

Gyula Klima as Medievalist

Jacob Archambault

December 24, 2021

1 Klima's contributions in the history of semantics

The breadth of Klima's scholarship stretches historically from some of philosophy's best-known figures in Anselm, Aquinas, Ockham and Descartes to lesser-known figures including Thomas of Sutton and Henry of Ghent, to Frege, Geach, Kenny, and others who have produced some of the most impactful scholarship in the analytic tradition; and thematically from debates on identity, categories, and causation in metaphysics, on skepticism in epistemology and theories of mental content in philosophy of mind, to others too numerous to mention.

From his earliest work in semantics, Klima recognized that classical logic, being primarily interested in developing an account of the semantics of propositions as a precondition for the development of a theory of consequence, affords much less attention to the components of propositions themselves. Klima fills this lacuna by providing some of the earliest and most ambitious applications of restricted quantification in the history and philosophy of logic, using it both to formalize the medieval theory of supposition and to provide a general account of quantitatively ambiguous natural language sentences.¹ Elsewhere, Klima's formalizations of supposition theory specifically and medieval semantics more broadly provide us with an account of the semantics of intensional verbs (Klima 1991b), a semantic foundation for Aquinas' theory of the analogy of being (Klima 1996, 2002a), and a clean resolution of the problem of existential import in the Aristotelian square of opposition.²

In one sustained thread of that work, Klima decouples *via antiqua* and *via moderna* semantics from the realist and anti-realist metaphysics with which they are most commonly paired, contending that neither semantics by itself strictly entails its associated metaphysics (Klima 1999, 2011b). Rather, archtypical realists were required to adopt non-straightforward semantic accounts of the meanings of terms in at least some cases by their antecedent metaphysical commitments (e.g. to divine simplicity) (Klima 2002b), while some of the best known nominalist logicians incorporated what today would be regarded as realist elements in their logic (Klima 2005). For Klima, the *via antiqua* and *via*

¹(Klima 1988, 1990, 1991a; Klima and Sandu 1990). Cf. (Parsons 2014).

²(Klima 2001). Cf (Read 2015).

moderna traditions of medieval logic differ not in their *quantity* of ontological commitments, but in the tools they provide for *handling* ontological commitments, which in turn differ from those of the model-theoretic framework dominant today.

Via antiqua semantics takes an affirmative statement to be true when what is signified by its predicate inheres in what is signified by its subject - sometimes called the *inherence theory of predication*. Within this framework, terms predicating common natures or accidental features of a subject are taken to ultimately refer to exactly the categorical entities one might expect. But the framework avoids full, immediate, fundamental commitment to entities today's nominalists might find objectionable by providing a rich theory according to which being is predicated in different degrees.³

Conversely, the *via moderna* framework that became ascendant after Ockham takes an affirmative statement to be true when its subject and predicate term refer to the same object - sometimes called the *identity theory of predication*. Within this framework, terms predicating common natures or accidental features of a subject need not be taken to ultimately refer to different types of objects such as abstract genera or relations, but instead refer to familiar objects *differently*. For example, the truth of 'Socrates is a father' does not require commitment to a distinct entity that is Socrates' fatherhood. Instead, the sentence's predicate may (non-rigidly) refer to Socrates himself, albeit connoting his being a father, and hence refer to the same object as that rigidly referred to by the proper name 'Socrates'. Granting some license for intensional contexts,⁴ the verb 'is' or 'exists' in *via moderna* semantics is equally ontologically committing in its various uses, but *what* one is committed to by its uses need not be immediately apparent (Klima 2008b, pp. 437–430).

Both medieval frameworks would reject the object-language metalanguage distinction taken for granted since Tarski in their theory of truth, and in their use of ampliation for tensed, modal, and intensional contexts, both provide ample tools for rejecting a naïve application of Quine's account of ontological commitment in terms of existential quantification.⁵

1.1 Ontological neutrality and independence

None of this means that there is *no* relationship between an author's positions in metaphysics and his semantics: rather, the semantic framework an author adopts conditions what options that author has in metaphysics without fully determining them. For example, extreme realism in metaphysics doesn't follow strictly from the *via antiqua*'s inherence theory of predication, but it is the most natural fit for that theory if one accepts the view that terms signifying accidental being denote their referents rigidly while rejecting that framework's insistence on multiple, analogically related senses of 'being' (Klima 1999, p. 125). Conversely, the broad outlines of Ockham's account of the relation between

³See (Klima 2002a).

⁴See (Klima 2005).

⁵Cf. (Klima 2004), (Klima 2009b, pp. 171–174).

language, thought, and reality serve not only as a foundation for Ockham's own metaphysical reductionism, but also for the realism of a Descartes, Malebranche, Putnam or a Leibniz (Klima 1991b).

There is, however, no relationship of *entailment* from purely semantic principles to metaphysical truths. Klima writes:

To be sure, this is not to say that metaphysical principles are to be derived from, or somehow justified in a weaker sense on the basis of, semantic principles. Metaphysical principles, being first principles using the most general terms, such as the transcendentals and the categories, cannot be derived from prior principles, and their terms cannot be defined on the basis of more general terms. What semantics can do, however, is that it can provide the principles of interpretation of metaphysical principles. On the basis of these principles of interpretation the implications of metaphysical principles are more clearly delineated, which then can be used in their evaluation in dialectical disputations concerning their acceptability in the interpretations thus clarified. Furthermore, if the semantic principles of interpretation are made explicit, they can also be subject to further evaluation, in a disputation on a different level, the sort appropriate to the comparison of different logical theories (Klima 2011a, p. 49).

Modern mathematics calls this relation *independence*, though as the name implies the fundamental notion itself is by no means a recent one. Just as Cantor's continuum hypothesis is neither provable nor refutable from the principles of Zermelo-Fraenkel set theory alone, or - to provide a more medieval example - truths of revealed theology are neither provable nor refutable from the principles of natural philosophy, neither on Klima's account are metaphysical principles provable or refutable from those of semantics alone.

1.2 Pluralism, linguistic imperialism, and the problem of cross-cultural communication

Two complications distinguish the semantic case from those mentioned. The first is that while both the set-theoretic and theological case mentioned above concern provability and refutability in a single system, the sheer multiplicity of semantic frameworks itself may provide a barrier to a broadly acceptable account of provability across those frameworks. The second generalizes a problem nearly the opposite of that established by Gödel in his first incompleteness theorem (Gödel 1931): where that theorem established the expressibility of unprovable claims of number theory in any sufficiently robust system, the semantic problem we face here is that a claim of metaphysics may be taken to be established or refuted merely on account of the lack of expressibility of the particular semantic framework one is working in.

Klima's response to these problems is anti-pluralist without thereby being dogmatically classical. While it would be easy enough to, for instance, construct

a metalogical account of validity by quantifying over distinct logical systems on the model of possible world semantics and regarding as valid all and only those theorems valid in every system, Klima instead recognizes the known limitations of classical semantics while also taking the provable equivalence of systems containing distinct logical primitives as *prima facie* evidence for the possibility of a fundamental diversity at the *conceptual* level that nevertheless doesn't entail a despairing or indifferent anti-realism at the *metaphysical* level (Klima 2012). Instead, Klima's response, both technically and philosophically, is to *extend the framework*. Meeting the tradition where it is, he extends classical semantics to allow for treatment of donkey sentences (Klima 1988, 2010), non-existent entities (Klima 2001), and quantificational phenomena (Klima and Sandu 1990), while more broadly appealing (in a rare quote of a 'continental' philosopher that shows up in multiple places throughout his *œuvre*) to the possibility of a 'fusion of horizons' mentioned by Gadamer as a solution to the impasse of communication across distinct semantic frameworks, cultures, or philosophical traditions and the attitude of metaphysical anti-realism it encourages (Klima 2000, 2009a).

1.3 Why medieval semantics?

Despite the depth and breadth of his work, the amount of space Klima devotes to advancing positions that are unambiguously his own, rather than to steel-manning positions of historical or contemporary figures he may or may not agree with, is comparatively little.⁶ Still, Klima's solution here provides a window into the answer to a more personal question that his scholarship solicits: namely, of all the intellectual pursuits to devote oneself to, why study medieval philosophy, and specifically medieval semantics?

In one uncommonly autobiographical passage, Klima writes:

I remember that when I was at Notre Dame (so this happened in the second half of the nineties), I asked several of my colleagues, and even the then visiting David Armstrong, to provide metaphysically non-committal clarifications of the semantics of the language they were using in describing their metaphysical theories. In response, I was given puzzled looks and declarations strongly reminiscent of the way medieval nominalists characterized the attitude of their realist opponents: we don't care about names; we go right to the things themselves!—Well, just look at the history of late-scholasticism and early modern philosophy to see what good that attitude did for them.

So, what can we do to avoid the late-scholastic scenario, going on another cycle of endless and more and more meaningless metaphysical

⁶Exceptions include his acceptance of both Anselm's proof of God's existence and Aquinas' proof of the immateriality of the intellect as sound (Klima 2000, 2009a) and his advancing, based on an examination of Buridan's treatment of reciprocal liar paradoxes, that any adequate semantics for natural language must be semantically closed and token-based (Klima 2004, 2008a).

debates until the arrival of another Kant declaring the whole enterprise ill-founded and another Carnap declaring it to be meaningless, to launch another anti-metaphysical cycle of meaningless search for meaning to be abandoned yet again for metaphysics, etc., etc.? Why don't we try both in tandem, i.e., analysis and metaphysics at the same time, as the very designation "analytic metaphysics" would seem to demand? For then we could start by laying down our clearly defined semantic principles (instead of making them up and twisting them around as we go) and engage each other in our metaphysical debates according to the same principles, instead of talking past each other, making clear that whoever is talking according to different semantic principles is just playing a different game (Klima 2014, pp. 86–87).

Here, the difficulty that Klima's apology for analysis aims to alleviate remains - namely, that in much debate in the core disciplines of analytic philosophy and in metaphysics in particular, rival participants are often unable or unwilling to state their positions in a linguistic context their opponents would be able to agree to, leaving such debates unfruitful from the start. Without the opportunity for common ground that semantics provides, not only shared understanding, but even proof, refutation, and disagreement itself become unattainable.

With this problem in mind, the study of medieval semantics, as a study of frameworks of meaning remarkably foreign to that of our own time, provides an example *par excellence* of the kind of interpretive charity needed to surmount our own crises of meaning and communication.

2 John Buridan

Nowhere has this effort been more sustained than in Klima's scholarship on John Buridan', which has helped elevate the 14th century arts master from a lesser-known figure to one whose stature is closer to that of an Ockham, arguably surpassing the Franciscan in his logic.

Like the study of medieval contributions to logic and philosophy of science in the early 20th century more broadly, the recovery of Buridan's work at this time was in part stimulated by both its promise as a resource for solving contemporary problems in these disciplines and by the way in which it seemed herald contemporary developments: Duhem, for instance, held out Buridan's theory of impetus as a precursor to Galileo's account of projectile motion; Boehner took the logical systems of Buridan and his contemporaries to be closer to the formal work of the Lvov-Warsaw school than to the anti-formalist tendencies in neo-scholastic textbooks of the day (Boehner 1952), and Louise Nisbet Roberts took Buridan's solution to the Liar paradox to anticipate that of Tarski (Roberts 1953, p. 100). This interest paved the way for critical editions of Buridan's works, beginning with Hubien's edition of his *Tractatus de consequentiis* in 1976 and later extending to his various works on logic, philosophy of mind, physics

and metaphysics.⁷

Klima has built on these contributions both straightforwardly as an editor and translator as well as critically across his articles, books, and various other contributions. The subtlety of Klima's work as a translator is apparent throughout his translation of Buridan's *Summulae*, whose footnotes provide an interesting window not only into the text itself, but also into his own decisions on how to translate a text whose parts are frequently concerned with linguistic imprecision and ambiguity. Take, for instance, the following footnote text introducing his translation of the Latin *passio* as 'attribute' early on in treatise 1:

The term *passio*, deriving from the verb *pati* (to suffer, to be affected/acted on, to undergo change), has the primary sense of something affecting a subject (which receives the action of an agent). But since the relation between the term signifying such an affection and the term that signifies the subject is analogous to the relation between the affection itself and the subject itself, the term signifying the affection is also called a *passio* (and the term signifying the subject is also called *subiectum*). Therefore, in this technical sense, whenever a *passio* is correlated with a *subiectum*, referring to a term that is attributed to a subject term in an act of predication, I will translate *passio* as 'attribute'. Whenever *passio* is used to refer to the correlative of some action, however, as is normally the case in the context of Aristotelian physics, or to the correlative category of the category of action, or to the third species of the category of quality discussed below (3.5.4), as is usually the case in the context of the theory of categories, I will use the customary English transcription 'passion'. To be sure, even despite existing translational traditions to this effect, this may occasionally sound odd, given the primary contemporary meaning of the term indicating some strong emotion (which is actually quite fitting in the case of the third species of quality, especially in 3.5.4(2)). But this will be very useful when Buridan exploits some of the conceptual relations between the notions of 'passion' in the technical senses intended here and those of being affected, being acted on, undergoing change, suffering (as the Passion, i.e., the suffering of Christ), and passion in the emotional sense, all of which are conveyed by the Latin *passio* (John Buridan 2001, p. 5).

In this example (which apart from its discussion of present-day English idiom could well pass for a translation of one among the better specimens of scholastic Latin), Klima's parsing out the different significations of the term *passio*, relating its meaning to that of its English derivative, then justifying different translations for different scientific contexts provides a worthy example of how Klima's long study of Buridan's logic and semantics itself inform his translation

⁷See the extensive bibliography provided in (Zupko 2018).

of the very Latin texts conveying them.

Klima's Buridan scholarship contrasts with that of preceding generations, however in three main respects. The first is its breadth: the arc of Klima's work - first gaining notoriety in the fields of logic and semantics, extending from there into medieval natural philosophy and metaphysics, and with increased focus in recent decades on philosophy of mind and epistemology, culminating in an edition of and companion volume to Buridan's *Quaestiones De Anima* - has over time expanded to cover the whole territory of Aristotle's 'semantic triangle' mapping out the relations between word and thing through the mediation of concepts. Because of this, Klima's body of work provides what is arguably the most integrated and complete account of John Buridan's philosophy to date.

3 Semantic expressiveness and the meaning of metaphysics

In this way, Klima's seminal contributions on Buridan and in medieval philosophy more broadly provide an excellent example of how one can solve apparently intractable philosophical and communicational problems simply by *expanding the framework* - whether that framework be classical semantics expanded to include an existence predicate and restricted quantifiers or the broader historical consciousness of Anglophone philosophy of the past seventy or so years. Still, one wonders whether one can take the fundamental motivation further than even Klima himself does.

3.1 The concept of expressive power in formal systems

We know that some semantic frameworks are fundamentally more expressive than others. This can occur in a trivial sense when a language introduces new derivative syntactic elements, as occurs e.g. when we introduce a symbol \rightarrow into classical propositional logic as a shorthand for $\neg(A \wedge \neg B)$. In other cases, e.g. by augmenting classical first-order logic with an identity predicate, we can add a new logical constant to a language that thereby allows for the expression of previously inexpressible theorems and entailments. In still other cases, as occurs, for instance when extending the minimal normal modal logic K to $S4$ or $S5$, we can provide a more robust semantic interpretation of a term or symbol by further restricting the class of its previously permissible models, and thereby establish theorems and entailments for which countermodels previously existed. In still others, we can provide a translation of the claims of a logic L to those of another L' such that, given a translation function f from L into L' , a claim c is provable in L exactly when $f(c)$ is in L' . Perhaps the best-known case of this last mentioned is Gödel's proof that the claims of classical arithmetic can all be expressed in intuitionistic arithmetic, with the base case being that a claim A holds classically if and only if $\neg\neg A$ holds intuitionistically. This particular example also shows that a language may be fundamentally more expressive than another even when we have the same set of lexical elements defined across both

systems, and even when the weaker system appears at first glance to be the stronger one.

3.2 On what ontology is

Expanding this point about technical frameworks to natural ones, we can say that philosophy of the past seventy or so years has primarily interpreted ontology as a discipline whose theorems are, in their basic syntax, positive or negated existential, non-copulative uses of the verb ‘is’ or ‘exists’ joined to a common or proper noun, e.g. ‘baseballs exist’, ‘bats don’t exist’, etc. Given a suitably robust concept of induction, it then becomes possible to make universal statements about what is, usually expressed formally via a universal quantifier ranging over a disjunction, with each disjunct attributing a monadic predicate to the value of a variable bound by the universal quantifier such that the intersection of the value of any two predicates is the empty set and the union of all of them yields the domain of quantification - e.g. Everything is God or a creature; a mind or a body; a person or a mere thing; a substance or quantity or quality, etc., to provide some of philosophy’s better-known examples.

This understanding of ontology, however, is arguably an attenuation of a broader notion, one concerned not primarily with the question of what things there are, but of what *being is*. On this understanding, the principal syntactic form that a statement in ontology will take will be one predicating some monadic or disjunctive predicate of being itself as a subject. and claims like ‘everything is a substance or a quantity...’, etc., if true, will be derivative on that that *to be* is to be a substance or a quantity, etc. One simple yet powerful validation of the primacy of this understanding of ontology is that the converse entailment schema fails: the fact that everything is or isn’t my eldest daughter, for instance, does not entail that *to be* is to be or not be my eldest daughter. Furthermore, the reason for this failure is itself intuitively clear, namely, that it doesn’t belong to the *meaning* of being to contain any information about my daughter one way or another.⁸ Consequently, we find the classical expanse of ontology embracing matters not typically covered in its more recent Anglophone counterpart: the convertibility of the transcendental predicates with being itself; the different senses of being pertaining to past present, and future being; to real and rational; to substance and accident; to the potential and the actual, along with the relations of priority, posteriority and relative perfection displayed therein that prevent these distinctions from being understood as differences in kind.

But on this understanding, the task of positing different senses of being to avoid full ontological commitment - or, for that matter, refusing to make such distinctions - isn’t a way of avoiding metaphysics: it *is* metaphysics.

This doesn’t entail that a semantics is ontologically committing considered purely as an interpretation mapping lexical elements to a suitable mathematical model: nothing, for instance, so much as entails \wedge be understood to mean ‘and’.⁹

⁸Cf. (Fine 1994).

⁹For example, that fragment of the classical propositional calculus containing \wedge as its only a logical constant may be understood as providing a logic for preserving falsehood rather than

Nor does it entail any commitment at the level of our judgment concerning a particular system: to consider some of its less plausible claims, one may, for instance, adopt a standard first-order classical semantics for any number of reasons without thereby committing oneself to the claims that relations are sets of tuples, that natural language reference is functional in the mathematical sense, that there has to be at least one thing (though not always *the same* one thing), or that modality doesn't exist. It does, however, mean that a semantics containing structures meant to model being as a whole, considered in itself on its intended interpretation, must decide ontological questions on the matters it directly concerns.

Let us take, for example, the case of the convertibility of actualist and possibilist quantification. On possibilist semantics, a model (W, R, D) consists of a frame (W, R) , itself consisting of a set of worlds W and a binary relation R on worlds, and a set D containing all elements existing at any element in W . Quantifiers range over D in its entirety, and to represent actual existence at a given world w , possibilist semantics employs a monadic predicate E whose interpretation intuitively maps to the set of actual existents at w . Conversely, on actualist semantics, we take a model (W, R, D) to be as before, but with D being not a set, but a function from each element w in W to its actual existents. The interpretation of a quantifier at w is restricted to $D(w)$, and no first-order existence predicate E is admitted. We've long known that actualist and possibilist semantics are expressively equivalent, given the existence of a one-to-one translation procedure between the two on which, e.g. $\forall xFx$ and $\exists xFx$ hold in actualist semantics exactly when $\forall x(Ex \rightarrow Fx)$ and $\exists x(Ex \wedge Fx)$ hold, respectively, in possibilist semantics.¹⁰

Now, both possibilist and actualist semantics alike rule out a number of metaphysical theses: for instance, while there is ample room for interpretation in certain respects - the members of W could be interpreted as cases rather than worlds¹¹ - neither semantics is suited to monism or fatalism. Furthermore, on each's shared canonical assumption that the primary sense of being is that expressed by being the value of a bound variable, a genuine metaphysical disagreement will be expressed in these semantics themselves, on which the actualist accepts, and the possibilist rejects, the ontological thesis that to be is to be actual, while, the possibilist accepts, and the actualist rejects, the thesis that to be is to be possible. Despite their disagreement, the two will have no *linguistic* barrier to communicating with each other. An employer of possibilist semantics may even reject the semi-Quinean assumption about quantification above, and instead opt for the claim that the primary sense of being is that expressed by being in the extension of the first-order existence predicate E at some privileged world w , in which case possibilist semantics itself will be used to express the content of actualism. Consequently, the presence of distinctly on-

truth where *wedge* is intuitively given the meaning of 'or'. Cf. (Kripke 2017, p. 222).

¹⁰Cf. (Lejewski 1954). The full translation requires recursion, and the explication of the semantics here is necessarily cursory. For a full explication, see chapter 4 of (Fitting and Mendelsohn 1998).

¹¹Cf. (Belnap and Müller 2014a,b).

tological theses in a semantics' canonical interpretation does not *eo ipso* prevent understanding across distinct linguistic paradigms.

Lastly, each of these frameworks is fundamentally more expressive than classical semantics taken on its own. and the ontological viewpoint actually expressed in each is closer to that of the other than either is to that of the classical exclusivist who rejects modality altogether, in spite of the superficial similarity between the actualist and Quinean positions. Consequently, if we were to imagine the Quinean classicist attempting to grasp the meaning of either the actualist or the possibilist thesis in ontology from his own semantic vantage point *he could only misconstrue it*. Instead, grasping either ontological position would require genuine learning to take place, even if only to reject the positions advanced.

Similarly, Klima's body of work evinces a breadth and depth of expression rarely found in the discipline, and the position expressed here is ultimately closer to Klima's own than that of his late 90s Notre Dame colleagues - indeed, to translate it into the language of Klima's own position, we could say that theses such as the distinction between the various analogically related senses of being, concerned as they are with the *meaning* of being, are regarded by Klima as providing a semantic foundation for metaphysics distinct from metaphysics itself,¹² where the position expressed here takes such theses, being concerned as they are with the meaning of *being*, to be properly part of ontology. And yet, as with the Quinean actualist's superficial agreement with the modal actualist, there is a respect in which Klima's former colleagues were correct in their stated position, albeit not on their own terms.

Does this make the disagreement itself merely semantic? Arguably, no. At best, we have a rare instance of a claim that belongs to distinct disciplines in different ways, much as with Aristotle's claim that the subject matter of logic in the broadest sense - a discipline whose scope is strikingly close to that of modern semantic theory - is the same that the metaphysician works on.¹³ In its favor, this understanding of metaphysics is independently recommended by its greater intentional unity, by its increased expressive power, by its closer proximity to the understanding one finds in Aristotle's own treatment of the subject, and even by the relative fruitlessness of the Quinean understanding over the past seventy years.¹⁴ Conversely, relegating claims about the meaning of being to semantics rather than to metaphysics itself and thereby construing them as linguistic or conceptual *rather than* ontological, arguably motivates one of the bolder misconceptions in Klima's work, namely that 'Medieval realism and nominalism are just different versions of conceptualism, differing especially in how they handle the problems of describing and identifying mental content' (Klima 2011b, p. 110) - a claim which, tacitly assuming an ontological distinction between mental and real spheres that is somehow 'crossed' or 'bridged' by language, itself relegates claims about meaning to a purely mental sphere via

¹²Cf. (Klima 1996, p. 88), (Klima 2011a, p. 49).

¹³(Aristotle 1924, 1004b 22-23). Cf. (John Duns Scotus 1999, q. 3).

¹⁴Indeed, contemporary philosophy itself increasingly recognizes the program as exhausted. Cf. (Schaffer 2009, 2016).

its own question-begging metaphysical post-Kantianism.

References

- Aristotle (1924). *Metaphysics*. Trans. by W. D. Ross. Oxford: Clarendon Press.
- Belnap, Nuel and Thomas Müller (2014a). “BH-CIFOL: Case-Intensional First-Order Logic (II) Branching Histories”. In: *Journal of Philosophical Logic* 43.5, pp. 835–866.
- Belnap, Nuel and Thomas Müller (2014b). “CIFOL: Case-Intensional First-Order Logic. (I) Toward a Theory of Sorts”. In: *Journal of Philosophical Logic* 43.2-3, pp. 393–437.
- Boehner, Philotheus (1952). *Medieval Logic: An Outline of its Development From 1250 to C.1400*. Hyperion Press.
- Fine, Kit (1994). “Essence and Modality”. In: *Philosophical Perspectives* 8, pp. 1–16.
- Fitting, Melvin and Richard L. Mendelsohn (1998). *First-Order Modal Logic*. Dordrecht: Kluwer.
- Gödel, Kurt (1931). “Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme I”. In: *Monatshefte für Mathematik und Physik* 38.1, pp. 173–198.
- John Buridan (2001). *Summulae de Dialectica*. Trans. by Gyula Klima. Yale Library of Medieval Philosophy. New Haven: Yale University Press.
- John Duns Scotus (1999). *Quaestiones in Librum Porphyrii Isagoge*. Ed. by R. Andrews et al. Vol. 1. Opera Philosophica. Cited by question and paragraph. St. Bonaventure, NY: Franciscan Institute.
- Klima, Gyula (1988). *Ars Artium: Essays in Philosophical Semantics, Medieval and Modern*. Budapest: Institute of Philosophy of the Hungarian Academy of Sciences.
- (1990). “Approaching Natural Language via Mediaeval Logic”. In: *Zeichen, Denken, Praxis*. Ed. by J. Bernard and J. Kelemen. Vienna: Institut für Sozio-Semiotische Studien, pp. 249–267.
- (1991a). “Latin as a Formal Language: Outlines of a Buridanian Semantics”. In: *Cahiers de l’Institut du Moyen-Âge Grec et Latin* 61, pp. 78–106.
- (1991b). “Ontological Alternatives Vs. Alternative Semantics in Mediaeval Philosophy”. In: *S: European journal for semiotic studies* 3.4, pp. 587–618.
- (1996). “The Semantic Principles Underlying Saint Thomas Aquinas’s Metaphysics of Being”. In: *Medieval Philosophy and Theology* 5.1, pp. 87–141.
- (1999). “Ockham’s Semantics and Ontology of the Categories”. In: *The Cambridge Companion to Ockham*. Ed. by Paul Vincent Spade. Cambridge: Cambridge University Press, pp. 118–142.
- (2000). “Saint Anselm’s Proof: A Problem of Reference, Intentional Identity and Mutual Understanding”. In: *Medieval Philosophy and Modern Times*. Ed. by Ghita Holström-Hintikka. Vol. 288. Synthese Library. Dordrecht: Kluwer, pp. 69–87.

- (2001). “Existence and Reference in Medieval Logic”. In: *New Essays in Free Logic*. Ed. by Alexander Hieke and Edgar Morscher. Kluwer, pp. 197–226.
- (2002a). “Aquinas’ Theory of the Copula and the Analogy of Being”. In: *History of Philosophy & Logical Analysis* 5, pp. 159–176.
- (2002b). “Contemporary ‘Essentialism’ vs. Aristotelian Essentialism”. In: *Mind, Metaphysics, and Value in the Thomistic and Analytic Traditions*. Ed. by John Haldane. Notre Dame, IN: University of Notre Dame Press, pp. 175–194.
- (2004). “Consequences of a closed, token-based semantics: the case of John Buridan”. In: *History and Philosophy of Logic* 25.2, pp. 95–110.
- Klima, Gyula (2005). “The Essentialist Nominalism of John Buridan”. In: *Review of Metaphysics* 58.4, pp. 739–754.
- (2008a). “Logic without Truth: Buridan on the Liar”. In: *Unity, Truth and the Liar: The Modern Relevance of Medieval Solutions to the Liar Paradox*. Ed. by S. Rahman, T. Tulenheimo, and E. Genot. Berlin: Springer, pp. 87–112.
- (2008b). “The Nominalist Semantics of Ockham and Buridan: A Rational Reconstruction”. In: *Handbook of the History of Logic: Mediaeval and Renaissance Logic*. Ed. by Dov M. Gabbay and John Woods. Vol. 2. Amsterdam: Elsevier, pp. 389–432.
- (2009a). “Aquinas on the Materiality of the Human Soul and the Immateriality of the Human Intellect”. In: *Philosophical Investigations* 32, pp. 163–182.
- (2009b). *John Buridan*. Great Medieval Thinkers. Oxford: Oxford University Press.
- (2010). “Natural Logic, Medieval Logic and Formal Semantics”. In: *Magyar Filozófiai Szemle* 54, pp. 58–75.
- (2011a). “Thomas of Sutton and Henry of Ghent on the Analogy of Being”. In: *Categories and What is Beyond*. Ed. by Gyula Klima and Alexander W. Hall. Vol. 2. Proceedings for the Society of Medieval Logic and Metaphysics. Newcastle upon Tyne: Cambridge Scholars, pp. 49–64.
- (2011b). “Two *Summulae*, Two Ways of Doing Logic: Peter of Spain’s ‘Realism’ and John Buridan’s ‘Nominalism’”. In: *Methods and Methodologies: Aristotelian Logic East and West 500-1500*. Ed. by Margaret Cameron and John Marenbon. Leiden: Brill, pp. 109–126.
- (2012). “Ontological Reduction by Logical Analysis and the Primitive Vocabulary of Mentalese”. In: *American Catholic Philosophical Quarterly* 86.3, pp. 403–414.
- (2014). “The Rises and Falls of Analysis and Metaphysics”. In: *Metaphysical Themes, Medieval and Modern*. Ed. by Gyula Klima and Alexander W. Hall. Vol. 11. Proceedings for the Society of Medieval Logic and Metaphysics. Newcastle upon Tyne: Cambridge Scholars, pp. 85–88.
- Klima, Gyula and Gabriel Sandu (1990). “Numerical Quantifiers in Game-Theoretical Semantics”. In: *Theoria* 56.3, pp. 173–192. DOI: 10.1111/j.1755-2567.1990.tb00181.x.

- Kripke, Saul A. (2017). “Quantified Modality and Essentialism”. In: *Noûs* 51.2, pp. 221–234. DOI: 10.1111/nous.12126.
- Lejewski, Czesław (1954). “Logic and Existence”. In: *British Journal for the Philosophy of Science* 5.18, pp. 104–119.
- Parsons, Terence (2014). *Articulating Medieval Logic*. Oxford: Oxford University Press.
- Read, Stephen (2015). “Aristotle and Łukasciewicz on Existential Import”. In: *Journal of the American Philosophical Association* 1.3, pp. 535–544.
- Roberts, Louise Nisbet (1953). “Every Proposition is False - A Medieval Paradox”. In: *Tulane Studies in Philosophy* 2, pp. 95–102.
- Schaffer, Jonathan (2009). “On What Grounds What”. In: *Metametaphysics: New Essays on the Foundations of Ontology*. Ed. by David J. Chalmers, David Manley, and Ryan Wasserman, pp. 347–383.
- (2016). “Grounding in the image of causation”. In: *Philosophical Studies* 173, pp. 49–100.
- Zupko, Jack (2018). “John Buridan”. In: *The Stanford Encyclopedia of Philosophy*. Ed. by Edward N. Zalta. Fall 2018. Metaphysics Research Lab, Stanford University.