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# Career guidance theories related to vocational choice for pupils aged 12-14 and testing based on the theories

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C-Game project, O1-1.2

Prague, June 2020



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## 1 Introduction

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This document is part of the Output\_O1 of the C-Game project which aim is to develop a C-Game: CAREER GUIDANCE GAME IN A CITY FULL OF OCCUPATIONS. C-Game will be a new serious game providing pupils aged 12-14 with a fun tool of career orientation based on the gradual learning on different professions in five language versions (English, Czech, Slovak, Greek, and Bulgarian) and four countries (Czech Republic, Slovakia, Greece, and Bulgaria).

C-Game offers pupils the opportunity to get acquainted in an entertaining way with approximately 600 occupations, which would broaden their overview of the labour market, the necessary skills for the performance of occupations pursued, and stimulate them to thinking about their future careers and the educational path leading to it. C-Game is based on the assumption that getting to know the world of work in school age contributes significantly in shaping children's future career and professional identity, and that the most effective means to do so is a fun game.

C-Game is not designed as a substitute of career guidance, but it helps students in their professional orientation through play, broadening horizons of employment and thus influences their future career decisions.

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## 2 Career guidance theories – the inspiration for C-Game

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Designing an effective career guidance game required initially, familiarizing ourselves with career guidance related theories. In this chapter, we have clarified the theoretical basis for the development of the game and its direction. The first theories emerged during the first industrial era and since then, the number evolved to more than nearly two hundred. A limited overview of the most significant ones is presented in the ANNEX 1 which provided us a starting point for examining theoretical approaches and discovering practical tools for building C-Game. The publication is essentially a working material summarizing the findings of desk research. Therefore it is not exhaustive, but sufficiently comprehensive and informative for the needs of the C-Game project.

The Trait and Factor Theory, formulated by Frank Parsons and first published in the book "Choosing a Vocation" in 1909 right after his death, is still widely used for career guidance purposes. Since then, more theories followed. Many of those developed in the beginning of the 20<sup>th</sup> century are still valid today and have been further elaborated by other authors into new theories in accordance with new approaches, social situations, knowledge base etc. However, no single theory is comprehensive. Each contributes to the knowledge of the

process of career guidance from a certain point of view and brings specific knowledge and generalization.

## 2.1 Frank Parsons, The trait and factor theory

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The trait and factor theory ('trait' refers to individual characteristics and attributes, while 'factor' indicates the necessary elements to perform well in a vocation) is still used in career guidance, but the context in which it is used has dramatically changed, as it basically relied on psychometric measures. Nowadays, assessment tools are just one of many strategies in working with a client. Parsons' approach suggests that the wise choice of vocation consists of three broad factors: <sup>1</sup>

- 1) clear understanding of oneself (i.e. one's attitudes, abilities, interests, ambitions, resources, limitations and their causes),
- 2) knowledge of the requirements and conditions of success, advantages and disadvantages, compensations, opportunities and prospects in different lines of work,
- 3) true reasoning in the relations of these two groups.

This approach, describes career decision-making as a simple matching of personal characteristics with job requirements. Accordingly, the closer this match, the greater the likelihood of optimal productivity and personal satisfaction. <sup>2</sup>

## 2.2 Edward K. Strong, Strong Interest Inventory

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Strong Interest Inventory (SII) is based on the assumption that people with similar interests are often drawn to similar types of work, enjoy being with others sharing those interests, and are likely to do well in a work environment that reflects those interests. SII was developed in order to help people match their interests to careers and was the very first assessment tool focused to differentiating people's interests according to their likes and dislikes. SII scores, measure a complex of liked and disliked activities selected so as to differentiate suitable occupations from unsuitable occupations. The modern version of the SII is based on the Holland RIASEC codes typology. <sup>3</sup>

## 2.3 Donald E. Super, Life span & Life space approach

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Life span & Life space approach, deals with the stages and roles during a person's life span. It discusses the assumptions and procedures of how individuals make decisions about their careers in accordance with their self-understanding which evolves over time. People seek career satisfaction through work roles in which they can express themselves and further

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<sup>1</sup> *Spotlight on Parsons' trait and factor theory.* Available at: <https://www.careers.govt.nz/articles/spotlight-on-parsons-trait-and-factor-theory/>

<sup>2</sup> *Theories of career counselling.* <https://www.youtube.com/watch?v=vQbkzMYz3oE>

<sup>3</sup> *Strong Interest Inventory.* Available at: [https://en.wikipedia.org/wiki/Strong\\_Interest\\_Inventory](https://en.wikipedia.org/wiki/Strong_Interest_Inventory)

implement and develop their self-concept. However, knowledge of the requirements of individual professions is also a prerequisite for the right choice. If awareness of a profession or the requirements for exercising it is inadequate, a realistic assessment of the suitability of that profession is not feasible. Super argues that occupational preferences and competencies, all change with time and experience along with an individual's life situations. Super developed the concept of vocational maturity, which may or may not correspond to chronological age: people cycle through each of these stages as they go through career transitions.<sup>4</sup>

Super also dealt with the question of maturity for the choice of profession, which he considers it includes:

- awareness of the need to plan a future career,
- the will to take responsibility for career planning and to obtain the necessary information independently,
- selection of a profession that is in line with the interests of the individual.

Super emphasizes that self-knowledge changes and develops during human life as a result of gaining experience.

## 2.4 Donald E. Super, Work Values Inventory

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Work Values Inventory (WVI) is not a simple theory however, it constitutes a tool that assesses the relative importance of work values which Super drew from his developmental theory. Work values refer to the values that individuals believe should be satisfied as a result of their participation in the work role. They are regarded as one of the most important influences on career development, choice, and satisfaction, yet are largely an understudied field within vocational psychology compared to vocational interests.

Super's Work Values Inventory-Revised (SWVI-R) consists of 12 scales measuring the relative importance placed on the following work-related value dimensions: Achievement, Co-Workers, Creativity, Income, Independence, Lifestyle, Mental Challenge, Prestige, Security, Supervision, Work Environment, and Variety. Each of the scales includes 6 items. Items were scored according to Super's five-point response format, using descriptive statements ranging from "Not important at all. Not a factor in my job selection" (1) to "Crucial. I would not consider a job without it" (5). Mean scores within each WV scale, were obtained by summing all of the items in each scale and then dividing by the number of items (6), with higher scores indicating that the respondent places greater importance on that work value.<sup>5</sup>

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<sup>4</sup> Super's theory. Available at: <https://www.careers.govt.nz/resources/career-practice/career-theory-models/supers-theory/>

<sup>5</sup> ROBINSON, C.H. *Examination of the relationship of work values to the "bigfive" personality traits and measures of individualism and Collectivism*. Dissertation. Available at: [https://etd.ohiolink.edu/!etd.send\\_file?accession=osu1185569363&disposition=inline](https://etd.ohiolink.edu/!etd.send_file?accession=osu1185569363&disposition=inline)

Examples of WVI:

- <http://www.philau.edu/careerservices/inc/documents/selfAssessmentWorkValuesInventory.pdf>
- <https://humwork.uchri.org/wp-content/uploads/2015/01/Workvaluesinventory-3.pdf>
- <https://www.myplan.com/assess/values/pg1.php>
- <https://alis.alberta.ca/careerinsite/know-yourself/work-values-quiz/>
- <https://www.careerperfect.com/services/free/insight-work-values-1/>
- <https://www.123test.com/work-values-test/>
- <https://scales.arabpsychology.com/donald-supers-work-values-inventory-wvi.pdf>
- <http://sites.psu.edu/stephaniehainescareerportfolio/wp-content/uploads/sites/37738/2016/01/Work-Values-Inventory.pdf>
- [http://jobseekersguide.org/sites/default/files/work-values-1\\_3.pdf](http://jobseekersguide.org/sites/default/files/work-values-1_3.pdf)

## 2.5 Anna Roe, Career choice and development

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Roe's theory of career choice and development focuses on the relationship between occupational choice and personality. It can be separated into two key areas: theoretical aspects of personality and classification of occupations.

Inspired by Maslow's hierarchy of needs, Roe incorporated the psychological needs that develop out of parent-child interactions in her conceptualization of personality:

- Psychological needs
- Safety needs
- Need for belongingness and love
- Need for importance, respect, self-esteem and independence
- Need for information
- Need for beauty
- Need for self-actualization

Roe was dissatisfied with the classification of occupations available therefore she developed a new one that consists of two dimensions: level and field. Level is related to aptitude, training, responsibility and similar attributes which play a role in vocational guidance. Field is the dimension which provides information on the contents of the occupation, and is therefore particularly relevant to a classification by interests. These two dimensions are orthogonal to each other.<sup>6</sup>

Occupations can be classified by eight interest fields:

1. Service
2. Business
3. Organization
4. Technology
5. Outdoor

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<sup>6</sup> Psychology. *Roe's Career Theory*. Available at: <http://psychology.iresearchnet.com/counseling-psychology/career-counseling/roes-career-theory/>

6. Science
7. General Culture
8. Arts and Entertainment

The eight occupational categories were then subdivided into six classification levels based on degree of responsibility and ability:

1. Professional and managerial (Independence and Responsibility)
2. Professional and managerial (Less Independence and Responsibility)
3. Semi-professional and small business
4. Skilled
5. Semiskilled
6. Unskilled

Roe's system of classification and categorization has proved useful as a framework for organizing in a meaningful way, a multitude of occupations. Anne Roe's work has had an impact on interest test development and career research.

## 2.6 John L. Holland, Theory of career choice

John Holland's Theory of Career Choice (RIASEC) and instruments developed contributed significantly to counselling psychology. RIASEC structure is the most widely used model for organizing career interest assessment instruments. It is based on the premise that behaviour is determined by the interaction between personality and environment. In choosing a career, people prefer jobs where they can be among people and an environment that will let them use their skills and abilities, and express their attitudes and values, while taking on enjoyable problems and roles.<sup>7</sup> Therefore, career counselling should uncover personal characteristics and suggest matching occupations.

Holland's theory is centred on the notion that most people fit into one of six personality types (RIASEC) which are characterized by a constellation of interests, preferred activities, beliefs, abilities, values, and characteristics:

- Realistic
- Investigative
- Artistic
- Social
- Enterprising
- Conventional

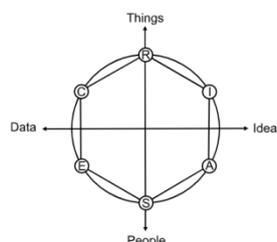


Fig. 1. Holland's (1959, 1997) interest types with Prediger's (1982) dimensions.

<sup>7</sup> Holland's theory. Available at: <https://www.careers.govt.nz/resources/career-practice/career-theory-models/hollands-theory/>

Although each individual is made up of all six types, usually one type is usually dominant. Most personalities tend to resemble up to three of the six personality factors. The six types can be applied also to working environments, occupations, jobs, majors, leisure activities, etc. The closer the match of personality to job, the greater the satisfaction.<sup>8</sup>

RIASEC types become the basis for a large number of different tests. For example:<sup>9</sup>

- Vocational Preference Inventory (VPI; Holland),
  - Self-Directed Search (SDS; Holland, Fritsch, & Powell)
  - Position Classification Inventory (PCI; G. D. Gottfredson & Holland)
  - Environmental Assessment Technique (EAT; Astin & Holland)
  - Vocational Decision- Making Difficulty Scale (Holland & Holland)
  - My Vocational Situation (MVS; Holland, Daiger, & Power)
  - Vocational Identity Scale (Holland, Johnston, & Asama)
  - Career Attitudes and Strategies Inventory (Holland & Gottfredson)
- and many others.

The integration of the RIASEC framework into these instruments helped ensure that thousands of people annually receive information about their interests in the form of RIASEC-type scores which undoubtedly contributed to the theory's popularity. Nowadays, the majority of all career-interest inventories use some version of Holland scales. It is also worth mentioning that Holland's RIASEC model has been used to organize occupational information in USA and occupational interest profiles based on the RIASEC typology have also been created for each occupation in the government-sponsored O\*Net database.<sup>10</sup>

Examples of Holland code career test:

- <https://www.truity.com/test/holland-code-career-test>
- <https://www.hawaiipublicschools.org/DOE%20Forms/CTE/RIASEC.pdf>
- [http://jobseekersguide.org/sites/default/files/interests\\_occupations\\_1\\_2.pdf](http://jobseekersguide.org/sites/default/files/interests_occupations_1_2.pdf)

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<sup>8</sup> Chi-Ping DENG, Patrick Ian ARMSTRONG, James ROUNDS. *The fit of Holland's RIASEC model to US occupations. Journal of Vocational Behaviour*. 2007. Available at: [https://www.researchgate.net/publication/222574471\\_The\\_fit\\_of\\_Holland's\\_RIASEC\\_model\\_to\\_US\\_occupations](https://www.researchgate.net/publication/222574471_The_fit_of_Holland's_RIASEC_model_to_US_occupations)

<sup>9</sup> NAUTA, M. M. *The Development, Evolution, and Status of Holland's Theory of Vocational Personalities: Reflections and Future Directions for Counseling Psychology*. Available at: <https://www.counseling.org/docs/david-kaplan's-files/nauta.pdf?sfvrsn=2>

<sup>10</sup> Chi-Ping DENG, Patrick Ian ARMSTRONG, James ROUNDS. *The fit of Holland's RIASEC model to US occupations. Journal of Vocational Behaviour*. 2007. Available at: [https://www.researchgate.net/publication/222574471\\_The\\_fit\\_of\\_Holland's\\_RIASEC\\_model\\_to\\_US\\_occupations](https://www.researchgate.net/publication/222574471_The_fit_of_Holland's_RIASEC_model_to_US_occupations)

## 2.7 John D. Krumboltz, Social learning theory of career decision making, Learning theory of careers choice & counselling

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Social Learning Theory of Careers Decision Making (SLTCDM) focuses on teaching clients career decision-making alternatives and makes use of the concept of the “triadic reciprocal interaction” (learning as the interaction with environment and genetic endowment) and emphasizes the role of instrumental & associative learning. Consequently, key concepts/tools for the practitioner are reinforcement and modelling. The application of SLTCDM to practice involves the practitioner attempting to identify and correct any incorrect beliefs held by the client about the decision-making process. It was developed to address the questions:

- why people enter particular educational course or jobs;
- why they may change direction during their lives;
- why they may express preference for different activities at different points in their lives.<sup>11</sup>

Krumboltz saw his theory as (1) a way of explaining the origin of career choice and (2) a guide to how career practitioners might tackle career related problems. The practitioner starts with understanding how a client came to their career related view of themselves and the world and what is limiting or problematic about this view. Once this has been established, the practitioner and client identify what career relevant learning experiences, modelling or skill building will help them reframe their view. Using Krumboltz’s approach a practitioner plays a major role in dealing with all career problems, not just occupational selection.<sup>12</sup>

Krumboltz defined four factors that influence career decision-making:

- Genetic endowments and special abilities
- Environmental events and conditions
- Instrumental and associative learning experiences
- Task approach skills

And four primary ways these factors influence career decisions:

- Self-observation generalizations
- Worldview generalizations
- Task approach skills
- Actions

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<sup>11</sup> BIMROSE, J. *Traditional theories, recent developments and critiques*. Available at: <https://warwick.ac.uk/fac/soc/ier/ngrf/effectiveguidance/improvingpractice/theory/traditional/>

<sup>12</sup> *Krumboltz's Theory*. Available at: <http://careercounselingai.blogspot.com/2015/02/krumboltzs-theory.html>

## 2.8 Linda Gottfredson, Circumscription, compromise, and self-creation

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Linda Gottfredson explains the rationality of career choices in her theory of circumscription and compromise, in which she presents possible origins of interests, abilities and other reasons guiding the selection of career path. The theory is based in that our self-concept (our identity) is defined by the genetics, environment, culture and relationships as we grow up, but is largely influenced by the experience gained. So, on one hand, we have some given starting points that we inherited from our family and social surroundings and on the other hand, we are active factors in the development of our identity by gaining unique experiences and feelings.<sup>13</sup>

Gottfredson defines the term “**circumscription**” as a process of eliminating unacceptable occupational alternatives which has four stages according to the age: orientation to size and power (age 3 to 5), orientation to sex roles (age 6 to 8), orientation to social valuation (age 9 to 13), and orientation to internal, unique self (age 14+). While the four stages of circumscription are processes by which we eliminate occupations we deem unacceptable, “**compromise**” is the process by which we relinquish our most preferred alternatives for less compatible but more accessible ones. Within the roles we have short-listed based on perceived effort, prestige and gender, we select those positions within our social space based on what is available. We then define what is “good enough” and what is not “good enough”.<sup>14</sup>

If our desired role is not available, we compromise on prestige rather than adjusting across gender roles. Someone who wants to be in engineering may opt for construction rather than taking a role as a hair dresser. Conversely, someone who wants to be a social worker may become an admin assistant rather than take a role in the mining industry. Compromise is also a process of adjusting career opportunities due to limiting factors such as the level of occupational insight gained and the availability of jobs.

## 2.9 B. Law, Anthony G. Watts, New-DOTS: Career development learning

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Law and Watts defined 4 core areas in the process of step by step approach to career decision- making and career development, and created the DOTS framework. The DOTS is abbreviation of:<sup>15</sup>

- Decision learning (D) What will I do?
- Opportunity awareness (O) Where am I?

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<sup>13</sup> Did you inherit your career? Gottfredson’s theory of circumscription and compromise. Available at: <http://www.sidewaysthoughts.com/blog/2013/06/did-you-inherit-your-career-gottfredsons-theory-of-circumscription-and-compromise/>

<sup>14</sup> Ibid

<sup>15</sup> LAW, B. 1999. *Career learning space: New DOTS thinking for careers education*. British Journal of Guidance and Counselling 27, no. 1: 35–54.

- Transition learning (T) Where will I do it?
- Self-awareness (S) Who am I?

DOTS framework is widely used as a minimum standard and useful model of career guidance steps in working with someone who is preparing for the transition from learning into work, as well as for other transitions related to education, training, and the labour market.<sup>16</sup>



The most likely developmental order for young people is S-O-D-T, as a certain level of Self-awareness needs to precede Opportunity awareness; which then requires Decision learning to enable any form of Transition.

Law and Watts also described four staged components, which were likely to comprise additive evolutionary stages in the development of a careers' education and guidance programme:

- information, e.g. a box of materials in a careers resource centre
- interview, e.g. advice and/or counselling
- curricular
- integrated (including extra-curricular and community engagement).<sup>17</sup>

## 2.10 Albert Bandura, Social cognitive theory

Social cognitive theory (SCT) belongs to the category of learning theories. It is based on the idea that people learn by observing what others are doing, and that human thought processes are key to understanding personality. A conclusion drawn from this is that monitoring what others are doing and the process of human thinking have also an impact on career choices and future employment.

<sup>16</sup> YOUNG, S. *DOTS Model by Law and Watts*. 2019. Available at: <http://www.cdanz.org.nz/te-mohiotanga/law-and-watt-s-dots-model/278/>

<sup>17</sup> HOOLEY, T., MARRIOTT, J., WATTS, A.G. AND COIFFAIT, L. (2012). *Careers 2020: Options for Future Careers Work in English Schools*. London: Pearson. Available at: <https://derby.openrepository.com/bitstream/handle/10545/251032/CAREERS+2020.pdf>

SCT describes the learning process that occurs through observation. In order to keep track of what other people are doing, it is important to be interested in the activity. If we consider something interesting, prestigious or attractive, we will pay more attention to it. If we are interested enough, we will keep it in our memory and when necessary, it will be invoked spontaneously and help to imitate (reproduce) the given activity. This does not mean, however, that everything seen can be reproduced immediately by everyone. For example, long-term monitoring of top athletes will not make a non-athlete a top competitor. Nevertheless, our skills are improving, even if we only imagine that we are performing them. SCT works with the concept of self-efficacy, through which individuals exercise control over their thoughts, feelings and actions. Self-efficacy is thought of as the most influential predictor of human behaviour. It influences the ability to organize and carry out the steps needed to achieve a given goal which rests on the four most influential sources:<sup>18</sup>

- personal previous successes or failures (most influential)
- vicarious experience from watching others
- verbal persuasion, encouragement or deterrence
- physiological and emotional factors like perception of stress reactions in the body

The level and strength of self-efficacy determines:<sup>19</sup>

- whether the behaviour will be initiated,
- what efforts will be made,
- how long the effort will be sustained in the face of obstacles.

Self-efficacy plays a central role in the career decision-making process. People are more likely to choose occupations that require skills that they think they either have or can develop, and avoid those for which they do not have, do not want, or are unable to develop the proper skills.

## 2.11 H. B. Gelatt, Positive uncertainty

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Positive uncertainty is a bit different approach to decision-making strategies in career guidance. It is an attitude that combines a sense of insecurity about the future and a positive sense of the insecurity. It is based on the assumption that the future is full of ambiguity and paradoxes in which it is impossible to see in advance what will happen and whether we will be able to react to it. Accepting uncertainty positively allows acting and making decisions.<sup>20</sup>

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<sup>18</sup> HOOLEY, T., MARRIOTT, J., WATTS, A.G. AND COIFFAIT, L. (2012). *Careers 2020: Options for Future Careers Work in English Schools*. London: Pearson. Available at:

<https://derby.openrepository.com/bitstream/handle/10545/251032/CAREERS+2020.pdf>

<sup>19</sup> ibid

<sup>20</sup> GELATT, H. B. *Positive Uncertainty: A New Decision-Making Framework for Counseling*. Journal of Counseling Psychology. 1989. Available at:

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.337.4511&rep=rep1&type=pdf>

Positive uncertainty works with two assumptions: The ability to recognize and accept that the future is uncertain; and at the same time, be positive about it. Positive uncertainty relates decision making to three basic guidelines:

- Information guideline: Treat your facts with imagination, but do not imagine your facts.
- Process guideline: Know what you want and believe, but do not be sure.
- Choice guideline: Be rational, unless there is a good reason not to be.

Gellat in his later work suggested following positive uncertainty's paradoxical, ambiguous principles:<sup>21</sup>

- 1) Be focused and flexible about what you want.
  - Know what you want but don't be sure
  - Treat goals as hypotheses
  - Balance achieving goals with discovering them
- 2) Be aware and wary about what you know.
  - Recognize that knowledge is power and ignorance is bliss
  - Treat memory as an enemy
  - Balance using information with imagination
- 3) Be objective and optimistic about what you believe.
  - Notice that reality is in the "eye" and the "I" of the beholder
  - Treat beliefs as prophecy
  - Balance reality testing with wishful thinking
- 4) Be practical and magical about what you do.
  - Learn to plan and plan to learn
  - Treat intuition as real

The concept of positive uncertainty has had a strong influence on some of the modern theories of career choice — especially those which emphasize chance and complexity, such as planned happenstance or the chaos theory of careers.<sup>22</sup>

## 2.12 Jim Bright, Robert Pryor, Chaos theory of careers

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The Chaos Theory of Careers (CTC) characterizes individuals as complex systems subject to the influence of complex influences and chance events. However, over time, patterns emerge in our behaviour that are self-similar but also subject to change. Career chaos theory provides a way to understand how to succeed in the 21<sup>st</sup> century.

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<sup>21</sup> GELATT, H. B. *Positive Uncertainty: A Paradoxical Philosophy of Counseling Whose Time Has Come*. 1992. ERIC Digest. Available at: <https://www.ericdigests.org/1992-3/positive.htm>

<sup>22</sup> *Can you be positive about uncertainty?* Available at: <https://careersintheory.wordpress.com/2009/12/14/positive-uncertainty/>

Thinking about the future is difficult, due to the complexity of the world we live in. It is stable but changing, like the weather. Each person is an individual, complex, open and dynamic system that is constantly changing and operating in another complex, open and dynamic system, and in constant contact with other human individuals. In parallel each individual has its own limits, internal and external. And it is almost impossible to determine how many different career options an individual has. These options are influenced by various factors such as the cultural, political and social environment in which he/she grows up, education, health, etc. Future options, regardless of their nature, vary in degree of certainty. Some are relatively certain, others very uncertain. Very uncertain are, for example, chance events which occur in an individual's life. This seems to be a "chaos", but not everything in our complex life system is chaotic and beyond our control. Even what appears to be chaos has a certain order and stability. We move in time and changes take place around us. We are also changing in our own way every day. Therefore, in career guidance, it is necessary to develop the clients' change perception, opportunity awareness, luck readiness, flexibility, curiosity, optimism, self-efficacy, strategy, luck, risk and persistence, adaptability, and ways to revise their careers plans innovation, creativity, flexibility. And most importantly, develop their ability to recognize chance events, be able to use them and draw from them.<sup>23</sup>

The complexity of influences on career development make accurate predictability challenging. Elements of chaos theory that can be used by counsellors to assist their clients include:

- Complexity
- Emergence
- Non-linearity
- Unpredictability
- Phase shifts
- Attractors

### **2.13 K. E. Mitchell, S. Al Levin, L. D. Krumboltz, Planned happenstance**

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Planned happenstance theory, is an amendment to the learning theory of career counselling, expansion of the social learning theory of career decision making with elements of positive uncertainty and the chaos theories. Planned happenstance theory is a conceptual framework extending career counselling to include the creating and transforming of unplanned events into opportunities for learning. The goal of a planned happenstance intervention is to assist clients to generate, recognize, and incorporate chance events into their career development. A strong component of planned happenstance is facilitating the client's actions of generating

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<sup>23</sup> BRIGHT, J. *The Chaos Theory of Careers - its about complexity*. Available at: <https://www.youtube.com/watch?v=AVGA1cQX4D4>

and anticipating possible opportunities. Clients need to learn to take action to generate and find opportunities.<sup>24</sup>

At the core of this theory is the fact that unpredictable social factors, chance events and environmental factors are important influences on clients' lives. As such, the counsellor's role is to help clients approach chance conditions and events positively. In particular, counsellors foster in their clients:<sup>25</sup>

- curiosity to explore learning opportunities
- persistence to deal with obstacles
- flexibility to address a variety of circumstances and events
- optimism to maximise benefits from unplanned events.

Krumboltz states that people with these qualities are more likely to capitalize on chance events and turn serendipity into opportunity.

Furthermore, several factors have been highlighted as being helpful in career management, including:<sup>26</sup>

- the commitment to ongoing learning and skill development
- ongoing self-assessment
- assessment and feedback from others
- effective networking
- achieving work-life balance
- financial planning to incorporate periods of unemployment.

These attributes and tasks enable individuals to turn chance encounters and occurrences into career opportunities.

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<sup>24</sup> MITCHELL, K.E., LEVIN, A.S. & KRUMBOLTZ, J.D. (1999) *Planned happenstance: Constructing unexpected career opportunities*. Journal of Counseling & Development, 77, 115-124.

<sup>25</sup> *Krumboltz's theory*. Available at: <https://www.careers.govt.nz/resources/career-practice/career-theory-models/krumboltzs-theory/>

<sup>26</sup> *ibid*

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### 3 Conclusions

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The main objective of the C-Game is to support pupils aged 12-14 in gaining information about a wide range of occupations, increasing their self-confidence and self-efficacy during the online game, which aims to be fun and entertaining for them and at the same time usable both for pupil teams in the classroom and for individual pupils outside the classroom. The partnership's aim is to contribute towards the achievement of comprehensive career development, which is essential in schools.

In this paper, we have explored theories about career guidance that would be useful to consider when developing a career guidance game have been explored. To identify suitable theories for the creation of C-Game, a list of theoretical approaches published by M. Savickas were used, to which some extra were added as well. Finally, there were selected 41 theoretical approaches that could be a source and inspiration for the development of C-Game. This comprehensive list, allowed us to gain an overview and consider the practical application of theoretical approaches. In between while getting better knowledge of the theories, we added three more authors to the original list have been added, so as to result in a short list containing 13 theories or inventories related to career guidance.

From the studied works, we identified the following interesting and potentially useful points in developing C-Game were identified.

#### 1) Frank Parsons, The train and factor theory

The idea of matching the skills, abilities, interests with occupations is useful for our approach and it will be taken into account using however, its followers' theories.

#### 2) Edward K. Strong, Strong Interest Inventory

For the C-Game's purposes, it is important that the pupils take an inventory of their interests. Nevertheless, from experience indicates that pupils do not like to read long texts and fill in long questionnaires. Therefore, even though it has been decided to use RIASEC extra thought is needed in order to find a way to combine fun and entertainment with some kind of "hidden" self-assessment.

#### 3) Donald E. Super, Life span & Life space approach

It is necessary for pupils to learn a set of skills that will assist them in their efforts to establish satisfying life structures across their life spans. In order to match the diversity of users, C-Game's information base should be as broad as possible in all respects. C-Game should contribute to the development and application of occupational self-concepts.

#### **4) Donald E. Super, Work Values Inventory**

Work values inventory (WVI) can be used in C-Game, as one of the self-assessment tools like the following self-assessment work values inventory:

<http://www.philau.edu/careerservices/inc/documents/selfAssessmentWorkValuesInventory.pdf>

Nevertheless, using the WVI in C-Game development, should be subject to discussion and available financial sources. We also have to take under consideration the C-Game target group and examine the potential usefulness to the target group of such self-assessment to the target group. Another point to examine is the level of knowledge needed to produce such a test, the need to make desk research, compare content and range of the WVI and suitability of questions to C-Gamers.

#### **5) Anna Roe, Career choice and development**

The city in which the C-Game will take place can have 8 districts that can be named according to the Roe's occupational classification. In each district one could view occupations falling into one of the 8 categories. Another potential use, can be to divide the occupations to the above mentioned 6 classification levels based on degree of responsibility and ability.

#### **6) John L. Holland, Theory of career choice**

Holland's theory of vocational personalities and work environments, can definitely be utilized in C-Game. The game should have some kind of interest self-assessment tool (one or more) resulting in the identification of 3 digit RIASEC code at least. Also, we will seek ways to get RIASEC codes for 600 occupations will be sought, which allow to propose occupations that are compatible with the game user's RIASEC profile.

#### **7) John D. Krumboltz, Social learning theory of career decision making, Learning theory of careers choice & counselling**

From Krumboltz's work we can be utilised the finding that not only a person's self-concept, but also their values, attitudes and interests are formed in the context of the environment they live in, and influence their career decisions and reframe their view. C-Game's aim is not only to provide information about occupations, but also to contribute to reframing the pupils' view on a wide scale of possibilities of the labour market and to outline occupations that the gamers did not think about in the context of their environment.

#### **8) Linda Gottfredson, Circumscription, compromise, and self-creation**

From the theory of circumscription and compromise we pick up the topic of social and gender stereotypes. Most girls and boys are still brought up in a more generically traditional way. For example, girls are encouraged to engage in games with dolls, while boys are led to games with cars and other technical simulation toys. Traditionally oriented gender socialization leads girls and boys to different life trajectories and develops different dispositions in them. However, these differences, which can be seen in a superficial observation between many women and men, are not based on female and male "nature",

but arise under social influences. Gender stereotypes often work automatically, are the most widespread and at the same time resistant to change.<sup>27</sup> During the C-Game development attention has to be paid into breaking gender stereotypes down and promote equal opportunities by expanding the space for the application of each person on the basis of their real abilities.

#### **9) B. Law, Anthony G. Watts, New-DOTS: Career development learning**

DOTS is a suitable model for creating a game, during which we need to achieve that students step by step:

- increase their self-awareness, i.e. clarify their abilities, interests, values and motivations, plus any other aspects of the "I" that seem relevant.
- get acquainted with as many professions and thought as possible, for example, about the environment in which the profession is performed, what is required in order to be able to perform the profession.
- gradually link what they learn about themselves with the profession's requirements.

Through the game, there is no need for pupils to make a decision about their future career, just to understand the importance of "self-marketing", gain information about the professions and internally clarify their attitude to them.

#### **10) Albert Bandura, Social cognitive theory**

The development and strengthening of self-efficacy in young people is being very important. Efficacy affects their access to education, their hobbies and interests. By helping them expand their knowledge on various professions through an entertaining C-Game, we support their potential choice and better prepare them for the decision-making process related to the choice of occupation. C-Game will not be preparing them directly for the choice of subsequent studies and for a particular school, but indirectly we facilitates this choice for them.

#### **11) H. B. Gelatt, Positive uncertainty**

The theoretical approach of positive uncertainty It can be applied if we choose to encourage positive thinking, embracing uncertainty and developing adaptation skills through appropriate messages in several parts of the game. Its message is that there is no need to worry about the uncertain future. Pupils need to approach the future positively and be prepared for the uncertainties that await them in their future career path. C-Game can help pupils keep an open mind and even teach them how to change their minds when necessary.

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<sup>27</sup> KOLKOVÁ, V. Motivace žáků základní školy k výběru budoucí profese během posledních dvou let povinné školní docházky. Diplomová práce. Available at: [https://theses.cz/id/qav4qh/Diplomov\\_prceV\\_KolkovUPED.pdf](https://theses.cz/id/qav4qh/Diplomov_prceV_KolkovUPED.pdf)

## **12) Jim Bright, Robert Pryor, Chaos theory of careers**

Chaos theory application in the development of the C-Game could mainly help pupils realize during the game how important it is to utilise random events and how many different career opportunities may arise out of them in the future. When thinking about a career goal it is better to make it wide and open, and taking in mind that it is more important is to revise and adapt the ideas about future occupation to the changes of circumstances, because the world is constantly changing, than to rely on setting individual static goals. This will potentially help them maintain the balance and work with the future uncertainty.

## **13) K. E. Mitchell, S. Al Levin, L. D. Krumboltz, Planned happenstance**

Planned happenstance suggests that a career is something that will gradually unfold and encourages individuals to make the most of sometimes strange and interesting opportunities as they arise. This theoretical approach should be challenge for the development of C-Game, because one of the game's goals is, in a fun and entertaining way, to provide an overview of occupations aimed to strengthen students' natural curiosity, their readiness to respond to suitable opportunities that could be beneficial for them in the future and release fear of taking risks on unexpected career opportunities.

\* \* \*

C-Game's users will be pupils aged 12-14, most of whom are expected to enter the labour market in 6-10 years from now. This suggests that we cannot be currently aware of what the epidemiological, economic, social, etc. situation will be. Consequently, it is not possible to know how many of the current occupations will exist in their current form at that time, or how many new occupations will emerge.

However, C-Game aims at adding an element of predictability in the pupils' future lives and careers, even though they are destined for a huge adventure, in a dynamic, fluid and global world, with a level of diversity throughout their lives that could not have been imagined in earlier centuries. Successful people will demonstrate a certain occupational resiliency characterized by flexibility, optimism, lifelong learning, daily networking, and a clever eye for opportunity.

The happenstance learning theory, explains how a lifetime of active involvement provides learning opportunities that may have been planned or unplanned. It is neither possible nor desirable to predict exactly what pupils' future occupation will be. The process continues throughout their life which is why it is vital to keep their options open at all times.

Perhaps it is therefore, more productive to ask youngsters, "What are you enjoying and learning to do right now?", "What would be fun to try next?"

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## 5 ANNEX 1

Table 1: Available theories, methodological approaches and tool related to vocational choice for pupils aged 12-14<sup>28</sup>

No	Title / author, year	Short description
1	Matching / Parsons, 1909	the wise choice of a vocation includes three broad factors: 1) a clear understanding of oneself, their attitudes, abilities, interests, ambitions, resources, limitations and their causes, 2) a knowledge of the requirements and conditions of success, advantages and disadvantages, compensations, opportunities and prospects in different lines of work, 3) true reasoning in the relations of these two groups.
2	Individual Differences / Thorndike, 1911	Individuals differ in intellect and character.
3	School-to-Work Transition/ Bloomfield, 1915	To bridge the gap between school and work, requires making school life more interesting and purposeful and working life more educative and productive.
4	Guidance / NVGA, 1921	Vocational guidance is the process of assisting the individual to choose an occupation, prepare for it, enter upon and progress in it.
5	Interest Inventories / Strong, 1927	Interest scores measure a complex of liked and disliked activities selected so as to differentiate members of an occupation from non-members.
6	Interests / Fryer, 1931	Interest is present when we are aware of an object or, better still, when we are aware of our disposition towards the object.
7	Congruence / Brewer, 1936	Probable success in entering an occupation depends on the correspondence between the requirements of an occupation and the qualifications an individual possesses for that particular occupation.
8	Case Conceptualization / Williamson and Bordin, 1941	What counselling technique and conditions will produce what types of results with what types of clients.
9	Occupational Self-Concept / Bordin, 1943	Vocational interests express the individual's view of self in terms of occupational stereotypes.
10	Work Values / Hoppock and Super, 1950	Work values are the general goals or satisfactions sought from work.
11	Career Counselling / Super 1951	The process of helping people to develop an integrated and adequate picture of themselves and of their role in the world of work, to test this concept against reality and to convert it into a reality, with satisfaction to themselves and benefits to society.
12	Vocational Development / Ginzberg, 1951	Occupational choice is a developmental process which typically takes place over a period of ten years.
13	Vocational Maturity / Super 1954	Counsellors help students to look ahead (planfulness) and look around (exploration) to increase career choice readiness.

<sup>28</sup> Mark L. Savickas. Ten ideas that changed career development. National Career Development Association. Available at: [https://associationdatabase.com/aws/NCEA/asset\\_manager/get\\_file/71112?ver=15864](https://associationdatabase.com/aws/NCEA/asset_manager/get_file/71112?ver=15864)

No	Title / author, year	Short description
14	Parental Status / Blau, Gustad, Jessor, Parnes, and Wilcock, 1956	A sociological perspective on occupational choice in which parental status affects occupational attainment of offspring.
15	Occupational Classification / Roe, 1956	Occupations can be classified by eight interest fields and six ability levels.
16	Career Stages / Super, 1957	Careers develop over the life course through a predictable series of stages and tasks.
17	Types / Holland, 1959	Vocational personalities and work environments can both be described in terms of resemblance to six prototypes.
18	Decision and Vocational Development / Tiedeman, 1961	The theory is based on assumption that one is responsible for one's own behaviour because one has the capacity for choice and lives in a world which is not deterministic.
19	Project TALENT / Flanagan, 1961	Over time, individuals change their career plans to fit their abilities and interests.
20	Career Consciousness / Tiedeman, 1964	Career is the imposition of meaning on vocational behaviour.
21	Opportunity Structure / Roberts 1968	Individuals are more or less constrained in their choice of occupations by social variables that are outside their control e.g. gender, ethnicity and social class.
22	Decision-Making Difficulties / Osipow, 1976	Individuals may face many different difficulties in making a career choice.
23	Social Learning Theory / Krumboltz, 1976	Teach clients career decision techniques and examine four basic factors to understand why people choose the work they do (i.e., genetic endowment, environmental conditions, learning experiences, and task approach skills).
24	Career Education / Hoyt, 1977	An effort aimed at refocusing American education and the actions of the broader community in ways that will help individuals acquire and utilize the knowledge, skills, and attitudes necessary for each to make work a meaningful, productive, and satisfying part of their way of living.
25	Vocational Identity / Holland, 1980	Vocational identity is a clear and stable picture of one's interests, talents, and goals.
26	Transitions / Schlossberg, 1981	A model for assessing and facilitation of an individual's adaption to transitions in terms of self, support, and strategies.
27	Circumscribed Aspirations / Gottfredson, 1981	Most youngsters circumscribe their vocational aspirations according to sex-type and prestige by age 13.
28	Career Self-Efficacy / Betz and Hackett, 1981	Differential background experiences associated with gender role socialization may lead to gender differences in self-efficacy and confidence with respect to specific domains of career behaviour, especially those associated with traditionally male dominated career fields.
29	Career as Story / Jepsen, 1990	Career is a narrative told by a working person.
30	Social Justice / Pope 1995	Best practice requires that career counsellors understand and appreciate cultural diversity and advocate for social justice.

No	Title / author, year	Short description
31	Cognitive Basis of Interests / Lent, Brown, and Hackett, 1996	Interest in an activity grows and endures when people (a) view themselves as competent (self-efficacious) at the activity and (b) anticipate that performing it will produce valued outcomes (positive outcome expectations).
32	Fit Work into Life / Richardson, 1996	Rather than fitting people into work, help individuals fit work into their lives.
33	Integrative Life Planning / Hansen, 1996	The ILP framework enables career professionals, counsellors, and their clients to develop career and life patterns that are holistic and focused on both individual satisfaction and community benefit.
34	Career Adaptability / Savickas, 1997	The post-corporate global economy requires that individuals develop the readiness and resources to cope with repeated vocational choices, occupational transitions, and work traumas.
35	Work and Meaning / Bloch and Richmond 1997	Find meaning and wholeness by infusing work by with values and spirit.
36	New-DOTS Thinking For Careers Education / Law, 1999	The DOTS analysis is a tool for reviewing and sharpening learning aims for careers education and guidance: decision learning (D); opportunity awareness (O); transition learning (T); self - awareness (S). New-DOTS were created as a new NICEC evidence-based theory. It sets out: how the DOTS analysis can be extended by mapping, not only what people learn, but how and why they learn; learning processes essential to learning-to-learn for life-long use; career learning for a changing range of work roles; how New DOTS can be used as an improved tool for designing and developing effective programmes.
37	Career Construction / Savickas, 2005	People build careers by turning their preoccupations into occupations and thereby actively master what they passively suffer.
38	Happenstance / Krumboltz, 2009	The goal of career counselling is to help clients learn to take actions to achieve more satisfying career and personal lives—not to make a single career decision.
39	Work Volition / Blustein, 2011	Starting with the work of Parsons (1909), vocational guidance addressed the needs of immigrants and working-class people, many of whom lived in poor urban communities. I propose that we need to get back to our roots in order to move forward as a discipline that will have life, vitality, and relevance in the years to come.
40	PIC model for career decision making / Gati, Asher, 2001	The PIC model consists of 3 stages—pre-screening, in-depth exploration, and choice. Each stage is presented in detail and compared to the other stages. The chapter concludes with a presentation of research that is relevant to the PIC model, as well as what implications the PIC model holds for the future of career decision making and counselling.
41	Myers-Briggs Type Indicator (MBTI) 1995, 2019	The Myers–Briggs Type Indicator (MBTI) is an introspective self-report questionnaire indicating differing psychological preferences in how people perceive the world and make decision

***Career guidance theories related to vocational choice for pupils aged 12-14 and testing based on the theories***

<b>Project</b>	C-Game: Career guidance game in a city full of occupations No 2019-1-CZ01-KA201-061204
<b>Output</b>	O1, part 1-2
<b>Funding</b>	ERASMUS+ program, 2019-2022
<b>Partners</b>	Asociace výchovných poradců, ČR Národní vzdělávací fond, ČR K.A.B.A. Slovakia, SK TeCeMko, SK Znam I Moga, BG ISON, GR
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