve laboratory-to-field generalization of cardiovascular response. Specifically, our research indicates that young adults perceive the stress associated with role-play scenarios as similar to that encountered in everyday life. Furthermore, these stress appraisals moderate cardiovascular response to role-play in men. We also find that a social stressor (i.e. speech task) is perceived as significantly more similar to a real-life stressor as compared to other standard laboratory tasks. We propose that particular constellations of cognitive, affective, and behavioral responses to laboratory-based social stressors, such as role-played interaction, may elicit different patterns of hemodynamic response. Further understanding of interrelations among cognitive, affective, behavioral, and physiological response patterns may assist in the study of cardiovascular reactivity as a potential mechanism linking personality factors and the development of cardiovascular disease.


INTRODUCTION
Individual differences in the magnitude and patterning of behaviorally-evoked cardiovascular reactivity have been hypothesized to predict future development of essential hypertension and coronary heart disease; associated empirical support emanates from several lines of investigation including longitudinal data (1–3). However, the ultimate utility of the “reactivity hypothesis” is also predicated, in part, on the demonstration of the reproducibility of cardiovascular responses in both laboratory and field settings and adequate laboratory-to-field generalizability (2–4). In this regard, the temporal stability of individual differences in blood pressure, heart rate, and other cardiovascular responses is generally moderate, but improves substantially when such measures are aggregated across several laboratory tasks (2,4,5).

Laboratory-to-field generalizability has also tended to be modest (6,7). This may be partially attributable to differences in methodology associated with laboratory assessment of reactivity and ambulatory monitoring techniques. However, another frequently acknowledged factor is the relative lack of ecological validity of many tasks commonly used to elicit reactivity in the laboratory (7). Cardiovascular responses to laboratory tasks that require cognitive challenge (e.g. mental arithmetic), psychomotor skill (e.g. mirror tracing), or physical adjustments (e.g. cold pressor) may not necessarily be expected to generalize to everyday life. It has been suggested that use of laboratory tasks that bear greater similarity to daily events may improve generalizability (6,7). As most people engage in interpersonal interaction during some portion of their waking hours, the use of social stressors in the lab may thus enhance laboratory-to-field generalization.

Also relevant to the development of laboratory-based social stressors are findings that personality variables such as anger, hostility, anxiety, and depression are associated, in both prospective and case-control studies, with essential hypertension and/or coronary heart disease (8–10). One of the presumed mechanisms linking personality factors to cardiovascular disease is repeated episodes of cardiovascular activation during emotional arousal. However, such a link must be further established, both in the laboratory and in the field. While standard laboratory stressors do not always engage subjects’ affective response, social interaction paradigms may provide an appropriate situational context in which negative emotions might be elicited (11,12). In this regard, a variety of social stressors, such as harassment paradigms and conflictual discourses, have been used to elicit feelings of anger in the laboratory (e.g. 12,13). Other types of social stressors may be equally effective in evoking emotional arousal with concomitant cardiovascular activation.

In the first half of this article, we discuss the use of conflictual role-played interpersonal interaction as a laboratory stressor. We first describe, and provide examples of, role-play scenarios. Next, we present a series of primary and ancillary data analyses from our laboratory addressing their ecological validity and associated cardiovascular reactivity. Specifically, these data examine: (a) subjects’ stress appraisals of hypothetical role-play scenarios; (b) subjects’ stress appraisals of actual role-played interactions following their performance in the laboratory; (c) the influence of stress appraisal on cardiovascular response to the role-play scenarios; and (d) subjects’ stress appraisals of a laboratory-based social stressor versus other traditional laboratory tasks.

In the second half of the article, we present a theoretical discussion of the role of cardiovascular reactivity in mediating the association between personality factors and cardiovascular disease.
and the use of laboratory-based social stressors to examine these interrelations. We suggest that the cognitive, affective, and behavioral responses elicited by social stressors, such as role-played interactions, may be important determinants of the magnitude and patterning of concomitant cardiovascular responses. We also consider postural influences on hemodynamic response patterning during interpersonal interaction.

**ROLE-PLAYED INTERPERSONAL INTERACTION AS A LABORATORY STRESSOR**

Role-played interpersonal interaction has been used to evoke cardiovascular reactivity in numerous laboratory investigations, particularly in relation to the study of essential hypertensives. In this regard, hypertensives have long been hypothesized to display ineffective social skills, such as unassertive behaviors (11). Conflictual role-play scenarios requiring assertive responding have thus been used to examine social skills in hypertensives or individuals having a positive parental history of hypertension as compared to normotensives or the offspring of normotensives, respectively (14–19). These studies generally noted a variety of deficits in social skills among hypertensives and the offspring of hypertensives, including either inappropriate aggression or unassertive behaviors, in addition to increased levels of anxiety and anger and significant elevations in blood pressure and heart rate.

At the University of Maryland, Baltimore County, we have continued to utilize conflictual role-play scenarios as a laboratory stressor with healthy, normotensive persons. Administration of such role-played interactions typically proceeds as follows: Participants are instructed that they will be presented with a series of “real-life hassles that could happen to anyone.” They are told to respond to the subsequent prompts of the study confederate as though they are actually engaged in the described situation and to look at and speak to the confederate during the interaction as they would during a real-life occurrence. The confederate (or a tape recording) presents each scenario to the participant. After each scenario is read, the confederate delivers a standard prompt to initiate the interaction. Following the subject’s reply, a second and then a third standard prompt are delivered by the confederate. Approximately seven scenarios comprise a three-minute stressor. Our interactions are audiotaped, and participants are told that later ratings will be made of the “quality and persuasiveness” of their responses. Other investigators have videotaped subjects’ responses (e.g. 17–19).

Examples of the 14 role-play scenarios we are currently using in our laboratory are provided below. Several scenes were developed by our group; one derives from “the mess scene” described by Semenchuk and Larkin (19); and others were developed by Morrison, Manuck, and colleagues at the University of Pittsburgh (indicated below with an asterisk and printed here with permission) (17,18):

*You have been in the registration line for a half-hour when you finally reach the service desk. You are told that you need permission from the professor to register for one of the classes that you will have to leave, get a permission slip, and wait in line again. She says:

First prompt: Just come back when you have a permission slip.
Second prompt: The class schedule says you need a permission slip.
Third prompt: Rules are rules.

You are at the hair-cutting shop, and the stylist has just finished cutting your hair. She turns the chair toward the mirror so you can inspect it. You are unhappy because you feel that she did not cut it the way you asked and left it too long on the sides. She says:

First prompt: There you are, a new you.
Second prompt: I cut it just the way you told me to.
Third prompt: This is a very popular style.

**ECOLOGICAL VALIDITY OF ROLE-PLAYED INTERPERSONAL INTERACTION**

Stress Appraisals of Hypothetical Role-Play Scenarios

In order to examine the ecological validity of role-played interaction, we first sought to determine subjects’ perceptions of our scenarios. We asked 46 undergraduate students (mean age = 22.43; 74% female; 64% White, 16% African-American, 16% Asian-American, 2% Hispanic, 2% Other) to read our 14 role-play scenarios and associated standard prompts. Subjects rated, on a Likert-type scale of 1 to 10, the following items (derived from Semenchuk and Larkin [19]) in relation to each hypothetical role-play scene: (1) How realistic is this situation? 1 = very unrealistic, 10 = very realistic; (2) How stressful would encountering this situation be for you? 1 = not stressful at all, 10 = very stressful; (3) How likely is it that you would encounter a situation like this in your daily life? 1 = very unlikely, 10 = very likely.

Results indicated that the 14 role-play scenes were indeed perceived as realistic, with mean responses for item 1 ranging from 6.37 to 9.04 for the individual scenarios. The situations were also viewed by the students as moderately to very stressful; mean responses on item 2 ranged from 5.25 to 7.96. Additionally, students felt that they might actually encounter such situations. Mean responses on item 3 ranged from 4.19 to 7.33. Although responses to these questionnaire items suggest that, on average, subjects perceive these situations to be fairly realistic, stressful, and likely to occur, it is also clear that there is substantial interindividual variability in responses. Indeed, the range of endorsed responses for each questionnaire item typically covered the entire spectrum of 1–10.

We next grouped the 14 role-play scenarios into four categories comprised of stressors involving work, school, dating, or other daily hassles. Mean ratings for each questionnaire item associated with the four categories of role-plays are displayed in Table 1. In order to identify possible differences in subjects’ perceptions of these categories of situations and to explore for moderating influences of gender and race, repeated measures analyses of variance (ANOVA) (Gender × Race × Category) were used to examine participants’ mean responses to the three questionnaire items. Race was categorized as White and non-White due to small numbers of participants in the four non-White groups.