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Performance of Alcohol and Safer-Sex Change Rulers
Compared to Readiness to Change Questionnaires

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Abstract

As part of a larger intervention study, we hypothesized that Change Rulers created for alcohol and safer sex would be equivalent to longer questionnaires. Ninety-six male college students completed rulers and questionnaires for assessing behavior change readiness. Participants' scores on the Rulers significantly correlated with their scores on the questionnaires ($r = .77$ for Alcohol; $r = .77$ for Safer-Sex). In both domains the Rulers outperformed the questionnaires in predicting behavioral intentions, suggesting that the Rulers had at least comparable concurrent criterion validity. This finding is the first of its kind in the safe sex literature, and suggests that quick assessments of readiness to change are possible. Since the Rulers are a continuous measure, the results are consistent with the idea that the change process is continuous rather than a series of discrete stages.

Prochaska and DiClemente (1986) extensively studied how people change behavior across a wide variety of actions and contexts. They developed the transtheoretical model of behavior change (TMBC), finding that people go through a series of stages when changing behavior. Miller and Rollnick (1991) used the TMBC or stages of change model in their seminal work *Motivational Interviewing*, their approach to preparing people to change behavior. They view the stages as a continuum of motivational readiness for changing behavior. Progress along the change continuum is an important aspect of a successful intervention, even if it does not immediately produce the desired behavioral change (Prochaska & DiClemente, 1992). Many researchers have used the stages of change model to develop the idea of “readiness to change,” a measure looking at the motivation of participants to change a desired behavior. Researchers have studied readiness to change in many areas including smoking cessation (Biener & Abrams, 1991; Herzog, Abrams, Emmons & Linnan, 2000), reducing drinking (Rollnick, Heather, Gold & Hall, 1992; Carey, Maitso, Carey, & Pumine, 2001; Carey, Carey, Maisto & Pumine, 2002) and increasing condom use (Morrison-Beedy, Carey & Lewis, 2002).

Measuring motivation is now an important aspect of alcohol and health-related research and practice. Researchers have developed several measures of motivation. These include the SOCRATES (Stage of Change Readiness and Treatment Eagerness Scale; Miller & Tonigan, 1996), the URICA (University of Rhode Island Change Assessment; McConaughy, Prochaska, & Velicer, 1983), and the RTCQ (Readiness to Change Questionnaire; Rollnick et al., 1992). The SOCRATES and RTCQ are measures specific to alcohol use. These measures contain between 12 and 32 items and attempt to determine the level of motivation of an individual by placing them in the appropriate stage of the change continuum.

Practitioners often need an assessment of readiness to change that is quick and able to identify patients who would best benefit from motivational enhancement therapies (Rollnick et al., 1992). A brief, inexpensive method could save time and money especially in the realm of managed health care (Rogers et al., 2001). The contemplation ladder or ruler, developed originally for smoking cessation by Biener and Abrams (1991), is a brief and affordable assessment tool. The contemplation ladder lets participants self-report their intention to change their behavior on a continuum. Verbal anchors help participants assess their own level of readiness to change. Versions of the ladder have been developed for use in alcohol studies (Carey et al., 2002), and studies on needle-exchange users (Blumenthal, Gogineni, Longshore, & Stein, 2001). The verbal anchors make this continuum a concrete measure that may be useful when trying to assess “readiness to change” among persons with certain mental illness who may have trouble with abstract thought (Carey et al., 2001; Carey et al., 2002; Rogers et al., 2001).

If the ladder or ruler could show the same reliability and validity as longer questionnaires it could be used as a quick, opportunistic measurement for readiness to change. The development of such a measure could save time and money in health care settings, and aid in research protocols. As a piece of a larger intervention study, we hypothesized that Change Rulers created for alcohol and safer sex would be equivalent to longer questionnaires and would adequately predict measures of intention.

Methods

Participants

Ninety-six men, average age 20.58 (SD = 2.45), who reported drinking at least twice a week and two or more sexual partners in the preceding two months participated in the study

(count me out, again). The study inclusion criteria provided participants whose drinking and sexual behavior put them at-risk for negative outcomes resulting from both problem drinking and risky sex. Sixty-five percent of participants were White, 19% Hispanic, 10% Asian, and 6% African-American. They drank on average 3.41 (SD = 2.45) times per week and consumed an average of 6.25 (SD = 2.72) standard drinks per drinking occasion. They averaged 3.23 (SD = 1.80) sexual partners in the previous three months and used a condom 58.5 % (SD = 33.08) of the time during sexual intercourse. Table 1 contains means and standard deviations for the participants on variables of interest.

Measures and Procedures

Participants responded to items assessing demographic and behavioral characteristics, as well as two measures of motivation or readiness to change both their drinking and their condom use. They also responded to items assessing intended future drinking and condom use. Means and standard deviations on variables of interest are found in Table 1.

Motivation Measures:

Readiness to Change Questionnaire (RTCQ) (Rollnick, et. al., 1992): The RTCQ, designed to measure motivation to decrease drinking, contains 12-items. It formed three factors (precontemplation, contemplation, and action) and persons received a score on each factor. The highest factor score represented the stage on the change cycle of the individual. Sutton (1996) critiqued the idea of discrete stages of change and proposed that researchers should view “readiness to change” as a continuous variable rather than as a series of discrete stages. Budd & Rollnick (1996) revised their initial RTCQ to reflect this ideal. Their subsequent research revealed a single higher-ordered factor emerging from the RTCQ which they called “readiness to change”. Items in the precontemplation subscale were reversed coded and added to the scores of

items from the other two factors. This single “readiness to change” factor served as a marker of motivation to decrease drinking.

A Readiness to Change Risky Sexual Behavior (RTCQ-SB) scale measured participants’ willingness to engage in increased safer sex behaviors (use a condom more often). This scale was adapted for this study from the alcohol RTCQ. The RTCQ-SB scale contained 11-items. These items are found in Appendix A. As with the RTCQ, the precontemplation items (Items 1, 5, and 10) were reverse-coded and added to the contemplation and action items.

Readiness to Change Rulers: Participants completed two Change Rulers scaled from 0 to 10 that asked them to rate their readiness to change their drinking and their readiness to change their condom use by circling the position on the rulers that best described them. The rulers, modeled on a ruler found on the Motivational Interviewing website operated by William Miller, are found in Appendix B.

Intention Measures: Two items (intended drinking days per month and intended drinks per drinking occasion in the next month) combined to form an Intended Drinking Quantity x Frequency Index. Participants also responded to five items from the UCLA Multidimensional Condom Attitudes Scale that assessed intended future condom use (Helweg-Larsen & Collins, 1994). These items, which assessed intended condom use and intended negotiation of condom use on a Likert scale, were averaged to create the condom intention variable.

Results

Reliability of RTCQ Questionnaires. The single factor alcohol RTCQ had adequate reliability ($\alpha = .72$; Mean = 3.46, SD = 1.06) consistent with the Budd & Rollnick’s (1996) findings. The RTCQ-SB, which assessed readiness to change condom use, was created for this study. The 11-item scale had adequate internal consistency ($\alpha = .84$; Mean = 3.78 (out of 7), SD = 1.31).

Equivalence of RTCQ and Change Rulers. The Alcohol Change Ruler and the original alcohol RTCQ correlated highly ($r(95) = .772, p < .001$), as did the Condom Use Change Ruler and the RTCQ-SB ($r(95) = .771, p < .001$). The very strong relationships between the rulers and their respective RTCQ questionnaires suggest that the RTCQ and the Change Rulers are measuring the same underlying construct. Correlations across behavioral domains were not significant. The correlations between the RTCQ and the Condom Use Change Ruler, the RTCQ-SB and Alcohol Change Ruler, and the two Change Rulers, were less than $r = .20$ and non-significant. Thus, the Readiness to Change Rulers appear to discriminately measure readiness to change of the particular behavior targeted.

Concurrent Validity: Correlations of the Rulers to variables of intended future behavior measured concurrent validity. The alcohol Ruler was significantly related to intended drinking days per month and intended total drinks per month (a Quantity x Frequency Index) for the upcoming month. The safer sex Ruler was significantly associated with intended condom use. We next compared the Ruler and the RTCQ correlations to the intention to change variables using Meng, Rosenthal, and Rubin's (1992) technique. The magnitude of the correlation between the Ruler and the target intention was always larger than the same correlation between the full scale RTCQs and the target intention. Two of the three were significantly larger. (See Table 2). Therefore, the Rulers appeared at least as good at predicting intentions as longer questionnaires.

Discussion

This study assessed the efficacy of change rulers (as compared to a longer questionnaires) in measuring motivation and in predicting behavioral intentions. Both of the Rulers outperformed their longer counterparts, either the RTCQ or RTCQ-SB, in predicting behavioral intentions. The alcohol Ruler was better at predicting an intended Quantity x Frequency Index

than the RTCQ; while the safer sex Ruler was better at predicting condom use intention than the RTCQ-SB. The Rulers also correlated highly with the RTCQ scores, suggesting that the two measures assess the same construct.

Limitations to the study need discussion. This study only compared the Readiness to Change Rulers with the RTCQ and not with either the SOCRATES or URICA. However, since the Rulers developed for this study were behavior specific and did not give a general measure of “readiness to change,” the URICA would not have been well-suited for our analysis. As Sutton (1996) suggests, measuring readiness to change as a continuous variable may prove the more reliable approach. The SOCRATES and URICA, which both measure readiness to change as discrete stages rather than along a continuum, might show even less internal consistency than the RTCQ scales. The RTCQ, however, allows for a continuous measure of readiness to change and therefore is better suited for testing the efficacy of the Readiness to Change Rulers.

Second, the study used behavioral intentions as a dependent measure in assessing criterion validity. While intentions are often outcome measures in safer sex research, future studies should address the relationship between readiness to change rulers and actual change in target behaviors (i.e., reduced drinking or increased condom use). Do the rulers perform equivalently to longer questionnaires in predicting actual prospective behavior change? There is also some overlap between readiness to change and behavioral intention. However, the revealed relationships (correlations near .20 -.30) suggest that, while similar, they are not the same construct (compared to Ruler and RTCQ correlations near .70). Furthermore, applications of the stage of change model (Miller & Rollnick, 1991) suggest that readiness level might be related to effectiveness of intervention type. The Change Rulers would allow future studies to determine if stage-specific interventions (i.e., decisional balance, relapse prevention) might apply

at different readiness levels. In contrast, while it might be possible to think of matching interventions to intention level, it is not usually done and it is further removed from the stages of change model. Thus, there are also theoretical reasons for considering readiness to change different from behavioral intentions.

Finally, the participants in this study came from a generally healthy population. The Ruler may not predict behavioral intentions as well as longer questionnaires in a clinical population. The present study also had a limited sample size (both in terms of number of in terms of its all-male college student population) making it necessary for the results to be replicated before change Rulers are widely advocated in both research and clinical settings. Nevertheless, these data suggest that these single-item Rulers correlate highly with longer questionnaires that are currently used in health care and research settings, making them an ideal approach for decreasing participant burden in research or intervention. The Ruler can be administered quickly in any setting. Doctors or case managers could give the Ruler during a short meeting to quickly assess readiness to change a targeted behavior. In addition, these data reveal that the Ruler initially designed for readiness to change alcohol and drug use adapts well to assessing readiness to change sexual behavior. While more research is necessary, it appears that readiness Rulers may be helpful in assessing motivation to change in numerous behaviors, potentially allowing clinicians to direct interventions more appropriately.

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Appendix A

Readiness to Change Questionnaire-Sexual Behavior

1. I don't think I engage in risky sex.
2. I am trying to use a condom more than I used to.
3. Sometimes I have sex without a condom when I'd rather not.
4. Sometimes I think I should cut down on my unsafe sexual behavior.
5. It's a waste of time to think about my condom use habits.
6. I have just recently begun using condoms more.
7. Anyone can talk about wanting to do something about using condoms more often, but I'm actually trying to do something about it.
8. I am at a stage where I should think about changing my unsafe sexual behavior.
9. My not using a condom during sex is a problem sometimes.
10. There is no need for me to think about changing my sexual behaviors to be more safe.
11. I am actually changing my unsafe sexual behaviors right now.

Appendix B

Readiness to Change Rulers for Decreased Drinking and Increased Condom Use

On the ruler below, please circle the number that best describes how you feel *right now*:

0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Never think
about my
drinking

Sometimes I
think about
drinking less

I have
decided to
drink less

I am already
trying to cut
back on my
drinking

My drinking
has changed
I now drink
less than
before

On the ruler below, please circle the number that best describes how you feel *right now*:

0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Never think
about safe-sex

Sometimes I
think about
using condoms
more

I have
decided to
use condoms
more often

I am already
trying to use
condoms more
during sex

My condom
use has
changed to
use always

Table 1

Group Means and Standard Deviations for Behavior and Motivation Variables

Variable	Mean (SD)
Age	20.58 (2.46)
Number of Sexual Partners (lifetime)	10.92 (13.41)
Age at First Sex	16.31 (1.86)
RTCQ (Alcohol)	3.46 (1.06)
Alcohol Readiness to Change Ruler	2.52 (2.02)
Drinking Intention I (Drinks/Month)	85.56 (66.13)
Drinking Intention II (Drinking Days/Month)	12.89 (4.96)
Drinking Days/Week (Previous 3 Months)	3.41 (2.45)
Drinks per Occasion (Previous 3 Months)	6.25 (2.73)
RTCQ-SB (Sexual Behaviors)	3.78 (1.31)
Safer Sex Readiness to Change Ruler	5.56 (3.34)
Condom Use Intention	5.56 (1.24)
Percent Condom Use (All Sex Previous 3 Months)	58.5 (33.08)

Table 2

Pearson's Correlations For Ruler and RTCQ Measures with Intentions to Change

Variable	Pearson's <i>r</i>	Z
<i>Condom Intention</i>		
Condom Ruler	.297**	
RTCQ-SB	.065	Z= 3.5**
<i>Intended Drinking Days Per Month</i>		
Drinking Ruler	-.324**	
RTCQ	-.219*	Z=1.54
<i>Intended Drinks Per Month</i>		
Drinking Ruler	-.206*	
RTCQ	-.071	Z=6.25**

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

RTCQ-SB = Readiness to Change Questionnaire- Sexual Behaviors

RTCQ = Readiness to Change Questionnaire