

Between Fashion and Technology: Investigating Mobile Fashion Applications

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Abstract: The increasing diffusion of smartphones has made popular new services and functions such as geolocation and, especially, applications (apps). There is in fact an extraordinary level of offering and adoption of mobile Internet applications, which help, support, and facilitate many aspects of domestic life. In the present paper we present explorative research focusing on mobile Internet applications in the field of fashion and on their main characteristics. Our starting point is the conviction that fashion applications deserve special consideration since they have the potential to play a very important role in the domestication and appropriation at mass level of an important social phenomenon such as fashion. In practice, we explore their role by triangulating three methods: a survey of the current fashion applications, qualitative analysis of the reviews posted in the 42 most popular applications, and a number of semi-structured interviews with their users. At the same time, we set up a sub-sample of 20 Chinese fashion apps from Google Play and 25 from iTunes to be compared with the 21 most popular English samples in the iTunes store and 23 in the Google Play store. Among these Chinese applications, some of them are Chinese versions of the most popular applications at international level and the rest represent the most popular fashion applications in China's iTunes app store. The main results of this case study enable us to have a sense of users' reception of apps and to understand the cultural differences between the English and Chinese mobile fashion applications.

Keywords: smartphones, Internet, fashion applications, China

Introduction

In the past years there has been an extraordinary range and take-up of mobile Internet applications (apps), which serve to help, support, and facilitate many aspects of domestic life (Allen, 2013). The aim of this study is to present explorative research focusing on mobile Internet applications in the field of fashion and on the different characteristics that these applications present at international level and in China. Mobile applications are pieces of software designed to run on mobile devices (smartphones, tablet computers, etc.) and have many purposes, such as to make money, to advertise, to gather users' data, and so on. Recently, they have expanded into other directions, for instance entertainment and GPS LBS (location-based services). Mobile applications create platforms for social or business networking purposes, in this way offering a high degree of satisfaction of users' needs and desires (Meso et al., 2005). Fortunati and Taipale (forthcoming) use the expression 'advanced use of mobile phones' to describe the extensive utilization of the services and functions available today with these devices. A smartphone is a mobile phone built on a mobile operating system, with more advanced computing capability and connectivity than a basic mobile phone. Through different kinds of applications, the smartphone nourishes fashion with user-generated content, and is also nourished by the online discourse of fashion bloggers, communities interested in fashion and users in general. At the worldwide level, as Harris and Vincent (2008) have already stressed, the amount of people accessing the Internet through mobile phones exceeds the number of those accessing it through a

desktop computer. And this trend is growing. As well remarkable it is what is happening to the Internet for its falling under the regime of mobile communication. The nature of Internet communication varies and there are pros and cons to communicating via mobile Internet: it is possible to do a number of things while on the move and it allows speedy communication, but this is often thoughtless. One of the pros, on which we focus our attention in this paper, is that through the mediation of the mobile phone, the Internet is ferried across the folds of everyday life.

The focus here is on fashion mobile applications, which represent an important contribution to the renewal of the fashion system (Kawamura, 2005). In particular, a fashion application consists of two concrete facets: fashion and mobile technology, and usually it conveys communication between the fashion industry/system and fashion consumers, as well as fashion services which help people to keep informed, choose, purchase, and adopt fashion proposals into their daily lives. Mobile applications seem to have the capability to offer new solutions to the problem of fashion integration. Unlike traditional media, which present, illustrate, and explain fashion collections to the public in a univocal way, mobile Internet applications represent more flexible possibilities for people to understand fashion, adapt fashion proposals to their everyday needs, and discuss fashion issues with other users, as well as to give feedback to the fashion industry itself. In fact, mobile Internet applications are characterized by the same attributes as the Internet – easy accessibility, interactivity, and potential networking – which are usually more suited to grassroots needs. These features of fashion applications enable users, by means of their embodied networking, to easily arrive at a conscious, collective selection and deliberation of what fashion is (Blumer, 1969). Contrarily to Simmel's (1957) analysis of fashion as a vehicle of class differentiation, Blumer argues that 'fashion is not guided by utilitarian or rational considerations' (pp. 286–87) and as a consequence that 'where choices can be made between rival models on the basis of objective and effective test, there is no place for fashion' (p. 287). Blumer's thesis about fashion as a collective selection of taste, of what fashion is, problematizes the assumption that fashion world is active through the mere rational choices of the single individual.

Besides the choice of consumer, what consumers do with the fashion items which come to them through their choices is far from explored and the present research might illuminate at least some aspects of this reality. The present study also addresses the issue of mobile fashion applications in China and their role in solving the problem of fashion adoption in modern Chinese people's everyday lives. Compared to the univocal manner in which traditional media have presented and explained new fashion designs to the public, mobile applications introduce diverse approaches to the understanding of fashion on the part of the public in order to adapt fashion proposals to their needs and communicate about fashion with other users, as well as with the fashion system. Before the advent of the mobile phone, people on the move were isolated from communicating with friends and relatives; mobile technology enables them to keep in contact without being static. Moreover, the affordances of the mobile phone enable many fashion practices of use while people are on the move, for instance on the street, maybe in front of a shop window or inside the shop itself.

The mobility of smartphones plays an important role also in the timely sharing of street fashion, by enabling users to break the limits of space more than they are able to with the fixed PC. Moreover, mobile phones share some attributes with the Internet, such as easy accessibility, interactivity, and potential networking, which are very much suitable to respond to grassroots needs, especially in China. But, differently from the Internet – which is situated in a hierarchically structuralized and highly censored social context – the mobile phone is more likely to avoid censorship.

In the same context, apparel spending in China has been growing by a robust 16% per annum, with the consequence that – according to McKinsey's survey released in 2011 – apparel is the online shopping category

most popular in China, accounting for 36% of consumers' spending. The awareness of fashion is awakening in China. The impressively rapid development of mobile Internet in China gives fashion a remarkable chance to bloom. According to CNNIC (China Internet Network Information Center), by the end of December 2013, the number of mobile Internet users in China had reached 500 million, representing growth of 80 million compared to the population of 2012, and with a proportion of 81% among all Internet users. The mobile phone has become the top Internet access terminal; compared to 2012, the number of users of mobile online gaming grew by 15.7% and e-commerce applications on mobile phones have developed fast, with mobile online payment use increasing by 43%. In addition, mobile shopping and mobile online banking grew by 3.3% and 2.7% in the past year.

The role played by fashion applications in the current smartphone world in China is thus becoming strategic, especially in the process of integrating fashion into everyday life there. This process of integration has traditionally been considered a major problem of the fashion system in Western countries and is, in some ways, an even more serious problem in contemporary China. It is true that in China, the era of the all-purpose Zhongshan suit ended several years ago, but integrating fashion into everyday life is a problem analogous to that faced by technology when any new innovation is introduced and applied in everyday life. As the two biggest smartphone markets, the US and China share a lot of the mobile application market, yet still may reveal some differences with regard to mobile fashion applications.

Hence we set our research questions as follows:

RQ1: In which ways are fashion mobile applications supporting users in ferrying fashion proposals into their everyday lives?

RQ2: Are there any differences between Chinese use of fashion applications and US mainstream use of fashion applications?

This paper is organized as follows. First, we focus on the illustration of methodology; in the section following that, the main results – both quantitative and qualitative – are illustrated. In the final section the results are discussed and tested to see if they enable us to answer our two research questions, after which some conclusions from the foregoing discussion will be made.

Methods

This study combines quantitative and qualitative methods in order to map and analyze the applications related to fashion on smartphones. In particular, three methods were triangulated. The first is a survey, the quantitative method for excellence in the sociological tradition. Current fashion applications were mapped. Their main characteristics, such as content typology, number, and average scores of ratings, as well as number of reviews posted by users and their content, were scrutinized. To give a sense of the data collected, mainly descriptive statistics are applied.

The second method is a qualitative content analysis of the reviews posted of the 42 most popular applications. Among the three major approaches to qualitative data analysis – interpretative approaches, social anthropological approaches, and collaborative social research approaches – we decided in this study to adopt the interpretative approach, which is the most suitable when the study involves texts or expressions posted online (McMilan, 2000). Qualitative content analysis was used here as a microscope which brings the meaning of the message content into

focus, as “any technique for making inferences by systematically and objectively identifying special characteristics of messages” (Holsti, 1968, p. 608). But before proceeding with this we did a survey of the reviews collected in this sub-sample of 42 applications in order to gain a sense of their quantity and map their main features. Furthermore, taking into consideration the different languages used in these applications, we set up a sub-sample of 20 Chinese fashion apps from Google Play and 25 from iTunes to be compared with the 21 most popular English samples in the iTunes store and the 23 most popular in the Google Play store.

The third tool is a number of semi-structured interviews that we administered in order to understand users’ reception of mobile fashion applications (Bailey, 1982). But for space reasons, here we will report and discuss only the results of the first two methodological tools.

Results

Mapping the phenomenon

By the end of January 2013 the overall number of applications available on iOS and Android – the two most adopted mobile operating systems – was around 1,475,000. These applications include categories such as games, news, music, pictures, cuisine, videos, shopping, productivity, and social networking. Fashion is also included, although it cannot be considered a major category of mobile applications. To operationalize the concept “fashion application”, we used “fashion” as a key word to search any possible applications relevant to “fashion”, from fashion information publishers to games featuring fashion design.

We searched in the App Annie database, one of the biggest databases of mobile applications, using “fashion” as a keyword. Only 1,188 fashion applications were found in iTunes and 1,376 in Google Play stores. In total, 2,564 fashion applications are available to users. Thus the first important result is that fashion applications play only a small role in the applications available for smartphones (Table 1).

Table 1. Overall mobile applications and fashion applications

	iOS	Android	Total
Overall mobile applications	775,000 (52.5%)	700,000 (47.5%)	1,475,000 (100%)
Fashion mobile applications	1,188 (46.3%)	1,376 (53.7%)	2,564 (100%)

Among these 2,564 fashion applications we selected those that have received the most downloads and reviews, because these embody the most vivid interest by users. This sub-sample consisted of 684 apps from the iTunes store and 505 from the Google Play store (in total 1,189). Of these applications, we analyzed their main features: content typology, number, and average scores of ratings, as well as number of reviews posted by users and their content.

Let us start with the first feature of analysis: the content typology. This feature arises from the necessity for iOS and Android stores to build a taxonomy of the applications available to potential customers with the purpose of organizing application searches in a rational way and orienting users. Thus application typologies represent a classification built by the managers of these stores and not by researchers. For this reason, the categories correspond to each other only partially. The fashion applications are classified on the basis of the specific way in

which they deal with fashion. The iOS and Android sites feature a series of categories to which they assign single fashion applications on this basis.

Table 2. The areas of everyday life covered by fashion applications

IOS		Android		Total
Area	N and %	Area	N and %	
Lifestyle	325 (47.5)	Lifestyle	117 (23.0)	442 (100%)
Games	188 (27.5)	Games	147 (29.0)	335(100%)
Entertainment	50 (7.3)	Entertainment	28 (5.5)	78(100%)
Photo & Video	21(3.1)	Photography	18 (3.6)	39(100%)
Books	18 (2.6)	Books & Reference	6 (1.2)	24(100%)
Catalogs	12 (1.8)			12(100%)
Social Networking	12 (1.8)	Social	10 (2.0)	22(100%)
Business	11 (1.6)	Business	7 (1.4)	18(100%)
News	10 (1.5)	News & Magazines	21 (4.2)	31(100%)
Reference	9 (1.3)			9(100%)
Education	8 (1.2)	Education	15 (3.0)	23(100%)
Travel	5 (0.7)	Travel & Local	4 (0.8)	9(100%)
Health & Fitness	4 (0.6)	Health & Fitness	3 (0.6)	7(100%)
Productivity	3 (0.4)	Productivity	1 (0.2)	4(100%)
Utilities	3 (0.4)	Tools	2 (0.4)	5(100%)
Music	2 (0.3)	Music & Audio	3 (0.6)	5(100%)
Navigation	1 (0.1)			1(100%)
Sports	1 (0.1)			1(100%)
Weather	1 (0.1)			1(100%)
		Communication	2 (0.4)	2(100%)
		Personalisation	17 (3.4)	17(100%)
		Libraries & Demo	8 (1.6)	8(100%)
		Media & video	3 (0.6)	3(100%)
		Shopping	92 (18.0)	92 (100)
Total	684 (100%)	Total	504(100%)	1,188(100%

NB. In Android the missing value is 1.

The most popular categories in iOS are Lifestyle and Games, while in Android Games comes first, followed by Lifestyle. Although this reversal, it seems that the majority of fashion applications (71.9%) are classified under entertainment and forms of social life (it can be an application about a dress for each social occasion, for a party, for a painting exhibition or a funeral).

Generally, most of the fashion applications are free of charge, and this makes them very attractive for users. It is worth noticing that the percentage of free fashion applications among the Android sample is higher than in the iOS sample (see table 3).

Table 3 Free or paid-for applications

	IOS (Base=684)	Android (Base=505)
free	384 (65.1%)	395 (86.1%)
not free	206 (34.9%)	64 (13.9%)
Total	590 (100%)	459 (100%)

NB. In iOS there are 94 missing values, while in Android this number is 46.

All these applications claim a high number of downloads (installs) and this gives a sense of the broad amount of users who access them. Table 4 gives an idea of the phenomenon, at least regarding Android – similar data for iOS was unavailable.

Table 4. How many downloads (installs) in the past 30 days?

Android	N and %
100 and below	91 (18.6)
100–500	75 (15.3)
500–1000	34 (6.9)
1,000–5,000	87 (17.8)
5,000–10,000	47 (9.6)
10,000–50,000	66 (13.5)
50,000–100,000	16 (3.3)
100,000–500,000	51 (10.4)
500,00–1,000,000	13 (2.6)
1,000,000–5,000,000	8 (1.6)
5,000,00–10,000,000	2 (0.4)
Total	490 (100)

The missing data here are 15.

In general the majority of the applications on Android received below 100 ratings and only a fraction received more than 50,000 ratings, as table 5 shows.

Table 5. By how many users were the applications rated?

iOS (Base=684)		Android (Base=505)	
Ratings	N and %	Ratings	N and %
0–100	316 (68.2%)	0–100	386 (76.8%)
101–1000	101 (21.8%)	101–1000	60 (11.9%)
1001–10000	35 (7.6%)	1001–10000	48 (9.5%)
10001–50000	7 (1.5%)	10001–50000	7 (1.4%)
More than 50000	4 (0.9%)	More than 50000	2 (0.4%)
Total	463 (100)	Total	503 (100%)

The missing data are 221 for iOS and 2 for Android.

After downloading an application, users are usually asked to rate, from “one star” to “five stars”, the application on the webpage of the application store: 1 star means “hate it”; 2 stars mean “don’t like it”; 3 stars mean “it’s OK”; 4 stars mean “It’s good”; 5 stars mean “it’s great”. Rating scores correspond to the average star rating given by users after they download these applications. Among the applications which have been rated, on Android 89.2% are above 3 (“It’s OK”). On iOS, the percentage is a little lower, at 64.5% (see table 6). This also mirrors in the general average that on iOS is 3.53 (SD=0.9436) and on Android is 3.977 (SD=0.7952). The fact that users’ appreciation is higher in Android probably means that this operational system represents a better infrastructure for applications.

Table 6. The average ratings received by fashion applications

IOS (Base=684)		Android (Base=505)	
Ratin gs	N and %	Ratin gs	N and %
1	5 (1.1%)	1	7 (1.8)
1.5	7 (1.5%)	1.5	1 (0.2%)
2	35 (7.7%)	2	2 (0.5%)
2.5	52 (11.5%)	2.5	8 (2.0%)
3	62 (13.7%)	3	25 (6.3%)
3.5	74 (16.3%)	3.5	50 (12.6%)
4	99 (21.9%)	4	93 (23.4%)
4.5	75 (16.6%)	4.5	123 (31.0)
5	44 (9.7%)	5	88 (22.2%)
Total	453 (100%)	Total	397 (100%)

NB: On Android missing data are 108; in iOS, 231.

As to the content classification of fashion applications, iOS and Android have different regulations and adopt slightly different systems. IOS explicitly suggests the age from which an application is suitable for users: 4+ (suitable for children older than 4 years); 9+ (older than 9 years); 12+ (older than 12 years); 17+ (older than 17 years). Android distinguishes the maturity of content and privacy issues, as follows: Everyone; Low maturity; Medium maturity; High maturity. In the iTunes store, 83.3% of fashion applications are suitable for users of 4 years or older (see table 7) and on Android 83.9% are suitable for most users. In fact, 43.2% of fashion applications’ content classification is in the category of “Everyone” and 40.7% are categorized as “Low maturity”.

Table 7. Content classification

IOS (Base= 684)	N and %	Android (Base= 505)	N and %
4+	530 (83.3)	Everyone	209 (43.2)
9+	22 (3.5)	Low maturity	197 (40.7)
12+	73 (11.5)	Medium maturity	52 (10.7)
17+	11 (1.7)	High Maturity	26 (5.4)
Total	636 (100.0)	Total	484 (100.0)

NB. In iOS the missing data are 48 and in Android, 21.

Comparison between international fashion applications in US and Chinese iTunes stores

The sub-sample of 89 international and Chinese fashion mobile applications is reported in table 8.

Table 8. Sub-samples of international fashion applications from iOS and Android

iOS	Android
1) Fashion story	1) Clothing
2) Fashion Icon	2) Cool Guy – Style App for Men
3) Jojos Fashion Show 2 Lite	3) Dress Up Prom Night – Girls Game
4) Fashion Design World	4) Dress up–Soap Bubbles Princess
5) Stylish Girl – Your Fashion Closet and Style Shopping app	5) ENCHANT U
6) Fashion Star Boutique	6) Fashion Freax Street Styles
7) Style Studio: Fashion Designer Lite	7) Fashion Icon
8) Ralph Lauren Collection – Spring 2013/Fall 2012 Fashion Shows	8) Fashion Kaleidoscope
9) Emily's Fashion & Shop	9) Fashion Ladies
10) Cool Guy – Fashion Closet and Style Shopping App for Men	10) Fashion Queen
11) Fashion City – World of Fashion	11) Fashion story
12) Modern Fashion: Dress Up And Make Up	12) Fashion style
13) Jojos Fashion Show 2	13) Fashion Style (Men version)
14) Disney Fairies Fashion Boutique	14) Glam life
15) Fashion Channel Summer 2010	15) H&M
16) Fashion Network Original	16) make up game(FREE)
17) Pose	17) Makeup
18) Girl Tale	18) MyCloset
19) Dress up! Fashion	19) pose
20) Fashion Fix Lite	20) Street Style Look Book
21) D&G Fashion Channel Summer 2010	21) Style Me Girl
	22) Snapeee – Fashionable Photo
	23) Top girl

Sub-samples of Chinese fashion applications on iOS and Android

Chinese-iOS	Chinese-Android
1) YOKA 时装-人人都是时装精 (YOKA fashion dresses)	1) Fashion City by Hangame
2) 明星衣橱 (wardrobe for stars)	2) 指甲设计 (Nails design)
3) 网易女人时尚杂志 (women fashion magazine)	3) 世界街拍时尚女孩 (Fashion girls on street)
4) 时尚壁纸-2012 高清版 (Fashion wallpaper - 2012 HD)	4) 街拍时尚风格高清 (Fashion on street HD)
5) 蜜友衣橱-衣橱时尚及时分享 (best friends' wardrobe – fashion and timely share)	5) 韩国时尚女孩 (Korean fashion girls)

6) YOKA 时尚网 (YOKA fashion network)	6) YOHO!E fashion
7) 杂志《时装 L'OFFICIEL》 (Magazine L'OFFICIEL)	7) YOKA 时尚网 (YOKA fashion network)
8) 微时尚限时免费杨幂的时尚修炼心经 (Macro fashion, fashion tips from Yang Mi)	8) 蘑菇街—淘宝微博最 In 购物精选 (Mushroom – most popular Macroblog shopping guide)
9) 美丽说-时尚女生逛淘宝必备 (Beauty tales – guide for online fashion shopping)	9) 衣度-凡客时尚搭配推荐 (Yidu – fashion assistant)
10) 时尚先生 – YOKA 精彩呈现 (Mr. Fashion)	10) Fashion Girl 时尚美图 (Fashion girl, fashion pictures)
11) YOHO!E 潮流, 随行而至. (YOHO!)	11) 淘宝购物街 (时尚主题) (Tao Bao E-commerce, fashion theme)
12) 时尚·男人装 (Fashion, dresses for men)	12) 时尚街拍-搭配达人分享与点评 (Street style – share and comments)
13) 微博图购-女生最爱的时尚搭配导购 (Macro bog – fashion assistant for girls)	13) 优购时尚商城 (Yougou Fashion E – shopping mall)
14) 我的衣橱 (My closet)	14) 热杂志 (Hot magazine)
15) 时尚·芭莎 (Fashion, Bazaar)	15) 指阅·时尚 (Finger reading, fashion)
16) 时尚家居 (Fashion lifestyle)	16) 时尚减肥 (fashion, lose weight)
17) 精品购物指南 (Shopping guide)	17) 淘宝夏季时尚 (Tao Bao, fashion for summer)
18) 时尚健康男士-YOKA 精彩呈现 (Fashion and health for men)	18) 汇搭--时尚潮流服装服饰搭配 (Huida, fashion matches)
19) 净辣衣橱 (Hot closet)	19) M18 麦网-时尚购物第 E 站 (Mai wang – fashion E shopping)
20) 口袋购物 (Pocket shopping)	20) Fashion (Font for FlipFont)
21) Fashion Decoration	
22) 昕薇美丽说 (Xin Wei beauty tales)	
23) Fashion Design world (CHINA)	
24) Fashion Story (CHINA)	
25) Closet	

One main difference emerging in this study is that the most popular international applications are much less popular in the Chinese application store, even though they have Chinese versions – at least in the iTunes store. This perhaps can be reconnected to the long tradition in China of “nationalizing” technologies – see the shanzhai culture, QQ, Jiebang, Renren, and so on. The strong preference for local versions continues even among the ba ling hou

generation. We choose to illustrate two examples to give the reader a sense of the diverse reception on the part of users: one is called “Fashion story” and is the most popular fashion application among Games applications; the other is “Closet” and is one of the most popular fashion applications among Lifestyle applications. Table 9 offers a comparison between the amount of ratings and reviews in US and China iTunes applications stores. The comparison shows the enormous difference between ratings and reviews of these fashion applications in US and Chinese iTunes stores.

Table 9. Comparison between two fashion international applications in US and Chinese iTunes App stores (Fashion story and Closet)

	US	China
Fashion story		
ratings	73024	8584
reviews	30631	4566
Scores (means)	4	4.5
Closet		
ratings	424	10
reviews	183	7
Scores (means)	3.5	3

In general, Chinese applications which clone the most popular international ones have been downloaded more often, have more reviews, and enjoy higher average rating scores. Taking the clone version of MyCloset as an example, in the Chinese iTunes App store, an application developed by a Shanghai company called “我的衣橱”(the literal translation is exactly “my closet”) enjoyed much more popularity than the official Closet or MyCloset (see table 10).

Table 10. 我的衣橱, My Closet, and Closet in the Chinese App Store

	我的衣橱	My Closet	Closet
Ratings	636	0	10
reviews	523	0	7
Scores (means)	4	0	3

We report here two reviews taken from the Chinese MyCloset:

“非常好用。界面简洁美观，一目了然，操作易上手，不需要额外注册账户也可以使用。用来管理衣柜的衣服再好不过了。可惜没有 iPad 版本，iPhone 版通用还好。” (“Very easy to use. The interface is simple and pretty, easy to catch up, do not need extra account to log in. Very suitable for managing the wardrobe. Pity they do not provide iPad version, yet with iPhone version is already good.”) MF728 – 27 Oct, 2013.

“蛮好的山寨。中文版本真心比英文的好用，反正我能看懂。” (“Good cloning. Chinese version is really more useable than English version, at least I can understand completely.”) by flowerfall – 28 Apr, 2012.

From the reviews posted on the webpages of these original international applications it is possible to understand that there are at least two main obstacles to Chinese users’ fluent experience: language translation and accessibility. This result shows that local Chinese users may need some sort of mediating

factor in order to tame and domesticate fashion (Silverstone and Haddon, 1996), as fashion itself still has a novelty factor after the long period of Maoist uniformity in dress.

Fashion in itself for them is newer than for many Western culture users. Hence, here two novelties are combined and intertwined: technology and fashion. This would explain the specifically strong need for cultural translation regarding international fashion applications among Chinese users, but it is also an important sign of the efforts e-users are making to domesticate fashion and the mobile Internet in their everyday life.

Observing users' behavior through their reviews

In the sub-sample of the 42 most popular fashion applications, 3,491 reviews posted on the Google Play and iTunes stores were collected and investigated. The general features of these reviews are illustrated in the following series of tables from 10 to 17. Let us start with the ratings received by the applications considered in these reviews (table 11).

Table 11. Rating Stars of the 42 fashion applications in the reviews analyzed

Rating stars	N and %
0	1 (0.01)
1	502 (14.4)
2	181 (5.2)
3	297 (8.5)
4	559 (16.0)
5	1949 (55.9)
Total	3489 (100)

The missing values here are 2.

The broad majority of the applications received high scores. This is mirrored also by the high percentage of positive comments on these applications, as illustrated in table 12. Considering that 84.2% of reviews contain some comment, among these 69.5% are positive.

Table 12. Comments posted on the sub-sample of the most popular 42 fashion applications

Comment	N and %
No comment	552 (15.8)
Positive comments	2427 (69.5)
Negative comments	471 (13.5)
Neutral comment	41 (1.2)
Total	3491 (100)

However, among these comments, only a few of them mention “fashion” directly or indirectly, as table 13 reports.

Table 13. Comments mentioning “fashion”

	N and %

Yes	47 (1.4)
No	3444 (98.6)
Total	3491 (100)

If conversing about fashion is not the main purpose of these comments, what do users do in these reviews?

A third of users share experience with other users of the fashion application, while very few post their own game ID to find friends to play together and even fewer advertise some kind of product (table 14).

Table 14. What are the reviews about?

	No	Yes	Total
Experience sharing	235 (66.9%)	1156 (33.1%)	3491
Finding friends	3402 (97.4%)	89 (2.6%)	3491
Advertising communication	3484 (99.8%)	7 (0.2%)	3491

The most often shared experiences are those related to the content of the application, the application functions, and assessment of how easy it is to use it, to the use of the application in their everyday lives, and in very few cases to advertising information (table 15).

Table 15 Experience sharing on different topics

Experience sharing	Base=1156
On content	487 (42.1%)
On function	316 (27.3%)
User friendly	185 (16.0%)
Using pattern	218 (18.9%)
Advertisement	34 (2.9%)

Users sometimes share more than one experience

There are also some users (but not many) who raise suggestions for applications' developers in their reviews. The aspects users are mostly concerned with are bug reporting, design of the application, content improvement, and updating feedback; aspects which show users' willingness to interact with developers and to contribute to the improvements of the applications they like (table 16).

Table 16. Suggestions and aspects of most concern

	Base=3491
Suggestions	378 (10.8%)
Bug reporting	168 (4.8%)
Design	164 (4.7%)
Content improvement	6 (2.2%)

Updating	90 (2.6%)
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From further scrutiny of these reviews, some qualitative findings have been captured. As we mentioned before, Game is one of the most popular categories for fashion applications on smartphones. Among fashion games, dressing-up games are the most popular. These are graphic games setting up a virtual social occasion, giving users a role, and asking these to choose an outfit for a certain occasion by using different shoes, jewelry, skirts, hairstyles or make up. Another type of popular fashion game is “Fashion World”, which describes itself as a game for users to design a fashion boutique, including choosing and stocking the most fashionable items, to allow them to visit their friends’ boutique, and to send “like” tags to their friends. Hence not only is a stylish combination of clothes, but also fashionable decoration, as well as a social network which might play an important role in building a virtual community. Dressing-up games are a gendered typology of fashion applications since they are mainly addressed to children and girls and mainly used by them, as can be understood by their reviews.

Fashion games are considered addictive by many users. Many reviews reveal in fact that with this type of fashion applications it is very easy for users to get “addicted”.

“I always find time to play this every single day. It's addicting!” Mary Ann Baleva May 8, 2013

“I did get into it but after a while it gets boring waiting for the clothes. However u can get addicted to it.”

Courts Cornes May 7, 2013

“Terribly addicted to this game lol” Amanda Curry May 7, 2013

“Love it, VERY ADICTTING” Sanya Mahajan May 7 2013

“Love this game. It’s addictive” mabel alubo May 6, 2013

“So addictive Such an amazing game but sometimes when I reload the app I've lost the majority of my savings but I won't let that stop me from playing” Mairi Edwards October 7, 2013

“best i love this game it is so addicting. At first i was all like this is a weird game i dont know how to play but as i played more it made more scense and as i reached a new level the clothes got cuter!!! i have never been thiss addicted to a game!!!” A Google User November 21, 2012

“Love this game I'm addicted. I haven't experienced any issues with the game except i have noticed that at times, the countdown on clothes in my catalogue stops for a while, yet others count down correctly an smoothly. Runs smoothly otherwise so this is a small glitch for me.” Fiona King January 2, 2013

“I love this game! It is so fun to play, I am addicted!! Got to get back to my game!!” Taylor Seymour May 5, 2013

Second, fashion games enjoy particular popularity among girls under 18 years old, and the related reviews are mostly posted by those who babysit for them. It came out quite clearly that these games’ target clients are children. Our conclusion is that these fashion games help babysitting, echoing Frizzo-Barker and Chow-White (2012), who report that some interviewees state they use smartphone game apps to juggle domestic tasks with parenting.

“GreatThis is a brill game it is its great for girls aged from 9-19” Hannah Okeeffe May 6, 2013

“Excellent game!! My daughter and I love it!!” Sheila Lawson May 7, 2013

“Very entertainment. Is a game I can play with my daughter” Yasmin Toro May 5, 2013

“i love it its very good i like fashion good for kids like me” Chiara Vasquez May 4, 2013

“Addictive. My kid got me hooked!” barb ocana May 2, 2013

“Best game ever. My daughter got it on her cuzins tablet so she would have something to play so we have it on my phone for her and she loves it” Kelly Howard May 2, 2013

“My daughters love the game so much.” Jing Alcantara May 2, 2013

“Be a business owner... My daughter and I adore this game.” Tameka Dixon May 2, 2013

“Its really funny games the children tinager and womens can play i really love it” Hanen Abdallah April 30, 2013

Yet a large number of “haters” also appear on the application web pages, who post negative comments on these applications, describing them as “childish, ugly, and boring”. These negative posts provoke the defenders of these games with the consequence that a clearer boundary in this specific kind of applications has been drawn between haters and defenders. The boundary is traced by putting the pros in a section and the cons in another. Some of the most typical haters’ comments are listed below:

“This is the stupidest game ever created!!!! Dont waste your time even going into it! !!!!!!!” Vanessa Marques May 6, 213

“Hate game so much Terrible game I hate it too much have to Wait hours and hours for a simple dress y would u waists precious time on a unlikable game weirdos if u like it” Sandra Toubia October 12, 2013.

By contrast, some users post defensive reviews, like this anonymous user:

“Guys it awesome...p.s NO MORE BULLYING IF U BULLYING A KID U GOT GO THREW ME FRIST I MEAN IT GOT IT!!!” November 11, 2012

In the world of fashion games, as mentioned above, players need other users to be their friends in order to gather more “like” tags to increase their reputation inside the game. Hence, a considerable number of reviews are posted with the simple aim of publicizing their user ID in the hope of making new friends. Besides friendship, users also need to make virtual income to buy new clothes or adopt a new style of decoration for their fashion boutique. In this case, some users even spend real money in order to purchase the virtual money to gain advantage in this game. How to make virtual money is also a hot topic among these reviews.

“Ciao ^o^ Lala love this game & Bakery Story, but had to start over because I got a new phone haha :) Overall, I'm happy. Add me for gifting and likes! ID Cinnexo” May 6, 2013

“My favorite of them all!Plz add me: MichiNiiNii i play nightclub story, bakery story and restaurant story :)” May 6, 2013

From the features of users’ reviews that we captured, fashion games are in reality connected to the core concept of fashion. From the social aspect of fashion, showing one’s own taste and winning appreciation from other users are two major achievements of users in this kind of social fashion game. This behavior resonates with the basic dynamics of fashion, as depicted by Simmel (1957) and based on two opposite aspirations: being like others and being different from others. The core of the fashion system is creating originality and difference inside a shared framework. As a serious form of entertainment for under-aged children and a way of passing time for grown-ups, fashion games also serve as a method of enjoyment. On the basis of this enjoyment, fashion games probably have

a positive effect on the adoption of fashion proposals (Kim et al., 2007) and may lead users to a better understanding of fashion itself in everyday life. Yet, in this step, fashion games may need more concrete fashion content.

Lifestyle is another very popular category for fashion applications, as we saw before. Here it must be recalled that while Android distinguishes between fashion and shopping applications, on iOS there is no “Shopping” category, and thus this category is included in the “Lifestyle” category.

“Makeup” is a typical example of this category. This application allows users to engage in virtual makeovers. After uploading or snapping a photo, users can choose from thousands of lipstick, blush, foundation, mascara, eye shadow, and liner colors they would like to try, and can send the perfect color combination to their preferred email address. This gives users a platform to experiment with makeup on their own photos. Even though this application is not updated frequently (the latest version was released on December 19, 2012), the reviews are quite up-to-date, with the latest posted on July 7, 2013. Users appreciate the creative idea of this application and some of them report that they can really practice their cosmetology skills.

“I can do peoples makeup, and it looks real! So before applying makeup u dont use, test it on here! Love it! Its simple, fast, and useful! Other makeup apps DO NOT compare to this one. SUPER AWESOME SO U BETTER GET IT OR I WILL COME TO UR HOUSE AND KILL YOU. O.O Im kidding! But I highly reccomend :)”
Henessey Martinez, April 27, 2013.

Some users have developed new usages of this application, like Angel Aquino, who posted on March 26, 2013:

“AMAZING!!! u can make ur ugly pics beautiful by this amazing app!! i can rate 100 stars on this amazing app!!!!”

In the negative reviews users seem to focus instead on technical limits or defects, such as the fact that the facial recognition points are difficult to adjust to the position of makeup:

“Works great but I wish adjusting the parts for the face was easier” Cindy Van Acker May 1, 2013.

Moreover, the development team on this application usually reply almost immediately to reviews which give this application only one or two stars (one star means “hate it”; two stars means “don’t like it”) (most of these replies are made 1 or 2 days after the negative reviews are posted online). From this point of view, our findings support the idea raised by Aguado (2013) that on these mobile application platforms, audiences can be directly accessed by professional and amateur content producers, while the traditional over-sized, cost-increasing cultural intermediaries fade.

“Before it was nice but now very bad face detection” farheen arshad May 2, 2013

The team replied on the same day:

“Hi Farheen, We're really sorry to hear that you had a negative experience with our app! When you say that before it was nice, do you mean that on a different device it worked well? Are you using the same image? Have you tried using the adjustment options to correct the automatic detection? We would really like to hear back from you soon! Thanks :)” ModiFace replied on May 2, 2013

Some users crave male fashion applications:

“MODIFACE ..doing a grt wrk.

I really enjoy n hve fun with this apps...my wish is if thre is a makeup for men werein one can set diff hairstyle for men along with accessories i ll b really glad” A Google User - April 25, 2013

Digital fashion magazines, such as ELLE, Harper’s Bazaar, Vogue, and Cosmopolitan, are also issued as applications on smartphones. Fashion information release applications have also been adopted by some design houses, such as Chanel, Dior, Gucci, Ralph Lauren, and so on. Mobile applications are also used as platforms to publicize new shopping information by H&M, ZARA, and Forever 21. These applications are mostly based on picture or video content and users are eager for content updating and faster content downloading. Branding applications seldom receive any reviews: e.g., on the Chanel and Dior applications in the US iTunes store, no reviews have been posted yet. Most of these applications are facing serious technical difficulties. Some comments reported below will indicate the problems, as in the case of InStyle Magazine, where one user posted:

“Not so bad after all.

Had a lot of trouble since the August issue, until then it was perfect. Have had to re-install to the app several times. But otherwise it is easy to navigate and read.” Rchodagam Sep 21, 2013

One iOS user posted on ELLE Magazine US:

“It’s a fail.

Like the other reviews mention, this app just isn’t working. I sign in, but it won’t recognize my subscription which is valid for another year. I don’t want to download every past issue, but It’s not giving me an option to download just the new issues unless I do all of them (?), yet if I select that option it goes into buffering purgatory.

They have some big subscription service issues to work out. As of right now, I either have too purchase an individual issue to get the new on (which makes no seese) or just be denied access. I’d wait to download until they fix this app.” Fairmont1955 Nov 10, 2013

Applications focusing on street fashion – on how people are dressed in the street – are equally popular. “Pose” is a very successful example. On Pose, users can not only find top fashion bloggers, celebrities, and stylists; they can also upload their own favorite outfits and share their favorite fashion item (or outfit) with their friends. Besides, users can provide shopping information on the items they wear to enable other users to trace their favorite fashion items. On the Pose webpage, users posted:

“Great

I like that you can actually see average people being stylish in their everyday life... Unlike those famous fashion gurus with clothes you could never afford. Anyway, just 5 stars.” A Google User Nov 3, 2012

“best app for trend setters

I enjoy creating my own design & expressing my own unique creativity, this app is the best I recommend it for those who are creative or just to post your own artwork best app I have as I’m a person who loves fashion design” Daniel Gonzalez Dec 16, 2012

Although most of the reviews of Pose are positive, the most often noted problem is shopping links to fashion items: some of them are not available, or the shops are impossible to reach. For example, Pose is not as popular in the Chinese iTunes app store as it is in the US store because the in-app links do not work well for users of the Chinese mobile network, as the links mostly direct to American shops.

Other wardrobe applications such as MyCloset, Closet, and Cloth allow users to upload photos of their items along with notes and tags, and then organize them according to the weather forecast and the occasion on the next day. Here users can get recommendations and share photos of outfits and individual items with their friends on Facebook and Twitter. The wardrobe management applications are also highly appreciated, according to users’ reviews, although some design and technical problems need to be fixed.

Finally, there are some other popular applications, such as “蘑菇街” in the Chinese iTunes app store, which integrate e-commerce information from different platforms and provide it to users through regularly updated, eye-catching visual content.

Discussion and final remarks

This study has shown that in the application turn (Versakalo et al., 2009; Goggin, 2011), mobile fashion applications represent only a fraction of overall mobile applications (nearly 0.2%). This result supports that released by the firm App Annie (2013): among the 100 most popular applications, none are about fashion. However, fashion applications nevertheless deserve careful attention from fashion and mobile phone researchers because, as we will see below, there are many lessons to be learned by the fashion system. While other dimensions of everyday life have benefited very much from the development of mobile applications, fashion seems to have reacted in a very limited way to this opportunity. This has happened because of the general delay that the fashion world, as an industrial sector, has shown in exploiting all the potential of new technology of communication and information.

Examining and discussing the main outcome of this research enables us to answer to our first research question, “In which ways are fashion mobile applications supporting users in ferrying fashion proposals into their everyday lives?” An important result is that the areas of everyday life covered by fashion applications, and thus supporting domestication and appropriation of fashion proposals, are mainly those of lifestyle and gaming. It is easy to understand why fashion deals with forms of social life, where style is built as a form of mass experience and where users need to translate fashion items to the material dimensions of their personal habits, tastes, practices, and so on. Mobile fashion applications support people in this mass exercise of learning about fashion and being prepared to appropriate the new proposals and to understand how to combine the new fashion items. The “ars combinatoria” is still today one of the most difficult practices of use for fashion users (Fortunati, 2005). The capacity to combine different fashion items and to transform them into a pleasant outfit is not so common and hence it needs to be

strengthened with a continuous exercise that fashion applications convey by also transforming it in fun. Those fashion applications that teach users how to combine different articles of clothing help people to build their own sense of style by means of repeated exercises and also teach this skill in an entertaining way

By contrast, the relation of fashion with games is less obvious. This study offers materials to support better understanding of this issue. Game applications with well-developed mobile technology are very easily accessed and used by most users, even underage children. This feature makes game fashion applications very successful as a time-passing method for users of all ages and as a “baby-sitter” (Frizzo-Barker and Chow-White, 2012), although they are not free from the dangers of addiction. But the convergence between fashion and games has other layers. Fun has always been a structural feature of fashion world, but more as a latent aspect than an officially declared one. On the contrary, the fashion application world makes fun visible and evident. In these game applications, fun might be the main content; socializing inside the game is also very important, but the fashion element remains weak in comparison. Users inside the game practice fashion in a virtual way without really adopting it in their real everyday life or seriously discussing its meaning. From the reviews of game fashion applications, it seems few users might connect these graphic games to the real fashion world. Melding more fashion content with these technologically mature applications is a task to be addressed by the fashion world.

A consequence of this convergence between fashion and gaming is that the age span of the public of fashion application has been broadened, including even more children and adolescents who can now perhaps be informed and “educated” in fashion by a fashion game.

Another important result is that the digital versions of traditional fashion media, such as fashion magazine applications, usually face several mobile technological challenges. Updating, fast downloading, force quit necessity, and interaction with developers and other users are the main problems. For this reason, although conveying in some cases excellent fashion content, these fashion applications do not enjoy high popularity. Clumsy technology adoption is the main reason for their limited success. However, the delay shown by the fashion world with regard to technology risks doing a lot of damage, because traditionally media plays a significant role in ferrying fashion to everyday life (Barthes, 1985). Barthes explains clearly the fundamental mission of fashion media in developing the links between image and text. “Language conveys a choice and imposes it. The image freezes an endless number of possibilities, words determine a single certainty” (1985:153).

The present study also provides some insights into the real features of the global fashion market, enabling us to answer our second research question: “Are there any differences between Chinese use of fashion applications and US mainstream use of fashion applications?” It turns out that when the “global” dimension is investigated more closely, a series of steps are needed in order to accommodate an international product in a local dimension. This is the case despite the local dimension in this case being the Chinese market, which is in itself strong. To be successful in China fashion applications have to be Chinese-ized somehow in order to reduce the amount of novelty they convey.

This research also reveals that the iOS and Android websites are hosting an intense and proactive form of expressivity and engagement by users by means of tools such as rating, leaving comments (although very few directly on fashion), sharing experiences, but also giving advice and suggestions to developers in order to improve the design of the application, the software, the quality of content, and its updating. This new behavior expressed by users cannot reach a fashion system that is completely unprepared. It is well known that fashion, as an abstract notion which “at best has nothing to be said about it, and at worst invites pure tautology” (Barthes, 2006:124), has its own internal logic, indifferent to outside concerns such as history or utility or even aesthetics, and is completely bound up with its own representation (something is fashionable because fashion says it is). But this is what fashion

must no longer allow itself: indifference to any outside concern or criticism must be overcome, because users, until yesterday obedient adopters, are the actual missing piece of the puzzle.

In this new mobile technology phase, a radical change from traditional unidirectional fashion communication (from design to users through traditional media) to a new, two-way/many-to-many relationship has occurred. Fashion application developers use the introduction page to persuade and guide users; in the other direction, users give their feedback rapidly and, after receiving users' feedback, developers usually react quickly. The whole bidirectional communication system works efficiently on fashion application platforms. In this era of major migration from offline to online (Castronova, 2007), from location-fixed Internet to mobile Internet, the communication between traditional producers and users is more and more frequent and the bonds between users increasingly tight. To take advantage of this new context, the fashion world must increase its understanding of how to adopt and capitalize on new mobile technology. This understanding would allow the fashion world to open effective communication channels with potential fashion consumers, not only with the purpose of informing users about its new proposals more efficiently but also in order to receive users' input, suggestions and so on. This issue is not yet completely solved and is in need of more attention. A simple conclusion can be drawn from this study: that good fashion content needs to be presented on a more mature mobile technology platform.

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