

Running Head: STAGE OF CHANGE CLINICIAN ASSESSMENT

Stages of Change Assessments in Alcohol Problems: Agreement across Self and  
Clinician-reports  
David C. Hodgins  
Addiction Centre, Foothills Medical Centre and University of Calgary

Correspondence to:

Dr. David Hodgins  
Addiction Centre, Foothills Medical Centre  
1403 29 Street NW,  
Calgary, Alberta, Canada T2N 2T9  
(403) 670-4785

Published: Hodgins, D.C. (2001). Stage of change assessments in alcohol problems: Agreement across self and clinician's reports. Substance Abuse, 22, 87-96.

## Abstract

A number of self-report scales and “algorithms” have been developed to measure stage of change in alcohol problems. These methods rely on client self-reports but an alternative approach is to use clinician judgments. The purpose of this investigation was to compare approaches including a newly developed Readiness to Change Questionnaire (RCQ) – Clinician Version. Clients being assessed for alcohol treatment (N=64) completed SOCRATES, the Readiness to Change Questionnaire, a social desirability scale and a stage of change algorithm. Clinicians completed the RCQ-Clinician Version and provided a simple assessment of stage of change. The agreement among the alternative methods was generally good with the continuous measures both between scales and between clients and both experienced clinicians and trainees. Agreement between categorical stage assignments was poor. The RCQ – Clinician Version shows promise as a clinical and research tool.

Key words: Readiness to Change, Stages of change, motivation, alcohol dependence

### Stages of Change Assessments in Alcohol Problems: The Clinician's Perspective

The measurement of stages of change has evolved as the transtheoretical model of change (4) has grown in popularity. According to the model, individuals proceed through a series of stages – precontemplation, contemplation, determination (also referred to as preparation), action, and maintenance – in initiating and maintaining behavior changes such as quitting drinking. A variety of methods of assessing stage of change for alcohol problems have been developed including self-report scales that provide continuous measures for each stage and simple categorical “algorithms.” The self-report scales include an alcohol version of the 32-item University of Rhode Island Change Assessment Scale (5), the Stages of Change Readiness and Treatment Eagerness Scale (1), which consists of alcohol and other drug versions of a 40-item scale developed specifically for substance abusers, and the Readiness to Change Questionnaire (6;7), a 12-item scale for alcohol that measures the precontemplation, contemplation, and action stages. These self-report scales provide subscales for each stage that are scored as continuous variables and, from these scores, an individual can be placed into one stage (or “staged”).

Examination of the content of the items of these three scales show, not surprisingly, a great degree of overlap. Some items for the RCQ were adapted from the URICA, for example. The URICA differs from the others in that it was designed to assess “problem behavior” change across a number of domains. Items are worded quite generally. The SOCRATES and the RCQ contain items specifically worded for alcohol problem change.

Support for the validity of each of these scales has been provided although no true gold standard is available. The RCQ responses are associated in predicted ways with cartoons depicting readiness to change (2) and the scale has been shown to predict drinking outcomes for hospitalized heavy drinkers (6). There is less validity data available for SOCRATES although associations with indicators of problem severity have been presented. Both scales have shown to have good retest reliability over one to two days (1;2). To date, there have been no direct comparisons of these scales. One purpose of the present investigation was to compare agreement between SOCRATES and the RCQ.

The algorithm approach to assessing stage of change involves a series of questions that ask directly about attempts and intentions to change behaviors. Precontemplation and contemplation are defined by whether or not a person has the intention to quit drinking within the next six months. Intention to quit within the next 30 days places an individual in the determination stage. The action stage is defined by quitting in the past six months and quitting more than six months ago defines the maintenance stage. The advantage of the algorithm method is that it is easy to apply in comparison with multi-item self-report scales and, consequently, it is often used in large-scale community surveys. However, there is variability in the wording of the questions and the response options that may have implications for the final staging of individuals (7). A second purpose of the present investigation was to compare the staging of individuals using the algorithm compared with SOCRATES and RCQ.

Both the continuous and algorithm methods are subject to response style biases. There is some pressure on treatment-seeking individuals to appear ready to change. A

further purpose of the present study was to examine the role of general response style. If social desirability plays a large role in client responses then it is expected that a negative association would be found between a social desirability measure and endorsement of precontemplation items and positive relationship would be found between social desirability and action items.

Both the self-report and algorithm methods rely on client reports for assessing stage of change. An alternative approach is to use clinician judgments. Clinicians familiar with the stages of change model often feel that they are aware of the stage that clients are in without formal assessment. Moreover, clinician judgment of client motivation during treatment has been found to be predictive of outcome (8). However, clinical judgment is often imperfect and clinician confidence in their judgments is unrelated to the accuracy of the judgment (9). Highly confident clinicians can be quite inaccurate. The validity of clinician judgment of stages of change is, therefore, important to determine. Use of structured and semi-structured assessment formats is recommended as one way of improving clinical judgment. In the present investigation a clinician-report multi-item scale of stage of change is developed and evaluated. Agreement between this structured clinician stage assessment is compared with a simple clinician global judgment of stage. The agreement for experienced clinicians is compared with less experienced trainees.

In summary, the present investigation had a number of goals: (1). Comparison of client responses to two alcohol-specific self-report scales, SOCRATES and RCQ. (2). Examination of the influence of response style as measured by the Marlowe-Crowne social desirability scale on client self-report using SOCRATES and RCQ. (3).

Comparison of structured clinician reports of stage of change with clinicians' simple global categorical judgments. (4). Comparison of clinician reports with client reports. A final goal (5) was to compare the clinician reports of experienced clinicians and trainees.

## Method

### Participants

Volunteer participants (N=64) were recruited from the Foothills Medical Centre Addiction Centre outpatient clinic. The clinic serves individuals with concurrent psychiatric or physical problems in addition to substance abuse problems. In terms of their substance use individuals present to the clinic representing the full continuum of stages of change (i.e., from individuals in precontemplation stage who are denying a substance abuse problem to individuals who have a substantial period of abstinence but are seeking help for a related emotional problem). The participants presented in this report all showed evidence of an alcohol problem and all were diagnosed as alcohol dependent according to DSM-IV criteria (APA, 1994). In addition, 37% of participants reported other drug problems, mostly cannabis and cocaine. Non-substance DSM-IV Axis 1 diagnoses were identified in 54% (mood disorders, 34%, anxiety disorders 11%, psychotic disorders 5% and other 3%) and Axis 2 disorders in 37%. Physical disorders, mostly chronic pain, were identified in 20%. The mean age was 38 years (SD=11, range 18 to 71) and the sample was 42% female. The mean education was 11.9 years of education (SD=2.7) and 49% were unemployed. Sixty percent reported previous addiction treatment.

## Procedure and Instruments

In advance of a face-to-face assessment interview, potential participants were approached to participate in the confidential study by a research assistant and all agreed to do so. They were asked to complete a package of self-report scales before the interview and during a brief waiting period after the interview. They were not reimbursed for their participation. Individuals assessed in the Addiction Centre are interviewed using a semi-structured interview that includes the Addiction Severity Index (10). No specific "staging" questions are included in this interview. Clinicians formulate a substance and psychiatric diagnosis and negotiate a treatment plan with the individual.

The self-report package completed by participants included the SOCRATES (Version 5), the RCQ, the algorithm, and the Marlow-Crowne social desirability scale (11). Table 1 provides a summary of the stage of change measures included in the study. SOCRATES provides continuous measures of the five stages. Each stage scale is comprised of eight items that are rated on a 1 (strongly disagree) to 5 (strongly agree) point scale. Although SOCRATES was developed to provide the five stage scores, Miller and Tonigan (1) provide an alternative set of three scales based on factor scores for SOCRATES. These factor scores were not used in the present investigation in order to compare the same constructs across methods. In addition to the continuous scores, a categorical "staging" of an individual was calculated based on the individual's highest scale score. In the case of two or more identical high scores, the stage further along in the continuum was chosen.

The RCQ provides continuous measures of the precontemplation, contemplation, and action stages. Each stage scale is comprised of four items rated on a five point scale (-2 strongly disagree, 0 unsure, +2 strongly agree). Staging was accomplished using the refined method described by Heather et al. (6) which allocates individuals into precontemplation, contemplation, determination, and action stages based on their profile of scale scores. Precontemplation is defined as a positive score on the precontemplation scale only; contemplation is defined as a positive score on the contemplation scale only, determination is defined as a positive score on the contemplation and action scales with the contemplation score higher than the action score; and action is defined as positive score on the contemplation and action scales with the action score greater than or equal to the contemplation score. .

The algorithm consisted of four questions asking about attempts to quit drinking alcohol recently and in the past year, and intentions to quit in the next six months and thirty days (3). A Likert-type scale with 5 options was used (1=strongly disagree, 2=disagree, 3=undecided or unsure, 4=agree, and 5=strongly agree). Participants abstinent for more than six months were considered in the maintenance stage; those abstinent for 30 days but less than six months were in the action stage; those drinking in the past thirty days but planning to quit in the next thirty days were in determination; those drinking but planning to quit in the next six months were in contemplation, and finally, those with no plans to quit were considered precontemplation.

The Marlowe-Crowne scale is a widely used 33-item true-false scale used to measure the impact of a social desirability response style on self-report. The scale taps



the tendency to present well in the interpersonal context in particular (12). Concurrent validity has been demonstrated using the MMPI validity scales as a comparison (11).

### Clinicians and Clinician Assessment

Six experienced clinicians and three trainees participated in the project, each providing from 1 to 15 assessments (mean = 7). The experienced clinicians represented a variety of disciplines including psychology (doctoral level), nursing (bachelor level), social work (masters level) and occupational therapy (bachelor level) and all had worked with the addiction centre for a minimum of four years. The trainees included one Master of Social Work student, one psychology pre-doctoral intern, and one psychiatric resident. All clinicians, including the trainees, were familiar with the stages of change model as the model is routinely introduced to patients as part of the clinical intervention offered in the Addiction Centre. No additional training on the model or the assessment tool was provided.

The clinicians were asked to conduct the assessment interview in a routine manner and afterward, within 24 hours, complete a one-page stage of change assessment. The clinicians were kept blind to the participant responses to the self-report scales. The clinician assessment included a modified version of the RCQ (16 items) and a simple global stage assignment (one item worded "Circle the stage that you feel best describes the patient's readiness to change his/her drinking"). Separate alcohol and other drug versions were available but only the alcohol version is presented in this report.

The 16-item Readiness to Change Questionnaire - Clinician Version (RCQ - CV) is presented in Table 2. As can be seen, the wording to the items was modified for

completion by the clinician. Four items measuring the maintenance stage were added. From these items, continuous measures of each of four stages, excluding the determination stage, are available and, from these scales, a stage allocation was completed using the RCQ refined method. In summary, the clinicians provided the continuous measures for four stages, a stage allocation, and a simple global stage assignment (see Table 1).

### Data Analyses

Pearson correlations were used to compare the participant SOCRATES and RCQ scales and the Marlowe-Crowne total scores. Agreement between RCQ-CV and participant SOCRATES and RCQ scales was assessed using Intraclass Correlation Coefficients. Agreement between the categorical staging methods was assessed using weighted kappa coefficients.

## Results

### Agreement Among the Continuous Self-report Measures

Table 3 displays the Pearson correlations between the scales of the SOCRATES and RCQ, and the Marlowe-Crowne completed by the participants. Examination of the pattern of the bolded correlations revealed that the two precontemplation scales and the two action scales were strongly associated and the two contemplation scales were moderately correlated. The other correlations were in the expected direction, as determined in previous analyses of the RCQ, SOCRATES, and URICA. For example, the precontemplation scales correlated negatively with the contemplation, determination, action, and maintenance scales and these latter three scales all showed positive correlations with each other.

The Marlowe-Crowne scale total did not correlate significantly with any of the RCQ or SOCRATES scales indicating that social desirability did not play a significant role in these self-reports.

To aid in the interpretation of the results we examined the internal reliability of each SOCRATES and RCQ scale. For SOCRATES, the coefficient alphas were 0.90 for precontemplation, 0.70 for contemplation, 0.95 for determination, 0.96 for action, and 0.84 for maintenance. For RCQ, they were 0.79 for precontemplation, 0.90 for contemplation, and 0.87 for action.

#### Readiness to Change Questionnaire - Clinician Version

Mean total scores for the Readiness to Change Questionnaire - CV scales were 8.4 (SD=3.9) for precontemplation, 14.0 (SD=4.5) for contemplation, 14.3 (SD=4.6) for action and 14.2 (SD=4.4) for maintenance. Internal reliability as measured by coefficient alpha was 0.78 for precontemplation, 0.80 for contemplation, 0.86 for action and 0.81 for maintenance which fall in the good range (13).

Intraclass correlation coefficients (ICCs) were computed between the RCQ-CV scales and the participant SOCRATES and RCQ scales. The ICCs for SOCRATES were 0.56 for precontemplation, 0.30 for contemplation, 0.56 for action, and 0.57 for maintenance. The ICCs for RCQ were 0.47 for precontemplation, 0.51 for contemplation and 0.58 for action. All these ICCs are considered to be in the fair range of agreement between participants and clinicians except the SOCRATES contemplation scale which falls in the poor range (14).

### Agreement among Categorical Staging Methods

Participants were allocated to one stage of change based on the RCQ-CV scales (using the refined method suggested by Heather et al. (6). Table 4 displays the agreement between this staging and the clinician simple judgment of stage of change. As can be seen, the RCQ-CV allocated fewer participants to the maintenance stage and more to the contemplation stage than the simple judgment method. Although 89% of participants were allocated to within one stage with both methods, exact agreement was only 50% yielding a kappa of 0.35, which is considered poor agreement (14).

The RCQ-CV staging was compared with the staging allocation from the participant SOCRATES and RCQ and the participant response to the algorithm questions. With the SOCRATES staging, 79% of participants were within one stage with both methods although exact agreement was only 33% and kappa was 0.13. With RCQ staging (which excluded the maintenance stage), 84% were within one stage with exact agreement at 54% and kappa was 0.33. With the algorithm staging, 86% were within one stage with exact agreement of 41% and kappa was 0.26.

A similar set of comparisons was made between the clinician simple judgments of stage and the staging allocation from participant SOCRATES and RCQ, and algorithm questions. Kappa coefficients were poor for SOCRATES (0.18), fair for RCQ (0.44), and poor for the algorithm (0.23).

### Influence of Clinician Experience

In order to examine the influence of clinician experience on their assessments, t-tests were performed comparing mean RCQ – CV scores of trainees (averaged over all participants rated) and experienced clinicians. None differed significantly. The staging

allocations based on the RCQ-CV scores did differ ( $X^2(4) = 9.5$ ,  $p < .05$ ) with trainees less likely to provide ratings that allocate participants to the precontemplation or maintenance stages than experienced clinicians. The patterns of results for the simple global judgments of stage between trainees and experienced clinicians were similar but did not differ statistically ( $X^2(4) = 4.3$ ).

### Discussion

The stages of change construct, proposed in the transtheoretical model of change, has found appeal to both researchers and clinicians. Clinicians find the stages to be a useful way to describe their clientele and to direct their interventions with them (15). Our ability to make accurate assessments of the stages is, therefore, of central importance to our work and an understanding of the ability of clinicians to make judgments about readiness to change is crucial.

The results of the present study show that agreement among continuous measures of the stages of change for alcohol problems is generally good, both between different measures for the participants (i.e., SOCRATES and RCQ) and between participants and the clinicians. The sole exception to this general finding is the contemplation scale of SOCRATES. The relatively lower correlation between this scale and the contemplation scales of the participant and RCQ-CV suggest that it may be psychometrically weaker. Post hoc examinations of coefficient alpha for the participant SOCRATES and RCQ scales support this suggestion. The SOCRATES coefficient alpha for this sample was only 0.70, which verges on unacceptable (14), compared with a mean of 0.91 for the other four SOCRATES scales and 0.90 for the RCQ contemplation scale (which are all considered excellent). Moreover, in Miller and Tonigan's (1)

analyses of SOCRATES using Project Match data, one of the three factors that they uncovered labeled Ambivalence was comprised of contemplation items. This scale was less reliable than the other two scales.

In contrast to the continuous measures, agreement was generally poor among the staging methods. Exact agreement between the clinician simple global judgment of stage and the staging provided from the RCQ-CV was only 50% ( $\kappa = 0.35$ ). Similarly, agreement between the two clinician methods and the staging from the participants' SOCRATES, RCQ and algorithm was low. Reliability was higher for agreement within one stage in either direction, however, which suggests that the lack of agreement reflects the difficulty in achieving high reliability with categorical data.

The results suggest that clinicians are able to judge stage of change when a continuous measure is used as the basis of the judgment. However, the reliability of staging methods based on these continuous measures, algorithms, and global clinician judgments is questionable. Similarly, trainees and experienced clinicians appeared to provide similar evaluations using the continuous measures but the staging allocations and the simple judgments of stage differed. The experienced clinicians used the full range of stages compared with the trainees who used only the contemplation, determination, and action stages. Further research with a larger group of trainees and randomly assigned assessments will be required to determine whether this is a robust difference between trainees and experienced clinicians.

The Marlowe-Crowne results suggest that participant reports of readiness to change are not highly influenced by social desirability response styles. This is an important finding in that the items have obvious content with clear face validity. In

short, they are easily faked. It is significant that the scores do not appear to be affected by more subtle demands to present positively. Self-report scales that measure severity of alcohol problems, such as the Alcohol Dependence Scale, are typically significantly correlated with social desirability measures (16).

The RCQ – CV shows promise as a useful clinical and research tool. A parallel version for readiness to change for other drug problems has also been developed. We are in the process of further examination of the psychometric properties and item content of both these scales with larger samples of substance abusers. From examination of the correlations among the RCQ – CV scales it appears that the factor structure may be similar to the SOCRATES. Refinement of the scales may further increase their reliability and validity. It is important to determine if clinician judgements of readiness to change are predictive of client outcomes post-treatment in the same way that client motivation has been shown to be predictive (17). Studies of the external validity are also important in which clinician judgements are compared with non-self-report criteria. As well, examination of the psychometric characteristics of the scale with substance abusers without concurrent psychiatric and physical problems is required. If clinician judgment can substitute for client self-report then the assessment burden on our research participants could be lessened. If clinician judgment supplements client self-report then it may further advance our understanding of the process of change.

## References

1. Miller, W.R. & Tonnigan, J.S. Assessing drinkers' motivation for change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES). *Psych Addict Behav* 1996;10, 81-89
2. Rollnick, S., Heather, N., Gold, R., & Hall, W. Development of a short "readiness to change" questionnaire for use on brief, opportunistic interventions among excessive drinkers. *Br J Addiction* 1992; 87, 743-754
3. Miller, W.R. Assessing drinkers' motivation for change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) 1993; Unpublished
4. Prochaska, J.O., DiClemente, C.C., Norcross, J.C. In search of how people change. Applications to addictive behaviors. *Am Psychol* 1992; 47(9), 1102-1114
5. McConaughy, E.A., Prochaska, J.O., & Velicer, W.F. Stages of change in psychotherapy: Measurement and sample profiles. *Psychother: Theory, Research and Practise* 1983; 20, 368-375
6. Heather, N., Rollnick, S., & Bell, A. Predictive validity of the Readiness to Change Questionnaire. *Addiction* 1993; 88, 1667-1677
7. Reed, G.R., Velicer, W.F., & Prochaska, J.O. What makes a good staging algorithm: Example from regular exercise. *Am J Health Promot* 1997; 12(1), 57-66
8. Brown, J.M. & Miller, W.R. Impact of motivational interviewing on participation and outcome in residential alcoholism treatment. *Psych Addict Behav* 1993; 7, 211-



218

9. Garb, H.N. Clinical judgement, clinical training, and professional experience. *Psychol Bull* 1989; 105, 387-396
10. McLellan, A.T., Luborsky, L., O'Brien, C.P., & Woody, G.E. An improved evaluation instrument for substance abuse patients: The Addiction Severity Index. *J Nerv Ment Dis* 1980; 168, 26-33
11. Crowne, D.P. & Marlowe, D. A new scale of social desirability independent of psychopathology. *J Consult Psychol* 1960; 24(4), 349-354
12. Holden, R.R. & Fekken, G.C. Three common social desirability scales: Friends, acquaintances, or strangers? *J Research in Personality* 1989; 23, 180-191
13. Cicchetti, D.V. & Sparrow, S.S. Assessment of adaptive behavior in young children. In: J.J. Johnston & J. Goldman (Eds.), *Developmental assessment in clinical child psychology: A handbook*. New York: Pergamon Press; 1990:173-196
14. Cicchetti, D.V. Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychol Assess* 1994; 6(4), 284-290
15. Miller, W.R. & Rollnick, S. *Motivational Interviewing*. New York: Guilford Press; 1991
16. Skinner, H.A. & Allen, B.A. Alcohol dependence syndrome: Measurement and validation. *J Abnorm Psychol* 1982; 91, 199-209
17. Project Match Research Group. Matching alcoholism treatments to client heterogeneity:

Project Match posttreatment drinking outcomes. *J Stud Alcohol* 1997; 58(1), 7-29

### Author Note

Portions of this project were presented at Addictions 96 Treatment across the addictions. An international symposium, Hilton Head Island, South Carolina, September 1996. I would like to thank the participants and clinicians who freely gave their time for this project and S. Currie for critical feedback on the manuscript.

Correspondence should be sent to Dr. David C. Hodgins, Addiction Centre, Foothills Medical Centre, 1404 29 Street NW, Calgary, Alberta, Canada, T2N 7N6.

Electronic mail should be addressed to: [dhodgins@ucalgary.ca](mailto:dhodgins@ucalgary.ca)

Table I. Self – report and Clinician Measures of Stages of Change

<u>A. Self-Report Measures</u>		
<u>Measure</u>	<u>Continuous Scales</u>	<u>Categorical Staging</u>
SOCRATES	P, C, D, A, M	Highest score
RCQ	P, C, A	Refined method
Algorithm	---	Item endorsed
<u>B. Clinician Measures</u>		
Clinician RCQ	P, C, A, M	Refined method
Clinician judgment	---	Stage indicated

Notes:

RCQ = Readiness to Change Questionnaire

P = Precontemplation; C = Contemplation; D = Determination; A = Action;

M = Maintenance.

Table II. Readiness to Change Questionnaire Items: Clinician Version.

Item	Stage
1. Doesn't think he/she drinks too much.	P
2. Is trying to drink less.	A
3. Was drinking too much at one time but has managed to change.	M
4. Enjoys drinking but feels he/she drinks too much.	C
5. Sometimes thinks he/she should cut down on drinking.	C
6. Has changed his/her drinking but is looking for ways to keep from slipping back to old patterns.	M
7. Feels that it is a waste of time talking about drinking.	P
8. Has recently changed his/her drinking.	A
9. Wants to keep from going back to the drinking problem he/she had before.	M
10. Is actually doing something about his/her drinking.	A
11. Feels he/she should consider drinking less.	C
12. Feels that drinking is a problem sometimes.	C
13. Feels that there is no need for him/her to change his/her drinking.	P
14. Is changing his/her drinking habits.	A
15. Feels it would be pointless to drink less.	P
16. Sees herself/himself as an alcoholic.	M

Note. Each item was rated as 1 = Strongly disagree; 2 = Disagree; 3 = Unsure; 4 = Agree;

and 5 = Strongly agree that the patient:

P = Precontemplation; C = Contemplation; A = Action; M = Maintenance.

Table III. Pearson Correlations Between Socrates and RCQ Subscales (Continuous Measures)

RCQ	SOCRATE					
	Pre	Cont	S Deter	Action	Main	Marlowe- - Crowne
Pre	.79	-.29	-.84	-.63	-.49	-.03 <sup>T</sup>
Cont	-.61	.43	.71	.42	.37	-.02 <sup>T</sup>
Action	-.59	.17 <sup>T</sup>	.56	.82	.83	.09 <sup>T</sup>
Marlowe- Crowne	.00 <sup>T</sup>	.15 <sup>T</sup>	.01 <sup>T</sup>	.10 <sup>T</sup>	.01 <sup>T</sup>	

RCQ = Readiness to Change Questionnaire

N = 60-61

Note: all p < .05 except as indicated <sup>T</sup>

Table IV. Agreement Between Clinician Judgement and Clinician “Staging”

Clinician Staging <sup>a</sup>	Clinician Judgement					
	Pre	Cont	Deter	Action	Main	Total
Pre	5	0	0	0	1	6
Cont	1	10	4	5	1	21
Deter	0	2	3	5	0	10
Action	0	0	3	10	9	22
Main	0	0	0	1	4	5
Total	6	12	10	21	15	

<sup>a</sup> Staging based on RCQ-CV - Refined method.