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Abstract. In the view of my philosophical position '*nominal conceptualism*', cognitive/knowledge agents, who are in some way aware of expressing the world based on their mental concepts, deal with their linguistic and/or symbolic expressions. In this paper I rely on nominal conceptualism to logically characterise agents' concept-based descriptions of the world and analyse a fundamental logical system for conception representation.
Keywords: agents, concept, conception, conceptualisation, logic, nominal conceptualism, world description.

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1. From Concepts to Conceptions

Over the years, the term *concept* has been used differently by many philosophers, cognitive scientists, and computer scientists. In my view (see Badie 2017a, 2017b, 2017c, 2020a, 2020b), concepts are mental (and non-physical) entities that are construed by cognitive, or knowledge, 'agents' in a particular state of awareness. Concepts can be interpreted to be produced based on (*i*) agents' conceptualisation of the world, and on (*ii*) their linguistic interactions (with other agents as well as with themselves). It is remarkable that both (*i*) and (*ii*) require some degree of awareness.

This research draws on *nominal conceptualism* (see Badie 2020a, 2020b) which is developed based on the fundamental positions *conceptualism* and *nominalism*. In particular, conceptualism sees concepts some 'mental' phenomena that are construed by human beings. In addition, nominalism posits that concepts do not really exist. According to nominalism, the only things that really exist are linguistic expressions; see (Allwood 1999).

In my view, agents' mental concepts are identifiable with specific contents in linguistic and symbolic expressions. Moreover, agents' descriptions of the world are identifiable with agents' mental representations. Summing up nominal conceptualism, agents, who are in some way aware of expressing their own descriptions of the world based on their mental concepts, deal with their expressions (that are spoken, written, and represented based on, e.g., letters, symbols). In more proper words, human beings need to become concerned with the production of their *conceptions* of the world. Thereby, in

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my theoretical model, conceptions are the consequences of concepts. It is an underlying hypothesis of nominal conceptualism that the most fundamental building blocks of agents' descriptions of the world are expressible based on their 'conceptions'. In such a framework, the phenomenon of *meaning* can be regarded as a function from one's pre-conceptions into their conceptions (and, in fact, from their conceptions into their conceptions' updated forms). Interpreting 'meaning' a *conception-update function*, any meaning would be a *dynamic conceptual structure* (based on the conceptual entities 'conception') that becomes updated over time.

In this paper I refocus on my research in (Badie 2017a, 2020a, 2020b) and on (Baader et al. 2017) in order to logically (a) characterise agents' concept-based descriptions of the world, and (b) analyse a fundamental logical system for conception representation.

2. Logical Analysis of Conceptions

For the logical assessment of conceptions, any conception $\mathcal{C}$ and its interconnections with other conceptions can—by means of *predication*[2]—be represented by symbols. In order to analyse some agent's conceptions logically, we can utilise the triple ⟨conception, singular, effect⟩; see the formal-logical system $\mathcal{CL}$ in (Badie 2020a). More specifically:

1. A *conception* (of a concept), or $\mathcal{C}$, is correlated with a distinct [conceptual] entity. For example, John's conception of the concept *Book* can be interpreted to have a correlation with a conceptual entity in his mind.

2. A *singular*, or s, is an instance of a conception (of a concept). Any 's' is capable of being mapped into itself (by means of the reference '$\mathcal{C}$' under which s has been classified). For example, John's conception of `apology` (that is an instance of his conception of the concept *Book*) is a singular. Note that John's conception of `apology` is classifiable under (and can be labelled by) his own conception of *Book*. By his own semantic interpretation, John transforms '`apology`' into his own conception of the concept *Book*. Moreover, the singular `apology` can be [semantically] mapped into itself (by means of John's conception of *Book*).

3. An *effect* (of a conception of a concept C), or $\mathcal{E}$, expresses a relationship between some specific 's' (which is conceptualised, by some agent, to be the instance of C) and other singulars (which are conceptualised, by that agent, to be the instances of either C or of any other concept in the world). For example, John's conceptions of *writingA–Book* and of *readingA–Book* are two effects (based on his own conception of the concept *Book*). In addition, an effect (of a conception ($\mathcal{C}$) of a concept (C)) has the ability to assign a property/attribute to some 's' (which is classified under C). For

[2]The predication of $\mathcal{C}$ is concerned with what we need/want to state about $\mathcal{C}$.

example, John's conceptions of *beingScientific–Book* and of *havingIntelligentAuthor–Book* are some other effects of his conception of *Book*.

It shall be summarised that one's (1) conception(s) of some concept C, (2) conception(s) of the instance(s) of C, and (3) conception(s) of the effect(s) of their conception(s) of C are the most fundamental descriptions from which human beings, inductively, build more-specified as well as complex C-based descriptions. Note that (1), (2), and (3) do not independently have any logical consequence in a logical description. In fact, we need to utilise logical operators in order to achieve logical consequences.

3. Conceptions & Fundamental World Descriptions

Let John express the descriptions 'Apology is a book.' and 'Plato is an author.'. Actually John has conceptualised that the singulars `apology` and `plato` are the instances of his conceptions of the concepts *Book* and *Author*, respectively. According to the description 'Plato is an author.', John has semantically interpreted that the singular `plato` is an instance of his conception of the concept *Author*. Note that John's descriptions 'Apology is a book.' and 'Plato is an author.' are expressed based on the effects of valence-1. Any effect of valence-1 can be described by 'is a' in an agent's description. Actually the term 'is a' can express the concept of 'being'.

Now let John express the description 'Apology is written by Plato.'. Here John has conceptualised that the singulars `apology` and `plato` are relatable to each other by means of *writingA–Book* (that is an effect of his conceptions of the concepts *Book* and *Author*). According to John's description 'Apology is written by Plato.', John has semantically interpreted that the singulars `apology` and `plato` are—collectively and coherently—expressible under his conception of the effect *writingA–Book*. Note that the description 'Apology is written by Plato.' is expressed based on the effect of the valence-2. According to 'Apology is written by Plato.', the singulars `apology` and `plato` (that are the instances of John's conceptions of the concepts *Book* and *Author*, respectively) are conceptualised (by John) and understood (by John) to be related to each other by means of the effect 'is written by'. Here the singular `apology` has—by means of the conception's effect 'is written by'—effected the singular `plato`.

4. Logical Characterisation of Conception Representation

In this section I informally analyse the logical system $\mathcal{CL}$ (see Badie 2020a) in order to logically characterise *conception representation*. The main building blocks of $\mathcal{CL}$ are as follows[3].

[3]The analysed building blocks (of conception representation) are also valid for and expressible in the representation of conceptions' effects.

1. We need to be concerned with how some agent's conceptions, as well as their conceptions' effects, can—logically—be constructed. A *conception construction* is the production, and the development of, new conceptions based on available conceptions of the world. Conception constructions are fundamentally produced in the following forms:

   (a) A *conception negation* that expresses the absence of an available conception of the world. A negation of a specific conception $\mathcal{C}$, logically and semantically, invalidates $\mathcal{C}$. For example, John's conceptions of *Book* and *Author* would have their negations (that are, respectively, equivalent to John's conceptions of the concepts ***NOT***–*Book* and ***NOT***–*Author*)[4].

   (b) A *conception conjunction* that produces the coincidence and concurrence of two, or more, available conceptions of the world. The conjunction of John's conceptions of the concepts *Book* and *Author* could produce his conception of the concept *Book*–***AND***–*Author*.

   (c) A *conception disjunction* that separates two, or more, available conceptions of the world. The disjunction of John's conception of the concepts *Book* and *Notebook* could produce his conception of the concept *Book*–***OR***–*Notebook*.

   (d) A *conception quantification* that quantificationally assesses and appraises the available conceptions of the world. Relied on his conception of *Book*, John can produce his conceptions of the concepts ***ALL***–*Book*(s) [in the world] and ***SOME***–*Book*(s) [in the world].

2. It shall be taken into account that any conception representation is logically and semantically correlated with the concepts (A) *Existence* and *Validity*, and (B) *Non-Existence* and *Invalidity*. According to John's conception of the concept *Book*, he can produce his conceptions of the concept ***BEING***–*Book* and of the concept ***NOT.BEING***–*Book*. It can be interpreted that agents' conceptions are semantically interpretable under agents' conceptions of the logical concepts '*True*' and '*False*'. This means that agents, by their *semantic valuation*, become concerned with the *truth* (i.e. semantic validity) and the *falsity* (i.e. semantic invalidity) of their own conceptions. It shall be summarised that:

   (a) John's ***TRUTH*** *conception*, logically and semantically, conceptualises the validity, and acceptability, of his conception of the concept *Book* based on his all possible interpretations of the concept *Book*. In fact, John conceptualises and interprets 'whether it is true that some specific concept is a book'.

   (b) John's ***FALSITY*** *conception*, logically and semantically, conceptualises the invalidity, and unacceptability, of his conception of the concept *Book* based on

[4]In this section the bold concepts are the fundamental logical concepts in the logical system $\mathcal{CL}$.

his all possible interpretations of the concept *Book*. In fact, he conceptualises and interprets 'whether it is false that some specific concept is a book'.

3. *Conception classification* and, correspondingly, *conception identification* shall be taken into consideration. By means of conception classification (and conception identification), agents categorise their available conceptions of the world (and, accordingly, identify various singulars). Relied on his conceptualisation of the concept *Book*, John may

   (a) classify various concepts in his mind (and in any other knowledge base) under the label 'BOOK'.

   (b) conceptualise and interpret whether some specific singular s can be identified by the label 'BOOK'.

   (c) conceptualise and interpret that his conception of *Stone* is *independent* of his conception of *Book*.

   (d) conceptualise and interpret that his conception of *Handbook* is *subsumed* under his conception of *Book*.

   (e) conceptualise and interpret that his conception of *Publication* is *equivalent* to his conception of *Book*.

5. Future Research

My future research will develop a formal-logical theory to answer the question of 'how agents form and change their conceptions of the world (based on exchanged information with each other)'. My special focus point will be the conceptual dynamics informed by conversational exchanges.

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