

## Career decisions as a cognitive information process

The theories of career development and career choice do not usually address the actual processes involved in the decision. This aspect is targeted by decision-theoretical approaches, where a distinction must be made between normative and descriptive models. The former explains how decisions should be made; the latter examines how individual decision-making behaviour actually takes place. The approach presented below is eclectic and belongs rather to the descriptive approaches (Ertelt, Schulz, 1997, p. 223.; Ertelt 2001, p. 1385; Peterson, Sampson, Reardon, Lenz, 1996, p. 423).

Individual decision-making and problem-solving processes can ideally be divided into a pre-decision phase, a decision phase and a post-decision phase, each with characteristic information activities. Three types of information interact in different ways: Factual knowledge includes information about possible alternatives, their 'offers of satisfaction' and their ways and chances of realisation; evaluative knowledge includes criteria that have developed from ideas about oneself in comparison to the perceived professional-social environment; personally binding problem-solving strategies show the individual which factual and evaluative information is to be combined and how.

Only the information included by the individual in a particular problem-solving situation is called 'decision premises'.

Factual premises mainly include occupational knowledge and subjective assessment of the chances of realising alternatives. Valuative premises are fed by interests, motivation, self-assessed abilities, and influences of 'important' reference persons. Prescriptive premises comprise subjective significant methods of problem-solving (cf. Mitchell, Krumboltz, 1996): 1) perception of the importance of a decision situation, 2) realistic determination of the necessary steps, 3) careful examination of previous experiences in similar situations, 4) development of various alternative courses of action, 5) collection of information about these alternatives, 6) weighting of the alternatives on the basis of the criteria and weeding out unattractive alternatives.

The processes involved in occupational problem-solving were treated in a differentiated manner from the early perspective of cognitive information processing approaches (cf. Ertelt, Feckler 1979; Ertelt 1982) and subsequently studied several times empirically (Ertelt, Schulz, Frey, 2022, p. 155). In a similar way, Peterson et al. (1996, p. 444) characterise the processes involved in occupational decisions with their 'Cognitive Information Processing Approach' (CIP).

Of central importance for information management in career guidance, however, is the question of how much information the individual needs to make an appropriate career decision. Opinions

differ on this, depending on whether one is guided by the normative idea that the client must be led to make a rational decision or whether one thinks more in terms of actual problem-solving behaviour.

Normative ideas assume how the individual should best make a decision; they are, therefore, called prescriptive models. In contrast, descriptive models build on observations of how decisions are actually made.

If people are expected to make rational decisions when choosing a career, for example, career guidance information management would have to make sure that they

- know all the alternative courses of action open to them and their contributions to the individual goals ('offers of satisfaction'),
- have sufficient evaluation criteria to assess these alternatives so that a preference scale according to (subjective) benefit emerges, and
- always choose the alternative that is not surpassed by any other in this order of preference.

The overload of the individual's capacity to absorb and process information, the reactions to information overload (information stress), individual conflicts and emotions, as well as the influence of coincidences or 'favourable opportunities' are largely neglected in these prescriptive models of decision-making (cf. Ertelt, 1992, p. 95; Holling et al., 2000, pp. 10 and 28). Therefore, these normative approaches are only suitable to a limited extent as a basis for future-oriented information management in career guidance, although a large number of national and international procedures for career and study guidance are still based on them (cf. Holling et al., 2000, p. 28). The descriptive models of human decision-making, which are oriented towards individual information needs and behaviour, seem more appropriate to the legal and professional-ethical framework of career guidance, i.e., they 'pick up' the addressee where he/she is at the moment in his/her problem-solving process. This is why we speak of a 'demand-oriented' approach, in contrast to the 'supply-oriented' character of prescriptive models.

Professional problems and decisions are usually complex in nature and, therefore, difficult to define clearly ('ill-defined situation'). There is rarely a 'right' solution and a clearly predictable conclusion or even a guarantee of a solution for a certain course of action. Such decision-making processes are usually accompanied by strong emotional involvement, such as problem-solving pressure, information stress, fear of irreversible wrong decisions due to incomplete information and doubts as to whether the selected alternative is actually the right one (cf. Peterson et al., 1996, p. 428).

Descriptive models describe the 'heuristic' behaviour of humans in poorly defined decision-making situations: Solutions are approached step by step by means of a tentative procedure and simplification strategies, only a few alternatives are included in the calculation and only evaluated with a few criteria, finally, binding decisions are postponed as long as possible in order to be able to take new information into account.

Heuristics are simplifying rules used by people in decision-making processes to substantially reduce the cognitive effort of information processing; such 'muddling through' strategies are thus not an accident to be avoided in problem-solving, but the rule. Wegmann (2005, p. 25) describes ten such heuristics after a literature review and states that they can be distinguished from each other by the following characteristics: 1. search rules for alternatives and/or their attributes, 2. stop rules for stopping the search and 3. decision rules for choosing an alternative. (cf. also Ertelt, Ruppert 2011).

Example Heuristics	1. search rule	2. stop rule	3. decision rule
Incrementalism	Search for alternatives that deviate only slightly from the initial state	Search is terminated when an alternative is found that represents an improvement on the initial situation.	Decision in favour of an alternative that differs only slightly from the initial situation but is an improvement.
Take the best' heuristic	Search for an attribute that has the strongest decision-making power	Search is terminated as soon as an attribute is found in which the alternatives differ	Decision in favour of the alternative with the higher value on the selected attribute
Satisfaction	Search rule according to the random principle	Search is stopped as soon as an alternative corresponds to the "satisfaction level".	Decision in favour of the first alternative, which corresponds to the "satisfaction level".
'Minimalist' Heuristic	Random search for a relevant attribute in which the alternatives differ	Search ends as soon as an attribute is found in which the alternatives differ	Decision in favour of the known alternative. If neither or both are known, a decision in favour of the alternative with the higher value on the selected attribute. -

Table 1: Characteristics to distinguish heuristics.

In order to record individual decision-making processes and the heuristics applied in the process, Tittel (2019) has developed and tested a questionnaire based on the ISM, which can be regarded as an essential aid in vocational guidance. This makes it possible to assign the corresponding questions to each of the heuristics dealt with, which serve for clear identification both during the counselling and for the subsequent content-analytical evaluation of recorded conversations. Based

on this, a demand-oriented guidance-accompanying and guidance-following information management can be built up (cf. Tittel, 2019, p. 91).

The quality of a demand-oriented guidance and information system now depends on how well it can adapt to the individual cognitive-affective individual information processing processes, i.e. simulate them. In this sense, ideas such as Peterson et al.'s solution cycle described above or the phase and stage breakdowns are diagnostic instruments for determining the individual's state in the decision-making process and are extremely helpful in conveying the respective helpful information. If a person is faced with a problem situation, e.g. triggered by dropping out of school, unemployment, or failure in education, they need information on the definition of the new situation for them, on the type of decision, on the disadvantages of not making a decision, on how to proceed and on the expected information effort.

According to this, aids for generating alternative courses of action are to be provided, whereby it is less important to have as large a number as possible, but rather an exemplary selection.

At the level of evaluating courses of action, information is needed to raise awareness of relevant evaluation criteria that can be used to assess the instrumentality of an alternative for individual goals.

In the decision-making phase, with a personally binding commitment to an alternative, the individual needs information that gives him or her information about his or her own decision-making ability, conflicts of choice and commitment, fear of loss, and chances of realisation.

In order to cope with the dissonance experiences that are characteristic of the post-decision phase, descriptive, reinforcing and interpretive information must be provided. It is particularly important, for example, in a new training position or job, to provide counselling and explanations in the case of doubts or failures so that rash reactions do not undermine the successful implementation of a decision.

Information structural guidance (ISM), which builds on these premises, refers to guidance support throughout a person's career. The focus is on decision-making and problem-solving behaviour in the transition phases, not only reactively but also proactively (cf. Ertelt, Schulz, Frey 2022).

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