at the Bulaq printing press in Egypt in 19th century (Fig. 2.9). That is the analytical view of the shape-shifting nature of Arabic letters. The logic is straightforward and hence attractive in its simplicity. The Arabic script is partially connected, therefore there are four different positions that a letter can be in: at the beginning of a word, at its middle, at its end, or on its own. These give rise to the initial, medial, final, or isolated forms that an Arabic letter can take. This logic seems all fine till one looks at the visual construction of the Nashk style, which has served as the model of most typographic design. The problem therein lies in the fact that letters do not sit side by side, they often climb on top of each other. To remedy that, punchcutters have resorted to adding ligatures that bring in that feel of fluidity that one sees in manuscripts. The more ligatures employed the more fluid the design.

This approach had varying degrees of success. Some designs showed great typographic texture such as the typeface designed by Eli Smith, cut by Homan Hallock from Izmir and later cast in Leipzig (Fig. 2.9). This was referred to as American Arabic and proved to be “popular and influential for the rest of the 19th century” (Glass & Roper, 2002, p. 191). One can see a stronger influence of calligraphic traditions and the design shows an extensive use of ligatures that bring more intricacy and complexity to the design (Fig. 2.10).

The main criticism of this approach is that it is still unable to fully replicate the kind of behavior that Arabic letterforms exhibit in the context of rounded styles such as Nashk. Still, this analytical view of looking at Arabic is very much the backbone of Arabic typography, and is the current definition by which Arabic letterforms are digitally encoded.

The Nashk typefaces designed within this view of Arabic are referred to in this dissertation as Traditional Nashk. The name derives from the fact that the majority of typefaces past and present employ this definition of Arabic.

The Rule of Continuous Pen Movement: Dynamic Nashk

There is another way to analyze manuscript Nashk and that is through pen movement rather than letter position. This approach looks at the fusion of strokes to make a continuous pen movement. The typeface is then composed of abstract shapes that, when dotted, transform into a group of letters. This approach was pioneered by Ögün Munehidinoglu in 1860. His approach to typeface design was fully based on “archigraphemes” (Milo, 2002) in the sense that the character set was made up of various stroke formations rather than contextual alternates of specific letters. Given the abundance of common basic shapes in Arabic, this approach makes sense when one is looking for a typographic flavor that follows the “script grammar” (Milo, 2010) of manuscript Nashk. The text is set via 1500 pieces of movable metal type to which dots and vocalization are then added (Milo, 2002). The design of the typeface is by far superior to anything that came before, and in a way to what came after. The strokes are well drawn, the rhythm is smooth though wider spaced than manuscript styles, and the design is in keeping with the aesthetics of manuscript Nashk (Fig. 2.10). Indeed, his inspiration was the calligraphic work of "Kazi Asker (Supreme Judge) Mustafa izzet Efendi (1801-1876), ranking among the viziers or ministers of the Ottoman State" and is thought to be the reference for later Nashk designs (Milo, 2002, p. 16).

The typefaces built and designed in this approach are labeled as Dynamic Nashk in this dissertation. These are the closest in adherence to the principles of word formation in manuscript Nashk. Their design, by extension, is the most fluid and dynamic in look and feel.
The Rule of Two: Simplified Naskh and The Quests for Speed

The strive to adhere to manuscript traditions changed in the 20th century to a strive for speed and efficiency. If the first four centuries of Arabic typography were about increasing complexity to achieve a closer impression of the calligraphic manuscripts, then the fifth century was one where the tables were turned and economy and speed took precedence. This was the century where Arabic questioned the value of the Arabic script and were plagued by dittos as to their ability to keep up with the developments in the west. This quest for speed and technical advancement is not surprising when one looks at the events that shaped the twentieth century. Other than the two world wars and a cold one that soon followed, the Arab world finally achieved independence after centuries of foreign rule. The Arab renaissance (um-nahda in Arabic) starting in the 19th century, the increasing levels of literacy and self-awareness, the rise of Arab nationalism, and the move towards industrialization all served as a wake-up call; the train has long passed and Arabs must try their best to follow. The calls for script reform coming out of the Academy of Arabic Language in Cairo in the middle of the 20th century are testament to the national feelings of angst.

The typographic solution came in the simplification of the rule of four into the rule of two. The design would simplify the contextual shapes and merge initial with medial forms and final with isolated ones. Some letters could not be simplified but those were the exception and the character set was greatly reduced, thus allowing for faster typesetting of Arabic texts. This solution was first used in the Arabic typewriter and then fully exploited in Linotype’s Simplified Arabic in 1954 (Fig. 2.11). This style became the de facto newspaper style and is very much part and parcel of the typographic spectrum as we know it today.

Breakthroughs

The technical limitations of setting Arabic have finally come to an end. The move to desktop publishing and the digital revolution were perhaps responsible for the fastest leap forward in terms of Arabic typographic design. The last couple of decades of the twentieth century witnessed a digital adaptation that was a continuous line of design development as that set by hot metal early on in the century. That would soon change with the development of the OpenType font format. This format allows a very large character set, and the possibility to program contextual behavior that brings in intelligent design to typographic practice. Contextual alternates, designs of letterforms that would have taken prohibitively amount of time to set in metal type can now be used on-the-fly. This brings endless possibilities to typefaces that require a more complex design that is context sensitive, as most of the Arabic calligraphic styles are. In terms of design, this has opened many doors and the quality of available typefaces—mostly Kufi or Naskh—has improved tremendously in the last decade.

This technical advancement brings to the foreground the most basic question that Arabic typography has struggled with: which model of analysis should Arabic typefaces follow? How close should they be to manuscript tradition? These are the questions driving this dissertation forward. The typographic reality offers three different ways to approach Naskh typefaces. To fully grasp the details involved, a detailed look at the anatomy of Naskh styles follows.

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5 Um-nahda is Arabic for “the awakening” and is a cultural and intellectual movement that started in Egypt towards the end of the 19th century and later spread to neighboring countries such as Lebanon and Syria.

Naskh Alignment Zones

The Latin script is characterized by having clearly defined vertical alignment zones. The characters walk across a horizontal baseline, and there are several possible heights for characters: the x-height, the cap-height, the ascenders, and the descenders. If one combines the baseline and the x-height, one can notice a horizontal band that runs through the middle of the script. This is not too different from Arabic, though this is not evident from the first glance.

When looking at Naskh in manuscripts, one is struck by the seemingly unstructured and unbound undulating strokes. The letterforms appear to flow freely, seemingly in defiance of the baseline (that the Kufi styles so faithfully adhere to). The Naskh world is one without a gravitational pull. In reality though, Naskh adheres to a strict set of proportions that govern its relationship of parts, as well as its vertical alignment zones. This becomes obvious once a band is drawn through its connecting strokes. Naskh is built around a flexible ribbon-like base stroke (Fig. 2.12) that rises and sways in a melodic and rhythmic fashion. Taking the ribbon as a start, the characters rise above or dip below in increments of rhombic dots. All in all, the system is 12 rhombic dots high with the base ribbon taking up approximately one dot. The system has 5 rhombic dots above the base ribbon and 6 below it. The relationship of the base ribbon to the baseline is also governed by the rhombic dots, and so the overall sense of movement within Naskh follows quite specific guidelines.

Most of the characters that are sitting above the base ribbon rise by either 1 or 2 dots. The initial Reh, Jinn, Ta, Sa, and the middle Ayin are 1 rhombic dot higher than the base ribbon. The initial Heh, isolated Dal and initial Heh are 2 dots higher, and the final Dal is either 1 or 3 dots higher.

The ascenders are either 5 or 6 rhombic dots high. The isolated Aff and its variant usually 5 rhombic dots high, and it goes one dot higher in case it has the Taa, and which is another frequent ascender, can be 6 rhombic dots high.

As for the descenders, they are 1, 2, 3, 4, or 6 rhombic dots deep. The middle and final Mim loop is the most shallow of descenders. The Reh is either 2 or 3 rhombic dots deep, depending if it has a lower loop or not. The Waw and the Reh are almost always 2 dots deep. The final and isolated forms of the Jinn and Ayin are the deepest descenders dipping 6 rhombic dots below the base ribbon.

The Different Interpretations of Typographic Naskh

As mentioned in previous sections, Naskh developed under the Ottoman hand to become the de facto text style. This resulted in the use of Naskh as the model for the first Arabic typefaces and thus started a long typographic tradition that continues until today. The various typographic interpretations of Naskh still in operation today can be placed in the three categories introduced earlier. Before taking a closer look at how they are formed, two important concepts need to be clarified:

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6 For the study of alignment zones, it was best to refer to manuscripts versions of Naskh since the typographic version had been flattened to fit onto a horizontal baseline. This affected the flow of characters into one another and changed the way text flows. It was more rewarding to study the letterforms in their original formation.
Complexity of Word Formation

Word formation is the key variable across the different interpretations of Naskh. Its degrees of complexity are what set the three categories apart. A less accurate description would be "complexity of the style" and the reason for the longer version lies in the analysis of what it is exactly that is changing across the Simplified, Traditional, and Dynamic Naskh (Fig. 2.13). The key lies in the number of forms that are employed per letter and in the stacking order.

Stacking Order

Another key factor that comes to play is the stacking order. It is the order in which characters are assembled to make words. Latin characters sit at the same baseline and are visually consistent with their linguistic position, and as such, the stacking order is a non-entity. Since Arabic is a semi-connected script, most characters are attached to their neighbors. Characters are written in the same order as they are spelled in a word. However, the rounded styles allow complex ligatures to form where characters move around to create quite complex strings. For example, the Min in the initial Lam-middle-Min combination is positioned to the bottom right of the Lam which is sharp contrast to the spelling order. Experienced readers are trained to recognize these ligatures and are able to read such sequences without error. Nevertheless, this brings the issue of stacking order to the front.

The three main categories of the typographic variants of Naskh are Simplified, Traditional and Dynamic Naskh. Dynamic Naskh also has a 4 tier stacking order: right-to-left, top-to-bottom, diagonal right-to-left, and diagonal left-to-right. This creates a quite dynamic front both on the x- and y-axes. By contrast, Simplified Naskh appears quite static and repetitive as it has only one stacking order which is the usual right-to-left. As to Traditional Naskh, it literally lies in the middle of the spectrum as the ligatures bring forth the various stacking orders, but their infrequency keeps the text from taking on a more elaborate formation.

Traditional Naskh

This category includes the number of interpretations of Naskh that follow these rules. The individual character structures and shapes follow those of manuscript Naskh but the stacking order is generally simpler. Each letter has four distinct letterforms based on the letter's position in a word: initial, middle, final, and isolated. These characters are joined together via a small horizontal connection that serves as the base ribbon. The stacking order is horizontal from right to left, and can be manipulated into a more complex order via a set of extra ligatures. Typefaces of this category vary in the number of ligatures that they support. The character set, then, is enhanced with this varying number of ligatures that serve to emulate, to a small degree, the feel of manuscript Naskh.

This interpretation of Naskh was used in both hand setting and hot metal technologies. It is also the basis of the digital interpretation of almost all of the Arabic typefaces today as can be seen in the definition of the Arabic script by the Unicode Consortium. It is also the norm for the teaching of the Arabic script. This term "traditional" is not a typical term used to describe Arabic typefaces. The typeface style that it represents here is usually simply referred to as Naskh. For clarity purposes, the
of forms per character, the design of the individual characters tends to gravitate towards the baseline, bringing with it a more static and rigid look and feel.

The story of Simplified Naskh is paradoxical in nature, a story that is simultaneously a success/failure story depending on the side one is looking at. Linotype had a solid head start in the automated typesetting of Arabic since 1913. In the forties and fifties, the Arab world was gripped by the calls to reform the script. The reasons cited were the inadequacy of the Arabic script to be as easy and economical to print as Latin. The Academy of Arabic Language in Cairo hosted a competition for script reformulation and the proposals poured in. To cut a long story short, none of the proposals were accepted since the solutions would necessitate that all existing material would have to be reprinted or else future generations would lose the ability to read it. This proved to be too radical for the Academy to accept, but the challenge to simplify the typesetting of Arabic remained.

It seems too much of a coincidence that Simplified Naskh was developed within this timeframe. Indeed, in the thirty-second issue of the Linotype Matrix journal, the headline ran:

"Linotype are first in the world to produce a system of Simplified Arabic for the mechanical composition from one magazine" (Linotype and Machinery Limited, 1959).

The article discusses the rising levels of literacy, the large number of Arab speakers, and the unsuccessful attempts at script reform. Their new typeface dealt with the economical problems of having to work with a large character set by reducing that number by half, and thus made the typesetting of Arabic, just like Latin, possible from only one magazine.

A revealing article of the workings at Linotype can be seen in this text from an article in the Linotype Matrix in 1955:

"Even before the war the mood of national re-awakening in the East was having far-reaching effects, not the least of these being a growth of literacy and an ever-increasing demand for reading matter of every sort. Since the war this particular demand has grown very considerably, particularly in the Arab world" (Linotype and Machinery Limited, 1955).

The demand for faster production was a hard pressing reality. Unfortunately, when seen through the eyes of calligraphers, Simplified Naskh is almost an abomination, a clearly inferior aesthetic output than what they themselves are able to conjure. Simplified Naskh lacked the visual impact and elegance of manuscript Naskh. It was a prime example of design conceding to technology. On the other hand, Simplified Naskh really did deliver on its promise. It simplified Arabic typesetting and reduced costs and in the process helped to speed up newspaper production. Undeniably, its cultural contribution is immense. And here is the paradox. Which is greater in value? Is it the aesthetics of a script, or the ability to make it more readily available to the public? If the story of Simplified Naskh is any indicator, then it seems that practical requirements tend to win over aesthetic considerations.

This may seem disheartening, but the story of Arabic type design is that of a struggle. Thankfully, recent technical breakthroughs have almost abolished these problems. However, Simplified Naskh continues to be part of the Arabic typographic culture, and it is also faster, and thus more economic, to design, and as such it remains a distinctive category within the interpretations of Naskh.
Dynamic Naskh

This term also is not part of the repertoire of terms used to describe Arabic typefaces. It is used here to refer to typefaces that almost fully emulate the behavior of manuscript Naskh. Several various technical methods are available for the implementation of such complex typesetting. The character combinations are done dynamically (Fig. 2.14) and so a great number of the usual restrictions are eliminated. The style brings into effect the fully-fledged complexity and intricacy of word formation of the Naskh style. The first instance of Dynamic Naskh in metal type was by Ohannes Mithendis-oglu in 1860 (Mills, 2002). The first digital instance is Decotype's Naskh.

Dynamic Naskh differs from Simplified and Traditional Naskh by the following:

- The analysis of text is done via letter strokes rather than full letter shapes.
- Letters are able to take on more than the basic four forms, and these are sometimes used in the justification of text, or in the addition of swashes.
- The addition of dots is added to dynamically formed strings, in contrast to the pre-prepared dot positioning of the previous two categories.
- Dynamic Naskh is able to come very close to the actual rhythm and feel of the handwritten Naskh of manuscripts.
- The stacking order is multi-directional. Due to its engineering, Dynamic Naskh is able to build the various stacking orders that are normally present in manuscript Naskh.
- The relationship of the base ribbon to the baseline is more flexible and varied and this leads to multi-teried alignment zones, as in manuscript Naskh.

Dynamic Naskh has several variant designs for its representational forms that are dependent on the preceding and following characters. This adds more diversity to the color of the text.

Perhaps the first digital and most prominent example of Dynamic Naskh is Decotype Naskh, accessible via the Tastemem extension for InDesign. Its design follows in the tradition of Ottoman Naskh and brings into typography the script grammar of manuscript Naskh.
Structural Comparison

Looking at the typographic spectrum of Arabic typography in the Arab world today, one notices a predominance of Naskh for text and headlines and slightly offset by the variations of the Kufi styles used mainly in headlines. Looking more to the east in Iran and Pakistan, one is greeted with the fluid lines of Nasta‘līq. Though these different styles of Arabic calligraphy look almost like different scripts altogether, they share a common foundation or so to speak. The structures vary in angularity, construction, and proportions while the angle of the tool provides different ways to dress the underlying structure.

To get a clearer view of the extent of typographic variation, three typefaces were abstracted into their basic structural forms (Fig. 2.16). The selected typefaces were Linotype’s Lotus for Naskh, Ahmadi for the Kufi styles, and Qalili for Nasta‘līq. These are by no means fully representative of their genre or anywhere near being exhaustive, especially in the case of Ahmadi since the Kufi styles vary quite widely. Still, they offer an initial view into how these styles are built. In the case of Naskh and especially so in Nasta‘līq, the letters can have several different structures. These are usually minor variations on a basic formation, though there are some exceptions to that. In this exercise, only one was chosen and this was done for the sake of simplicity. Otherwise, it becomes too complex to bear comparison. It is also interesting to note that proportions may vary among different typefaces and within different renderings of calligraphic styles. Thus, the proportions rendered in these examples are not fully definitive and are subject to a certain degree of stylistic variation.

With the three structures compared next to each other, several main differences are immediately obvious. The most striking is the fact that this specific structure of Kufi has only two variations per letter rather than the minimum of four. The fluidity of movement present in Naskh and Nasta‘līq is in stark contrast to the formal and rectilinear design of Kufi. This example of Kufi is built around geometric lines and curves while Naskh and Nasta‘līq are based on purely organic forms. This results in having a more disciplined and formal appearance for the Kufi while the two offer an impression of a more human and personal touch.

In terms of the progression of words into lines, Kufi appears to be quite static and firmly rooted on the baseline. On the other hand, Naskh is more in keeping with a handwritten style that flows with the baseline without actually merging with it. Nasta‘līq, on the other hand, is simply divorced from horizontality and is in reality based on a series of downward diagonal strokes.

The relationship of Naskh and Nasta‘līq, from a purely structural perspective, is similar to that of the Roman and Italic. While the Italic is in most of its letters forms a variation of the Roman but with a slanted y-axis, Nasta‘līq is similar to Naskh but with a slanted x-axis. However, the similarity ends there. The stacking order in both Roman and Italic is the same: a simple side-by-side left-to-right horizontal stacking. The characters in Naskh interact in quite complex formations such as vertical and diagonal stacking. The diagonal stacking in Naskh goes in both directions, diagonal pointing downwards either to the left or to the right. While in Nasta‘līq, the stacking order is almost exclusively diagonal pointing downward to the left.

In terms of vertical proportions, Naskh and Nasta‘līq are closer together than Kufi. This is especially evident in the depth of descenders. Kufi usually has quite shallow descenders especially in the Jim and Ayn families. These are made up of a small curve that often transforms into a horizontal line parallel to the baseline. This is in contrast to the arched descenders of the Naskh and Nasta‘līq styles where these curves bloom into full-scale washes that are significantly larger than the top parts.

As to horizontal proportions, when set at the same optical size and weight, this Kufi is tighter, and Naskh and Nasta‘līq have quite generous final and isolated characters as the fluid nature of the style lends itself to swash finals. However, this is offset by their stacking nature as their characters merge together into quite dense and complex strokes. The density of Kufi, on the other hand, is quite widely spaced out.

Relationship of Elements

As can be found in music or dance, the Arabic script has a set of repetitive forms that can be found in several characters. This is true in both manuscript as well as typographic forms, and to a certain extent in all the different styles of the Arabic script. These forms serve to create a sense of continuity and rhythm. The fact that many forms are repeated in several other characters further multiplies this effect.
Alif–Beh–Sin Relationship

The Alif–Beh relationship is the first to be addressed in a typeface. The Alif ә indicates the height of the ascenders, and the Beh ﺒ will provide the dimensions that govern both the optical size of a typeface as well as its width proportions. As seen in the Nashim alignments, the initial Beh rises by one dot higher than the base ribbon. In the Kufi styles, the height is quite flexible but becomes almost set once the Beh is drawn. The tooth of the initial Beh is related to the first tooth of the initial Sin س (Fig. 2.17). Similarly, the middle Beh ۱ is related to the middle teeth of Sin س.

Waw–Reh Relationship

The descending strokes of Waw غ and Beh ﺒ are almost identical (Fig. 2.18 Right). Together they are the most frequent descenders, and they very quickly set the rhythm of the paragraph. There are several variations on how they are drawn. In the Kufi styles, they start as a vertical descender that ends in a curve to the left. In the rounded styles, they are either a downward diagonal or a curved stroke that might or might not curl upwards after it flattens out.

Waw–Qaf–Feh Relationship

The heads of the Initial Waw غ, and Initial and isolated Feh ۰ and Qaf ق are usually identical (Fig. 2.18 Left). These are closed loops that vary significantly between the squarish and rounded styles. They have are either a single-story or double-story head.

Beh–Feh–Kaf Relationship

The horizontal stroke and upward finishing stroke in the isolated and final Beh ﺒ is found in the corresponding contextual forms of Feh ۰ and Kaf ﻛ (Fig. 2.19). The upward finishing stroke is usually shorter than the initial tooth. This sweeping final is one of the ways to add elegance to the design. An elongated and nicely drawn swash adds to the generous proportions of the typeface. A short Beh final might make the design look somewhat cramped.

Nun–Sin–Sad–Lam Relationship

The final Nun ﻥ is duplicated in the final and isolated forms of Sin س and Sad ص (Fig. 2.20). The Lam ل is comparable to Nun but with an elongated initiating stroke. Nun is a shallow descender that appears frequently. In the rounded styles, the stroke is fully curved with an unequal weight shift to the lower right corner and giving an unequal triangular shape. In the squarish styles, it varies from fully curved to having straight verticals with a connecting semi-circle at the bottom.

Sad–Tah Relationship

The head of the Sad ص is similar to that of the Tah ط (Fig. 2.21). In the rounded styles, it is usually a triangle with a tilt towards the upper right. Its sides are never equal. The upper right corner is always an area of emphasis. In the squarish styles, it is the only curved corner while the other three and straight angles.

Dal–Kaf Relationship

The upper part of Dal د finds resonance in the middle part of the initial and middle Kaf ﻛ. Though it is not exact the same, they are still related in form and proportion. In the rounded styles, it is often a curved or diagonal stroke (Fig. 2.22 Left). In the squarish ones, it is a horizontal line with a circular transition to a vertical stroke.

Jim–Ayn Relationship

The descenders of the isolated and final forms of Jim ج and Ayn ی are closely related (Fig. 2.22 Right). These are the deepest strokes and often extended below previous characters. They are characterized by an elegance of movement even though they are not frequently used. Their depth can cause clashes in tightly spaced lines.

Qaf–Yeh Relationship

The semi-circular stroke of the isolated and final forms of Qaf ق and Yeh ی are related though Qaf can occasionally be tighter (Fig. 2.23 Right). The movement is similar to that of the Nun but is a little bit wider. The ending stroke is the same.
Ayn-Hamza Relationship

The head of the initial Ayn  is related to the Hamza  even though the Hamza is smaller in size (Fig. 2.23 Left). The head of the Ayn is the only stroke above the base ribbon that is open to the right. It is also the head that has the largest counter.

Homogeneous and Heterogeneous Letters

Homogeneous letters can be defined as ones that maintain their basic initiating form in all contextual positions (Fig. 2.25). Heterogeneous letters are ones that do not (Fig. 2.26). The basic initiating form can be found in the first one or two strokes of the initial form of a letter. In a homogeneous letter, this shape remains unchanged in the isolated form, but is complemented by a finishing stroke. Finishing strokes can be a horizontal swash as in Beh, a downward right-facing semi-circle as in the Ayn, an upward facing semi-circle as in Nun, Qaf, and Yeh, or a vertical descender as in Min (Fig. 2.24 Left). It is interesting to point out here than within such a definition, the letters that do not connect to the right do not have a finishing stroke. The entire letter is essential to its recognition. By contrast, other letters can be easily recognized by their initiating strokes, and the finishing strokes function as purely decorative washes. This is not to say that these strokes are superfluous for they give the script the space needed to flourish. As it is, the beauty of Arabic calligraphy is greatly enhanced by the alternating rhythm between the Wahe and Beh descenders (Fig. 2.24 Right) and the finishing strokes that mark the end of a word.

Letter Frequency in the Arabic Language

Historians note that it was the Arab polymath Al-Kindi in the ninth century who first noted that Arabic had a characteristic letter frequency, and that this could be utilized in breaking ciphers. He thus pioneered the field of cryptography, as well as many others. Of his many achievements, one is quite interesting to this paper, and that it was he who was mostly responsible for introducing the HIndi numerals into both the Middle Eastern and European cultures.

Given this background, it is shocking that there are barely any sources today of letter frequency in Arabic. An online search revealed only 2 studies. One used the Quranic text as source material and the other used an impression 193 million words. The first is not representative of all sorts of Arabic texts and so is interesting to note, but not to take as a reference. The second is very impressive, but the online source seems to be truncated as it is hosted on the web archives and contains no indication of who the author is. This is unfortunate, but at least the results are very close to the analysis that this author made on a sample of 503,000 words.

The corpus was gathered from various online magazines and newspapers and was divided in the following categories: business, culture, legal, literature, math, religious, science and technology, and sports. The most interesting aspect of the results was that half of the letter count was made up of 6 letters only. These were: Alif, Lam, Yeh, Mem, Waw, Nun. If put together they make up the word: Alayman, meaning "the lemon."

Though the appearance of Arabic text seems quite varied, it is surprising to find out that 80 percent of the letter count is made up of 15 letters only (Fig. 2.27). Most of the rest of the alphabet has a percentage occurrence of less than one percent. From the top 15 most frequent letters, the top 2 are ascenders, 2 are descenders, and 5 have descending finishing strokes.
### The Anatomy of the Arabic Script

<table>
<thead>
<tr>
<th>Name</th>
<th>Percentage</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alif</td>
<td>14.86%</td>
<td>أ</td>
</tr>
<tr>
<td>Lam</td>
<td>11.75%</td>
<td>ل</td>
</tr>
<tr>
<td>Yeh</td>
<td>7.38%</td>
<td>ي</td>
</tr>
<tr>
<td>Mim</td>
<td>6.27%</td>
<td>م</td>
</tr>
<tr>
<td>Waw</td>
<td>5.53%</td>
<td>و</td>
</tr>
<tr>
<td>Nun</td>
<td>5.36%</td>
<td>ن</td>
</tr>
<tr>
<td>Teh</td>
<td>4.33%</td>
<td>ت</td>
</tr>
<tr>
<td>Reh</td>
<td>4.36%</td>
<td>ر</td>
</tr>
<tr>
<td>Beh</td>
<td>3.53%</td>
<td>ب</td>
</tr>
<tr>
<td>Ain</td>
<td>3.41%</td>
<td>ا</td>
</tr>
<tr>
<td>Heh</td>
<td>3.10%</td>
<td>ه</td>
</tr>
<tr>
<td>Teh Marbuta</td>
<td>3.04%</td>
<td>تَمَّ</td>
</tr>
<tr>
<td>Dal</td>
<td>2.78%</td>
<td>د</td>
</tr>
<tr>
<td>Feh</td>
<td>2.58%</td>
<td>ف</td>
</tr>
<tr>
<td>Sin</td>
<td>2.26%</td>
<td>س</td>
</tr>
</tbody>
</table>

The reason this is included here is mainly due to rhythm. The frequency of characters informs the general rhythm that a language creates. For example, the Latin language frequently uses the letters m, n, and u. This gives a sense of uniformity since these letterforms are very similar and built with straight upright strokes connected by a curved line. In Arabic, the Alif and Lam are very frequent, and often together as they form the article "the." The final versions of the Hijazi family and Ayin family are not often seen so that descender does not show up often. However, the Nun shape that also shows up in the final and isolated version of the Sin family, the Sad family, and the Lam ا is very often seen. The Waw and the Reh are also common so this gives up the view of what kind of descenders to expect in Arabic. The deep descenders are therefore less common, and as a result, Arabic tends to shoot up rather than down.

### Why Anatomy?

This dissertation could have worked well without having to delve into the different calligraphic styles or into the details of how letterforms are formed. This chapter is more fitting in a dissertation related to type design itself, rather than the study of typeface legibility. However, at the heart of legibility is the understanding of the forms that people are used to reading, and the question of complexity of style is rooted in the manuscript traditions and their evolution into typographic forms. In that sense, this chapter provides the first glimpse of the visual setting in which the question of legibility is being asked. This will be further expanded and clarified once we move on to the next chapter and we look at the typographic norms in place today.

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### Arabic Typography Today

Chapter 3

The previous chapter looked at the manuscript traditions of the Arabic text styles and their transition into typographic forms. But if one were to walk the streets of the Arab world today, the Arabic script is present mainly through its typographic interpretation and the manual and lovingly crafted work of Arabic calligraphers is seldom seen. The Arab world has evolved to a point where its calligraphy, once its highest form of art, is now confined to museums and the occasional use here and there. That there is a loss there, there is no doubt, for the main problem lies in the poor transition of manuscript forms into typographic ones.

This chapter misses an important element: the role of Kufi styles in Arabic typograhy. To put it simply: the Kufi styles offer the richest playing fields for typographic design. The reason they are not featured prominently here is the fact that till today, the Kufi styles are still very much ones meant for headlines or short pieces of text. This is not to say that that form of typography is not worthy of investigation, but this whole dissertation is an investigation into continuous long reading. This is an area where the Kufi style of typefaces rarely enters.

This chapter is not a review of good design, but a review of the reality of design today.1 Most of it focuses on the generalities of type styles in use rather than the specifics of typeface popularity. The discussion steers clear of the quality of design, which is often very poor. The reason for this is simple. A good designer can design aesthetically pleasing typefaces in any style he or she may see fit to design in. The legibility study is concerned with the style as a reference, rather than the effect of good design on legibility. Though that would be a very interesting approach to take, it is one that is outside the scope of this study. As will be discussed later, the typefaces used for testing are all by this same designer, and designed to good aesthetic level. So, that factor is maintained constant, and the focus remains on the style.

Within the overall frame of this research, this chapter is dedicated to the question: what are Arabs reading today? Or to put it more accurately, which typefaces are Arabs reading today, for this study is more concerned with the visual rather than the linguistic nature of text. As mentioned earlier in Chapter 2, Licko's statement that people read best what they read most is relevant in this study. And so, it is important to take note of the current typographic culture for it forms the basis for the collective visual memory in the minds of Arab readers today.

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1 This review is very much the point of view of the writer, seen through the lens of 8 years of working as the Arabic Specialist at a leading type foundry. Though there might be some variation in how one designer exercises the field versus another, the views expressed here are quite consistent with those expressed by leading practitioners in the field of Arabic type design.
Fig. 3.1 Examples of type on signage with different styles in use.
General Picture

A quick look at the body of available Arabic typefaces used in Arab-speaking countries reveals the following. The number of available typefaces is quite small in relation to the size of the market they service and the number of quality designs is extremely small, though the situation is quickly improving. This is evident in the increasing number of Arabic typefaces honored by the Type Directors Club in New York. Those were: Palatino Sans Arabic, Thuraya, and Tabal in 2011, Aisha in 2010, Palatino Arabic, Al Rajhi, and Fresco Arabic in 2008, Midan and Nasrani in 2007, Adobe Arabic in 2006, MS Uighur in 2004, and Arabic Typsetter and Tahli in 2003 (TDC, 2012).

Of the numerous calligraphic styles that have developed around the Arabic script, it is mostly the Naskh and the Kufi styles that have migrated into typographic forms. The Naskh style of calligraphy has several typographic interpretations that vary in usage and complexity. Text faces are almost always an interpretation of Naskh. These are usually in either the Simplified or Traditional forms. Headline and display faces are usually based on either Naskh or one of the Kufi styles. Other calligraphic styles that are also represented are Rupa and Maghribi, though these exist in much smaller numbers.

Furthermore, in stark contrast to Latin type design, Arabic typeface families are usually quite small in their number of related variants. Most families are simply made up of a regular and bold. A few families also include lighter and heavier weights and there is only a handful of larger families and type systems. With regards to companion styles, the idea of using an oblique variant is not fully developed in Arabic typology. There are some typefaces that have an oblique companion but the use of a secondary style for highlighting parts of text has not been widely embraced by the public.

Arabic type design has picked up its pace in the last few years where the number of type designers has dramatically increased and the interest in Arabic is quite high. This interest in Arabic type design is high in both local and Western circles. However, there is still a technical divide between practicing calligraphers and font technology. Very few calligraphers have crossed this gap and the most notable figure is Mamoun Sakak. In the meantime, the demand for new designs is quite high, and this is especially evident in branding design and advertising while the realms of book design are usually more conservative.

Close Up: In Books

Arabic book typography is quite homogeneous in appearance. The majority of book faces in use belong to the Traditional Naskh category (Fig. 3.2), with Linotype’s Lotus being one of the most popular. A minority of books is set in typefaces that fit the Simplified Naskh description. The Quran is either typographically set in Dynamic Naskh or, most commonly, penned by calligraphers in traditional manuscript Naskh and then photographically reproduced. The majority of non-Quranic books are set in Traditional Naskh, and a small number are set in Simplified Naskh (Fig. 3.3).

Arabic book typography tends to be quite straightforward and lacking in the complexity that Latin book typography has. This might be due to the shortage of typeface families that would allow the use of related variants to create hierarchical structures within the body of text. Many typographic niceties that are associated with the Latin script are non-transferable into Arabic. All caps settings, small caps, and true italics are devices that support the creation of rich typographic content. Though these are missing from the realms of Arabic typography, it is still important to note that the concepts of page design, related stylistic variants, grids and margins, and style sheets were already in place in Quranic manuscripts for almost a millennium now.

Surviving samples show clear signs of sophisticated book design skills such as binding and gliding techniques and the use of ruling to create the margins and a baseline grid. The development of related stylistic variants, such as Naskh and Thuluth, would serve for body text and headlines showed a high level of appreciation for the contribution of calligraphy to manuscripts. Moreover, the development of hierarchical structures such as the use of Kufi for header headings, Naskh for body text, and Thuluth for titles is testament to a highly refined understanding of the graphical and calligraphic elements in book design.

Some of these practices remain today, and one can often find chapter titles, headlines, and forewords that are set in styles that are different from the main text face used. However, the hierarchical structure within the text is usually achieved by a change in size or in the use of a bold variant. Given the scarcity of high quality Arabic typefaces and skilled book typeographers, Arabic typography still needs to go a long way before it can achieve the standards of excellence set in manuscript design.

Close Up: In Newspapers and Magazines

The topic of Arabic newspaper design and typography is scanty covered. Whether this is indicative of the rare unsophisticated approach to newspaper design in the Arab world, or is due to the lack of interest or expertise in the topic, one can never be sure. In the most likely case, it is a combination of both.

The uniformity of Arabic book design is echoed in Arabic newspaper design as well. Other than the lack of significant variation in size and layout, the near uniformity of Linotype’s Yakout results in the fact that many newspapers feel almost identical in look and tone of voice. A pan-Arab survey of typefaces used in newspapers reveals that thirty-three of forty-three newspapers are set in Yakout or in exact replicas that are differently named (Nemeth, 2006).

As mentioned earlier, Yakout was developed by Linotype for the specific purpose of simplifying the production of newspapers. Its ubiquitous use today testifies to the success of that strategy, and the service that it had offered. However, one can only wonder if the supremacy of Yakout, and simplified Naskh in general, over newspaper design would have continued unchanged until today if the Arabic type design scene had been more active in the second half of the twentieth century.

Of the typefaces used in newspapers other than Yakout and its replicas, one stands out. Marwan, designed by Walid Tueni for an-Nahar newspaper in Lebanon (Fig. 3.4), is one of the most legible and sturdy typefaces available. Its design is solid and with open letterforms. It follows in footsteps of Yakout with its simplified structure but its baseline is strictly straight and horizontal. This strict horizontality is a feature of many of the Simplified Naskh designs, though its effect is quite rigid and static.

The lack of variety in text faces in Arabic newspapers is also echoed to a lesser extent in the headline faces. Newspapers’ headlines were written by calligraphers in the seventies and eighties but the desktop publishing revolution changed all that. The headlines found today are often either the Linotype display faces or very close variations of them (Nemeth, 2006). In most cases, these typefaces are based on Simplified Arabic structures but they have an exaggerated baseline that serves to darken the color of the title. This method of emboldening has questionable aesthetic result, since the letterforms sometimes disappear into the thick horizontal band and legibility suffers as a result.
على ذلك السماكت الثلاث
ما زلت أسمع رسمة
لا يوجد من السماك
فيها، وأكسي منها وعاجزة.
وكان ذلك العيد غير حسن,
لم يكن لابك يا قريبا أحد، وفقر
فكان عليه بالله صيادان فأيضاً يا قريبا فلو حاز
عليه في شباكة ما ما فيه من السماك، سمع
على لولهما، أما أكسيه فما سمعت لولهما
على الكثير الإدماج (2) الإدماج

لا يوجد من السماك
فيها، وأكسي منها وعاجزة.
وكان ذلك العيد غير حسن,
لم يكن لابك يا قريبا أحد، وفقر
فكان عليه بالله صيادان فأيضاً يا قريبا فلو حاز
عليه في شباكة ما ما فيه من السماك، سمع
على لولهما، أما أكسيه فما سمعت لولهما
على الكثير الإدماج (2) الإدماج

إسأل يا رضي
لا يوجد من السماك
فيها، وأكسي منها وعاجزة.
وكان ذلك العيد غير حسن,
لم يكن لابك يا قريبا أحد، وفقر
فكان عليه بالله صيادان فأيضاً يا قريبا فلو حاز
عليه في شباكة ما ما فيه من السماك، سمع
على لولهما، أما أكسيه فما سمعت لولهما
على الكثير الإدماج (2) الإدماج

عظاماً على المقعد المحشولين، يلمع
لم يكن يندفع رأسه بين يديه مفكرا، فهو
هذا SEEK مُذاب في مقتبل العمر لا تعدد
ليذ في أنت شاب في مقتبل العمر لا تعدد
LIKE الدنيا عسر وبيسر، فأصير على

Fig. 3.3 Examples of type
in school books, example
shows fully vacated
Simplified Nash for the
literacy test to be read.
Another characteristic of newspaper headlines is their compressed proportions. This only serves to aggravate the situation, as the result is a quite tightly spaced and badly compressed typeface that is almost analogous to a wide band with randomly protruding strokes. Of course, there are exceptions to this, such as the headline typeface of an-Nahar and Linotype's Qadi designed by Walter Tracy in 1985.

It is interesting to note that Arabic language newspapers in the seventies and eighties used handwritten Rupaqa for their headlines. In comparison to today’s newspapers, their effect was more lively and casual. This was interesting on a visual level, but newspapers need to maintain a level of seriousness and authority. This was lacking in the Rupaqa headlines, and the right tone of voice is better achieved through a well designed Naskh typeface that is both anatomically correct and easy to read.

Moving over to magazines, the typographic landscape suddenly widens (Fig. 3.5). The restraint, or lack of experimentation, in typeface choices in books and newspapers is here abolished. Though most magazines are consistent in the use of Simplified Naskh for body text, the field of titling and display design is constantly changing. Magazines employ the full range of typographic choices in their titles, sometimes pushing the limit too far. The lack of extensive large typeface families makes the job of choosing compatible display and text faces rather tough. The result is often a cocktail of various typeface designs that are not well suited to one another and the overall design standards of magazine design today are not at the same level as other fields such as branding design or TV motion graphics design. This is a reflection of the lack of typographic expertise in this field. Magazine typography is definitely an area where there is a lot of room for improvement.

Close Up: In Branding and Advertising

Branding and advertising in the Arab world is certainly challenging. Up until recently, the scarcity of quality typefaces and the lack of variation within the typographic spectrum meant that designers are faced with the task of trying to create different tones of voice and brand identities using only a handful of typefaces. When the available typefaces are so few, and used so frequently, it is often the case that their shelf life is much shorter than what one can expect in Latin (Fig. 3.6).

In terms of which typographic styles are used, Naskh-based typefaces are very common though the majority of the new designs in the past decade are in the Kufi style of typefaces (Fig. 3.7). The typographic spectrum is changing very quickly and recent years have seen an increasing demand for custom designs. This is especially the case in branding. This is one of the fastest growing sectors in Arabic type design, though the exclusivity of some of the designs means that the repertoire of available typefaces is not growing as quickly.

Close Up: On Screen

The realm of Arab TV broadcast exceeds expectations. Though one might imagine that one would be faced with the usual onslaught of low quality typefaces, there are a few of good quality designs that have managed to set the bar high in terms of on-screen legibility. Of these, the Al-Arabiya typeface by Mourad Botrous stands out. Its distinctive final form of Heh has created an easily recognizable trait that would prove a valuable aspect of the channel’s branding. Kufi-based designs are occupying a large portion of on-air time and space. The mono-linear and geometric nature of