

Social-psychological features of people highly motivated to act for biodiversity and nature: Multivariate analyses on a 7 EU country sample



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Aim

- to describe the main social-psychological characteristics of people who are highly motivated to act in favour of biodiversity and natural protection and conservation, according to the general aim of BIOMOT EU 7th FP project

Survey study

- Based on self-report questionnaire (to be filled on-line)
- 190 items that represent measures covering different constructs included in the BIOMOT Common Concepts Framework

Constructs # 1

- Universal values (Schwartz, 1992)
- Meaning in life (Steger et al., 2006)
- Self-sacrifice (Belanger, 2012)
- Willingness to sacrifice (Stern et al., 1999)
- Self-esteem (Robins et al., 2001)
- Collective self-esteem (Luhtanen & Crocker, 1992)
- Regulatory focus: Promotion & Prevention (Higgins et al., 2001)
- Quest for significance: Loss & Gain (Kruglanski et al., 2009)
- Connectedness to nature (Mayer & Frantz, 2004)
- Inclusion of nature in self (Schultz, 2001)
- Environmental motives (Schultz, 2000)
- Personal concern (Dunlap et al., 1992)
- Ascription of responsibility (Stern et al., 1995)
- Awareness of consequences (Stern et al., 1995)
- Moral norms (Stern et al., 1995)
- Injunctive social norms (Cialdini et al., 1991)
- Descriptive social norms (Cialdini et al., 1991)
- Human/Nature relationship (de Groot et al., 2011)
- New Human Interdependence Paradigm (NHIP: Corral-Verdugo et al., 2008)

Constructs # 2

- Perceived behavioural control (Ajzen, 1991)
- Social identity in organizations (Bergami & Bagozzi, 2000)
- Environmental identity (Clayton, 2003)
- Place identity (Jorgensen & Stedman, 2001)
- Place attachment (Williams & Vaske, 2003)
- Self-efficacy (Sherer et al., 1982)
- Collective efficacy (Bandura, 1986)
- Leadership (Avolio et al., 1991)
- Empowerment (Spreitzer, 1995)
- Corporate ethic value (Hunt et al., 1989)
- Corporate Reputation (Ponzi et al., 2011)
- Legitimacy of local authority (Bonaiuto et al., 2008)
- Affinity toward diversity (Corral-Verdugo et al., 2009)
- Future consequences (Corral-Verdugo et al., 2009)
- Emotion toward who do not respect the environment (Belanger, 2012)
- Environmental behaviour (Dutcher et al., 2007)
- General Ecological Behaviour (GEB: Kaiser, 1998)
- Self-reported proenvironmental behaviour (Schultz & Zelezny, 1998)

Normative influence constructs

Injunctive Norm: *what other people think
it should be done in a certain context or situation*

Descriptive Norm: *what the majority of others actually
do in that context or situation*

(Cialdini, Kallgren, & Reno, 1991)

Moral or Personal Norm: *what I think that it's right to
do to have a positive self-evaluation (and feel good with
myself)*

(Fransson & Biel, 1997)

Universal Values

(Schwartz, 1992)

“Self-transcendence”

Universalism:

- Social justice
- Equality
- Unity with nature
- Protecting the environment

“Self-enhancement”

Power:

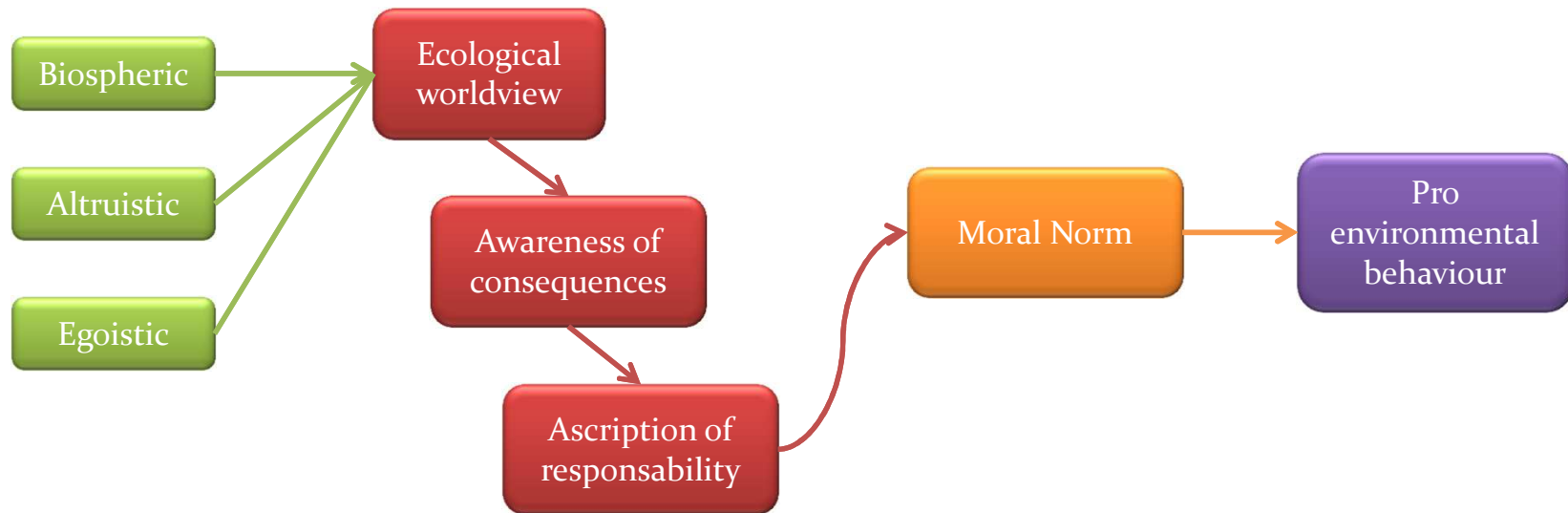
- Authority
- Dominance

Achievement:

- Success
- Ambition

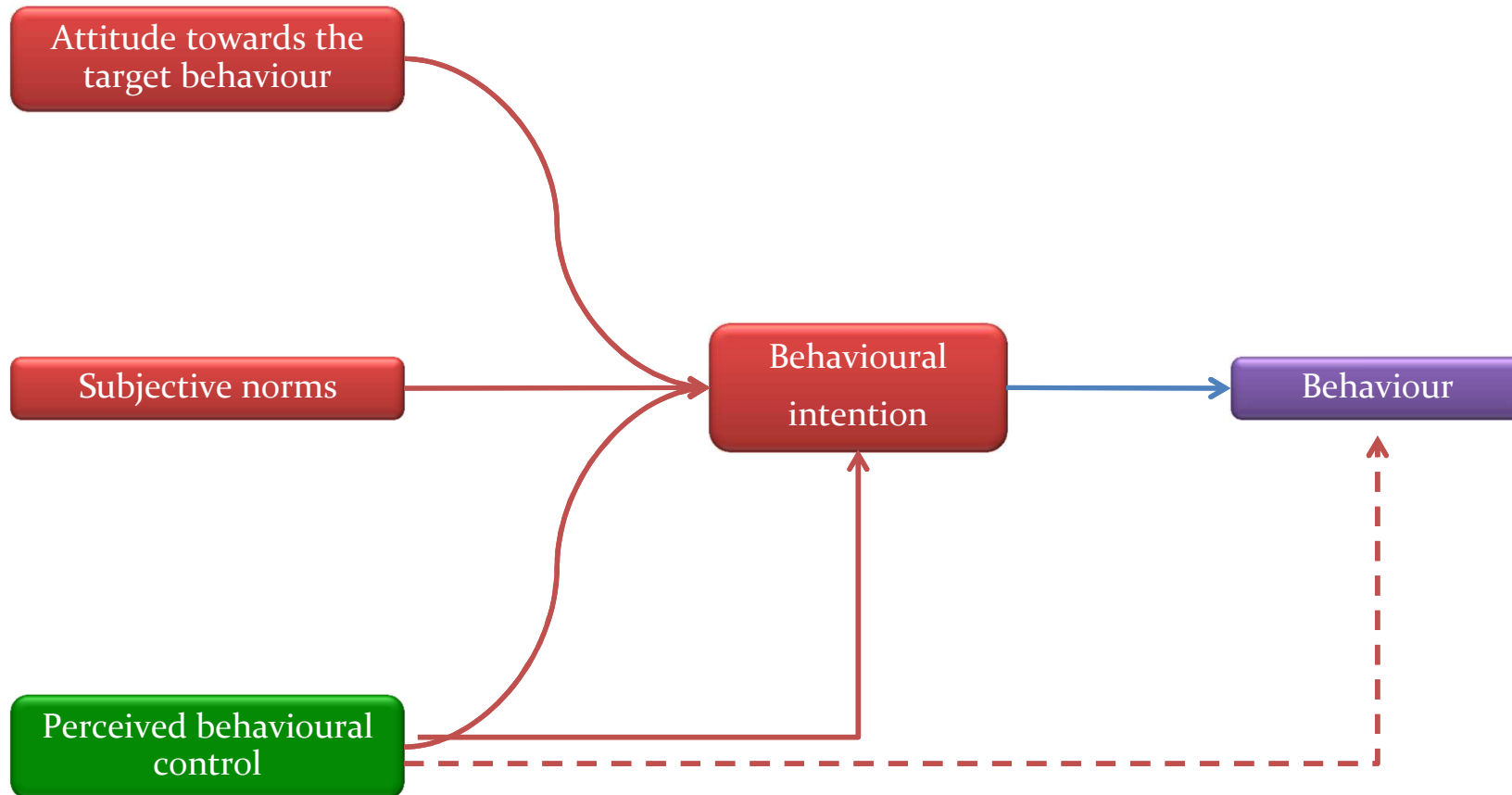
Value-Belief-Norm Theory

(Stern, 2000)



Theory of Planned Behavior

(Ajzen, 1991)



Constructs # 3

BIOMOT *ad hoc* creation:

- Scale of Activism toward Nature and Biodiversity (8 items)
- Motives underlying the Actions toward Nature and Biodiversity (20 items)

Questionnaire sample # 1

- 183 Ss filled in the on-line questionnaire (137 Ss selected from WP3)
- For each of the BIOMOT 7 countries selection of:
 - 15 persons who achieved outstanding actions in terms of pro-biodiversity and nature (so called "Initiators")
 - 15 persons who did not achieve such outstanding actions or who achieved outstanding actions in other areas (so called "Non-initiators")
 - other persons who were also involved in some biodiversity and nature relevant actions (as part of WP2 data gathering)
- On the basis of the interviews' content, WP3 respondents were regrouped in order to better statistically detect the distinctive features characterizing those persons who act towards nature and biodiversity
- New *post-hoc* categorization: Highly Motivated and Active towards Nature (HM-AN) versus all other respondents (Others)
- % of overlap between initial categorization (Initiators vs. Non-Initiators) and *post-hoc* categorization (HM-An vs. Others) = 83.94%

Questionnaire sample # 2

Gender	
F	49
M	130
Missing	4
Tot	183

Age			
Min	Max	M	SD
27	80	50.55	11.33

Nation	
Belgium	35
Finland	18
Germany	33
Italy	25
Slovenia	30
The Netherlands	21
UK	21
Tot	183

Motivation	
High Mot Act to Nat	102
Others	81
Tot	183

On-line Questionnaire Road Map of the Analyses # 1

	<i>Objective</i>	<i>Type of Analysis</i>	<i>Expected results</i>
1.	Verify the psychometric qualities of each item (distribution, mean, standard deviation, skewness, kurtosis, etc.)	Descriptive statistics	Acceptable psychometric qualities of most items (a few items may be discarded)
2.	Check the internal consistency (i.e., an indicator of reliability) of the constructs' measures (i.e., clusters of items)	Cronbach's Alpha (or bivariate correlations for 2-item measures)	Acceptable Alpha (or significant Pearson's r for 2-item measures) values
3.	Compute aggregate measures (i.e., clusters of items) of the reliable constructs	Building aggregates of items (i.e., aggregate scores)	Acceptable distribution indices of the constructs' measures
4.	Group respondents on the basis of their scores in some (or all) measures	Cluster Analysis	Distinction of groups of respondents
5.	Detect similarities within groups and differences between groups	Analysis of Variance and Chi-Square	Identification of group profiles on the basis of both their questionnaire responses and their sociodemographic characteristics

- Before the statistical analyses, the data set will be cleaned (e.g., check of missing values). Further variables may be added to the data set from the coding of interviews' information (e.g., respondents' age when they had the first epiphany, etc.) and from the card exercise tool.

On-line Questionnaire

Road Map of the Analyses # 2

	Objective	Type of Analysis	Expected results
6.	Verify <i>whether</i> the measures discriminate and detect <i>which</i> dimensions discriminate more between Highly Motivated to Act toward Nature vs. Others	Discriminant Analysis (and Analysis of Variance)	Significant discrimination power between groups of the psychological dimensions
7.	Verify relationships among constructs	Pearson's r bivariate correlation and Multiple regression	Significant positive relationships among pro-environmental motivations, values, attitudes, intentions, behaviours, etc.
8.	Test the fit of multivariate models based on previous theoretical reflections and models included in the Common Concepts Framework (e.g., Theory of Planned Behaviour - TPB, Value-Belief-Norm Theory -VBN, etc.)	Structural Equation Modelling	Acceptable fit indices for theoretically sound models
9.	Compare different theoretically-based models	Structural Equation Modelling	Some models are better than others (e.g., in terms of theoretical rootedness, congruence with the other BIOMOT results, explanation power, model parsimony, overall fit, etc.)
10.	Inform the development of a theory of motivations towards biodiversity action	Structural Equation Modelling	Meaningful empirical contribution for theory-building

Constructs' measures and their internal consistency # 1

Construct	Dimension	Variable	Cronbach's Alpha (or <i>Pearson's r</i>)
NCC	Need cognitive closure	2 items	.74
LOC	Locomotion	3 items	.48
ASS	Assessment	3 items	.72
MEA	Meaning in life	2 items	.64
SSac	Self-sacrifice	2 items	.42
SEff	Self-efficacy	2 items	.50
CSEs	Collective self-esteem	2 items	.38
TAut	Trust in authorities	2 items	.37
Pro	Promotion	2 items	.21
Prev	Prevention	2 items	.68
Loss	Loss	2 items	.73
Gain	Gain	2 items	.79
Time	Time perspective	2 items	.44
Lead	Leadership	2 items	.69
CEff	Collective efficacy	2 items	.58
Emp	Empowerment	2 items	.73
Rep	Rep Track pulse	4 items	.93
Eth	Corporate ethics	2 items	.13
Amb	Positive nature city	4 items	.64

Constructs' measures and their internal consistency # 2

Construct	Dimension	Variable	Cronbach's Alpha (or <i>Pearson's r</i>)
WSac	Will to sacrifice	2 items	.72
EId	Environmental identity	2 items	.56
PBC	Perceived behavioural control	2 items	.67
ATD	Affinity to ecological diversity	2 items	.65
Ind	Indignation	2 items	.62
Conn	Connectedness	2 items	.29
GAC	Awareness of consequences	2 items	.57
AR	Ascription of responsibility	2 items	.53
PNB	Normative believes	2 items	.73
HAN	Human nature relations	8 items	.74
NHIP	NHIP	2 items	.84
SN	Subjective norms	2 items	.58
LN	Local norms	2 items	.81
WId	World identity	6 items	.89
CId	Country identity	6 items	.86
RId	Regional identity	6 items	.62
CityId	City identity	6 items	.73
NId	Neighbourhood id.	6 items	.73
OId	Other Identity	6 items	.80
Hard & Soft beh.	Hard behaviors	3 items	.68
	Soft behaviors	3 items	.71
EBS	Environmental behaviour	2 items	.82
GEC	General ecological behaviour	5 items	.60
DCN	Disposition to nature	8 items	.78

Constructs' measures and their internal consistency # 3 Environmental Motives (Schultz, 2000)

Construct	Dimension	Variable	Cronbach's Alpha
Environm motives	Concern for people	EnMot_8 MY FUTURE	.94
		EnMot_9 MY HEALTH	
		EnMot_4 ME	
		EnMot_5 MY LIFESTYLE	
		EnMot_10 MY COUNTRY	
		EnMot_12 ALL PEOPLE	
		EnMot_6 MY CHILDREN	
Environm motives	Concern for nature	EnMot_2 CHILDREN	.92
		EnMot_3 BIRDS	
		EnMot_1 PLANTS	
		EnMot_7 ANIMALS	
		EnMot_11 MARINE LIFE	

Constructs' measures and their internal consistency # 4

Universal Values (Schwartz, 1992)

Construct	Dimension	Variable	Cronbach's Alpha
Values (1)	Positive Self & Relations with Others and Nature	Val_11 UNITY WITH NATURE Val_18 PROTECTING ENVIRONMENT Val_22 HONEST Val_15 SOCIAL JUSTICE Val_24 HELPFUL Val_10 FAMILY SECURITY Val_14 WORLD OF BEAUTY Val_19 HONORING PARENTS ELDERS Val_8 CREATIVITY Val_3 FREEDOM Val_20 CAPABLE Val_9 RESPECT FOR TRADITION Val_4 SOCIAL ORDER Val_28 FORGIVING	.92
Values (2)	Power, Achievement and Rigidity	Val_13 AUTHORITY Val_1 SOCIAL POWER Val_16 AMBITIOUS Val_6 WEALTH Val_29 SUCCESSFUL Val_23 OBEDIENT	.75
Values (3)	Pleasure, Excitement, and Learning	Val_5 EXCITING LIFE Val_2 PLEASURE Val_25 ENJOYING LIFE Val_26 DEVOUT Val_12 VARIED LIFE Val_27 CURIOUS	.72

Constructs' measures and their internal consistency # 5

The 20 motives for Action toward Nature & Biodiversity

Construct	Dimension	Variable	Cronbach's Alpha
20 Motives	Positive self and relations with others and nature	12 CARE FOR FUTURE GENERATIONS Motives_19 PLEASURE TO BE GOOD AT Motives_20 PLEASURE IN JOINING Motives_11 CARE FOR FAMILY Motives_17 SOCIAL BENEFIT Motives_7 CURIOSITY - LEARNING Motives_8 VALUE IN ITSELF Motives_10 ATTACHMENT Motives_15 GOOD AND WORTH LIFE Motives_4 DUTY - RESPONSIBILITY	.86
20 Motives	Power of self and negative emotions towards the others	Motives_2 INSECURITY - ANXIETY Motives_14 CONTROL Motives_1 ANGER - NEGATIVE EMOTIONS Motives_13 RECOGNITION Motives_3 PREVENT COLLISION	.78
20 motives	Union and spirituality	Motives_9 CONNECTEDNESS Motives_6 BEAUTY Motives_5 RELIGIOUS - SPIRITUAL Motives_16 DESTINY	.66

Constructs' measures and their internal consistency # 6

Scale of Activism toward Nature and Biodiversity

Construct	Dimension	Variable	Cronbach's Alpha
Activism	Activism	KActivism_3 MANY ANIMAL SPECIES	.86
		KActivism_2 MANY PLANT SPECIES	
		KActivism_4 RARE SPECIES	
		KActivism_1 VERY ACTIVE	
		KActivism_7 GROUPS IN FREE TIME	

ANOVA differences between HM-AN vs. Others # 1

Universal Values

HM-AN people showed higher scores than Others on the Universal Values:

- Unity with nature ($F_{(1, 179)} = 17,53, p = .000$)
- Protecting the environment ($F_{(1, 179)} = 15,26, p = .000$)
- World of beauty ($F_{(1, 179)} = 11,05, p = .000$)

Others showed higher scores than HM-AN on the Universal Values:

- Family security ($F_{(1, 179)} = 5,63, p = .019$)
- Enjoying life ($F_{(1, 179)} = 4,87, p = .029$)

ANOVA differences between HM-AN vs. Others # 2

Environmental Psychological dimensions

HM-AN people showed higher scores than Others on:

- Positive attitude towards urban green ($F_{(1, 179)} = 14,22, p = .000$)
- Concern for nature ($F_{(1, 181)} = 12,03, p = .001$)
- Willingness to sacrifice ($F_{(1, 181)} = 20,98, p = .000$)
- Perceived behavioural control ($F_{(1, 181)} = 14,09, p = .000$)
- Affinity towards ecological diversity ($F_{(1, 181)} = 14,79, p = .000$)
- Personal norms ($F_{(1, 181)} = 12,21, p = .001$)
- Human/Nature relationship ($F_{(1, 180)} = 14,11, p = .000$)
- General Attitude toward the Env ($F_{(1, 181)} = 4,20, p = .042$)
- Biospheric values ($F_{(1, 181)} = 19,02, p = .000$)
- Environmental identity ($F_{(1, 180)} = 17,81, p = .000$)
- Awareness of consequences ($F_{(1, 181)} = 6,50, p = .012$)

ANOVA differences between HM-AN vs. Others # 3

Motives and Behaviours for the protection of the environment

HM-AN people showed higher scores than Others on:

- Union and spirituality ($F_{(1, 179)} = 6,49, p = .012$)
- Soft behaviors for the protection of nature ($F_{(1, 181)} = 16,45, p = .000$)
- Disposition to connect to nature ($F_{(1, 181)} = 6,29, p = .013$)
- Environmental behavior scale ($F_{(1, 181)} = 16,08, p = .000$)
- Recycling ($F_{(1, 181)} = 4,65, p = .032$)
- **Activism toward Nature and Biodiversity ($F_{(1, 181)} = 44,96, p = .000$)**

Function discriminating HM-AN vs. Others

Variable	Function
Activism toward Nature & Biodiversity	.84
Environmental Identity	.54
Environment Behaviour Scale	.53
Biospheric Values	.52
Human/Nature relationship	.51
Perceived Behavioural Control	.48
Positive attitude to urban green	.47
Concern for Nature	.40
Awareness of Consequences	.32

On the basis of this discriminant function, 70.8 % of the participants are estimated in the correct group (i.e., HM-AN or Others)

Cluster Analysis # 1

Active variables: Behavioural measures

	Cluster 1 (N=94)	Cluster 2 (N=19)	Cluster 3 (N=68)
BIODIVERSITY ACTIVISM	5.12 a	4.77 a	3.84 b
HARD BEHAV	1.54 a	1.17 b	1.03 b
SOFT BEHAV	4.58 a	3.14 b	2.62 c
DISPOSITION TO NATURE	3.65 a	3.30 ab	3.09 b
ENV BEHAV DIMENSION	5.18 a	4.02 b	3.30 c
TRANSPORT	4.57 a	3.34 b	3.19 b
RECYCLING	6.89 a	5.15 b	5.97 a

Cluster Analysis # 2

Descriptive variables: Env psychological measures

	Cluster 1 (N=94)	Cluster 2 (N=19)	Cluster 3 (N=68)
Biospheric Values	6.37 a	5.71 b	5.81 b
Environmental Self-Identity	6.39 a	6.10 a	5.57 b
Awareness of consequences	6.23 a	5.92 a	5.41 b
Subjective Norm	5.08 a	4.81 ab	4.38 b
Ambivalence (Positive)	6.29 a	5.92 b	5.77 b
Meaning of Life	4.97 a	4.36 ab	4.26 b
Environmental Motivation to Nature	6.39 a	5.93 b	5.78 b
Willingness to Sacrifice	6.07 a	5.84 a	5.29 b
Perceived Behavioural Control	5.93 a	5.57 ab	5.38 b
Affinity to Ecological Diversity	6.48 a	6.00 b	6.01 b
Personal Normative Believes	5.75 a	5.31 a	4.77 b
Ascription of Responsibility	5.54 a	5.23 a	4.62 b
Human-Nature Relationship	5.41 a	5.14 ab	4.80 b
New Human Interdependence Paradigm (NHIP)	6.25 a	5.81 a	5.29 b
MOTIVES: Positive Self & Relations to Others & Nature	5.63 a	4.89 b	5.15 b
MOTIVES: Union & Spirituality	4.25 a	4.15 ab	3.66 b

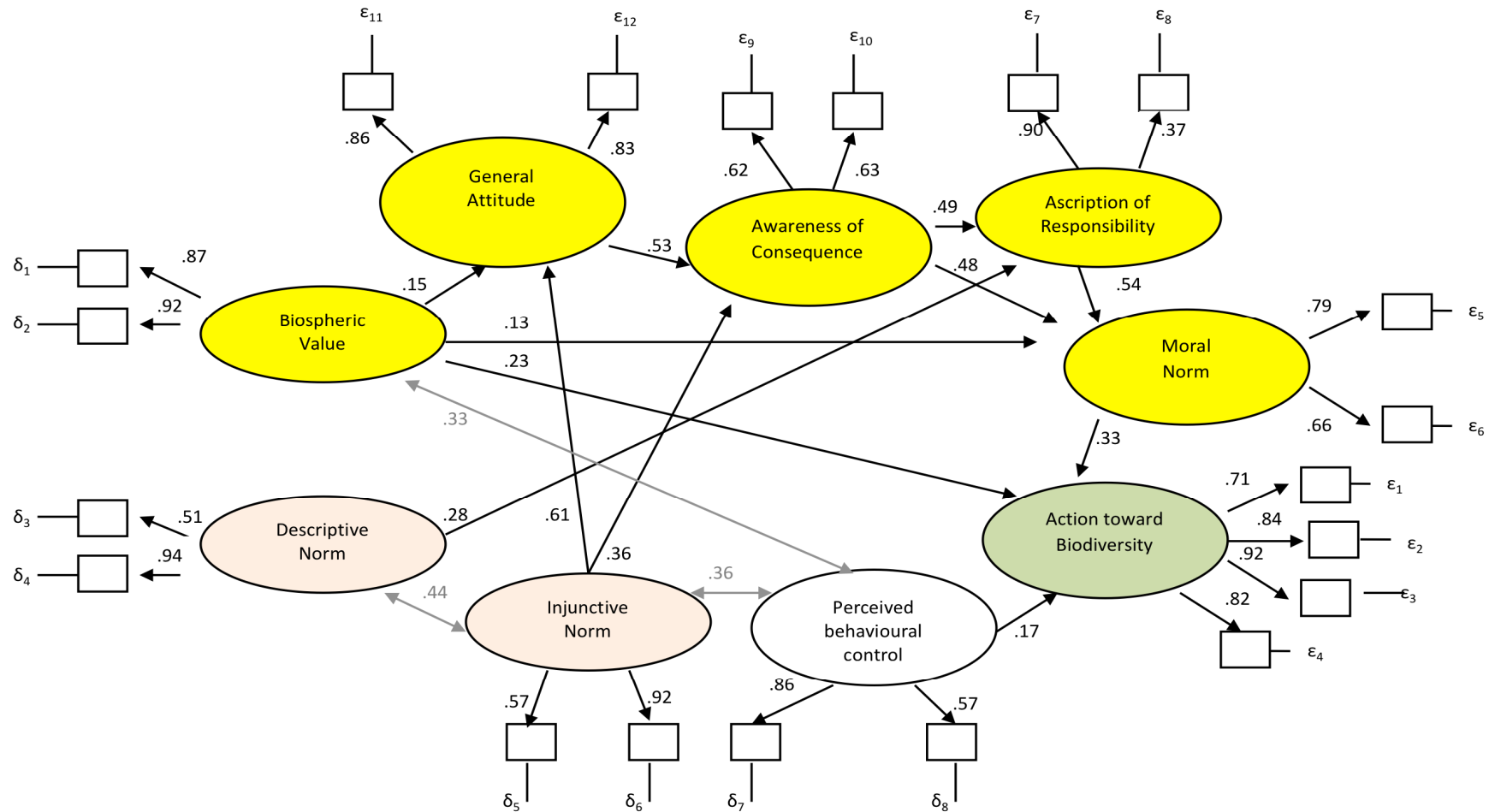
3-cluster solution

Chi-square Test: HM-AN vs. Others

	Cluster 3 (the least “green”)	Cluster 2	Cluster 1 (the most “green”)	<i>Total</i>
Others	47 30.1	4 8.4	29 41.5	80 80
HM-AN	21 37.9	15 10.6	65 52.5	101 56
<i>Total</i>	68 68	19 19	94 94	181 181

$$X^2_{(2)} = 28.04 \text{ (} p < .001 \text{)}$$

Structural Equation Modelling



Chi²₁₅₂=229.95(p=.000), Chi²/df ratio=1.51
 CFI=.95, TLI=.94, RMSEA=.053, SRMR=.027

Note: VBN variables are in yellow background
 social norms variables are in pink background



Conclusions

- The motives underlying the Actions toward Nature and Biodiversity at least partially reflect the altruistic (and biospheric) vs. egoistic value distinction
- HM-AN (Highly Motivated and Active towards Nature) persons are distinguished from the others for showing higher biospheric values, higher pro-environment psychological patterns, and higher motives and behaviours for the protection of the environment
- Activism toward Nature and Biodiversity is the main dimension discriminating HM-AN from the others, besides other pro-environmental patterns
- The clustering process of cases on the basis of the behavioural patterns produced a “green” cluster mainly represented by HM-AN persons, and a “not-green” cluster mainly represented by others
- The relationship among variables predicted by Value-Belief-Norm Theory (Stern et al., 1995) works well with our data. In particular, Moral norm and Biospheric value have a direct impact on Action, whereas the two kinds of social norms, i.e. injunctive and descriptive (Cialdini et al., 1991), seem to have only an indirect influence on Action, via other variables





Thank you!

