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Assessment of Emotional Intelligence Aspects in the Methods of Pfister's and Zulliger's

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Abstract

Emotional intelligence relates to the ability to adequately perceive and understand emotions and to manage them in an adaptive and constructive manner. Emotion regulation is part of the construct and is traditionally assessed by way of hypothetical stories, which are similar to self-reports. Although developed prior to the proposal of the emotional intelligence construct, projective techniques, which are considered performance instruments, also feature indicators of emotion regulation. The present study's aim was to discover which variables in Pfister's Color Pyramid Test would be associated with an indicator of cognitive emotion regulation in the Zulliger Inkblot Test. Ninety-eight people participated in the survey, 57.1% of which were women. Linear regression analysis showed that the frequencies of Pure Carpet and Bored Carpet (both negative) in the Pfister test were predictors of the Zulliger emotion-regulation formula. It is believed that aspects of emotional intelligence can also be found in projective techniques. The association between Pfister's and Zulliger's variables is discussed as an indicator of psychological health.

Keywords: Emotional intelligence, projective techniques, self-report inventories, psychological assessment.

Avaliação de Aspectos da Inteligência Emocional nas Técnicas de Pfister e Zulliger

Resumo

Inteligência emocional diz respeito à capacidade de perceber e compreender adequadamente as emoções e gerenciá-las de maneira adaptativa e construtiva. A regulação emocional faz parte do construto e é tradicionalmente avaliada por meio de histórias hipotéticas, o que se assemelham ao autorrelato. Embora desenvolvidas antes da proposta do construto inteligência emocional, as técnicas projetivas, consideradas instrumentos de desempenho, também apresentam indicadores referentes à regulação das emoções. A presente pesquisa teve como objetivo estudar quais variáveis do Teste das Pirâmides Coloridas de Pfister estariam associadas a um indicador de regulação cognitiva das emoções no Teste das Manchas de Tinta de Zulliger. Participaram 98 pessoas, sendo 57,1% do sexo feminino. Análise de regressão linear identificou que as frequências de Tapetes Puros e de Tapetes Furados (ambas negativamente) do

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Pfister foram preditoras da fórmula de regulação emocional do Zulliger. Considera-se que aspectos de inteligência emocional podem ser encontrados também em técnicas projetivas. A associação entre as variáveis do Pfister e do Zulliger são discutidos quanto à sua indicação de saúde psicológica.

Palavras-chave: Inteligência emocional, técnicas projetivas, testes de autoexpressão, avaliação psicológica.

Evaluación de Aspectos de la Inteligencia Emocional en las Técnicas de Pfister y Zulliger

Resumen

La inteligencia emocional es la capacidad de percibir y comprender adecuadamente las emociones y gestionarlos de una manera adaptativa y constructiva. La regulación emocional es parte del constructo y se evalúa tradicionalmente por historias hipotéticas, que es similar a la auto-informe. Aunque se desarrolló antes de la propuesta de la construcción de la inteligencia emocional, las técnicas proyectivas, instrumentos de desempeño, también disponen de indicadores de regulación emocional. Esta investigación tuvo como objetivo estudiar qué variables de la Prueba de Pirámides Coloridas del Pfister estarían asociadas con un indicador de regulación cognitiva de las emociones de la Prueba de Manchas de Tinta de Zulliger. Participaron 98 personas, con 57,1% mujeres. El análisis de regresión lineal mostró que la frecuencia de Tapetes Puros y Tapetes Perforados (ambos negativamente) en el Pfister fueron predictores de la fórmula de regulación emocional en Zulliger. Consideramos que aspectos de la inteligencia emocional también se pueden encontrar en las técnicas proyectivas. Se discute la asociación entre variables Pfister y Zulliger como indicadores de la salud psicológica.

Palabras clave: Inteligencia emocional, técnicas proyectivas, pruebas de auto-expresión, evaluación psicológica.

Emotional intelligence relates to the ability to identify emotional manifestations, both one's own and those of others; understand the trigger situations and potential consequences; and use such information to promote wellbeing and social development (Caruso, Salovey, Brackett, & Mayer, 2015; Mayer, Roberts, & Barsade, 2008). The construct is typically composed of four areas: emotion perception, that is, the ability to adequately recognize such manifestations; thought facilitation, which relates to the aptitude to use the emotions to better perform a task; emotion understanding, which concerns one's capacity to perceive the way in which emotions change and intermingle over time; and emotion management, which refers to the ability to engage in thoughts and actions that facilitate both conflict resolution and favor adaptation (Mayer & Salovey, 1999).

There are models that consider emotional intelligence a trait, which can be evaluated by way of self-report inventories, presenting its correlation with other personality traits (Petrides, Pita, & Kokkinaki, 2007; Woyciekoski & Hutz, 2010). On the other hand, there are models that treat emotional intelligence as a cognitive ability, which is assessed via performance tests, presenting its correlations with other types of intelligence (Caruso et al., 2015; Miguel, 2010; Zeidner, Shani-Zinovich, Matthews, & Roberts, 2005). Intellectual-performance or maximum-performance tests are typically recommended when evaluating a cognitive skill since they do not depend on the individual's adequate self-perception in relation to his/her abilities, which occurs in the case of self-reports; instead, they test the use of the skill.

Nonetheless, although tasks in the areas of perception, facilitation and comprehension can be operationalized in instruments by way of items with correct and incorrect responses (which would test the examinee's aptitude), those relat-

ing to management would be more difficult to operationalize in a test. In such cases, the traditional method has been to present stories and ask the examinee what the hypothetical character should do to best resolve the situation (Bueno, 2008; Mayer, Salovey, & Caruso, 2002). This format thus evaluates the person's knowledge as to how to resolve the conflict, which does not necessarily mean that s/he puts such knowledge into practice when facing situations requiring emotional self-regulation. In this sense, such a format is similar to a self-report, with respect to the type of result and its interpretation.

On the other hand, conducting an emotion-management assessment without using a self-report is a difficult task for a psychologist to perform, for it would involve monitoring the individual during various moments in his life, in the case of direct observation, or creating a situation in which such an aptitude would be required, such as in group dynamics. Another possibility would be to propose performance tasks that indirectly assess management skills. For example, Bueno (2013) developed an emotion regulation test similar to the Stroop test, in which the examinee has to read words and name the color in which they were printed, while emotionally positive and negative images are presented in the background as emotional distractors from the task. Although the test's factorial structure has proved to be adequate, the results still do not correspond to performance expectations, thus requiring further studies.

Considering that the ability to manage emotions is also studied outside the area of emotional intelligence, it can be argued that other instruments would be able to assess it indirectly. It is possible to find indicators along these lines in projective tests – also known as techniques of self-expression or of personality performance evaluation (Meyer & Kurtz, 2006; Miguel, 2014; Villemor-Amaral, 2008).

For example, the Rorschach and Zulliger inkblot tests include the formula "FC-CF-C" (depending on the interpretation system employed, it is also represented as FC:CF+C or (CF+C)/SumC). This formula indicates the proportion of determinants of color with a predominant form in relation to the determinants of color in which the form is not predominant or is absent. Studies have shown that a higher ratio of responses determined by color, whose form is clear and precise (represented in the formula FC-CF-C with positive values), is associated with greater modulation of emotional expression and with the cognitive filter, implying emotion regulation and less impulsiveness or reactivity in relation to dealing with situations (Berant, Mikulincer, Shaver, & Segal, 2005; Exner & Sendín, 1999; Malone et al., 2013; Meyer, Viglione, Mihura, Erard, & Erdberg, 2011; Villemor-Amaral & Primi, 2012). It is thus an indicator of maturity as to emotion regulation, demonstrating cognitive dominion of the situation.

Although Herman Rorschach was the first to call attention to the relationship between the different types of color-determined responses as an indicator of emotional control and maturity, the relationship between color reactions as correlated to emotional reactions was already a very ancient, culturally shared notion. However, it was only with the advance in neurosciences that this relationship could be demonstrated scientifically, when studies confirmed the predominance of the same areas of cerebral specialization for different modes of processing color and emotion (Levy & Trevarthen, 1981). Later, in his review of studies associating color with emotion, Bash (1984) concluded that color perception is in fact purely sensorial, in contrast to recognition of the form, structure and qualities of objects, which involves cognitive functions even more – the same occurring with the emotions.

Another projective technique that exhibits indicators related to emotion management is Pfister's Color Pyramid Test (Villemor-Amaral, 2012). The frequency of certain colors and the preference for certain form-related aspects when constructing pyramids using colored squares can indicate the level of the subject's ability to regulate her/his emotional states. In the Pfister test, the better organized the pyramid's final shape is, the higher the level of such ability; conversely, if the shape is highly disorganized, poor emotion-management is presumed.

Considering these two techniques' capacity to evaluate the subject's way of dealing with emotions, or emotion management, we began with the hypothesis that a positive form-related aspect in the Pfister test would be associated with a positive FC-CF-C formula and that accentuated disorganization in terms of the pyramids' form would be associated with a negative FC-CF-C formula. Based on such hypotheses, the present study focused on analyzing which form-related aspects in the Pfister test would be related to emotion regulation according to Zulliger's FC-CF-C formula.

Method

Participants

98 people participated in the survey, of which 56 (57.1%) were female, residents of the city of Londrina and vicinity, in the state of Paraná, Brazil. Their average age was 21.25 (*SD*=3.34), with minimum and maximum ages of 18 and 35 years, respectively. All participants were undergraduate students (with various majors, such as Psychology, Law, Biology and other fields) or high school graduates.

Instruments

Comprehensive System Zulliger Test

This test was developed by Hans Zulliger in the 1940s, based on the Rorschach test. The Comprehensive System was developed by Exner as a proposed advancement of the Rorschach test; and, in light of the benefits achieved, this system was also adapted for the Zulliger test, with studies as to standardization and validation for the Brazilian populace, which were conducted by Villemor-Amaral and Primi (2012). The test consists of interpreting inkblots. The material is made up of three cards containing inkblots: one card is black and white; another is colored; and the third is black, white and red. The cards are exhibited one at a time, while requesting the subject to describe what they look like. The answers obtained are codified based on a meticulous classification system that takes into consideration various aspects of the perceived concept and the verbalization, including the area in which the subjects place their answer; which aspects of the inkblot suggest the idea; the adequacy to the contours of the inkblot of the perceived object; the type of content; and so forth. The result of formulas and calculations made based on the frequency of these categories is interpreted, which makes the test complex from a psychometric standpoint. The combination of the results, which are grouped in various ways, provides information as to cognitive functioning, affective dynamics, self-perception, capacity for relationships, control capacity and stress tolerance, as well as several psychopathological indicators. With respect to responses determined by the inkblot's color, as aforementioned, the degree of predominance of shape in defining the perceived concept is an indicator of the subject's ability to control the expression of emotions.

Pfister Color Pyramid Test

This test was created in the 1950s by Max Pfister. It consists of requesting examinees to use small colored squares to fill in a diagram of three pyramids. The pyramids are assembled one at a time, and the examinee is provided with a set of 50 squares each of 24 hues of 10 basic colors: green, blue, red, yellow, orange, purple, brown, black, white and gray. In order to analyze the results, one takes into consideration not only the frequency [incidence rate] of the colors used, but also, and above all, the shape-related aspect that forms each pyramid; the way the subjects perform the task; the degree of consistency in their use of the colors across the three pyramids; the main combinations; and other indicators. Considerations as to the degree of organization of the colors on the pyramid diagram are of special importance, which results in form-related aspects that are more or less structured. The main information obtained from the results principally enables us to make inferences as to the subject's level of emotional maturity in social interactions, thus making it eventually possible to generate hypotheses as to the subject's intellectual capacity, given the predominance of cognitive

mechanisms when dealing with the colors, arranging them in a harmonious, organized manner while performing the task.

Data Collection Procedures

The tests were applied within the discipline of Projective Theories and Techniques, a component of the undergraduate course in Psychology of *Universidade Estadual de Londrina*, over a period of two years. The first author of this study trained the students as to how to administer the tests, a task that was conducted in pairs and supervised by the professor. The students invited the examinees to the evaluation session, which was conducted in the psychology clinic of the same university during a single meeting.

All examinees initially received an Informed Consent Form at the school-clinic. After reading it and consenting to participate, the tests began. All ethical procedures were respected.

The Zulliger test was given first, followed by the Pfister test. The way in which the tests were administered complied with instrument standardization procedures in accordance with the tests' respective manuals. Records of tests that departed from the correct procedures for administering the tests (for example, incomplete instructions) were excluded from the study.

Data Analysis Procedures

180 test-data registry forms were initially collected. After excluding forms evidencing improper test-administration procedures, only those that contained responses to color were selected. To do so, we took into account the recommendations made by the new Rorschach interpretation system (Rorschach Performance Assessment System, or R-PAS), which suggests the use of at least four color-related responses to calculate the shape-predominance formula, in order to avoid imprecise ratios (Meyer et al., 2011). However, this amount of responses is difficult to obtain in the Zulliger test, for the frequency of responses in this test tends to be much less than that of the Rorschach test. Hence, only 19 examinees produced four or more responses to color, and 42 produced three or more. In order to provide for greater score variability, we opted for the criterion of two or more responses to color, which resulted in 98 examinees.

The Zulliger test's independent variable was calculated by subtracting the values of CF and C from FC, and then dividing by the total number of responses on the test, R. Dividing by the number of responses is recommended for studies in order to avoid results that are biased due to the variability of R (Meyer et al., 2011). A linear regression analysis was conducted using the *enter* method, seeking to predict the Zulliger test score [(FC-CF-C)/R] by way of numerical variables from the Pfister test.

We selected the Pfister test's form-related aspects that, according to its manual (Villemor-Amaral, 2012), were specifically related to emotional control or lack of control due to adequate or inadequate use of thought, namely, Pure Carpet, Bored Carpet, Starting Order Carpet, Layer Formation and Symmetrical Structure. In the case of Layer Formation, the three subtypes (one-shade, one-color and multicolor) share the same interpretation in the sense of insufficient maturity to regulate emotions; accordingly, the total frequency of this aspect was considered.

The Pfister test also exhibits the frequency (rate of recurrence) of colors as numerical variables; however, they were not used in this study because their interpretation is nonlinear. This means that extreme numerical values, indicating excessive or insufficient color use on the test, can reflect negative aspects. For example, the color green is considered an indicator of one's capacity for insight and empathy, as long as it appears within normal limits, which denotes good interpersonal relationships. Although a low incidence of this color indicates a decrease in such abilities, a high prevalence of green would not receive a positive interpretation; rather, it would indicate excessive stimulation that overburdens the individual and leads to emotional instability.

In order to analyze the statistical effect, we employed the following standard: amounts below 0.20 were considered weak; between 0.20 and 0.40, moderate; and above 0.40, strong (Cohen, 1992; Hemphill, 2003).

Results

The statistics that describe the studied variables are presented in Table 1. One observes that the greatest frequency was that of the Layer Formation aspect, while the carpets and the structure exhibited less frequency. These distributions were quite similar to those related in the standardization surveys of the Pfister test (Villemor-Amaral, 2012).

Table 1
Descriptive Statistics of the Studied Variables

Variable	Mean	*SD*	Minimum	Maximum
(FC-CF-C)/R	-.01	.25	-.67	.50
Pure Carpet	.10	.31	0	1
Bored Carpet	.07	.33	0	2
Starting Order Carpet	.28	.55	0	3
Layer Formations (total)	.94	1.04	0	3
Symmetrical Structure	.19	.46	0	2

The formula generated by the linear regression analysis can be found in Table 2. The result pinpointed two form-related aspects of the Pfsiter test as performance predictors in the Zulliger test with respect to cognitive regulation of the emotions, namely the amounts of Pure Carpet and Bored Carpet, both negative. The R^2 index of this model was 0.15. Next, we implemented a linear regression model with only the two variables, which can also be found in Table 2. R^2 was 0.12.

In order to verify collinearity, the variables used in the regression were correlated among themselves. The results are presented in the lower part of Table 2. A significant correlation was found between the amount of Carpet with Starting Order and the total amount of Layer Formation, although the magnitude of this correlation was not high. In fact, upon performing the linear regression a second time, and excluding the Layer Formation variable, there was no significant alteration in the results.

Discussion

By way of the regression analysis, one observes that two form-related aspects of the Pfister test presented a significant connection with the Zulliger test's cognitive emotion-regulation formula: the frequency of Pure Carpet and the frequency of Bored Carpet. The amounts were negative in both cases, indicating that the greater the frequency of these form-related aspects, the lower the regulation capacity according to the Zulliger test.

The association with Pure Carpet is expected because this form-related aspect is indicative of a lower degree of emotional and cognitive development (Villemor-Amaral, 2012). On the other hand, this aspect is also observed in people that exhibit a more harmonious emotional existence, despite their immaturity. In this sense, the association with the (FC-CF-C)/R formula in the Zulliger test seems to indicate a connection with immature cognitive capabilities.

In addition to Pure Carpet, the regression analysis indicated less incidence of the Bored Carpet aspect as a predictor of higher (FC-CF-C)/R in the Zulliger test. According to the Pfister test manual (Villemor-Amaral, 2012), Bored Carpet aspects indicate thought dissociations or disturbances, and they are usually produced to a greater extent by schizophrenic patients, although not exclusively. Such patients typically

Table 2
Linear Regression with Pfister's Variable Predicting Zulliger's (FC-CF-C)/R and Correlations between the Variables

Regressions					
Models and Variables	Beta	*B*	CI (95%)	*t*	*p*
Model 1 (all variables)					
Constant		.02	-.07 to .11	.48	.631
Pure Carpet	-.26	-.22	-.38 to -.06	-2.66	.009
Bored carpet	-.23	-.17	-.32 to -.02	-2.31	.023
Starting Order Carpet	-.04	-.02	-.11 to .07	-.40	.689
Layer Formations (total)	.07	.02	-.03 to .07	0.70	.489
Symmetrical Structure	-.12	-.07	-.18 to .04	-1.20	.235
Model 2 (final)					
Constant		.02	-.03 to .07	.79	.430
Pure Carpet	-.26	-.22	-.38 to -.06	-2.69	.008
Bored Carpet	-.22	-.17	-.32 to -.03	-2.32	.023
Correlations					
	1	2	3	4	5
1. Pure Carpet					
2. Bored Carpet	.03				
3. Starting Order Carpet	.07	.00			
4. Layer Formations (total)	-.14	-.11	-.28**		
5. Symmetrical Structure	-.14	-.09	-.08	-.19	

**$p<.01$.

exhibit deficiencies in the use of cognitive strategies to manage emotions (O'Driscoll, Laing, & Mason, 2014; Strauss et al., 2013), indicating coherence with the results obtained, including the association with Pure Carpet.

One must take into account that the magnitude of the effects was moderate to low (-0.26 for Pure Carpet and -0.23 for Bored Carpet), which indicates that the constructs evaluated by the Pfister variables exhibit a slight relation to the Zulliger formula, yet insufficient to affirm that they deal with the exact same thing. To affirm this, a greater effect magnitude would be necessary. It is thus not possible to assert that the occurrences of Pure Carpet and Bored Carpet measure emotion regulation in the same way that the (FC-CF-C)/R formula of the Zulliger test does. In fact, the numerical value of R^2 in the linear regression of the final model indicates a mere 12% variance shared between the Zulliger test and the aspects of the Pfister test, reinforcing that the explicative power of the result of one test by the other is relatively low and that one should thus not consider that both evaluate the same construct. Nonetheless, the significant connection between the two form-related aspects suggests that these three variables refer to related aspects of one psychological process. Accordingly, it is possible that the variables of the test share part of the same construct – emotion regulation.

Moreover, the other form-related aspects that used to be part of the hypotheses (Carpet

with Starting Order, Layer Formation, Symmetrical Structure) did not exhibit a significant connection with the Zulliger formula, demonstrating slight or insignificant effects. This result does not exclude the possibility that such form-related aspects evaluate emotion-regulation aptitude; however, the psychological process employed in these aspects proved to be very slightly related or even unrelated to cognitive control according to the Zulliger test.

In light of the results presented, one perceives coherence in the connection between the variables, in the sense that a lower frequency of pyramids with Pure Carpet and Bored Carpet aspects is slightly associated with the balanced (FC-CF-C)/R formula in the Zulliger test, an indication of greater cognitive control of the emotions. In this manner, it is possible to verify that this aspect of emotional intelligence in particular – cognitive regulation of the emotions – can be present in both of the techniques studied since there is a correlation between the indicators of both, although, as seen above, the two techniques evaluate the construct in ways that are hardly similar, yet related. Therefore, it is believed that these instruments can contribute to the evaluation also from this perspective, even though they were not originally developed specifically to evaluate the emotional intelligence construct, which was defined subsequent to the creation of the two techniques. This occurs naturally, since the use of cognitive functions to regulate the emotions was already being studied in psychological evaluations as emotion regulation, even before the proposal of emotional intelligence.

As discussed earlier, one should view these low-to-moderate associations as hypotheses of interpretation when using such instruments. Furthermore, one must not lose sight of the context of each examinee's test-data record in its entirety because excesses can denote imbalance instead of greater ability. In the case of FC, difficulty of emotional adaptation would arise through an excess of rationality that would impede emotional expression that is more spontaneous, thus affecting the quality of the relationships. Additionally, as is common in projective tests, the variables should also be interpreted in relation to other variables of the test itself, as well as external indicators, other tests and the subject's personal history (Campos, 2013; Fensterseifer & Werlang, 2008). Along these lines, it is suggested that further studies continue to verify aspects grouped under the name of emotional intelligence in other variables of the instruments, such as the Zulliger EA-es code, which relates to the adequate use of resources and strategies for dealing with stress (Villemor-Amaral & Primi, 2012), or the frequencies (rates of recurrence) of colors on the Pfister test, which can demonstrate various levels of the ability to use and control emotions. More specifically as a proposal for future studies, the relationship between Layer Formation and Starting Order Carpet could be investigated, for in the present sample there was a significant correlation between these two form-related aspects. Although this correlation is of a medium-to-low magnitude, the result suggests a slight overlapping in the evaluation, and there is a possibility that they both measure related psychological characteristics.

One of the conceivable limitations of the present study is the small size of the sample, which was occasioned by the overall low incidence of responses to color. It would be important to conduct investigations aimed at obtaining a minimum number of Zulliger test responses that would guarantee the improved psychometric quality of several results, as was proposed by the R-PAS (Meyer et al., 2011). Doing so would also make it possible to enlarge the sample in order to obtain results that are more generalizable.

It is also important to emphasize that, with respect to the sample studied, there was an uncommon frequency of the use of the color black on the Pfister test, when compared to the norms. Although colors were not used in the regression analysis, it is possible that their high rate of recurrence reveals specific psychological aspects in the present sample. Furthermore, most of the participants had a high school diploma or higher, which would thus require expanding the study to include other educational levels.

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