

Human Value based Design

Matthias RAUTERBERG

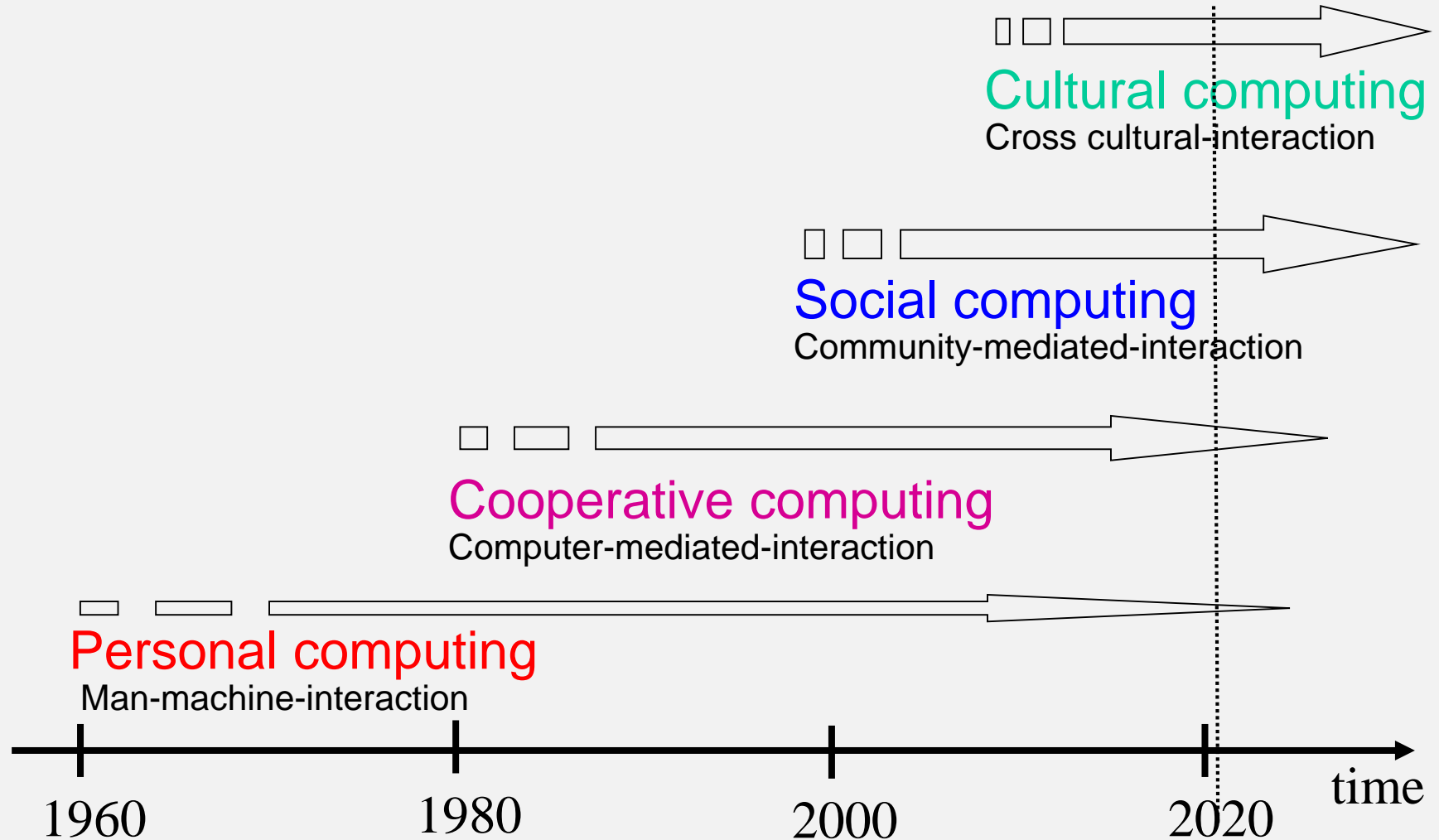
Eindhoven University of Technology – TU/e

The Netherlands

2020

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Interaction Paradigms in Computing



What is Culture?

Culture is the **integration pattern** of human behavior that includes

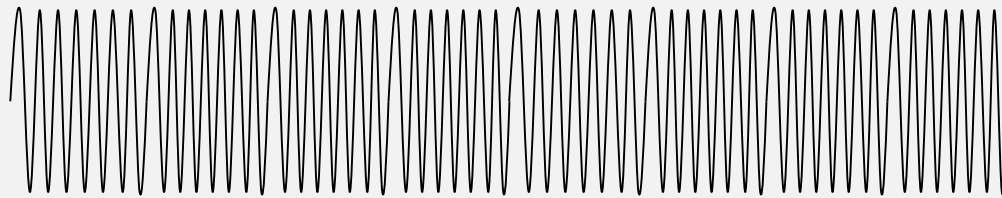
- actions,
- attitudes,
- beliefs,
- norms,
- values,

- communications and language
- institutions of a race, ethnic, religious and/or social group.

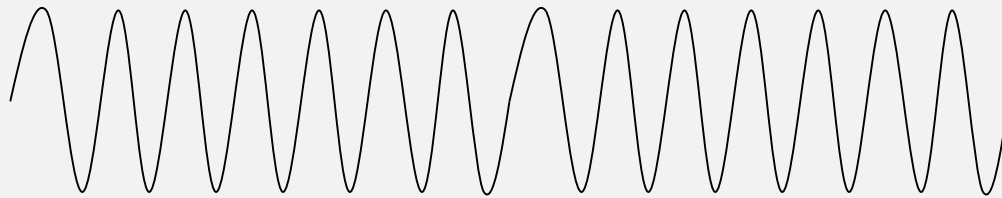
The word *culture* comes from the Latin root *colere* (to inhabit, to cultivate, or to honor). In general, it refers to human *activity*; different definitions of culture reflect different theories for understanding, or criteria for valuing, human activity. Anthropologists use the term to refer to the universal human capacity to classify experiences, and to encode and communicate them symbolically. They regard this capacity as a defining feature of the genus Homo.

REF: Rauterberg M. (2006). [From personal to cultural computing: how to assess a cultural experience](#). In: G. Kempter & P. von Hellberg (eds.) *uDayIV--Information nutzbar machen* (pp. 13-21). Lengerich: Pabst Science Publisher.

Culture on different layers



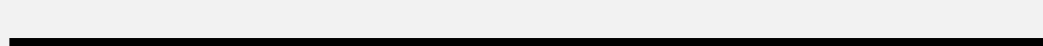
Year-layer



Century-layer

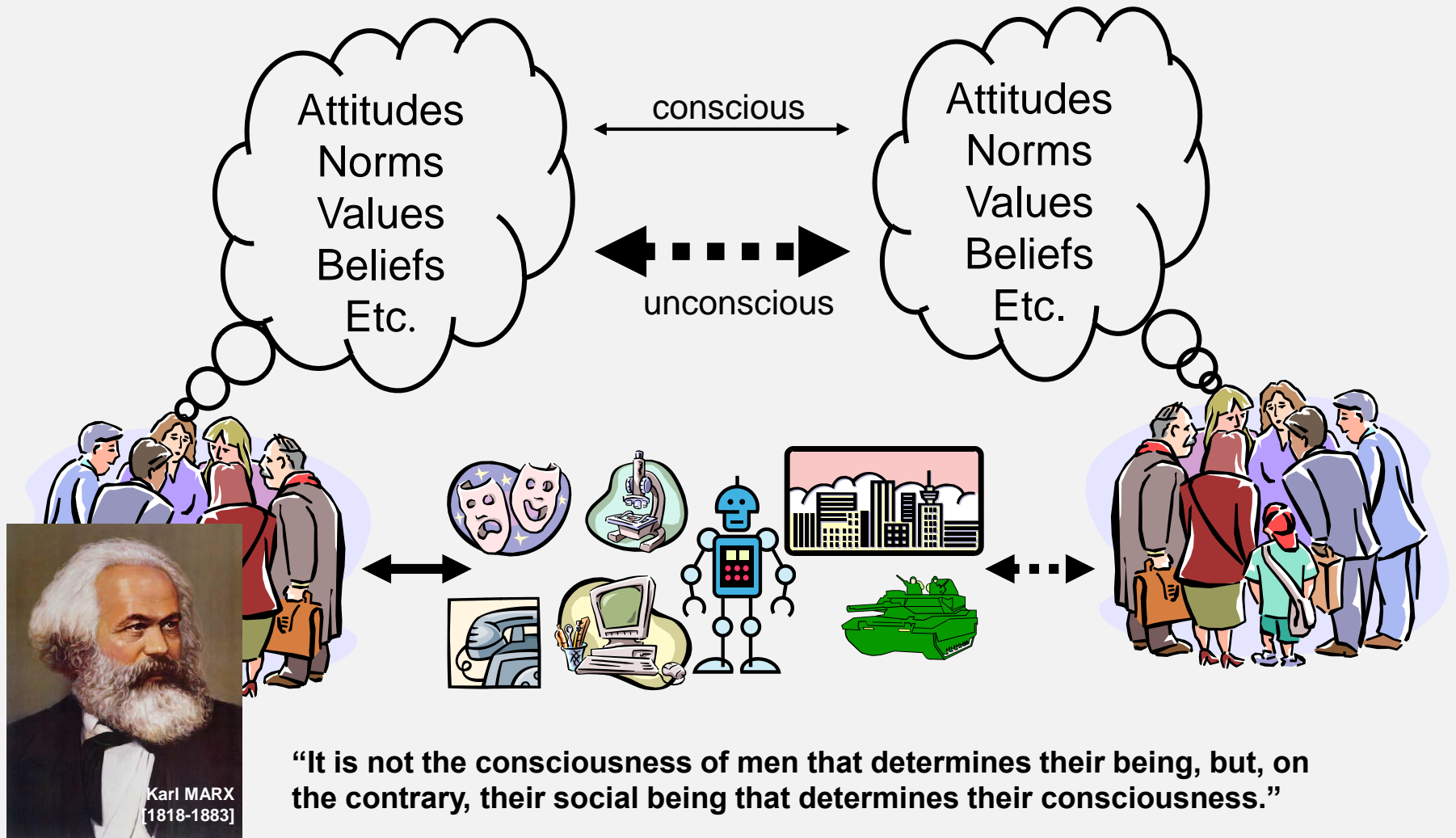


Millennium-layer

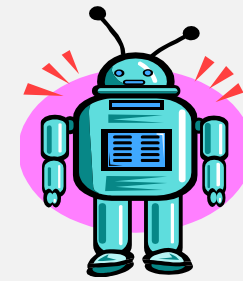


Universal-layer

Cultural Computing:



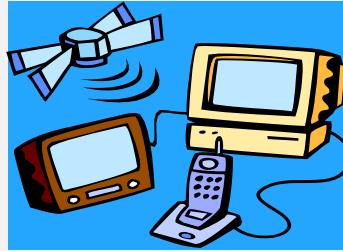
Design Metaphors



Active Form



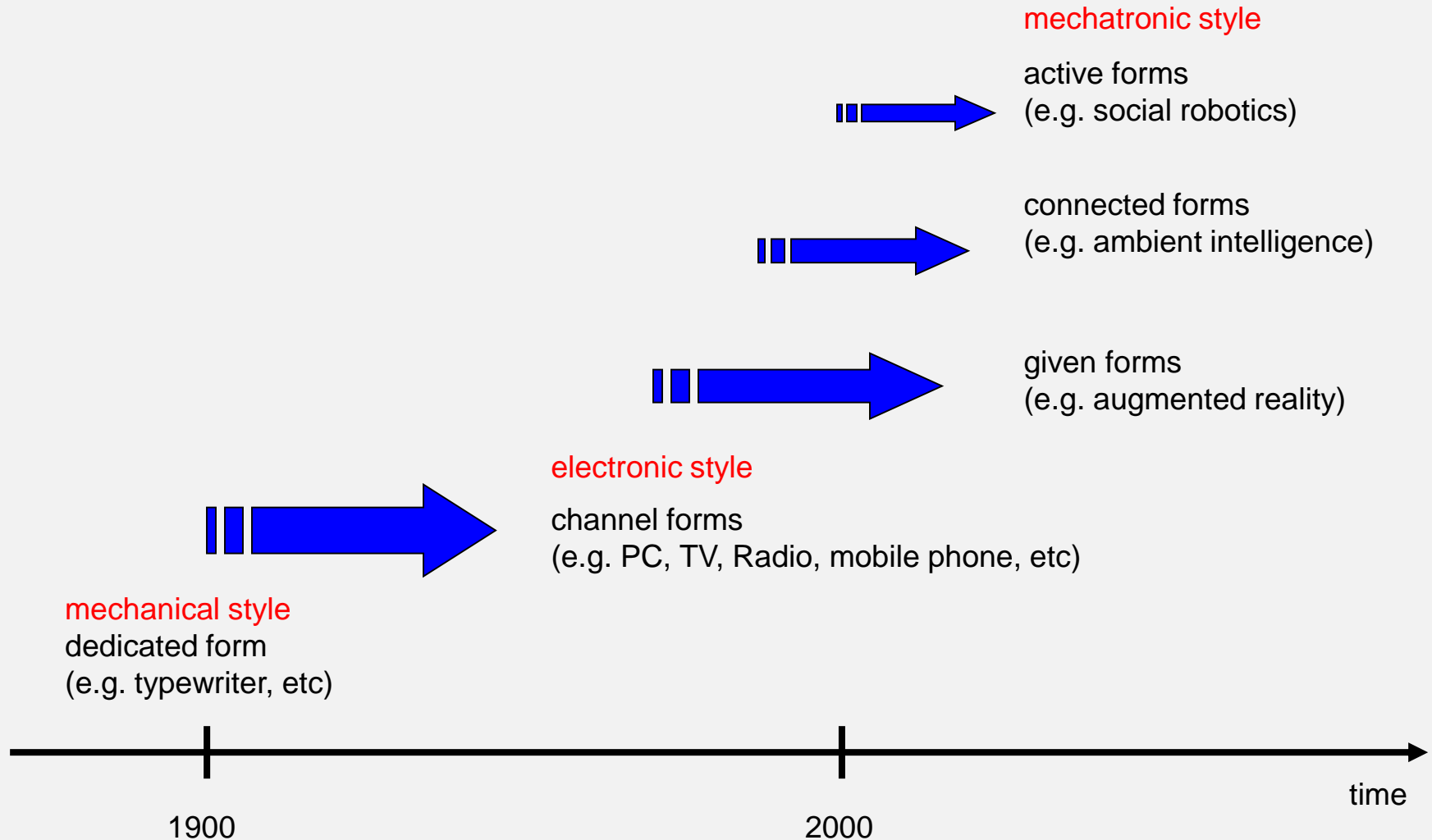
Tool



Channel



Design Forms



Big Questions:

**How to design product/service systems
based on human values?**

and

**How to convey these human values
through their usage?**



Shadi KHEIRANDISH

PhD Scholarship 2013-2018:
Ministry of Science, Research
and Technology in the Islamic
Republic of Iran



Supervisory Team: Matthias RAUTERBERG and



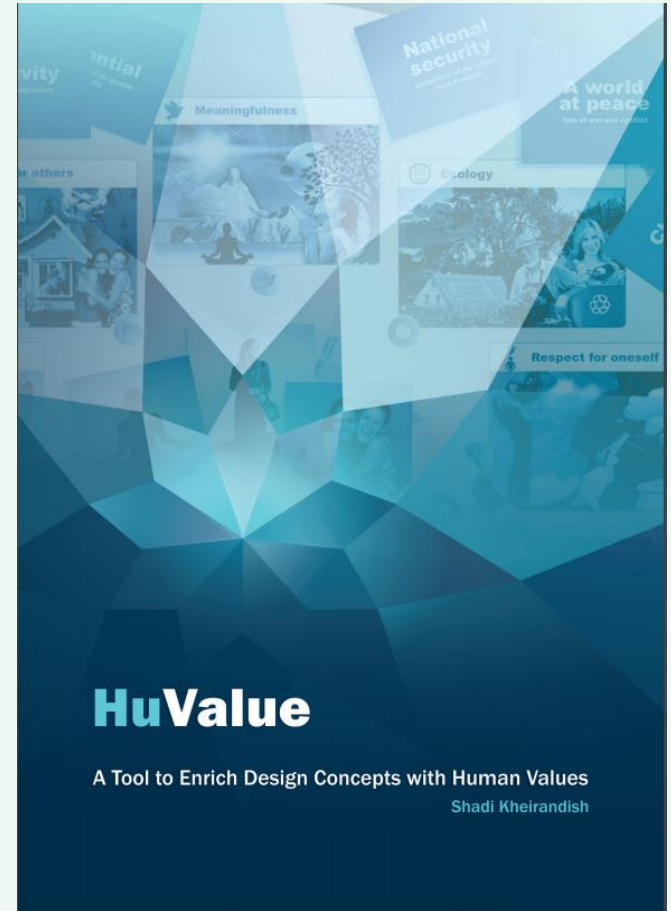
Maarten VERKERK
Professor of
Reformational
Philosophy



Stephan WENSVEEN
Professor of
Constructive Design
Research



Mathias FUNK
Associate Professor of
Design with and for
Data and Systems
Behavior



PhD Thesis, 2018

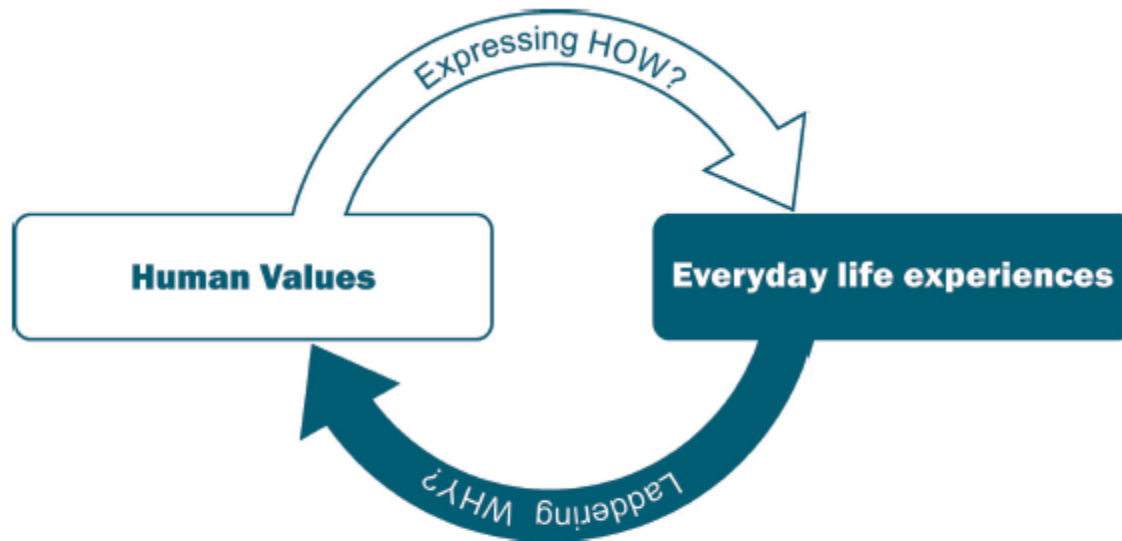
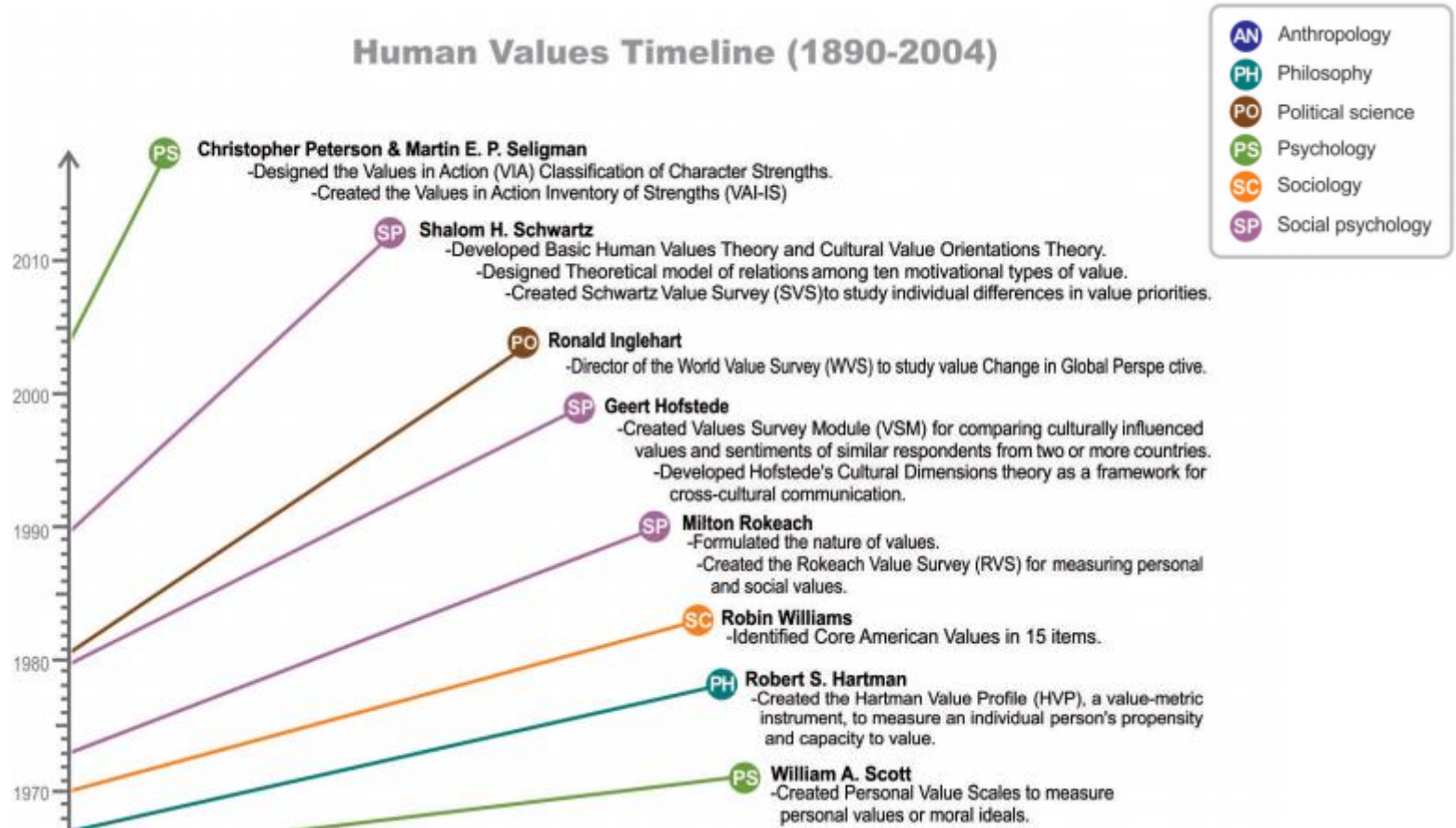


Figure 4-19: Expressing human values with everyday life experiences “How can this value be actualised?”, and revealing the human value(s) behind daily experiences by asking “why is this experience important?”

Human Values



Selection Criteria

- Comprehensive: cover all types of human values and different aspects/dimensions of human life, and also be capable of being used in different parts of design for various purposes and diverse topics. This means we need a diverse list that includes various types of human values and is not limited to basic or universal values (Schwartz, 1992). In addition, such a framework should not be specified for a design area (Friedman, Kahn, Borning, & Huldtgren, 2013) or specific value group(s) (Jurkiewicz & Giacalone, 2004).
- Well-classified: be layered into different levels meaningfully. This framework, by clustering value items to 'value groups', introduce different types of values, and also shorten the long value list. The value grouping layout is the main skeleton of the framework. In addition, by defining general themes outside the value groups and key values inside them, the framework simplify understanding, remembering and using the value items, and clarify the relations between them (Cowan, Johnson, & Scott Saults, 2005; Goubko & Danilenko, 2012).

Value Framework Design

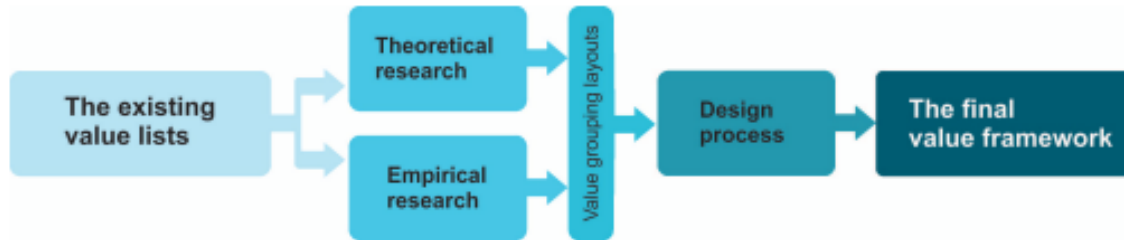
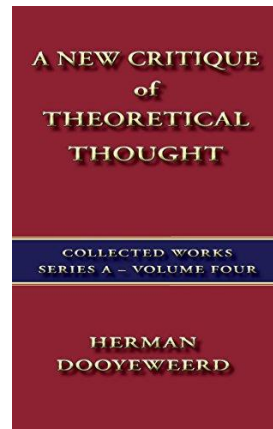


Figure 3-1: To create a new value framework, the existing value lists were clustered via theoretical and empirical research and the framework was finalised based on tests and experiments during the design process.



Dooyeweerd, H. (1955). A new critique of theoretical thought. Volume 2. *The general theory of the modal spheres*. H.J. Paris.



Herman Dooyeweerd (7 October 1894, Amsterdam – 12 February 1977, Amsterdam) was a professor of law and jurisprudence at the [Vrije Universiteit, Amsterdam](#) from 1926 to 1965.

Human Values Survey

Step 1: Ranking human values in their order of importance to you.

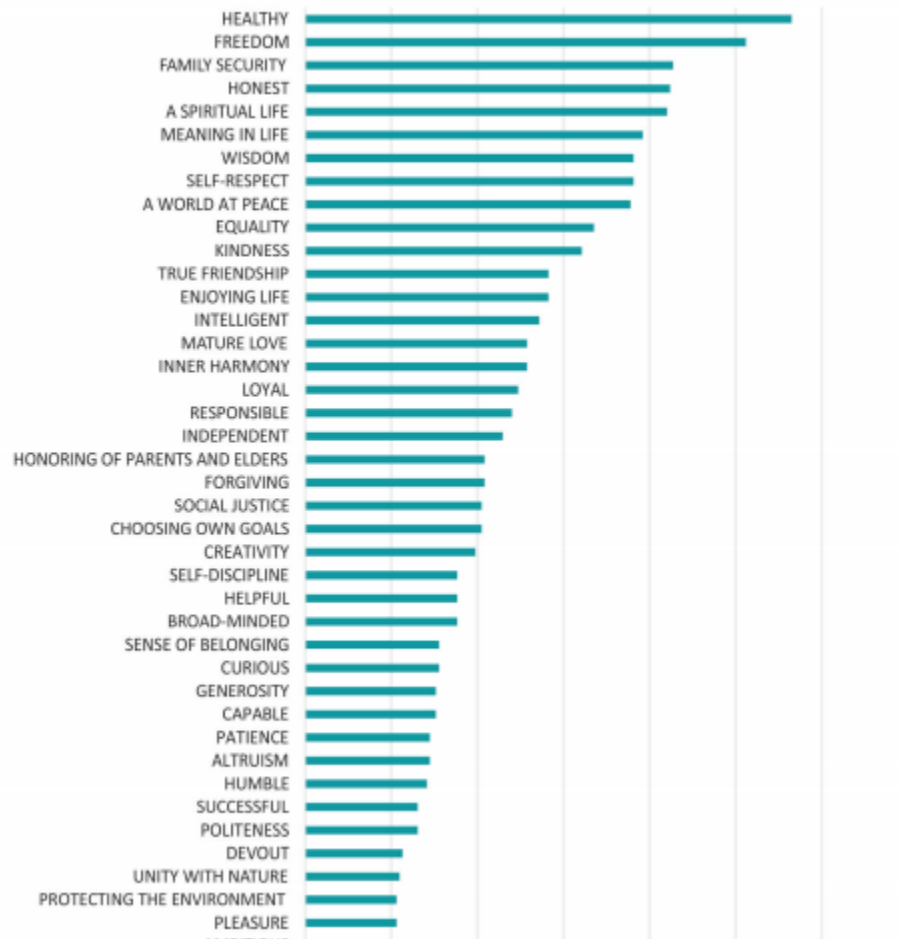
Below you will find 63 human values, please read all items carefully (hover the mouse pointer for a short description of the different values), then drag values from the top list into the rank boxes at the bottom. The first rank should contain the most important values in your life, values in second rank the second importance and so forth.

Note:
 * You can give the same rank to two or more values.
 * Feel free to ignore values that make no sense for you.

Human Values											
A SPIRITUAL LIFE	A VARIED LIFE	A WORLD AT PEACE	A WORLD OF BEAUTY	ACCEPTING MY PORTION IN LIFE	ALTRUISM						
CHASTITY	CHOOSING OWN GOALS	CLEAN	CREATIVITY	CURIOUS	DARING	DETACHMENT	DEVOUT	ENJOYING LIFE	E		
HEALTHY	HELPFUL	HONEST	HONORING OF PARENTS	HUMBLE	INDEPENDENT	INFLUENTIAL	INNER HARMONY	INTELL			
NATIONAL SECURITY	OBEDIENT	PATIENCE	PLEASURE	POLITENESS	PRESERVING MY PUBLIC IMAGE	PROTECTING THE					
RESPONSIBLE	SELF-DISCIPLINE	SELF-RESPECT	SENSE OF BELONGING	SOCIAL JUSTICE	SOCIAL ORDER	SOCIAL POW					
UNITY WITH NATURE	VIRTUE, PIETISM	WASTE AVOIDANCE	WEALTH	WISDOM							

Rank 1	Rank 2	Rank 3
Rank 6	Rank 7	Rank 8

Ranking



N=563 respondent worldwide; 63 different values

Grouping

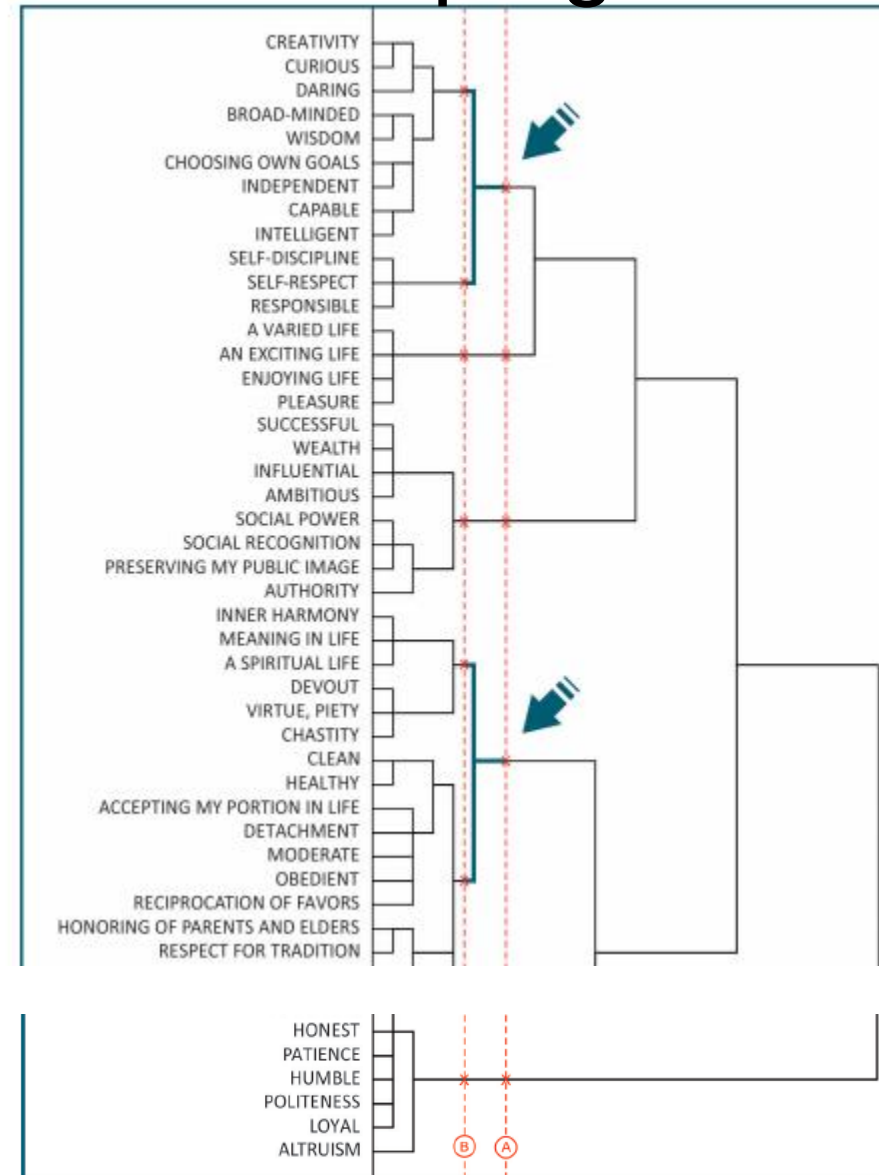


Figure 3-4: Final results of Hierarchical Cluster Analysis of 63 human values based on 563 cases. Two alternative levels to cut; A makes seven clusters and B makes nine clusters. Differences between the two cuts are highlighted with green and pointed with arrows.

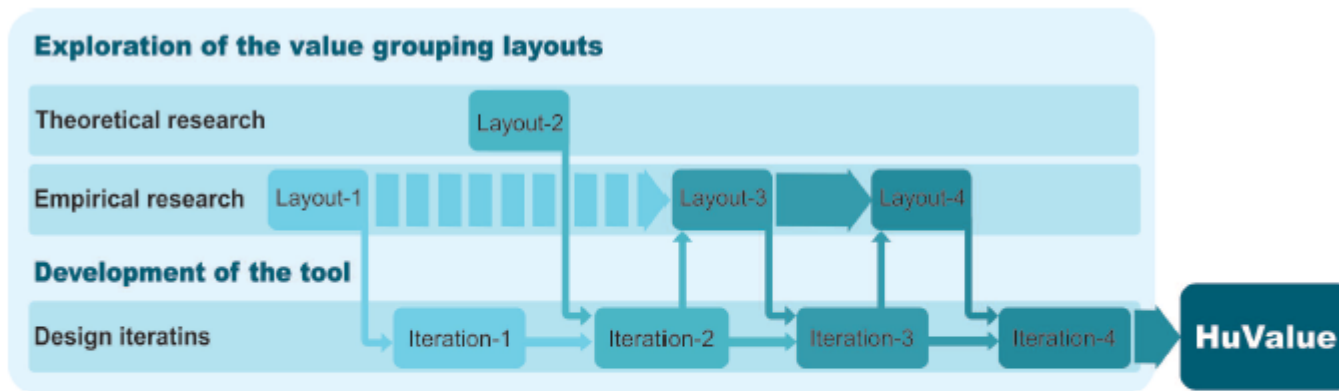


Figure 4-2: The process of developing the HuValue tool was interwoven with exploring the value grouping layouts and structuring the value framework. This diagram shows the relation of the four value grouping layouts with the four design iterations.

Final Grouping (9 categories):



Figure 4-13: Labels and icons designed for the value grouping layout-4

Table 4.1: The HuValue framework including four themes, nine value groups, five key values for each value group in addition extra values. The rows are sorted based on themes alphabetically. Key values are sorted based on empirical ranking, and extra values are sorted alphabetically.

Theme	Value Group	Key value	Extra values
Basic beliefs	Meaningfulness (The quality of searching for meaning in life)	A spiritual life (emphasis on spiritual not material matters) Meaning in life (a purpose in life) Inner harmony (at peace with myself) Devout (holding to religious faith and belief) Virtue (Piety)	Chastity, Holy, Hope, Inner peace, Meaningfulness, Meaning of life, Religiousness, Sacred, Salvation, Spirituality, Tranquillity, Transcendence, Truth, Wholeness.
	Ecology (The quality of caring for nature)	A world at peace (free of war and conflict) Unity with nature (fitting into nature) Protecting the environment (preserving nature) A world of beauty (beauty of nature and the arts) Waste avoidance (time, natural sources, opportunities, etc.)	Appreciation of beauty and excellence, Beauty, Care and concern for the environment, Eco-Friendly, Harmony with Nature, Magnificence, Sustainability.
Self	Respect for oneself (The quality of regulating yourself)	Self-respect (belief in one's own worth) Responsible (dependable, reliable) Self-discipline (self-restraint, resistance to temptation) Self-control Self-regulation	Self-awareness
	Personal development (The quality of developing your abilities)	Wisdom (a mature understanding of life) Intelligent (logical, thinking) Independent (self-reliant, self-sufficient) Choosing own goals (selecting own purposes) Creativity (uniqueness, imagination)	Autonomy, Bravery, Broad-minded, Capable, Competence, Completion, Courage, Daring, Discernment, Education, Flexibility, Knowledge, Intellectualism, Logical, Love of learning, Necessity, Persistence, Perspective, Physical development, Practicality, Progress, Prudence, Rationality, Self-sufficiency, Utility.
	Pleasure (The quality of enjoying something)	Enjoying life (enjoying food, sex, leisure, etc.) Pleasure (gratification of desires) A varied life (filled with challenge, novelty, and change) An exciting life (stimulating experiences) Material comfort	Cheerful, Effortlessness, Fun, Hedonism, Humour, Imaginative, Playfulness, Simplicity, Stimulation, Teasing, Zest.

(Table 4.1 continued)

Theme	Value Group	Key value	Extra values
Society	Carefulness (The quality of caring for others)	Honest (genuine, sincere) Kindness (cordiality, tenderness) Loyal (faithful to my friends, group) Forgiving (willing to pardon others) Helpful (working for the welfare of others)	Altruism, Benevolence, Care and concern for others, Carefulness, Compassion, Courtesy, Empathy, Generosity, Goodness, Gratitude, Humanity, Humble, Integrity, Modesty, Moral, Patience, Philanthropy, Politeness, Selflessness, Temperance.
	Justice (The quality of treating fair and just)	Freedom (freedom of action and thought) Equality (equal opportunity for all) Social justice (correcting injustice, care for the weak) National security (protection of my nation from enemies) Social order (stability of society)	Democracy, Fairness, Lawfulness, Legal, Order, Political, Retribution, Security.
	Respect for others (The quality of connecting to others)	Healthy (not being sick physically or mentally) Family Security (safety for loved ones) True friendship (close, supportive friends) Honouring of parents and elders (showing respect) Mature love (deep emotional and spiritual intimacy)	Accepting my portion in life, Affection, Being together, Clean, Collective life, Conformity, Connectedness, Culture, Customary, Detachment, Individualism, Love, Moderate, Obedient, Privacy, , Reciprocation of favours, Respect for tradition, Sense of belonging, Social intelligence, Social skills, Solidarity, Solitude, Teamwork, Tradition, Trust, Universalism.
	Status (The quality of being distinguished between others)	Successful (achieving goals) Ambitious (hardworking, aspiring) Wealth (material possessions, money) Social recognition (respect, approval by others) Social power (control over others, dominance)	Achievement, Authority, Competition, Fame, Leadership, Perfection, Preserving my public image, Richness, Sense of accomplishment, Social power, Status, Superiority, Uniqueness.

Carefulness



This group is about:
The quality of caring for others

Key values:
Honest (genuine, sincere)
Kindness (cordiality, tenderness)
Loyal (faithful to my friends, group)
Forgiving (willing to pardon others)
Helpful (working for the welfare of others)

More values and related words:
 Moral, Humanity, Benevolence, Goodness, Temperance, Gratitude, Generosity, Patience, Altruism, Humble, Politeness, Modesty, Carefulness, Philanthropy, Integrity, Compassion, Empathy, Courtesy, Care and concern for others, Selflessness

Ecology



This group is about:
The quality of caring for nature

Key values:
A world at peace (free of war and conflict)
Unity with nature (fitting into nature)
Protecting the environment (preserving nature)
A world of beauty (beauty of nature and the arts)
Waste avoidance (time, natural sources, opportunities, etc.)

More values and related words:
 Care and concern for the environment, Eco-Friendly, Sustainability, Harmony, Beauty, Magnificence, Appreciation of beauty and excellence

Justice




This group is about:
The quality of treating fair and just

Key values:
Freedom (freedom of action and thought)
Equality (equal opportunity for all)
Social justice (correcting injustice, care for the weak)
National security (protection of my nation from enemies)
Social order (stability of society)

More values and related words:
 Fairness, Democracy, Legal, Political, Security, order, Retribution, Lawfulness.

Meaningfulness

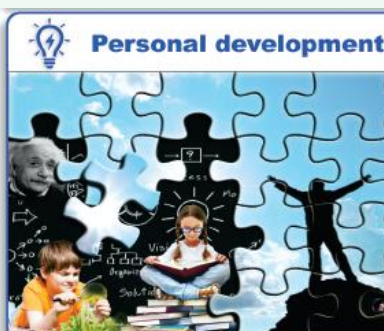


This group is about:
The quality of searching for meaning in life

Key values:
A spiritual life (emphasis on spiritual not material matters)
Meaning in life (a purpose in life)
Inner harmony (at peace with myself)
Devout (holding to religious faith and belief)
Virtue, Pietism

More values and related words:
 Meaningfulness, Transcendence, Wholeness, Truth, Hope, Salvation, Religiousness, Holy, Sacred, Spirituality, Meaning of life, Inner peace, Tranquility, Chastity

Personal development



This group is about:
The quality of developing your abilities

Key values:
Wisdom (a mature understanding of life)
Intelligent (logical, thinking)
Independent (self-reliant, self-sufficient)
Choosing own goals (selecting own purposes)
Creativity (uniqueness, imagination)

More values and related words:
 Broad-minded, Capable, Daring, Bravery, Physical development, learning, Knowledge, Education, Progress, Perseverance, C. Discernment, Logical, Intellectualism, Perspective, Rati self-sufficiency, Utility, Practicality, Prudence, Flexibility, Completion, Autonomy, Necessity

Pleasure



This group is about:
The quality of enjoying something

Key values:
Enjoying life (enjoying food, sex, leisure)
Pleasure (gratification of desires)
A varied life (filled with challenge, novel)
An exciting life (stimulating experience)
Material comfort

More values and related words:
 Hedonism, Stimulation, Playfulness, Simple, Imaginative, Zest, Humor, Cheerful, Teasing

Respect for oneself



This group is about:
The quality of regulating yourself

Key values:
Self-respect (belief in one's own worth)
Responsible (dependable, reliable)
Self-discipline (self-restraint, resistance to temptation)
Self-control
Self-regulation

More values and related words:
 Self-awareness

Respect for others



This group is about:
The quality of connecting to others

Key values:
Healthy (not being sick physically or mentally)
Family Security (safety for loved ones)
True friendship (close, supportive friends)
Honoring of parents and elders (showing respect)
Mature love (deep emotional and spiritual intimacy)

More values and related words:
 Love, Sense of belonging, Team work, Social skills, Social Universalism, Conformity, Tradition, Culture, Customary Connectedness, Collective life, Being together, Solidarity, Privacy, Solitude, Clean, Accepting my portion in life, Reciprocity of favors, Obedient, Respect for tradition.

Status



This group is about:
The quality of being distinguished between others

Key values:
Successful (achieving goals)
Ambitious (hardworking, aspiring)
Wealth (material possessions, money)
Social recognition (respect, approval by others)
Influential (having an impact on people and events)

More values and related words:
 Social power, Preserving my public image, Authority, Status, Richness, Uniqueness, Superiority, Perfection, Achievement, Sense of accomplishment, Leadership, Competition, Fame



Figure 4-14: The HuValue framework with nine value groups and five key values for each. In this framework, the relation of value groups to “Basic beliefs”, “Nature”, “Self” and “Society” was indicated.

Virtue

Devout

holding to religious faith

Basic

Loyal

faithful to my friends, group

Kindness

cordiality, tenderness

Honest

genuine, sincere

Helpful

working for the welfare of others

freedom

of action and thought

forgiving

willing to pardon others



Respect for others



Carefulness



Meaningful



Experimental Setting

Participants: This study, the same as baseline measurement (See section 5.2.1), was conducted in the context of Project-1-Design with 192 first year design students (48 project groups) as participants.

Plan: After collecting students' deliverables, to answer the research question "Is the tool effective to enrich designs with human values?" we assessed all projects and evaluated design concepts from a value point of view. The relevant groups of values in each concept were identified and rated on a five-point rating scale from "not relevant" to "extremely relevant". To avoid bias in this assessment, we used three independent persons (raters), with a design background.

Procedure: Independent variables in this study were *treatment*, and *value groups* in the design process and the dependent variables were *nine value scores*, *total value score* and *value diversity* of design concepts.

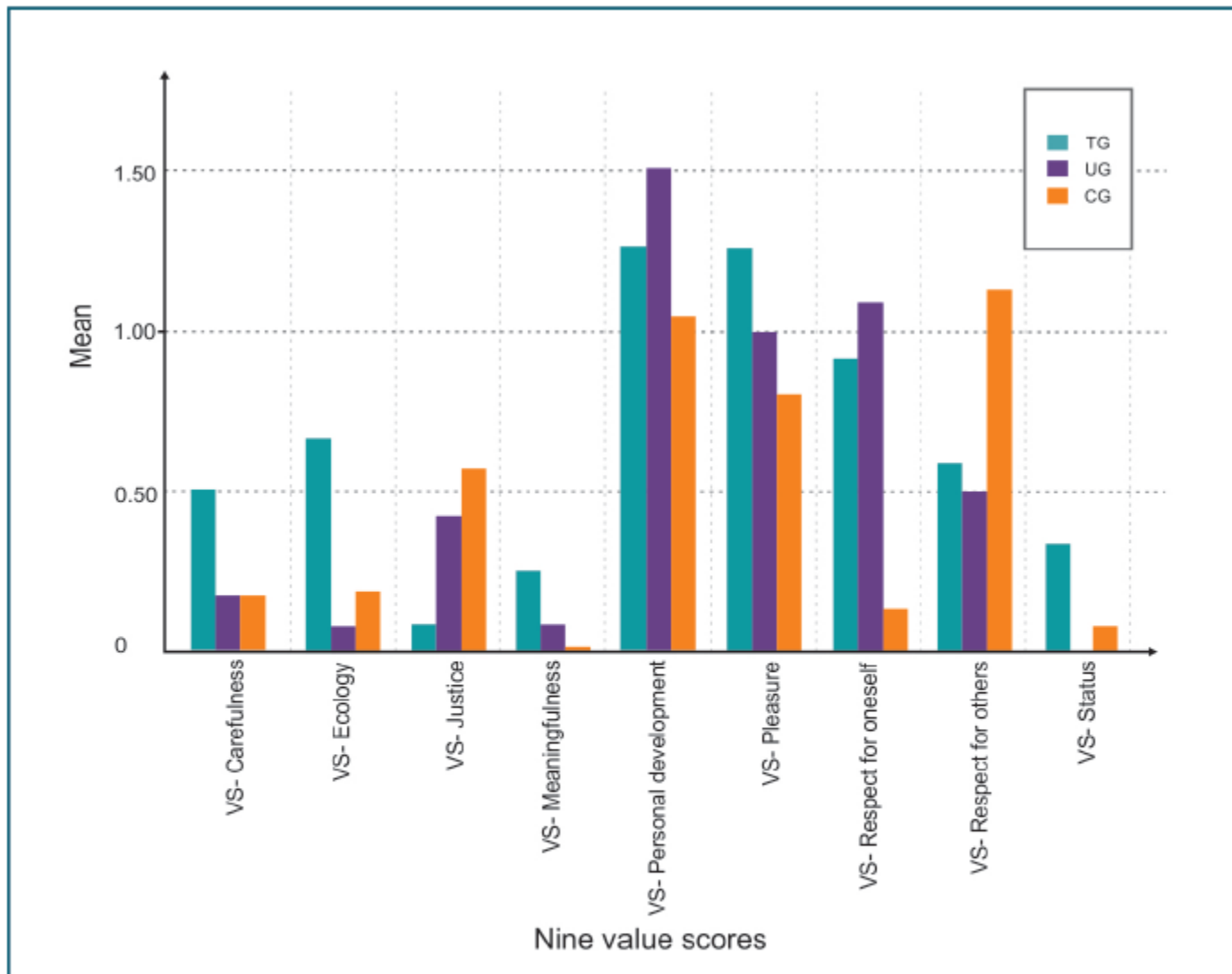


Figure 5-20: Comparing the means of *nine value scores* for “Trained Groups” (TG), “Untrained Groups” (UG) and “Control Groups” (CG) on a five-point rating scale, “not relevant at all” (0), “somewhat relevant”(1), “relevant” (2), “very relevant” (3), and “extremely relevant” (4). Zero scores are included in means.

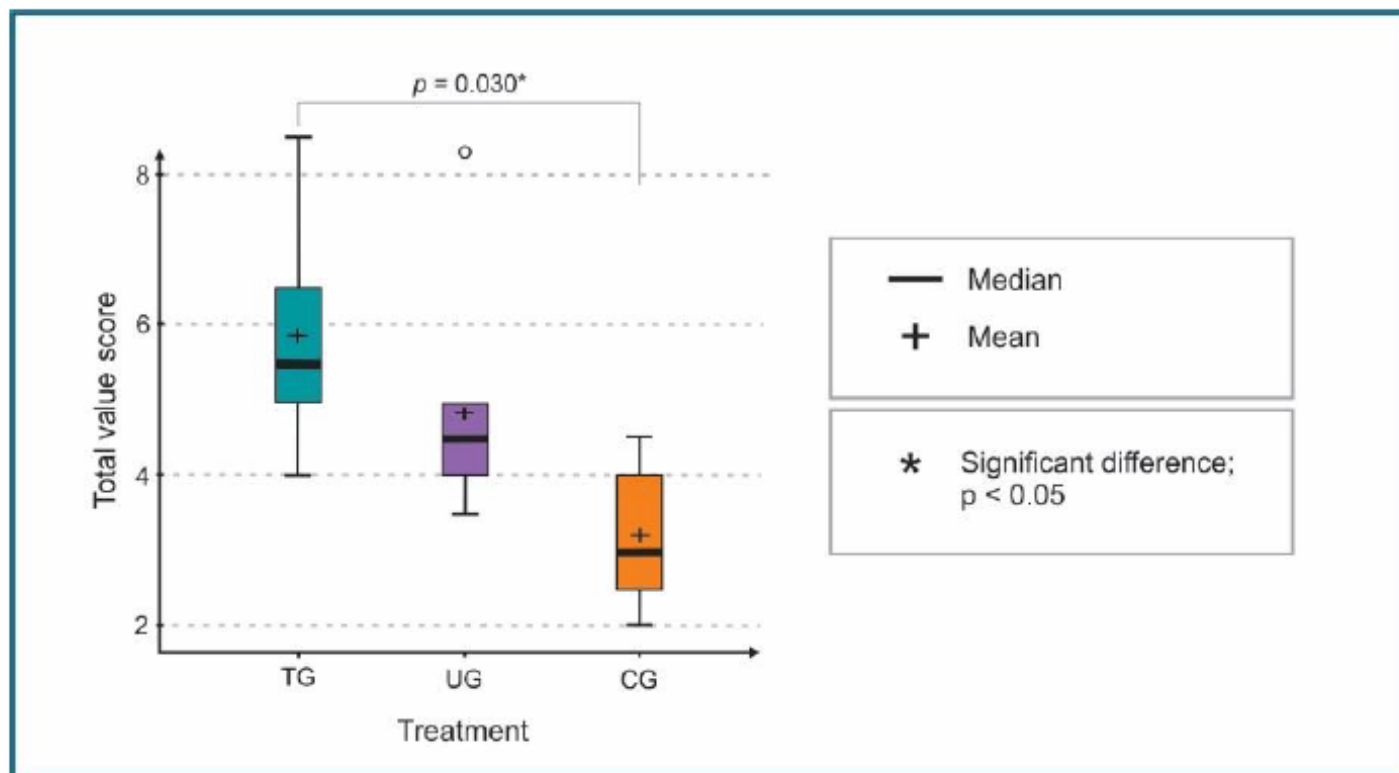


Figure 5-23: Descriptive analysis of *total value score* for TG, UG, and CG. Trained Groups (TG) had statistically significantly higher total value score compare to Control Groups (CG).

Table 5.34: Results of the statistical analysis of One-way ANOVA on *total value score* and *treatment*, including only two project themes of “It did it again” and “Dreams come to life”. In this test the difference between means of total value scores was statistically significant.

Variable	Treatment									df	F	Sig.
	TG			UG			CG					
	N	M	SD	N	M	SD	N	M	SD			
Total value score	6	5.83	1.54	6	4.83	1.40	4	3.25	0.96	2,15	4.265	.038*

*, Significant difference; $p < 0.05$

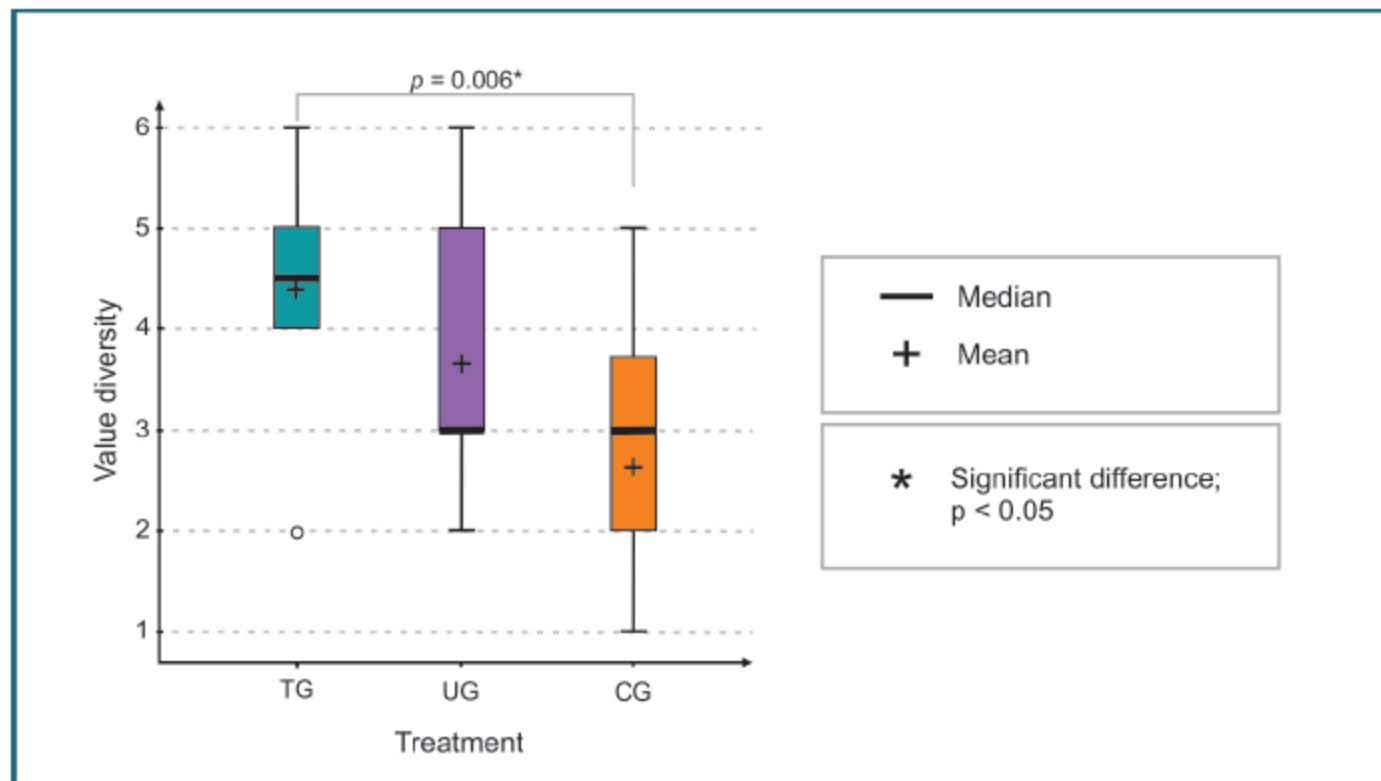


Figure 5-22: Descriptive analysis of *value diversity* for TG, UG, and CG. Trained Groups (TG) had statistically significantly higher value diversity compare to Control Groups (CG).

Table 5.33: Results of the statistical analysis of One-way ANOVA on *value diversity* and *treatment*, including all six project themes. The difference between means of value diversity for TG, UG, and CG was statistically significant.

Variable	Treatment									df	F	Sig.
	TG			UG			CG					
	N	M	SD	N	M	SD	N	M	SD			
Value Diversity	6	4.33	1.37	6	3.67	1.51	36	2.64	1.10	2, 47	6.434	.003*

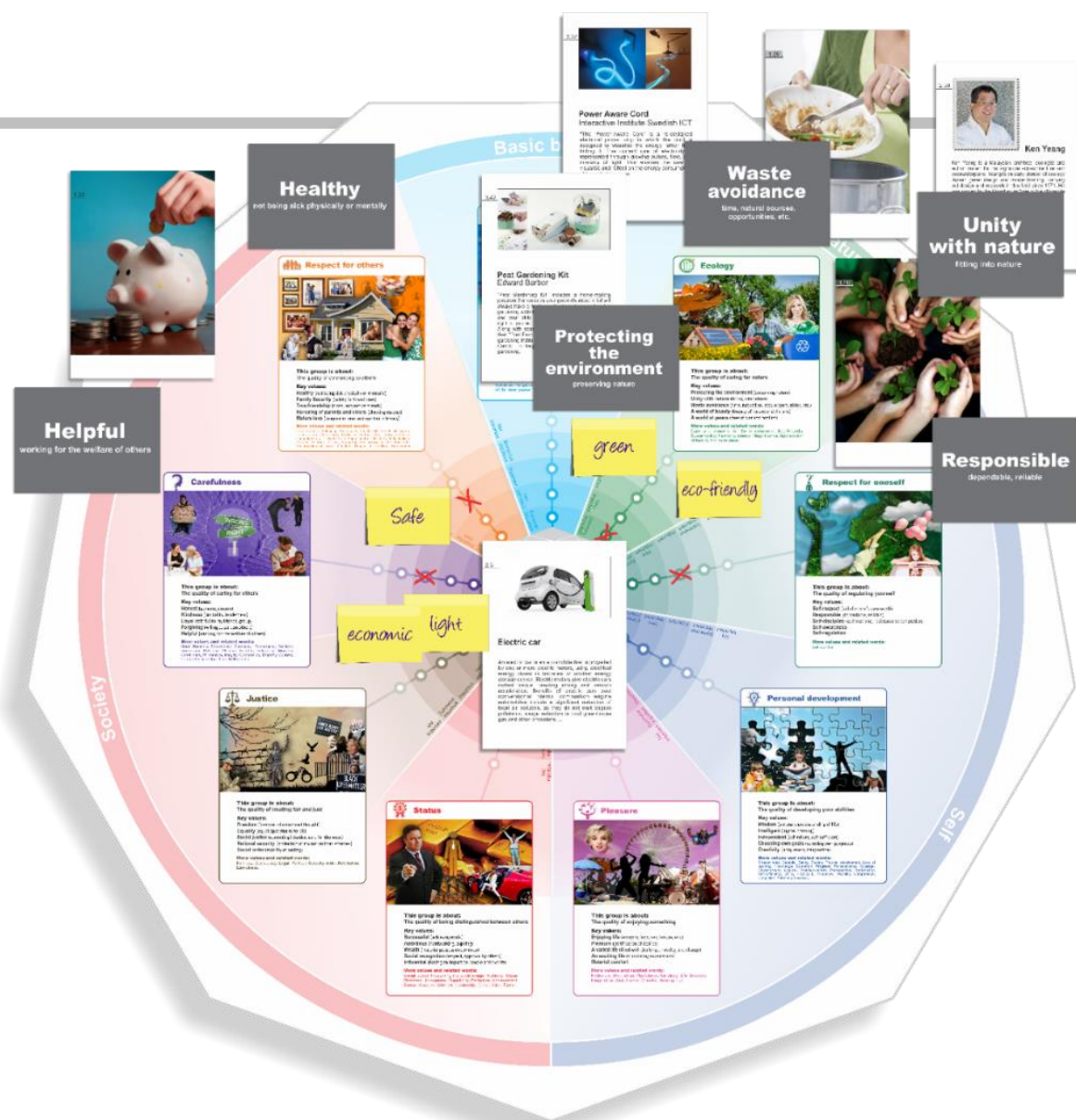
*. Significant difference; $p < 0.05$



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Using the tool for defining designer's vision or identifying the user and other stakeholders



Using the tool as criteria for evaluating existing products or new concepts

Three main conclusions can be drawn:

- The HuValue framework, a comprehensive value framework to widen designers' view on human values.
- The HuValue tool, a card-based design tool grounded on the value framework to facilitate using the framework in practice.
- The HuValue perspective, a design approach to apply the tool in a design process for seeing, analysing, ideating and evaluating from a human value point of view.

KHEIRANDISH, Shadi (2018). HuValue - A tool to enrich design concepts with human values.
PhD Thesis, Eindhoven University of Technology (305 pages). ([online](#))

Kheirandish S., Funk M., Wensveen S., Verkerk M., Rauterberg M. (2019). HuValue: A tool to support design students in considering human values in their design.
International Journal of Technology and Design Education, pp. 1-27. ([online](#)) **[IF=1.339]**

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Poster presented in the International Convention of Psychological Science (ICPS). Amsterdam, The Netherlands.

Thank you for your attention.

A door goes open to a new world...

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