John Maraist, Martin Odersky, David N. Turner and Philip Wadler
Call-by-name, call-by-value, call-by-need and the linear lambda calculus
http://www.elsevier.nl/locate/entcs/volume1/maraist

Girard described two translations of intuitionistic logic into linear logic, one where $A \to B$ maps to $(!A) \multimap B$, and another where it maps to $!(A \multimap B)$. We detail the action of these translations on terms, and show that the first corresponds to a call-by-name calculus, while the second corresponds to call-by-value. We further show that if the target of the translation is taken to be an affine calculus, where ! controls contraction but weakening is allowed everywhere, then the second translation corresponds to a call-by-need calculus, as recently defined by Ariola, Felleisen, Maraist, Odersky and Wadler. Thus the different calling mechanisms can be explained in terms of logical translations, bringing them into the scope of the Curry–Howard isomorphism.

Michael Mislove
Denotational models for unbounded nondeterminism
http://www.elsevier.nl/locate/entcs/volume1/mislove

Unbounded nondeterminism has played a fundamental role in the areas of refinement between models of languages and in the treatment of fairness. Unlike bounded nondeterminism, unbounded nondeterminism has not been amenable to a satisfactory treatment using, for instance, the techniques of domain theory. In this paper we explore this issue, and we show that only one of the three powerdomains has a suitable analogue for modeling unbounded nondeterminism. In the process, we are forced to leave the realm of directed complete partial orders and continuous maps. The theory we develop is based on the theory first presented in earlier work on Timed CSP with Roscoe and Schneider, which itself was based on work on unbounded nondeterminism in untimed and Timed CSP done by Roscoe, Barrett and Roscoe and Schneider.

Ugo Montanari and Marco Pistore
Concurrent semantics for the pi-calculus
http://www.elsevier.nl/locate/entcs/volume1/montanari

In this paper we give both operational and abstract concurrent semantics for the π-calculus (a process algebra with the ability of handling channels as messages) and discuss their consistency. For the operational semantics, we map the language into graph rewriting systems, which are already equipped with a concurrent semantics; for the abstract semantics we introduce interleaving, partial ordering and mixed ordering observations, define the corresponding bisimulation relations and discuss them.

Kay-Jeannette Nuessler
Universality and powerdomains
http://www.elsevier.nl/locate/entcs/volume1/nuessler

In this paper we investigate the Plotkin powerdomain under order-theoretical aspects. We answer a problem of G. Plotkin whether any bifinite domain can be embedded (with embedding-projection pairs) into the Plotkin powerdomain of a Scott-domain. Here we obtain counter-examples. There is a 9-element domain which cannot even be embedded into the Plotkin powerdomain of any bifinite domain. In the case of L-domains, we find that there is no mub-complete domain whose Plotkin powerdomain is universal for the class of all L-domains. However, any finite domain can be "weak mub-embedded" into the Plotkin powerdomain of a finite Scott-domain, where a weak mub-embedding is an order-embedding f which preserves minimality of upper bounds of sets. The class of all Scott-domains as well the class of all L-domains is not closed under the Plotkin powerdomain. We give an order-theoretical characterisation of those Scott-domains and L-domains whose powerdomain is again a Scott-domain or L-domain, respectively. For Scott-domains we obtain: the powerdomain of those Scott-domains into which the posets M and W (just like the letters) cannot be order-embedded is itself a Scott-domain.