

## **THE PORTUGUESE VERSION OF THE ADOLESCENTS' FORM OF THE DEFENSE MECHANISMS INVENTORY (\*)**

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### **ABSTRACT**

Defence mechanisms constitute an important concept at the domains of psychoanalysis and personality psychology with important consequences spreading at the fields of psychotherapy, psychopathology and psychological development. A short résumé is presented about the psychoanalytical theory of defence mechanisms, empirical research with defence mechanisms as also about the use of defence mechanisms in psychological investigation about adolescence; also some examples of research in adolescence psychology using the Defense Mechanisms Inventory (DMI) are presented. In order to present this instrument, we start by the description of its characteristics. Finally, we present data of the Portuguese version of the DMI adolescents' form, resulting from application at schools of Lisbon area in a sample of adolescents of both sexes with ages ranging between 13 and 19 years. Results from principal components analysis, internal consistency and descriptive statistics are displayed.

### **INTRODUCTION**

Defence mechanisms belong to the world of psychodynamic concepts. Originally proposed by Sigmund Freud to explain the functioning of mental disturbances, in short time defence mechanisms took a first order place in the global explanation of dynamic psychopathology. Due to the development of psychometrics defence mechanisms were submitted to empirical research at a wide number of psychological research fields. During the last decades of the twentieth century, the systematic research about these mechanisms also overlapped the field of adolescence. One of the instruments that most contributed to the psychological investigation of defensive organization during ado-

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lescence is the Defense Mechanisms Inventory created by Gleser and Ihlevich (1969) which includes, along with versions for adults and elderly, one version for adolescents. The adolescents' version of the DMI was translated and adapted for Portuguese language, and after it was used in a sample of Portuguese adolescents in order to obtain information about its psychometric properties. The results of this adaptation will be displayed after a short introduction about the psychoanalytical theory of defence mechanisms, as also about the use of this concept in psychological research in general and specifically in psychological investigation about adolescence.

## **THE PSYCHOANALYTICAL THEORY OF DEFENCE MECHANISMS**

The existence of mental mechanisms dedicated to the psychological protection of human beings was described several times by Freud during the course of his scientific work (1894, 1908, 1911, 1915, 1917, 1920, 1923-a, 1923-b, 1926). At the end of this elaboration there are ten most important examples of these mechanisms: regression, repression, reactive formation, isolation, undoing, projection, introjection, turning against the self, reversal and sublimation (Anna Freud, 1946). According to the theoretical description, defence mechanisms have the following characteristics: a) its nature is psychological, b) they are acquired and built during the life of the human individual, c) they operate unconsciously and d) they protect the individual from intra-psychic conflicts. Still within this vision these mechanisms are built and organized by the Ego. At the development of the psychoanalytical theory several authors proposed the existence of different mechanisms among which we should mention: a) altruism, identification to the aggressor and intellectualization (Anna Freud, 1946) and b) projective identification, splitting of the object and idealization (Melanie Klein, 1946). Melanie Klein also stated that some defence mechanisms (introjection and projection) are active since the beginning of human life. In addition to the contributions of very important authors like Otto Fenichel (1945), R. Greenson (1967), or R. Schafer (1968), we should underline George Vaillant's alternative (1971, 1976, 1983), which ranks defence mechanisms in three levels: immature defences (projection, fantasy, hypochondria, passive-aggressive behaviour, dissociation and acting out; intermediate defences (repression, displacement, reactive formation and intellectualization) and mature defences (altruism, humour, suppression, anticipation and sublimation).

For the psychodynamic investigators it is consensual to consider that defence mechanisms perform a very important and specific role in psychopathological functioning. More than to illustrate the distinction between neurotic functioning (where usually we observe the performance of displacement, repression and formative reaction) and psychotic functioning (where usually we observe the performance of splitting, projection and projective identification), it is argued that it is the relationship among defences that constitutes the clinical specificity of mental illness.

The concepts of defence and coping were notably articulated by Norma Haan (1965), establishing a very fruitful combination of these two kinds of mental mechanisms in order to achieve a deeper understanding of the human mind.

## **EMPIRICAL RESEARCH WITH DEFENCE MECHANISMS**

With the emerging field of personality psychological research produced objective instruments sensitive to defensive functioning and so it became possible to investigate about defences with empirical bases. Particularly fruitful results have stimulated researchers from the most varied fields to explore the associations between these mechanisms and personality variables, its influences in many sectors of human life without mentioning the inevitable investigation in clinical psychology.

Psychopathology: a) intropunitive defence mechanisms are associated with MMPI depressive profiles (Ihilevich & Gleser, 1991); b) borderline patients may be discriminated from schizophrenic patients because of a more pronounced use of mechanisms like splitting, primitive devaluation, idealization, negation and projective identification (Lerner and Lerner, 1980, 1982; Lerner et al., 1981); c) using the Defence Mechanisms Test, Sundbom, Kullgren and Armelius (1989) arrive to the same conclusion; d) defence mechanisms evaluation can be used correctly to classify subjects scoring in clinical levels of anxiety and depression (Olson, 2010); e) immature defences are possibly working as mediator variables between sexual and or physical abuse, on one side, and the extent of psychological distress or somatization in adulthood, on the other side (Nickel, 2006); f) alexithymia is related to immature defence styles (Helmes et al., 2008) and g) turning against self is significantly associated with depression (Campos, Besser & Blatt, 2011).

Personnel selection. In professional settings that generate high stress levels (fighter pilots, paratroopers, navy divers) defence mechanisms are good predictors of individuals that will show psychological vulnerabilities (Kragh, 1960; Neuman, 1967 and 1978; Termoelen & Johansen, 1980; Vaernes, 1982; Vaernes et al., 1987 and 1988).

Perceptive styles: a) subjects characterized by field-dependence use defence mechanisms of repressive kind or mechanisms that involve the reversal of hostility against the self and b) individuals characterized by field-independence use defences that allow the external expression of hostility and defences that favour the intellectualization of frustrating situations (Witkin, 1965; Witkin et al. 1968; Witkin & Goodenough, 1977, Bogo, Winget & Gleser, 1970; Ihilevich & Gleser, 1971; Erickson et al., 1976).

Brain dominance: a) subjects with right hemisphere brain dominance prefer mechanisms like negation, reactive formation and repression while b) subjects with left hemisphere brain dominance prefer mechanisms that turn aggression against the frustrating object or mechanisms that project aggression upon it (Gur & Gur 1975).

Traffic accidents. Mechanisms like regression, projection and repression enable the prediction of subjects that will relapse on driving under the influence of alcohol (Saitner, 1991).

Health. Defence mechanisms: a) are associated with survival after a heart stroke (Peglar & Borgen, 1984); b) are associated with high blood pressure (Belfrage, 1978; Minsky, 1978); c) are important in illnesses like asthma (Steiner et al., 1987); d) are associated with some addictive behaviours (O'Leary et al., 1975-a, 1975-b; Sugerman et al., 1975; Donovan et al., 1977); e) are important for the understanding of menstrual and pre-menstrual discomfort (Heilbrun & Renert, 1988); f) under the form of cognitive defence relate negatively to anxiety and under the form of defensive hostility relate negatively to social provisions in women waiting for breast biopsy results (Dragaset & Lindstrom, 2003); g) under the form of cognitive defence were negatively related to educational level in a sample of women with suspicion of breast cancer (Dragaset & Lindstrom, 2005); h) belonging to TAO and REV categories are able to discriminate between patients in haemodialysis and healthy subjects assigned to a control group (Zoccalli et al., 2006); i) under TAO, PRO, TAS and REV categories are able to discriminate between obese patients and normal-weight subjects in a control group (Zoccalli et al., 2008) and j) are associated with burnout among health workers (Ragio & Ercolani, 2009).

Abuse behaviour in dating relationships. In a sample of college students it could be observed that men characterized by the combination of narcissistic entitlement defences with attachment avoidance and stressful problems reported more dominance of female partners, while women characterized by the use of other-splitting defences reported more dominance of male partners (Gormley & Lopez, 2010).

## **DEFENCE MECHANISMS IN PSYCHOLOGICAL INVESTIGATION ABOUT ADOLESCENCE**

Psychological research about adolescence has pointed out some very important contributions related to defence mechanisms performance at this stage of the life cycle.

Defence mechanisms and social mobility: Snarey and Vaillant (1985) used the two generations longitudinal sample gathered by Glueck and Glueck (Glueck, 1966; Glueck & Glueck, 1950 e 1968). Adding to this sample the data of a third generation, they tried to relate defence mechanisms with ascending social mobility observed along these three generations. In short, we are speaking about a data set that took nearly four decades to be recollected. From this data it is possible to conclude that, in addition to the role played by variables like IQ, educational level, mother's occupational level and ego strength during childhood, defence mechanisms (e.g., intellectualization, dissociation, sublimation and anticipation) also contribute to explain how children from lower social classes are able to progress socially.

Defence mechanisms and psychopathology. Noam and Recklitis (1990), working with a sample of adolescents of both sexes while staying at a psychiatric hospital for assessment and treatment, coupled defences evaluation with psychiatric symptoms evaluation according to Achenbach and Edelbrock (1983, 1987). This option divides the psychological and behavioural problematics of adolescents in two different types: internalizing and externalizing. It was concluded that externalizing symptoms is statistically associated with defences that "place" the psychic conflict outside of the individual (TAO and PRO), while interiorizing symptoms is statistically associated with defences that "place" the psychic conflict inside the individual (TAS). Adolescents at psychotherapeutic consultation were found to have a prevalence of immature defences, even when their global functioning pointed to a slight or moderate degree of disorder (Finicelli, Colombo & Tomasoni, 2003). Among adolescent psychiatric patients, defences that placed conflict sources outside the self were related with higher levels of self-reported aggression while assault incidents taking place at the hospital were related to a lack of cognitive based defences (Recklitis & Noam, 2004). Chabrol and Leichsenring (2006) found strong associations between primitive defence mechanisms and psychopathic traits of callousness and impulsivity. Among adolescent patients admitted for psychiatric treatment, those with obsessive-compulsive disorder showed to use regression, reaction formation and undoing more frequently than adolescents in other psychiatric groups (Shoval, Zalsman, Sher, Apter & Weizman, 2006).

Defence mechanisms and eating disorders. Female adolescents affected by partial anorexia nervosa or bulimia nervosa are prone to use more immature defences and more neurotic defences than adolescents without eating disorder (Stein, Bronstein & Weizman, 2003).

Defence mechanisms and behaviour problems. Projection seems to be a good predictor of aggression and denial is a potential protective resource against suicide attempts among adolescents at risk (Wiebe, 2008). Adolescents with conduct disorder are prone to use immature defences like denial while adolescents selected by adjustment reaction are prone to use mature defences like identification (Cramer, 2004). Comparing adolescents with conduct disorders, patients with borderline personality disorder and prisoners with antisocial personality disorder, La Grutta et al. (2006) found that defensive strategies differed among groups.

Defence mechanisms and psychological development. Phebe Cramer (1987) tested the hypothesis that defence mechanisms emerge and develop in different moments of human development. Using four samples with different ages (G1- M = 5 years and 8 months; G2- M = 9 years and 10 months; G3- M = 14 years and 6 months; G4- M = 16 years) and a TAT specific scoring system for detection of some defence mechanisms, it was concluded that: in G1, negation and projection are used in much higher frequency than identification; in G2 and in G3, projection and identification are used much more frequently than negation and, finally, in G4 identification is used much more fre-

quently than projection, and in addition it could be observed that projection was used much more frequently than negation. Working with adolescents' responses to the TAT, Porcerelli, Thomas, Hibbard and Cogan (1998) observed that denial and projection decreases with educational grade, and the opposite happens with identification. Using the Comprehensive Assessment of Defense Style, Laor, Wolmer and Cicchetti (2001) found that, while compared to children, adolescents tend to use more mature defences and fewer other-oriented defences. This conclusion was recently reinforced by Ye, Ling and Xiong (2010).

Defence mechanisms and sexual identity. Comparing adolescents from both sexes, Phebe Cramer (1979) reached the conclusion that they can be differentiated by preferences for some defence mechanisms, according to Erikson's hypothesis (1964) which states that male individuals tend to externalize their reaction to intrapsychic conflict while female individuals tend to internalize. Male subjects got results significantly higher at TAO (mechanisms that direct the aggressive impulse against the frustrating object) and PRO scales (mechanisms that project aggression upon the frustrating object) when compared with the results of the female sample that more frequently choose mechanisms represented by scales PRN (mechanisms that separate content from affect, allowing the repression of the last one) and TAS (mechanisms which direct the aggressive impulse against the self). At 1984, Frank, McLaughlin and Crusco studied the relation between sexual attributes and defensive styles among university students (mostly adolescents). Results allowed the observation that defensive styles strongly differentiate between male and female youngsters. These results are very similar with those obtained by Cramer and Carter at 1978. Laor, Wolmer and Cicchetti (2001), using the Comprehensive Assessment of Defense Style, found that girls tended to use more mature defences as well as less other-oriented defences than boys. Similar conclusions were recently achieved by Ye, Ling and Xiong (2010). Psychosexual fixations seem to be related with defence mechanisms, especially sadism which is significantly associated with reversal of the affect and phallic fixation which is significantly associated with projection (Mogami, 2010).

Defence mechanisms and psychotherapy. Cramer and Blatt (1990), working with a sample of patients at hospital for intensive psychotherapeutic treatment (ages ranging from 18 to 29 years old;  $M = 21$ ) used TAT in order to assess subjects defensive functioning, before and after fifteen months of treatment. This way it could be seen that at the second moment there was a significant decrease in the use of defences assessed by Cramer's method (negation, projection and identification). This change at defensive functioning was significantly correlated with an important diminishing of psychiatric symptoms. Also in 1990, Kachman and Mazer used the DMI to prove the efficacy of the "Rational Emotive Education" (ERE) as a program of mental health prevention for adolescents. Applying the DMI before and after the ERE program, they observed that after the intervention subjects could be differentiated from the control group in four scales of defence mechanisms (TAO, PRN, TAS and REV). These differences suggest that ERE may induce a much healthier and mature use of the ego defensive abilities. Geiser et al. (2005) data showed that: at the beginning of therapy the level of turning against self is high, during the clinical process this level tends to decrease and this decrease is related to an important symptoms decrease.

Narrative performance and defensiveness. According to Nelson, Bein, Huemer, Ryst and Steiner (2009) there is a negative association between narrative immersion (the degree to which the past is retold in chronological sequence) and proneness to avoid negative affects in the form of defensive avoidance.

Homophobia during adolescence. Lewis and White (2009) concluded that idealisation, denial, somatisation and devaluation were the best predictors amongst defence styles for the discrimination between homophobic and non-homophobic adolescent males, lending strong support to the idea that immature defences play an important role at the origin of that problem.

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Defence mechanisms and addiction. In adolescents studied according to substance use, defensiveness presented a very important association with poorer school credits as well as with legal and discipline troubles for defensive males (James, Lonczack & Moore, 1996).

Defence mechanisms and cross-cultural differences. James Martin (1977), comparing white and Indian adolescents, observed that there are at least two kinds of defensive preferences that can discriminate between the two samples: while the white adolescents choose more frequently mechanisms that deal with conflict directing the aggressive impulse against the relational object (TAO), Indian adolescents choose more frequently mechanisms that deal with conflict generating positive or neutral responses (REV). Banks and Juni (1991) working with a sample of African-American and Hispanic youths found an important trend for these subjects towards the internalizing polarity of the composite measure of the DMI.

### **THE “DEFENSE MECHANISMS INVENTORY“ (GLESER AND IHILEVICH, 1969)**

According to its designation, the DMI is an inventory dedicated to obtain a profile of the defensive preferences of the human individual. This test comprises ten stories about someone who is submitted to frustrating experiences. These ten stories are related to five fundamental areas of relational life: authority, independence, competition, masculinity/femininity and situational. About each one of the stories, four questions are made, in order to obtain information on behaviour, fantasy, thought and affection that the subject would experience in case he would be living the stories by him-self. For each one of the four questions, five answers are proposed. Those five answers are related to five scales of defence mechanisms:

TAO (turning against object) - mechanisms that deal with conflict directing aggression towards the frustrating relational object;

PRO (projection) - mechanisms that “place” aggression on the object attributing him negative, threatening or persecutory characteristics;

PRN (principlization) - mechanisms that deal with conflict separating content from affection, repressing the former;

TAS (turning against self) - mechanisms that deal with conflict directing aggression against the self;

REV (reversal) - mechanisms that deal with conflict creating positive or neutral answers while facing frustrating situations.

Facing this group of five answers, the subject must choose which answer he considers to be most close of his personal way of reacting, and at the same time he must choose the answer he considers to be most distant of his way of reacting under similar circumstances. At the moment that the psychologist scores the protocol sheet, answers signed as most close will be scored two points, answers signed as most distant will be scored zero points and answers not signed will be scored one point. Proceeding this way, the five scales of defence mechanisms have a possible minimum of zero points and a possible maximum of eighty points. Taken together these scales allow us to obtain a “defensive profile” and its use can be relevant for clinicians as well as for researchers.

The validity of this test has been studied at numerous investigations. According to Ihilevich and Gleser (1986), these studies obtained favourable results about reliability, stability of results through time as well as about the relation of items with the theoretical constructs. More than that, in the field of clinical intervention, DMI profiles have been studied together with other psychometric instruments (MMPI and 16-PF), presenting results that are consistent with the theory that underlies its creation as well as consistent with the results of the other tests (Ihilevich & Gleser, 1991).

An extensive review of the DMI and of research made with it was published in 1988 by Phebe Cramer who concluded that scales used in this instrument are meaningfully related to variables such as cognitive, personality, pathological and demographic ones.

## THE PORTUGUESE ADAPTATION OF THE DMI ADOLESCENTS' VERSION

After the translation of the adolescents' version of the DMI from its original form into Portuguese language, and its subsequent retroversion into English, minimal differences were found and definitive versions were established with few adaptations due to cultural issues, for both the male and the female sex. These versions were applied to students at schools of Lisbon and surrounding municipalities in order to get a sample of adolescents with ages between thirteen and nineteen years old of both sexes: Alenquer (n = 48, 5.6%); Almeirim (n = 3, 0.4%); Amadora (n = 13, 1.5%); Lisboa (n = 315, 36.7%); Loures (n = 124, 14.4%); Mafra (n = 2, 0.2%); Oeiras (n = 18, 2.1%); Santarém (n = 23, 2.7%); Sintra (n = 80, 9.3%); Sobral do Monte Agraço (n = 98, 11.4%), Vila Franca de Xira (n = 135, 15.7%). At the beginning of the application subjects were inquired about some socio-demographic data (sex, birth date, father's occupation, mother's occupation, place of residence, family at home, education, school, etc.). This way, about sex, we have 442 female subjects and 416 male subjects. In both groups, ages ranged from 13 to 19 years old. In total, our sample comprises 858 adolescents. In what respects to parents' occupation, we can observe that all professional groups of the "Classificação Nacional das Profissões" (IEFP, 2001) are represented. More than that, when compared with the distribution of professional groups at Lisbon District (INE, 2002) we may assume that this sample is not affected by a systematic bias. Nevertheless, among our subjects' mothers, groups 1 and 3 are underrepresented while groups 4, 7, 8 and 9 are overrepresented. Among our subjects' fathers, group 5 is underrepresented but all other groups seem to be represented according to the population distribution.

According to the authors of the DMI (Ihlevich & Gleser, 1986: pp. 53-55) the ipsative format of this instrument induces the subject to a choice where there are only four degrees of freedom. In the principal components analyses performed with an unrotated matrix they found two most important components that explain 77% and 80% of the total variance for male and female subjects, respectively: a) one bipolar component with which TAO and PRO correlate negatively while PRN and REV correlate positively; b) a second component with which TAS correlates negatively. Using a rotated matrix, the authors found four components which explain nearly 100% of the total variance for both male and female subjects: a) a bipolar component with which TAO correlates negatively and REV correlates positively; b) a second component with which TAS correlates positively; c) a third component with which PRO correlates positively and d) a fourth component with which PRN correlates positively.

As can be seen in Table 1, before rotation, principal components analyses of male and female adolescents' data in our sample shows results very similar to those reported by the authors.

TABLE 1: Principal components analyses (unrotated matrix)

Subjects Compon.	Male Adolescents				Female Adolescents			
	1	2	3	4	1	2	3	4
TAO	-.895	.035	-.236	-.377	-.904	-.022	-.045	-.424
PRO	-.780	-.221	.308	.498	-.816	-.135	.092	.554
PRN	.686	-.448	.515	-.252	.685	-.440	.578	-.055
TAS	.318	.912	.254	.054	.380	.906	.172	.069
REV	.816	-.152	-.497	.254	.822	-.211	-.520	.097
% of var.	52.905	22.092	14.539	10.417	55.474	21.554	12.898	10.067

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Also in Table 2, principal components analyses of male and female adolescents' data after rotation produces results very near to the original ones reported by the authors.

TABLE 2: Principal components analyses (varimax rotation)

Subjects	Male Adolescents				Female Adolescents			
	1	2	3	4	1	2	3	4
TAO	-.748	-.577	-.325	.036	-.790	-.489	-.365	.063
PRO	-.286	-.204	-.203	.914	-.306	-.249	-.228	.890
PRN	.157	.965	-.078	-.194	.194	.955	-.058	-.216
TAS	.035	-.032	.987	-.154	.059	-.034	.984	-.163
REV	.907	.084	-.084	-.404	.910	.086	-.079	-.399
% of var.	29.777	26.279	22.669	21.228	31.715	24.436	23.272	20.569

In short, before rotation we have mainly two components that explain 74.997% of variance in male data, and 77.028% of variance in female data. In both sexes, the first component integrates TAO and PRO with negative correlations and PRN and REV with positive correlations, while the second component integrates TAS. After varimax rotation the first component only integrates TAO and REV, the second component integrates PRN, a third component integrates TAS and the final component integrates PRO.

In Table 3, means, standard deviations, as well as minimum and maximum values are displayed for the five scales of DMI for both male and female adolescents.

TABLE 3. Ms, SDs, mins. and maxs. for male and female adolescents in DMI scales.

Sex	Male Adolescents				Female Adolescents			
	M	SD	Min.	Max.	M	SD	Min.	Max.
TAO	39.37	9.27	15.00	66.00	37.43	10.04	9.00	65.00
PRO	40.94	5.54	24.00	57.00	38.92	5.99	24.00	55.00
PRN	46.29	6.17	32.00	61.00	48.23	6.11	32.00	66.00
TAS	35.34	5.39	13.00	52.00	36.57	6.17	18.00	56.00
REV	38.12	8.13	9.00	64.00	38.90	9.04	10.00	66.00

Multiple analysis of variance shows that differences between male and female adolescents for the five scales of the DMI are significant ( $F = 8.171$ ,  $p < .000$ ). Looking for differences scale by scale we can find significant differences for all scales except for one: a) TAO ( $F = 8.675$ ,  $p < .003$ ); b) PRO ( $F = 25.013$ ,  $p < .000$ ); c) PRN ( $F = 20.698$ ,  $p < .000$ ); d) TAS ( $F = 9.787$ ,  $p < .002$ ) and e) REV ( $F = 1.615$ ,  $p < .204$ ). These results allow to say that male adolescents are prone to use TAO and PRO defences while female adolescents are prone to use PRN and TAS defences.

In Table 4, descriptive statistics are displayed for the five DMI scales for the male sex, according to subjects' age.



TABLE 4. Ms and SDs of DMI scales for the male sex, according to age (yo = years old).

DMIScales	TAO		PRO		PRN		TAS		REV	
	M	SD	M	SD	M	SD	M	SD	M	SD
13 yo	39.70	10.9	40.92	6.3	45.08	6.0	36.00	5.4	38.30	10.3
14 yo	41.73	9.0	41.73	4.3	43.23	5.9	34.95	4.6	38.36	7.5
15 yo	40.30	9.9	41.37	4.9	44.42	4.9	35.64	5.4	38.27	8.1
16 yo	39.55	9.2	40.36	6.0	46.27	6.1	35.57	6.0	38.25	9.8
17 yo	40.78	8.7	40.50	5.5	46.64	6.0	35.38	5.8	36.71	7.3
18 yo	37.44	8.7	41.40	5.9	48.22	6.3	35.21	5.5	37.75	7.1
19 yo	36.15	7.9	39.72	5.7	49.74	6.0	35.10	5.1	39.30	7.4

In Table 5, descriptive statistics are displayed for the five DMI scales for the female sex, according to subjects' age.

TABLE 5. Ms and SDs of DMI scales for female sex, according to age (yo = years old).

DMIScales	TAO		PRO		PRN		TAS		REV	
	M	SD	M	SD	M	SD	M	SD	M	SD
13 yo	38.52	10.1	39.94	6.2	47.13	5.9	34.76	6.1	39.65	9.8
14 yo	36.26	11.1	39.49	6.1	46.41	6.5	37.64	5.8	40.20	9.4
15 yo	39.07	10.3	38.88	6.4	48.41	6.5	35.71	6.0	37.93	8.6
16 yo	37.64	9.5	38.81	6.2	48.30	5.9	37.24	6.0	38.00	9.0
17 yo	39.11	10.9	38.67	6.1	48.40	6.7	36.28	6.5	37.54	9.0
18 yo	37.43	8.7	38.95	4.7	49.08	5.4	37.20	7.4	37.35	7.6
19 yo	33.78	8.4	37.66	5.7	50.40	5.0	37.07	5.1	41.10	8.3

At Table 6, correlations between DMI scales are displayed for both male and female subjects.

Table 6. Correlation coefficients between DMI scales for male and female subjects.

DMIScales	Male subjects					Female subjects				
	TAO	PRO	PRN	TAS	REV	TAO	PRO	PRN	TAS	REV
TAO	1	.429*	-.655*	-.333*	-.713*	1	.502*	-.612*	-.400*	-.755*
PRO		1	-.403*	-.342*	-.628*		1	-.479*	-.379*	-.638*
PRN			1	-.073	.308*			1	-.042	.352*
TAS				1	.009				1	.038
REV					1					1

(\*) Correlation is significant at the .01 level (two-tailed).

TAO and PRO always correlate positively and significantly one with the other while their correlations with the other scales are negative at a significant level. PRN and REV also correlate signifi-

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cantly in a positive sense. Finally, TAS presents negative significant correlations with TAO and PRO but its correlations with PRN and REV are never significant.

Internal consistency of the DMI scales is far better for TAO ( $\alpha = .821$ ) and REV ( $\alpha = .807$ ) than for PRO ( $\alpha = .567$ ), PRN ( $\alpha = .679$ ) or for TAS ( $\alpha = .583$ ) in what respects to male adolescents data. The same goes for female data with TAO ( $\alpha = .857$ ) and REV ( $\alpha = .854$ ) presenting good Cronbach Alphas and PRO ( $\alpha = .653$ ), PRN ( $\alpha = .682$ ) and TAS ( $\alpha = .694$ ) showing poorer results. In order to improve the internal consistency of the scales, we proceeded with the elimination of the worst items and the Alphas rose substantially after that. In male data: TAO raises to  $\alpha = .837$  after deleting items 49, 88, 97, 101, 116, 130, 150, 158, 174 and 184; PRO raises to  $\alpha = .607$  after deleting items 19, 22, 27, 47, 52, 82, 86, 99, 144, 161, 179, 181 and 193; PRN raises to  $\alpha = .713$  after deleting items 30, 32, 43, 50, 96, 141, 152 and 172; TAS raises to  $\alpha = .623$  after deleting items 35, 57, 72, 142, 147, 160, 177 and 183; REV raises to  $\alpha = .827$  after deleting items 23, 34, 62, 98, 185 and 192. For female data: TAO raises to  $\alpha = .862$  after deleting items 97, 116, 184 and 198; PRO raises to  $\alpha = .671$  after deleting items 7, 22, 65, 144 and 179; PRN raises to  $\alpha = .713$  after deleting items 30, 43, 50, 54, 103, 129, 141, 152, 172, 178, 182 and 194; TAS raises to  $\alpha = .714$  after deleting items 45, 81, 142, 147, 153, 160, 177, 183 and 197; REV raises to  $\alpha = .866$  after deleting items 62, 98, 124, 185, 189 and 192.

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