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RESEARCH ARTICLE

Reducing Life Dissatisfaction by Ecological Intelligence: Psychological and Psychopathological Implications

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Abstract:

Background:

Our planet's recent ecologic perturbation solicited the researchers to deepen their analysis of environmental impacts. The concept of Life Satisfaction (LS) described as the degree to which a person positively evaluates the overall quality of his/her life as-a-whole.

Objective:

This study examined the relationship between ecological intelligence and perceived life satisfaction.

Materials and Methods:

1025 adult males and females were selected for the study through an online announcement. The research was carried out in a single phase and participants completed Life Satisfaction and Ecological Intelligence questionnaires.

Results:

A statistically meaningful and satisfying outcome emerged from the relationship between Life Satisfaction and Ecological Intelligence. Additional important final results marked a positive relationship between Ecological Intelligence and the education level.

Conclusion:

The conclusions of statistical interpretation of the data highlight the urge to revitalize the citizens' sense of respect of the environment, in order to reach two fundamental aims of mankind life: to love our own planet and to feel calm along one's own life path.

Keywords: Ecological intelligence, Life satisfaction, Correlation, Health psychology, Clinical psychology, Intelligence.

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1. INTRODUCTION

Our planet's recent ecologic perturbation solicited the researchers to deepen their analysis of environmental impacts. The urgent necessity to save our residual environmental resources, to modify people's habits and to redirect our priorities, constitute the motivational foundation of Goleman's engagement [1].The visionary author of Ecological intelligence (2009) predicts an optimistic future where humans will have developed a new system to interpret the external incentives which are, in fact, defined as "ecological intelligence". Therefore, in the hypothetical future condition of Goleman, mankind will have the useful means to perceive the cause-effect relationship of their behaviour; and also, those to understand the ecological threats.

The concept of Life Satisfaction (LS) belongs to this category: we can define it in many ways as the one given by Ruut Veenhove (1996), a sociologist and Happiness scholar who described life Satisfaction as the degree to which a person positively evaluates the overall quality of his/her life as-a-whole. In other words, how much the person likes the life he/she leads [2]. The psychological researcher analysed this concept from different points of view, by hypnotizing some co-variations linked to many variables. Many cases where the LS

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dimension contributes to the change of other variables or cases where the causality is inverted where found. As scientific research confirms, there are more relationships between the LS and the following group of elements: Personality, Self esteem, Life perspective, Age, Life experiences and events, Values, Culture, Family, Career, Season variation. Another important question concerns understanding how an increment of the LS in people's life is possible in order to start some programs where feasible. Could be interesting to investigate how and why life satisfaction increases or decreases in some populations. In the research conducted by Orru and collaborators [3], the aim was to estimate whether atmospheric pollution could contribute to a diminishment of life satisfaction sense. More specifically, the level of concentration of PM10 was observed, which exerts disturbing influences on the ecosystem [4]. The final results prove how an increment of PM10 in the air corresponds to a decrease of Life satisfaction in the examined sample. Furthermore, recent studies have stated significant data about the relationship between LS and mental health. An increment in the depressive behavior, anxiety disorders, alcohol addiction and drugs and suicidal tendencies are frequently related to the scarce sense of life satisfaction. In addition to this, it seems that the relationship between LS and mental health is mutual [5]. The individual personality traits correspond to factors strictly connected to this construct. Considering the traits hypothesised by the Big Five model, in many studies, the extroversion is related to a higher perception of LS, whereas an introverted personality will mostly be less satisfied with their life [6]. Self-esteem as well is positively linked to LS, as shown by an experimental research held in Spain with a 316 adolescents' sample [7].

Objectives of the study were to investigate the relationship between Ecological Intelligence and perceived life satisfaction level among males and females and to observe the impact of age, sex and education level on ecological intelligence.

2. METHODS

The study was conducted in compliance with the guidelines in the Declaration of Helsinki, approved by the IERB of the Department of Education Sciences on 29 July 2019. The study was conducted in agreement with the ethical norms set by the Italian National Psychological Association. The sample of 1025 participants, 399 males and 626 females, aged between 18 and 70 years, were selected for the study through an online announcement.

The study sample consisted of individuals aged 18 and older living in Italy. Participants were invited to complete a questionnaire. Before entering the questionnaire, participants had to read an informed consent form and check that they agreed to participate. The informed consent presented the purpose of the survey, the names and contact details of the study investigators, information about who is eligible to take part and how survey data will be used, assurances of participant anonymity and confidentiality. Subsequently, participants were asked if they are permanent residents of the Italy, age, gender and level of education. Participants satisfying the inclusion criteria were directed to the main questionnaire. No financial or other incentive was offered in exchange for participation. The study was open for participation from January 3rd to June 2nd, 2018. No personal identifying details were collected. The research was carried out in a single centers; subjects entered in the structure and before the beginning of the interview the questionnaire related to the Life Satisfaction and the one related to Ecological Intelligence was administered. In order to guarantee the reliability of the answers, for the entire sample an adequate understanding and expression of the Italian language was considered a further inclusion criterion.

For investigation and collection of data descriptive survey method was used to find out the link between ecological intelligence and life satisfaction. In order to obtain better cooperation and face to face contact, the clinical psychologists involved in this study examined each participant personally. Psychological observation and clinical psychology interview were also used to collect detailed information about the participant's attitude towards life and ecology.

The present research was carried out within the development project of the clinical psychology deepening associated with the ecological intelligence construct. The participants were asked to complete the informed consent, a medical and psychological history and the questionnaires aimed at measuring the level of "Life Satisfaction" and the level of "Ecological Intelligence". The study included a design between the measurement of the two dependent variables perceived life Satisfaction and Ecological Intelligence, to see how the dependent variables correlated and to see differences between average values in the groups of the sample divided by sex and level of education. The level of education was codified as follows 1 = degree, 2 = high school diploma, 3 = middle school degree.

2.1. Participants

The Sample Consists of 1025 Subjects (Average Age 26.6 ± 8.2; Range 18-70).

2.2. Instrument

A self-report, single-item measure of life satisfaction was developed on the basis of an item from the World Health Organization's quality of life (WHOQOL Brief scale) [8]. Life satisfaction was measured by the question "How much do you enjoy your life?" with 9-point response scale, from 1 - "Not at all" to 9 – "An extreme amount". Initial studies provided data supporting its validity and reliability [9]

A self-report, three-item measure of ecological intelligence was developed on the basis of item from the Ecoliteracy Scale [10]. Ecological Intelligence was measured by the following questions, "Environmental disasters can unfold in several parts of the world simultaneously", "The effects of an environmental disaster are not limited to the area where it took place", "I worry when I learn about the increase in incidents of cancer among people living in industrial areas", with 5-point response scale, from 1 - "strongly disagree" to 5 – "strongly agree". Initial studies provided data supporting the validity and reliability of the items [10].

2.3. Data Analysis

The data were analysed using version 25 of the Statistical Package for Social Science (SPSS). For all analysis conducted, the significance value considered was $p<0.05$. For the analysis of the correlation coefficient, we considered the one-way test.

At the preliminary level, the homogeneity of the sample, with respect to the socio-demographic characteristics, was investigated through the $\chi 2$ analysis for the 2 non-parametric variables and Anova for parametric variables. According to the study's objectives, an analysis of Multivariate Variance was conducted to report and compare the "Life Satisfaction" and "Ecological Intelligence" measurements in the sample divided by gender and education level.

3. RESULTS

The socio-demographic and anamnestic characteristics of the sample are shown in Table **1**. The χ^2 and Anova analyses showed an overall homogeneity of the sample divided by the level of education and gender. Low school participants were older compared to high school and degree participants. Moreover, degree participants showed a greater life satisfaction compared to the high school and overall too low school participants. The Ecological Intelligence increases with the increase in the level of education, however, the differences among the groups are not significant (Table **2**).

As reported in Table **3** female participants were significantly younger compared to the males. Moreover, females showed lower levels of life satisfaction; the ecological intelligence mean value is greater in the female group, but Anova test showed that the sex factor, relative to our sample, is not significant.

4. DISCUSSION

The main findings of the present study were that the ecological intelligence was correlated with life satisfaction. This result confirms the relevance of the ecological sensitivity in our life.

Moreover, the cultural levels of the people seem to be associated with the ecological intelligence and the life satisfaction showing the importance of favourite cultural knowledge in order to increase own ecological sensitivity

Finally, women showed a greater ecological intelligence confirming probably their greater predisposition to focus on a preventive attitude towards the future of humanity.

Table 1. Participants' Characteristics.

-	**Low School (n= 55) *Male/Female* 30/25**	**High School (n=597) *Male/Female* 240/357**	**Degree (n=373) *Male/Female* 129/244**	**F (2,1025)**	**p**	**Post Hoc**
Age in years, mean (ds; range)	34.5 (14.4; 18-70)	25.1 (7.5; 18-59)	27.8 (7.0; 19-63)	43.0	<.001	L> D*** H*** D>H***
Life satisfaction mean (ds)	5.5 (2.3)	5.8 (2.0)	6.2 (2.1)	6.6	.001	D>H** L*
Ecological intelligence mean (ds)	12.8 (1.8)	13.0 (1.6)	13.0 (1.5)	0.8	.43	-

Life Satisfaction and Ecological Intelligence appear to be correlated in a direct/positive way for the non-parameter index (Spearman Rank Order Correlation, r= 0.06; p= .03) and with a limit significance for the parametric index (r Pearson= 0.05; p= .054), as reported in Table **2**.

Table 2. Correlation table between Life Satisfaction and Ecological Intelligence scores.

-	-	-	**Total_Score_LS**	**Total_Score_IE**
Spearman' rho	Total_Score_LS	R index	1,000	,062*
-	Total_Score_IE	Sign. (one-tail)	-	0,030
-	-	N.	1028	1028
-	-	-	Total_Score_LS	Total_Score_IE
Pearson index	Total_Score_LS	R index	-	0,054*
-	Total_Score_IE	Sign. (one-tail)	-	0,054
-	-	N.	1028	1028

Table 3. Comparison between males and females on age, life satisfaction and ecological intelligence.

-	**Males (n=399)**	**Females (n=626)**	**F (1,1025)**	**p**
Age in years, mean (ds; range)	27.8 (8.9; 18-70)	25.8 (7.6; 18-59)	14.04	.0002
Life satisfaction mean (ds)	6.2 (2.16)	5.78 (2.04)	9.04	.003
Ecological intelligence mean (ds)	12.92 (1.63)	13.04 (1.51)	1.44	.231

It was interesting that the life satisfaction did not vary among the variables, confirming the solidity of this construct.

The study presents some limitations. The sample was adolescents and young adults, in the future could be useful to compare this data with older samples. Moreover, in the future, it could be interesting to test the association between psychological characteristics and the ecological intelligence.

The individualist aspect of the ecological skills' evolution would be inconclusive: in other words, to ignite an environmental revolution, the verification of a collective change is necessary. Consequentially, the main rule of creating individual behaviours favourable to the natural system is not relevant unless it is sided by a sensibilization campaign. Regarding this, recommended directives arise: To know one's environmental fingerprints; To sustain the ecological development; To share what we learn in regard the call for the awakening of our minds, together with the mentioned rules, mean social responsibility that would no more be in the hands of scientists, engineers and ecologists. Nevertheless, it is a long way to knowledge, which is full of obstacles. The companies have the authority to hide processes and environmentally harmful materials used in their production; therefore, the risk that those components that create kids' toys would be highly toxic is scarily high. Furthermore, the same object once it is no more to be used, may be disposed of into our seas and oceans. Finally, if the assembly and distribution of the toy were possible thanks to minors, women and disabled people's exploitation, this aspect of the production process can easily be hidden from the consumer. In spite of these occultations, the world market demand is gradually becoming more ecological, obliging the companies and multinationals to change their processes. The customer loyalty will derive from the producer's honesty about their product introduced into the market. Furthermore, the urban and social modernization process ignited an increasing and insidious transformation of the human being. Skyscrapers, grey areas caused by excessive automatization, bridges, great malls: all of these elements reflect the idea of the mentioned change. The product of capitalism is an organization made of an artificial abyss between mankind and nature that obstacles their reconciliation. People - so small compared to the great mix of lime and cement- are so overwhelmed by this that they cannot handle anymore its consequential malaise. The disorders and maladaptive behaviours that derive from this seem to be too many; but there are also many upsides coming from the reconciliation with nature. In the psychological field, an increasing awareness of the necessity to provide a clear and common definition of the psychological constructs is developing. Nevertheless, this aim is not always feasible since the step from a purely abstract dimension to a clear and undisputed one frequently crashes with the limit of individual subjectivity.

The curiosity, which fomented the following study, was jointed to the statement of the total absence of researches in the literature field, which analyses the Life Satisfaction-Ecological and Intelligence union. A related study has processed an investigation on the hypothesis that pro-environment actions could provoke a certain outcome on the life satisfaction of samples of American and Canadian people [11].The outcoming data show an important affinity between pro-environmental behavior and LS; there is a bigger perception of well-being among the individuals whose behavior contributes to preserve the environment. Another proof has its origins from an article published from the American Psychology Association, in which hypothetical causes that relate to individual well-being and environmentalism are described [12]. The mentioned study defines four causes: positive past in environmental contexts; perception of an internal locus of control focused on the environmental protection; intrinsic motivation; socialization in environmental groups. The majority of the activists in the examined group notice the association between LC and the feeling of having lived a life full of meaning; connected to the environmental activism enhanced by the individual fulfillment. This paper has dealt with the study of ecological intelligence from a new perspective, wondering if and how we can relate LS variables, age, sex and education level. A statistically meaningful and satisfying outcome emerged from the relationship between LS and EI, because the examined sample revealed how the perceived own life well-being matches a more intense EI presence as well; therefore, it also corresponds to bigger sensibility and worries towards the Earth's well-being and vice versa. The two variables influence each other and no third disturbing factor that could hinder this bond was found. In the same way, the LS dimension – a perception of well-being born from one's own life experience – is positively and meaningfully linked to one's education level: the it is, the bigger is the LS. According to the work of Ryff & Heidrich [13] young adults prefer life activities that prove to be primary; for middle-aged adults, priority was given to the domination of family and friends; during old age, previous work and educational experiences were the main predictors of well-being. Non-regulatory events are significant positive predictors of personal growth alone in young adults. Additional important final results marked a positive relationship between EI and the education level: therefore, in the sample we noticed how an increasing education level corresponds to an expansion of one's own ecological intelligence. Schools and universities should promote ecological intelligence in ways that go beyond the obvious recommendation that students don't want to be strengthened in the belief that their ideas come only from their thought processes. Ecological intelligence should be promoted through the formal educational process where there is an opportunity to strengthen thought patterns that may be absent in the home, church, media, peer group and other life contexts [14].

CONCLUSION

The conclusion of statistical interpretation of the data highlight the urge to revitalize the citizens' sense of respect of the environment, in order to reach two fundamental aims of mankind life: to love our own planet and to feel calm along one's own life path. In spite of the efforts to limit the influence of other variables during the data collection, their effect can be found first of all in the experimenter effect, since most of the time the questionnaire was distributed in the presence of the interviewer; a possible consequence of this could be as well the tendency to answer in a socially-desirable way. In addition to

this, the participant's socio-economic status was not considered, while this factor is actually linked to the LS in the literature field, and it could have confirmed the previous scientific in-depth analysis. We shall not forget that our sample culture of belonging is quite reluctant to reveal one's socio-economic situation or, else, it could distort its truthfulness. In conclusion, we hope that the following investigation could break through the limits of this research and enrich literature in terms of mankind-nature reconciliation proposals and programs.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was conducted in agreement with the ethical norms set by the Italian National Psychological Association. (Department of Educational Sciences, University of Catania, Italy Section of Psychology, 27719).

HUMAN AND ANIMAL RIGHTS

No Animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Written informed consent was taken from all the participants when they were enrolled.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the coauthor [L.I] upon request.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declared none.

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