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The Development of a Behavioral Measure of Type C

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Abstract

It is known that behavioral traits can lead to a weakened immune system. A scale was developed to measure Type C behavior, which are behavioral traits that may make a person more susceptible to cancer. Study 1 was a reliability study to test the developed scale using an exploratory factor analysis. Study 2 was a validation study, which is conducted to validate the structure that was found in Study 1. The items that formed in Study 1 were retained, and tested against other scales, for validation of discriminant and convergent validities.

The Development of a Behavioral Measure of Type C

"…dig a little deeper, Go a little farther, anything to please you…"

-Diamond Rio, 1994

Recent investigations have placed emphasis on the concept that psychological responses may be linked with the promotion of cancer (McKenna, Corn & Zevon, 1999), a weakened immune system and other health problems. Even popular press has taken hold on this same notion. For example, the January 1997 issue of Self Magazine reported hostile arguing may diminish a woman's immune function (McAuliffe, 1997). Interest in this topic has been growing since its inception. Type C behavior can be defined as a personality type that exhibits self-sacrificing, emotional non-expressiveness, which in turn may weaken the immune system to the point of development of cancer.

One of the first researchers to study the link between behavioral variables and health was Dr. Linda Temoshok. In a study published in 1992, entitled *The Type C connection: The Behavioral Links to Cancer and Your Health,* Dr. Temoshok focused on certain behavioral traits exhibited by cancer patients. The most common trait that has been found is self-sacrificing behavior, which can be characterized by an individual going to extreme inconvenience to please another individual. She interviewed 150 cancer patients, focusing on their behavioral traits, in order to compare them with a number of other cancer patients she had interviewed. She concluded that there are certain behavioral characteristics exhibited by cancer patients. One of the most important traits that were shown by most patients was the fact that they would do almost anything to please her, including cancel important appointments with doctors, just to talk to her. Just

as the quote above states: "… anything to please you…" these patients seemed overly concerned with the well being of others before themselves. This self-sacrificing technique was the most common trait found by Dr. Temoshok during her study at the University of California in San Francisco. Many of these patients were concerned with the approval or endorsement from whomever they met. Other traits that have been associated with Type C personality are: emotional non-expressiveness, conflict avoidance, and fear of social non-acceptance.

Previous researchers have also uncovered a link between the brain and the immune system. Psychological constructs, such as depression, stress, or other health problems have been associated with deficiencies in the immune system. Personality, however, has not been the subject of many researchers in further developing this link. It is accepted that personality has a "pervasive influence on psychological and potentially, physical well-being" (Segerstrom 2000, p. 180). In order to strengthen this link between the brain and the immune system, personality traits should be studied more.

The purpose of this study was to develop a scale to measure the behaviors that have been associated with Type C personality. A research team of 4 individuals constructed the "Type C Behavior" scale or TCB. This scale was developed with the thought in mind that three subscales would each contribute equally to the overall scale. Study 1 was conducted to test this hypothesis. After analysis, Study 2 was conducted as a validity study. We expected to see a high correlation between the scores of the TCB and the Type C behavior Questionnaire (PCTC, Spanish pronunciation) scale that Dr. López created at the Universidad de Málaga, and no correlation with The Toronto Alexithymia scale. The Marlowe-Crowne Social Desirability scale was also administered, which

should show no correlation. We also expected a negative correlation between the TCB and the Emotional Expressiveness Scale since Study 1 showed that emotional non-expressiveness was a behavior commonly shown in Type C personality people.

Study 1 – Reliability study

Method

The four group members involved with this group project generated the initial set of 36 items. After background research was conducted, a conscious attempt was made to generate items that would load on one of three factors: (1) Self-sacrificing behavior, (2) Emotional non-expressiveness, or (3) Conflict Avoidant behavior. There were twelve items created for each sub-scale, for a total of 36 items on the scale. After this data was collected, an exploratory factor analysis of the questionnaire was conducted using Statistical Package for the Social Sciences 10.1, or SPSS, to check the factor loadings. The significant loadings appear in Table 1.

Participants. One hundred forty-six undergraduate introductory psychology students at Armstrong Atlantic State University participated in the initial reliability study. These participants were given extra credit at the discretion of their instructor.

Materials and Procedure. The initial version of the TCB was given to introductory psychology students in a classroom setting. An exploratory factor analysis was then conducted to evaluate the factor loadings and to obtain an Alpha reliability coefficient for the scale total as well the individual factors.

Results

The 36-item version of the scale was submitted to an initial exploratory principle-components factor analysis with varimax rotation applied, using SPSS 10.1. This

analysis revealed that there were two factors that required retaining, according to the variance explained, which is 10%. The scree plot also indicated that there were two factors present. The items were considered to be loaded on a certain factor if a value of .40 or greater was obtained. These values can be seen in Table 1. As a result of this analysis, we decided to drop the items that did not load on either factor and double loaded items were also dropped. After all dropped items were removed another analysis was conducted and an overall alpha level was obtained for each of the two factors and for the overall scale. The alpha level for Factor 1 (Self-sacrificing behavior) was .83 and .77 for Factor 2 (emotional non expressiveness). These values appear in Table 2. The overall scale showed an acceptable alpha level of .77. According to Paul Spector, who published the book entitled *Summated Rating Scale Construction An Introduction* (1992) he states that a value of .7 or greater is acceptable. After the varimax rotation, the eigenvalues of the two factors were 3.7 and 2.5, respectively. In addition, after the final analysis the questionnaire demonstrated simple structure. After the exploratory factor analysis was conducted and interpreted, an analysis was conducted to obtain the correlations between each factor themselves, and the scale as a whole. These values can be seen in Table 3.

Discussion

It was found that the correlations were not significant between the two factors themselves, but were for each factor related to the scale as a whole. Self-sacrificing behavior and Emotional non-expressiveness may be two different behaviors, but coupled together, they work well in explaining the overall construct of Type C behavior. The significant correlations of Factor 1 and the total were significant as was Factor 2 was to the total. Conflict avoidant behavior did not significantly load as a factor. This may be

because it is not a good predictor of Type C behavior, or our items did not accurately represent the proposed factor. More research should be conducted in order to examine if conflict avoidant behavior would have loaded with the use of different items.

Study 2 – A validation study

Method

The final version of the TCB scale consisting of the 12 items that were obtained from study 1 (see Appendix for final version of the TCB) was administered along with the PCTC scale and the King and Emmons Emotional Expressiveness Scale for convergent validity, and The Toronto Alexithymia Scale and Marlowe-Crowne Social Desirability scale for discriminant validity. These tests were given in a packet that was administered in a classroom setting.

Participants. There were a total of 76 introductory psychology students attending Armstrong Atlantic State University who took part in this study. There were 15 subjects had to be dropped because of failure to complete the entire questionnaire packet. The participants were compensated with extra credit, which was determined by their instructor.

Materials and Procedure. All of the scales, including the TCB, were placed into a packet, and administered to the participants at the same time. The participants were instructed to complete the questionnaires at there own pace, and that if they so desired they could withdraw at any point.

Results

The TCB was submitted to a confirmatory factor analysis, the maximum-likelihood solution to test the hypothesized factor structure that was found in Study 1.

The factor loadings that were obtained in this study can be found in Table 1 in parenthesis. The same amounts of factors were found in Study 2 as in Study 1. The Cronbach alpha for factor 1, Self – Sacrificing behavior was .88, and .85 for Emotional Expressiveness or factor 2. These values are presented in Table 2 along with the values from study 1. A Goodness-of-fit Test was conducted to test how well the data fit the model, and the test was non-significant, which is what one would want to see. The result of the Goodness-of-fit test was, X^2 (43, N =61) = 53.1, p = .138. That means the data did not deviate significantly from the model obtained from Study 1. Since the model did not deviate from Study 1, the two-factor model has been validated.

To test discriminant validity the Toronto Alexithymia Scale and Marlowe-Crowne Social Desirability Scale was administered. The results of the correlations can be found in Table 3. The TCB did not correlate with social desirability scale, but did show a slight positive correlation with the alexithymia scale. The reason for this will be explored in the following discussion section. As for convergent validity, the King & Emmons Emotional Expression Scale and the PCTC scale were administered. There was a negative correlation between the TCB and the Emotional Expressiveness Scale. The TCB also showed a positive correlation with the PCTC.

Discussion

Study 2 was conducted in order to validate the TCB scale by the means of administering other scales to demonstrate validity. The TCB was validated on most grounds, all except one. The TCB was not expected to correlate with the Toronto Alexithymia Scale, because in previous research this scale exhibited no correlation with Type C behavior, but in this instance it did. This may be due to fact that alexithymia

behavior is such a similar construct, that the correlation was found. . More research

should be conducted to assess the relationship between these two constructs. The other

discriminant validity scale that was administered was the Marlowe-Crowne Social

Desirability Scale, and these two scales showed no correlation, which was expected. As

for Convergent validity, the PCTC scale, which highly correlated with the TCB, and the

Emotional Expressiveness, which exhibited a negative correlation, scale were

administered. The PCTC scale was originally created in Spanish; therefore, a member of

the group that was fluent in both English and Spanish performed a translation to the best

of her ability. An observation of Table 3 shows a correlation between the PCTC and the

Social Desirability scale, which may have been the result of the translation. Another

issue that could have contributed to the correlation is the difference within the cultures of

Latino speaking people and English speaking individuals. Further research should be

conducted within these two different cultures to help to determine if there is a cultural

difference that affected this study's results. The Emotional Expressiveness Scale was

administered to test convergent validity, and it showed negative correlation, which is

exactly what we predicted, because Type C individuals do not express themselves as

much as non Type C people.

The TCB may be particularly useful when attempting to study self-sacrificing

behavior and emotional non-expressiveness behavior. The TCB also measured Type C

behavioral characteristics well in this study, so it could be used when attempting to

measure that construct for further research.

Type C behavior is characterized mainly by a self-sacrificing behavior and

emotional non-expressiveness tendency.   The TCB is an attempt to measure these areas,

and is expected to correlate with other Type C measures. It offers researchers a valuable

tool when attempting to measure Type C behavior.

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Table 1

Factor Loadings for Type C Questionnaire

ITEM	Principal factor	
	Self-sacrificing behavior	Emotional non-expressiveness
1. I go out of my way, even ignoring my own needs to help others around me.	.62 (.73)	.06 (.02)
2. I do more for others than myself.	.77 (.77)	-.06 (-.04)
3. I feel it is my duty to put others needs above my own.	.83 (.83)	-.06 (-.09)
4. I feel that others needs are more important than my own	.73 (.80)	.08 (.05)
5. I feel I should focus first on my needs than on others. *	.57 (.49)	.16 (.0)
6. I've been told I am too giving.	.67 (.73)	.17 (.07)
7. I would sacrifice my needs in an attempt to help others.	.75 (.75)	.0 (-0.11)
8. I don't feel comfortable telling someone how I feel.	.22 (.57)	.75 (.02)
9. I like to tell others about my feelings.*	.04 (.83)	.81 (.05)
10. No matter how much sorrow I feel, I do not feel comfortable expressing it.	-.02 (.84)	.66 (.03)
11. When I feel overwhelmed by stress, I go to friends or family for advice.*	-.02 (.79)	.68 (.05)

Table 1 (continued)

Factor Loadings for Type C Questionnaire

ITEM	Principal factor	
	Self-sacrificing behavior	Emotional non-expressiveness
12. Throughout my life, I have been allowed to communicate my intense emotions. *	.09 (.6)	.71 (-.12)

Note: Items marked with an asterisk (*) were reverse coded for analysis. Numbers in

parentheses are factor loadings for Study 2.

Table 3

Scale Correlations

Scale	TCB	SD	EE	Alex.	PCTC	Self-Sac	Emot. Non.
TCB	1	.14	-.35**	.28*	.34**	.77**	.66**
SD	.14	1	.02	-.23	.31**	.15	.04
EE	-.35**	.02	1	-.38**	-.33*	.07	-.63**
Alex.	.28*	-.23	-.38**	1	.13	-.07	.52**
PTOC	.34**	.31*	-.33*	.13	1	.21	.28*

Note: N = 61 for all scales represented. (**) denotes that the correlation is significant at the 0.01 level (2-tailed). (*) denotes that the correlation is significant at the 0.05 level (2-tailed. Self-Sac represents Factor 1 of the TCB and Emot. Non represents factor 2 of the TCB.

Appendix

Instructions: Indicate the extent to which each of the following statements represents your usual behavior, using the following format:

          not like me   a little like me   somewhat like me   a lot like me

This is an anonymous survey so please answer honestly. Keep in mind there are no right or wrong answers.

1. I go out of my way, even ignoring my own needs to help others around me.

          not like me   a little like me   somewhat like me   a lot like me

2. I do more for others than myself.

          not like me   a little like me   somewhat like me   a lot like me

3. I feel it is my duty to put others needs above my own.

          not like me   a little like me   somewhat like me   a lot like me

4. I feel that others needs are more important than my own.

          not like me   a little like me   somewhat like me   a lot like me

5. I feel I should focus first on my needs than on others.

          not like me   a little like me   somewhat like me   a lot like me

6. I've been told I am too giving.

          not like me   a little like me   somewhat like me   a lot like me

7. I would sacrifice my needs in an attempt to help others.

          not like me   a little like me   somewhat like me   a lot like me

8. I don't feel comfortable telling someone how I feel.

       not like me   a little like me   somewhat like me   a lot like me

9. I like to tell others about my feelings.

       not like me   a little like me   somewhat like me   a lot like me

10. No matter how much sorrow I feel, I do not feel comfortable expressing it.

       not like me   a little like me   somewhat like me   a lot like me

11. When I feel overwhelmed by stress, I go to friends or family for advice.

       not like me   a little like me   somewhat like me   a lot like me

12. Throughout my life, I have been allowed to communicate my intense emotions.

       not like me   a little like me   somewhat like me   a lot like me

Last six digits of SSN _____

Male ____   Female ____

Age ____

Race/Ethnicity:
Caucasian ___ African American ___ Latino/ Hispanic___ Native American___ Other ____

Thank you for participating in this survey.