



## INTRODUCTION

### The Quality of Quantity: Monetary Amounts and Their Materialities

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Anthropologists rarely portray themselves as quantitative specialists or people who know about numbers. Instead, the adjective ‘qualitative’ plays a central role in our self-conception. We do qualitative fieldwork; we record and transcribe qualitative interviews; we are skeptical of quantifying methods—especially those of economists—which many anthropologists believe fall short of portraying rich lived worlds. In economic anthropology, this haste to distance ourselves from the disciplinary taboo—that-which-is-quantitative—has generated a division of labor wherein economists mathematically explore money’s quantitative, abstract potential while anthropologists analyze money’s qualitative aspects (Dupuy 2009; Peebles 2002). This situation neatly reproduces an economy-society binary that economic anthropologists and sociologists have struggled to overcome since the ostensible end of the formalist-substantivist debate (Hann and Hart 2011: 72–99). By avoiding quantitative methods and analyses, economic anthropology has largely abandoned the study of money’s quantity and numbers.<sup>1</sup>

Different monies, despite having a diverse range of forms, shapes, and materials—coins, bank notes, stones, shells, and so on (Einzig 1951)—have often been

Notes for this section begin on page 13.

understood as conceptually similar, as sharing abstracting properties that spring ‘naturally’ from money’s inherently quantitative nature (Bohannan 1959; Dalton 1965; Simmel [1907] 2011). If a form of money did not share this abstracting potential, it could be classified as special-purpose money, an object that seems money-like, but is not actual all-purpose money (Polanyi 1968). From this perspective, money’s abstract potential must be tamed socially or culturally, in a realm that is positioned as outside of, or encompassing, economies (Parry and Bloch 1989; Graeber 1996; Karlstrøm 2014; Taussig 1980; Zelizer 1997).<sup>2</sup> The baby, money’s quantity, has been thrown out with the bath water, money’s abstracting potential.

However, the social sciences as a whole are in the midst of a quantitative turn. In contemporary economic anthropology, quantities—and to a lesser extent numbers—are associated with algorithmic trading and high finance; macro-economic phenomena, such as global crises and economic policies; and the ontology and epistemology of *homo oeconomicus*. Reinvigorated interest in quantitative approaches is largely focused on increasingly complex models and techniques for analyzing colossal data sets, but we believe that thinking about quantitateness predominantly in terms of Big Data is a failure of imagination. We take inspiration from anthropologists (Almeida 1990; Ascher 2002; Boellstorff and Maurer 2015; Eglash 1997; Guyer et al. 2010; Mitchell 1980; Mosko and Damon 2005; Passes 2006; Peebles 2012; Saxe 2012; Urton and Llanos 1997), philosophers (Badiou 2008; Bateson 1979; Hacking 2014; Rotman 1993), science historians (Verran 2001), and sociologists (Day et al. 2014; Espeland and Sauder 2007; Gerlitz and Lury 2014) who have begun to explore the theoretical boundaries of this emerging quantitative turn. This edited volume argues that economic anthropology has a stake in the new quantitative frontier, not only through the study of high finance or quantitative methods with large data sets, but also through studies of diverse ethnographic and historical conceptualizations of money’s qualitative quantities.

Chapters in this collection build upon recent emphasis on quantity as a central aspect of money (Akin and Robbins 1999; Guyer 2004; Holbraad 2005; Maurer 2008; Pickles 2013), rather than as a side effect of its use as a measure of value and medium of exchange. These contributions focus on exchanges that involve breaking down, calculating, dividing, and recombining sums of money—reconfiguring quantitative and physical heaps—to make new quantities that are qualitatively different. Rather than seeing money as a measuring stick, this book explores how money is used to make and symbolize quantities in different cultural contexts, and how such quantities can be qualitatively different and multiple. Peter Oakley’s chapter presents historical and contemporary evidence of gold jewelry as a form of para-money, a substance whose material quantification—value by weight—could be easily assessed but artfully concealed in the form of the jewelry itself. The paradox of the money chain is its ambiguous status as a gift defined through its quantitative (weight) and material (purity) equivalences with money that might remain invisible for some actors. In other words, different monetary objects bring forth different practices that can prevent the achievement of or bring forth new forms of quantification.

Anna Echterhölter’s chapter, for example, connects quantities and sensual experience: sounds, feats of strength, or seasonal changes. In her analysis of Frisian tax payments, as recounted by Jacob Grimm, she shows that these tax payments were assessed by the intensity and volume of sounds. Payments were adequate only if the collector, 12 rooms away, could hear coins sounding as they fell onto a shield. From Martin Fotta’s chapter about contemporary Brazilian Gypsy men’s monies, which become carefully quantified and ranked measures of masculinity, to Martin Holbraad’s chapter about the two-tiered money economy in Cuba, which influences experiences of need and states of poverty, contributors to this volume are thinking ethnographically about how money’s quantities are entangled with its qualities and physical forms.

Our introduction situates these insights in a broader theoretical context, explaining how contributors’ analyses are related to some long-standing topics in mathematics: modes of divisibility; relationships between wholes and parts as understood through set partitioning; and hysteresis, which draws attention to non-linear, delayed qualitative transitions between quantitative amounts or states. We explore the concreteness of numerical quantities and offer novel ways to consider how quantities have, are, or index qualities. Our goal is not a comprehensive explanation of these phenomena. Rather, we hope to show how these chapters create and suggest illuminating analogies between mathematical ideas and ethnographic contingencies in the study of money, following Claude Lévi-Strauss’s (1954: 585) suggestion that anthropologists should embrace “qualitative mathematics.” Another main intellectual ancestor of ours is Marcel Mauss. In a famous, but often misunderstood, footnote in his *Essai sur le don*, Mauss ([1925] 2007: 94; our translation) wrote that money is an object that has “purchasing power, and this power is enumerated.” Although much has been written on money’s ability to buy things, on calculative devices in finance and business (Çalışkan 2007; MacKenzie and Millo 2003), and on calculation itself, whether ‘rational’ or otherwise, very little has been written on how the enumeration of money’s purchasing power is negotiated by ordinary people in everyday life.<sup>3</sup> This book addresses that gap by exploring new dimensions of money’s quantities.

## Modes of Divisibility: Arithmetic and Recursive Quantities

Jean Piaget’s (1965) research on how children understand conservation of quantities can help explain differences between arithmetic and recursive divisibility. One of his experiments begins with two wide beakers containing equal amounts of liquid, let us say 200 milliliters. The contents of one beaker are divided equally between two tall, narrow glasses with 100 milliliters in each vessel. Children are then asked whether there is the same amount of liquid in the glasses as in the beaker. Those who recognize that the glasses and the beaker have the same quantity have understood the conservation of quantities. These children have perceived and accomplished an arithmetic division of quantity: one whole (the beaker’s contents) is broken into two equal parts (the liquid in the two glasses). This is considered a mark of successful intellectual development. But

there are also children who perceive the glasses as holding more liquid than the beaker. For those who follow Piaget, these children have failed to understand the conservation of quantities. However, these children have perceived a recursive division of quantity: one whole (the beaker's contents) has been transformed into two new wholes (one in each glass). These children perceive two wholes as more than one whole because two is more than one.

Arithmetic divisibility creates larger or smaller quantities of money through amalgamation (addition), expenditure (subtraction), and so on. Such money quantities are wholes composed of parts. In contrast, recursive divisibility creates whole quantities that are produced with and composed of other wholes, not parts. Borrowing from Helen Verran (2010: 173), we can understand recursively divisible objects as “having plurality contained within a unity.” Recursively divisible sums are unique wholes composed of other equally unique wholes. We find an echo of this logic in Georg Simmel's ([1907] 2011: 195–196) *The Philosophy of Money*: “The unity of the sum of money that is paid for an object incorporates the values of all the elements of its uses, extending perhaps over a long period of time, as well as the particular values of its spatially separate parts and the values of all the powers and substances that prepared, and finally ended in, money.” The materialization of money quantities, in this case as price, produces a whole that encompasses other potential wholes representing different expenditures or equivalences. Conversely, through arithmetical divisibility, money contains “unity within the plurality” (Verran 2010: 173). As a result of its numerical character, any amount of money stands in relation to all other amounts of money by being in a relationship with them through arithmetic functions such as addition, subtraction, multiplication, or exponentiation.

A focus on arithmetic divisibility is thus useful in ethnographic encounters where people are forced to translate different amounts from one currency or sphere of life to another. In his chapter, Emanuel Seitz rightly argues that how quantities of money are divided and recombined reflects highly specific forms of normatively and socially situated ethics and morals (Lazzer 2014; Ross 2014). To use money's quantity virtuously requires experience: it is a discipline requiring practice as well as a practice requiring discipline. In Sandy Ross's chapter, for instance, affluent migrants must learn how to use cash in ways that urban Russians find acceptable, such as making up payments with ‘correct’ combinations of denominations. Through trial and error, and sometimes with the assistance of local people, migrants come to understand how money quantities should be divided in particular settings and that not all money is always divisible. Money's quantity can also, as Echterhölter's chapter exemplifies, be mirrored in and shaped by the quantity of seasonal rhythms, growth, and decay. Fotta's contribution implies that the arithmetic approach to numbers must be divided further into a logarithmic and a linear understanding (Sun et al. 2012). Brazilian Gypsy men's loan repayment dates are based on logarithmic increases rather than linear ones: a 15-day term is followed by 30 days, but three months by one year. These logarithmic expansions reveal underlying logics of money's quantitative expansion.

Arithmetic dimensions of money's quantity play a further role in historic and ethnographic moments where money's numerical quantity takes on conceptual

(Seitz, this volume), economic (Braudel 1992; Weber [1923] 1981), or cosmological (Chu 2010) importance. The calculative potential of money's quantity can have repercussions in other social spheres (Apter 2014): a single token of money—a 1 shilling coin in Northwestern Tanzania (Weiss 1997) or a 5,000 ruble note in Russia—can symbolize the whole monetary economy. We suggest this is possible because of money's arithmetic divisibility. By engaging in real or speculative addition, subtraction, division, and multiplication, any part can be understood as being constitutive for diverse wholes, and any whole can be understood as composed of different parts.

While money's arithmetic potential and properties are widely discussed topics, money has rarely been considered as recursively divisible. This is surprising because monetary practices, even in finance and accounting, include many instances where wholes are composed of other wholes of the same status. Progressive taxation systems, for instance, divide one whole unit or sum—a citizen's total income—into brackets. Each bracket is a whole on which different rates of tax are paid. Let us consider the 2012–2013 tax contributions of an unmarried British citizen with a gross income of £60,000 who has no dependents and was born after 1948. This whole, £60,000, is composed of several other wholes. The first segment is an £8,105 personal allowance on which no tax is paid. The remaining amount, £51,895, falls within the basic rate and higher rate tax bands, which means it contains two further wholes: £34,370 taxed at 20 percent, and £17,525 at 40 percent. Each of these elements, for an accountant if not for a taxpayer, is a quantity whose importance is equal to that of the gross income. Thus, recursive understandings of quantity reflect some everyday realities in advanced capitalist economies. However, the unique ability of quantities to conceptualize the relations between parts and wholes is not only a mathematical matter. Money's quantities also become a medium for participation in other humans, the future, and divinities.

## Experiencing the Whole and Participating in Others

Holbraad's (2005: 247) concept of money as a "ground" that is able to "register displacement" is also concerned with relationships between parts and wholes. In his view, money's quantities are made visible and significant by reversing the assumed ground-figure configuration of monetary economies. Instead of goods being a whole from which money cuts a part, Holbraad suggests that amounts of money are wholes from which goods cut parts. Money is not only a transcendent means of calculation for comparing different objects; it is also a ground against which immanent expenditures appear as figures. In the moment of expenditure, any totality of money becomes a background that makes soon-to-be consumed sums meaningful. Thus, every amount of money is recursive, a whole containing other potentially qualitatively equal wholes. As each moment of expenditure reconfigures relationships between quantities, we can think of any monetary purchase as a form of self-reflexive bartering (*ibid.*: 244).<sup>4</sup>

Thus, despite money's multiplicity, expenditures cancel the possibility of other exchanges. This view is opposed to a conception of money as "unfettered empowerment" (Dodd 1994: 154) or as freedom (Simmel [1907] 2011: 214) that permits us to imagine many or even infinite potential expenditures. If we, however, follow Holbraad's analysis of money use in Cuban Ifá divination cults and understand quantities of money as part of figure-ground relations in which expenditure forecloses other options, then these figured quantities confront us with the potentially alien nature of our desires just as much as a divinity presents us with our unalterable fate. If a divinity informs us that we have no choice ("You really cannot choose between A and B. Your future depends on accepting A, and I suggest the sooner the better"), or if a commodity insinuates that we could not want or have anything else ("You imagine me as one of several possibilities, but in this moment, you only want me"), then quantities of money become revelatory objects. They inform us that we never truly wanted something else in the first place.

Thus, we agree with Noam Yuran's (2014: 8) suggestion to understand money as an "object of desire" that "underscores the extent to which our own desire is foreign to us." Yuran uses Dickens's industrialist from *Hard Times*, Josiah Bounderby, to consider how others' perceived desire for money shapes relations of power. When his employees demand better wages, Bounderby believes they are trying to 'steal' his money to live luxuriously. These desires that Bounderby projects onto the workers allow him to justify the cruelly exploitative working conditions in his factory. Fears about others' desire to appropriate his money shapes Bounderby's relationship with his wealth: "Bounderby imagines that his workers desire excessive pleasures that he himself conspicuously avoids" (ibid.: 85). Having identified luxury and desire as pathological, Bounderby excludes his employees from basic subsistence and himself from enjoying his money, which is exhaustively signified by the desires of his employees.

Placing desires unknown to ourselves or the unknown desires of others at the heart of money's conceptualization is a fascinating way to square the concept of money and notions of personhood in anthropology. Precisely because an amount of money allows its owner to imagine it both as a known whole with unknown parts and as a known part of an unknown whole, it enables us to participate in unknown dimensions of ourselves, goods, and other humans or geographical and ontological spheres without necessarily being acquainted with or already a part of them, and vice versa. This is impossible in context-bound gift exchanges where the impartibility of the given object symbolizes the impartibility of the represented and established social relation (Godelier 1999). An example is the famous *symbolon*, a material object serving as a pledge by being cut into two halves, with both parties of the agreement keep one-half (see Seitz, this volume). In contrast, money is a medium of participation in unknown others (Simmel [1907] 2011: 210), unforeseeable futures, and the untouchable divine. However, this is only possible through money's quantitative properties.

If money were neither partible nor multiple, we could neither trust in our own monetary wealth's hidden potentials nor identify a single coin as a sign of future

affluence. Thus, money's quality of quantity allows it to function as the ground on which social relations of Brazilian Gypsies emerge (Fotta, this volume); enables Dholuo-speaking Kenyans to imagine and calculate with amounts they currently do not possess (Schmidt, this volume); helps families or individuals to compensate for death or injury (Echterhölter, this volume); and lets migrants pass 'impartial' judgment on, yet see themselves as participating in, urban Russian society (Ross, this volume). In the case of Cubans' struggles in a dual currency economy (Holbraad, this volume), the simultaneity of the dollar's absence and its presence reminds poor Cubans that they, although intricately entangled with it, are ultimately excluded from the consumerist benefits that 'others'—rich Cubans as well as Americans—enjoy. In an attempt to fulfill their desires nevertheless, poor Cubans internalize the external division between the dollar and the peso economy through window-shopping and in the experience of need.

## Set Theory and Boundless Recursivity

The infinity of monetary desire is an old topic in academic debates and artistic approaches to money. Both the continuously growing amounts of gold that Scrooge McDuck hoards in his money vault and Simmel's ([1907] 2011: 253) "endless series of possible volitions, self-developing actions and satisfactions" illustrate how infinity, often masked as abstraction, plays a central role in money's conceptualization. However, we rarely consider how finite amounts of money permit these experiences of infinity. Set partitioning, an element of mathematical set theory, helps us understand how a finite amount of money—an investment banker's £200,000 bonus—can seem like an infinite quantity. Furthermore, it illustrates how desire and recursivity are entangled through monetary quantities.

Set theory is a foundational branch of mathematics. Sets are groups of objects, known as elements. Sets are defined by common attributes of their elements. For example,  $A_9$  is a set containing all positive integers between 1 and 9:  $A_9 = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ . However, elements need not be numbers or quantities; they can be any arbitrary object or even other sets. A set consisting of fluffy objects could contain plush toys, clouds, and bouffant hairstyles. Set theory does not discriminate between qualities and quantities. Sets may also contain an infinite number of elements, such as all real numbers between 0 and 1. Set partitioning deals with how sets are divided into mutually exclusive subsets and/or single elements.  $A_9$  can be partitioned many ways. We could divide it in two subsets, even and odd integers:  $\{\{1, 3, 5, 7, 9\}, \{2, 4, 6, 8\}\}$ . We could make two subsets, one containing multiples of 3, and another containing the remaining elements:  $\{\{3, 6, 9\}, \{1, 2, 4, 5, 7, 8\}\}$ . As the number of elements grows, the number of potential partitions increases rapidly. This increase is more than exponential. Bell numbers ( $B_n$ ) express the number of potential partitions in a finite  $n$ -element set. The set  $A_9$ , for instance, can be partitioned in  $B_9 = 21,147$  ways. Sets of infinite size can be partitioned in an even bigger infinite number of ways.

With respect to money, set partitioning provides a mathematical foundation for understanding how a finite quantity can seem like infinite possibility. We can think of \$1,000 as an interval on the real number line, containing all real numbers between 0 and 1,000. Splitting the interval in two parts, or any number of parts, can be done at infinitely many points. Alternatively, we can think of \$1,000 as a set of all amounts between \$0.00 and \$1,000.00, down to the level of a penny. In this case, there are 99,999 different points—at any penny—where the total can be divided in two parts. In financial markets, even fractions of the smallest denominations may be used, creating more division points. Thus, a quantity of money permits seemingly boundless partitioning.

We can apply these insights from set partitioning to further conceptualize Simmel's image of money ("endless series of possible volitions") as a set with three elements: an almost infinitely partible quantity of money, a huge variety of goods potentially bought with the whole sum or wholes within it, and moments of an infinitely partible time in which these goods are purchased. With this logic, we can then understand how even a small amount of money, perhaps \$10, can be divided into an "endless series" of different purchases in future moments (Schmidt, this volume). In other words, as recursive quantitative wholes of potential expenditures, both little quantities like \$10 and bigger quantities such as \$100 or \$1,000 can be spent in infinitely different ways.

Set partitioning, however, not only allows us to understand that \$10 and \$100 are quantitatively comparable because they both enable infinitely diverse ways of purchasing goods. It also helps us to understand why a larger sum does not necessarily encompass smaller amounts. While the quantity of \$10 is arithmetically included in the quantity \$100, when we conceive of an amount of money as a set of purchasing potentials, these two sums are both quantitatively similar and qualitatively different. Quantitatively, \$10 and \$100 are similar because both allow the experience of an infinite diversity of purchases. But qualitatively, these two quantities are different because the internal structures defined by the partitioning of \$100 and \$10 are not equivalent and cannot be grasped by arithmetic means. Put another way, giving away \$10 of \$100 'feels' quite different from giving away \$10 from \$1,000 or even \$100 from \$1,000. One sum is simply bigger, as one shade of green is greener than another. Monetary amounts thus bypass the difference between countable multitudes—assessed with numerical, arithmetic tools—and continuous magnitudes, whose extent can only be estimated. They are both numerical, like numbers, and material, like colors (Schmidt, this volume).

Set partitioning considers how finite quantities of money can seem infinite. But several contributors to this edited volume—notably Fotta and Oakley—are concerned with transitions in the other direction, from boundlessness to finitude or even worthlessness. Fotta, for example, examines how quantities of money are transformed into measures of masculine potency and influence. His chapter examines how, why, and when economic registers of value are transferred to political spheres of valuation. Among Brazilian Gypsy men, money quantities and materialities are entangled and transformed together, but in ways that complicate boundary drawing between different qualitative states because transitions



are delayed and boundaries are elastic. We use the hysteresis effect—a concept used by physicists to capture lags between changed conditions and changed states—and the sorites paradox, also known as the paradox of the heap, to examine the importance of past qualities for understanding current quantities.<sup>5</sup> The hysteresis effect helps us to interpret the sorites paradox in a way that offers new insights into delayed transformations between qualitative states marked by elastic quantity thresholds.

## Delayed Transitions, Elastic Thresholds, and Hysteresis

In the sorites paradox, we begin with a heap of sand. If we take away a single grain, the quantity remains a ‘heap’. In Holbraad’s terms, the figure fails to stand out against the ground because the amount removed is too small. But if we continue to remove grains of sand, when does the remainder become a non-heap? When does the grain of sand become a visible figure against the ground of the pile? If we think of the heap in terms of recursive divisibility, it would consist of many fairly similar wholes combined into a larger entity. Thus, we are seeking the moment when a whole—the heap—can no longer sustain its integrity as a meaningful amalgamated quantity.

The sorites paradox therefore becomes a problem about material transformations between states. When is a quantity of high-purity gold worth more, or possibly less, than its weight? When do the inhabitants of the Western Kenyan market Kaleko perceive of a sum of money as finite instead of infinite? When does an additional Gypsy loan transform from a mere transfer of pecuniary wealth into a measure of influence and masculine power? The transition between being a man who loans some money and being a potent man who loans great sums of money is neither binary nor instantaneous. There is no threshold up to which men must loan in order to acquire or demonstrate strength (*força*). Rather, how much is owed to someone today is compared to how much was borrowed in the past, how much he owes to others, how much he has borrowed previously, how much he has gained in marriage, and how well he provides for his family. Slowly, a Gypsy man builds his *força*, but the moment he becomes a strong man arrives some time after he has built up the requisite money circulations. We suggest such temporal lags and delayed transformations between qualitative and quantitative states can be explained rather well with hysteresis.

Hysteresis is a concept used by physicists to describe how an object’s or system’s current state depends on a sequence of past conditions that lead up to it. A thermostat and heater are designed to exhibit hysteresis. When a thermostat is set at 18°C, whether or not it activates the heater depends on the previous temperature of the room as well as its current temperature. If the room were 17°C but had previously been 18°C, the heater will not activate until the temperature drops a bit more. But if the room was previously 16°C, then the heater would remain active until the temperature rises to 19°C. For the thermostat to activate or deactivate the heater, the room’s recent temperature history is just as important as whether the most recent temperature shift was upward or

downward. This temporal aspect, or memory of past events, influences how near or far the threshold is to the adjacent state. Hysteresis therefore allows us to focus on qualitative transformations that are triggered by a quantitative decrease or increase but do not occur immediately. This concept frames how past quantities shape current qualitative assessments.

But how do thermostats relate to the sorites paradox? We must redefine our knowledge of the heap's materiality and quantities. If we knew that there was previously a heap of 5,000 gold doubloons and took away one coin at a time so that there were only 4,000, the quantity would appear somewhat diminished. By the time there were only 1,000 coins left, the pile would seem significantly diminished. We would still have a heap, but we would be aware that our quantity of money was approaching a non-heap. There is a flexible boundary between the heap and the non-heap, or one material state and the next. But our awareness that the quantity used to be bigger would lead us to redefine the remainder as a little heap or maybe just a collection. But if we suddenly receive a windfall of 2,000 doubloons, we would have a heap once more. As the bundle dwindles, its quality of heapness somehow remains. Yet once it has become a non-heap, achieving the status of a heap once more takes a significant input. Alternatively, if we began with 500 doubloons, which we perceived as a heap, and accumulated more and more until we had 5,000, the resulting treasure hoard might seem like many coin heaps rolled into one. There is not a fixed boundary between heap and non-heap. Instead, there are elastic thresholds where heapness depends on whether there has recently been accumulation or depletion. Hysteresis thus highlights the importance of past perceptions and the nature of the quantitative change on qualitative evaluations and draws our attention to the immediate past and its long shadow in the present.

If money is memory, as Keith Hart (2000) has argued, then hysteresis provides a way of considering how qualitative estimations of current money quantities are shaped by memories of former quantities and the qualities attached to them. Time becomes visible as the ground against which material, qualitative, and quantitative changes and flexible thresholds are defined, as exemplified by François Simiand's (1932) observation that workers perceive an increase in the absolute numerical value of their salary as more money even if their purchasing power simultaneously decreases. Our interests as scholars of money is in finding moments where quantities and qualities are transformed with temporal lags. This is not about reflexive measures that constitute what they index; rather, it is about discerning turning points in physical and qualitative transformations that are entangled with quantities. This approach is not opposed to that of scholars studying ordinal rankings (Guyer 2004, 2010) or ranking algorithms and metrics (Espeland and Sauder 2007). We are concerned with transformations between qualitative or physical states, whereas work on the reflexivity of metrics and rankings is concerned with competition and variable gaps between ranks (Guyer 2010) and the calculations behind ratings (Gerlitz and Lury 2014). Guyer in particular has highlighted how distance between intervals increases (between some points, seemingly exponentially)

at the upper end of a ranking scale. This insight helps us understand why it is harder to move from fifth to third position in such a scale than from seventy-fifth to seventieth. With rankings, thresholds between positions are defined by another person's algorithmic evaluation or performance. Although new records may be set, the new thresholds remain fixed hurdles that others must overcome. In contrast, we are interested in elastic changes and boundaries, like bidding increments in an auction, rather than fixed thresholds, like the rank ordering of the auction bidders and their bids. A hysteresis-informed approach is suited to thresholds that recede or come nearer depending on previous quantities and qualities, rather than the set hurdles of metrics and scales. This perspective is more relevant to monetary quantities that are entangled with qualities, where boundaries between states are more like shades of color that blend.

## Introduction to the Chapters

In this introduction, we have tried to show how the historic and ethnographic challenges examined in these chapters relate to blurred quantity-quality boundaries. Drawing on ideas from mathematics and physics that are inspired by our contributors' approaches, we have further attempted to provide several different entry points or frames through which their chapters can be read. We begin with Oakley's chapter, which asks whether gold jewelry can be money. In his response to this question, Oakley reminds us of the continuing importance of money's diverse substances, especially when those substances have other uses. In his examples of gold musters melted down as scrap and Tudor money chains, Oakley highlights how gold as a substance slips between registers of quantitative valuation—as jewelry, as a pile of tangled metal, and as para-money.

Echterhölter's chapter picks up on this theme of quantities that are expressed through substances and qualities. Drawing on Jacob Grimm's accounts of rural Germanic law and legal customs, she connects quantification and measurement, then presents a mode of quantification without numbers. Quantities can be expressed 'poetically' with images that define relationships between quantities through objects, living things, and cycles of growth. These quantifications present measures that are open to negotiation. Rather than being accurate—producing measures of a 'true' quantity—these measures, and the procedures that create them, are precise. They reliably produce similar results, even when elements of chance are introduced. Oakley's and Echterhölter's chapters thus offer two views of qualitative quantification, one based around substances and divisibility, the other built on poetic images or qualitative measurement procedures with elements of chance.

Ross's chapter also examines blurred boundaries between quantities and qualities. She explores how affluent migrants in Moscow and St. Petersburg struggle to domesticate the ruble's seemingly large quantities through qualitative means, turning quantities into evidence that justifies or legitimates fears or moral judgments about Russian culture and society. The symbolic potential

of money's quantity and its ability to mediate the participation of actors with one another are equally central to Schmidt's contribution. Schmidt argues that money's recursivity—its capacity to be a whole composed of equally significant wholes—enables Dholuo-speaking Kenyans to experience freedom of actions. Yet money's mathematical divisibility, linked to required expenditures and fixed (often inadequate) resources, relates the concept of money, as well as individual tokens of it, to coercion and life's pitfalls.

Like Schmidt's contribution, the chapters by Fotta and Holbraad explore themes around marginality and money. For Holbraad, Cuba's two-tiered money economy of dollars and pesos creates different experiences of need and privation. He argues that quantitative commensuration becomes an inextricable part of qualitative moral struggles and discourses about inequalities. Fotta's chapter brings us full circle, sharing Holbraad's and Schmidt's focus on money and poverty. His account of informal moneylending among Calon men furthermore presents money's quantities as indexes of masculinity. On one hand, this links Calon men's conceptualization of money's quantity with Calon cosmology and morality; on the other, it exemplifies how money's quantity can relate to allegedly non-quantitative spheres of social life.

Before Nigel Dodd summarizes the contributions in his afterword against the background of the quantity-quality divide, Emanuel Seitz's chapter provides a provocative, wide-ranging dialogue on money's immaterial and quantitative nature. Seitz interrogates the shifting place of money's quantity in the history of economic thought, linking his discussion to diverse themes explored ethnographically in the other chapters. He demonstrates that these chapters should not be read as counter-hegemonic descriptions of how various 'others' conceptualize money's quantity, but rather as examples of the immense potential of a type of ethnography that does not flinch from philosophically rethinking its basic concepts. Thus, we do not shy away from our conclusion that recursive and other 'alien' understandings of quantity explored in this edited volume entail correct and true statements about quantity and its qualitative and material manifestations. As such, we hope to pave the way for further explorations of money's quantity and to offer a way out of theoretical and practical dead ends.

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## Notes

1. Notable exceptions to this tendency include Crump (1978), Guyer (2004), Lave (1988), Mauss ([1925] 2007), Mimica (1988), Rosin (1973), and Strathern (1992).
2. See Maurer (2006) for an overview of the anthropology of money.
3. For exceptions, see Cochoy (2008) and Rosin (1973).
4. For more on this form of self-reflexivity, see the chapters by Holbraad, Ross, and Schmidt in this volume.
5. See Bourdieu ([1977] 1980) for a different application of hysteresis.

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