

Science–Practice Gap in e-Recruitment

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We conducted a content analysis of online job application forms used by companies listed on the Spanish Stock Exchange (i.e., *Bolsa de Madrid*). We collected data from 76 companies in 2005 and then again for 66 of these companies in 2009. We coded the type of information required on the application forms based on 24 categories related to potential illegal discrimination and personnel selection social context issues (i.e., fairness, intrusiveness, and privacy). Results indicated that the relative frequency of the 24 information categories has remained stable from 2005 to 2009. Moreover, averaging 2005 and 2009 results, a large percentage of companies require information that can be used for illegal discrimination and can be perceived as unfair, intrusive, and invasive of applicants' privacy such as age or date of birth (87%), nationality (61%), marital status (48%), place of birth (57%), passport number (47%), a photograph (23%), and number of children (11%). Our results document a science–practice gap in e-recruitment because scholarly research suggests that requesting these types of information leads to negative applicant reactions ranging from negative perceptions and emotions to actually initiating legal action against the recruiting firm. Our results also point to e-recruitment as an area that could be targeted as a good collaboration topic between scientists and practitioners because the resulting research has the potential to make important contributions toward bridging the science–practice gap.

1. Introduction

Internet recruitment or *e-recruitment* is quickly becoming a prevalent human resource management practice worldwide (Pfieffermann, Wagner, & Libkuman, 2010). In addition to providing information about the hiring organization and positions available, an important component of e-recruitment is the availability of online job application forms (Sylva & Mol, 2009). It is not surprising that so many companies choose to use the Internet to administer job application forms given the many practical benefits compared with traditional methods including lower cost for the hiring organization, a reduction in the hiring cycle time, and 24/7 access for job applicants regardless of their physical location (Sylva & Mol, 2009; Viswesvaran, 2003). Together with these practical advantages, however, administering online job application forms also poses novel challenges for personnel selection practitioners (Jones & Dages, 2003; Sylva & Mol, 2009). As is typical for most technological innovations, e-recruitment

implementation has moved at a faster pace compared with empirical research (Lievens & Harris, 2003). Thus, as noted by Sylva and Mol (2009), 'while the implementation of Internet-based recruitment practices and application systems have been widely embraced by organizations, many outstanding issues with regard to Internet-based application systems have remained unanswered' (p. 312). Consequently, there is a need for 'more field studies to be conducted . . . and the use of real company web sites as opposed to the use of fictitious web sites created by investigators' (Pfieffermann *et al.*, 2010, p. 41).

The purpose of the present article is to investigate the use of online job application forms in Spain before and after the passage of important legislation regarding Equal Employment Opportunity (EEO). To do so, we conducted a content analysis of job application forms available on the websites of publicly traded companies in Spain in 2005 and again for the same companies in 2009. Results show that a substantial amount of information requested on online job application forms is potentially

discriminatory and unfair, intrusive, and invasive of applicants' privacy. Moreover, the relative frequency that such information is included on online application forms has not changed much between 2005 and 2009. These results document a science–practice gap regarding e-recruitment because, as we describe later in our article, these practices do not follow science-based recommendations regarding what type of information should be included on application forms. In addition, however, the presence of this gap points to an important opportunity for researcher–practitioner collaborations in the area of e-recruitment.

1.1. Focus on Spain

There are important cross-country differences regarding personnel selection legislation and practices (Myors *et al.*, 2008). Our study focuses on e-recruitment in Spain for the following two principal reasons. First, research, education and training, and practice in work and organizational (W&O) psychology, which is the label used in Spain and other European Union (EU) countries in referring to industrial/organizational psychology, are now well established (Peiró, 2008). Regarding research, empirical and conceptual work is published regularly in several journals including *Revista de Psicología del Trabajo y de las Organizaciones* (*Journal of Work and Organizational Psychology*) and additional more general journals such as *Revista de Psicología Social Aplicada* (*Journal of Applied Social Psychology*), *Revista de Psicología General y Aplicada* (*Journal of General and Applied Psychology*), *Spanish Journal of Psychology*, and *Psicothema*. Regarding education and training, W&O psychology is taught at undergraduate and/or graduate levels at about 35 Spanish universities (Peiró, 2008). Moreover, there are several initiatives involving cross-country educational collaborations such as an international master's degree in W&O psychology granted by the EU and jointly offered by universities in Barcelona and Valencia (Spain), Bologna (Italy), Paris V (France), and Coimbra (Portugal). The growth in research and education and training activities has been accompanied by an increasing importance and stature of the practice of W&O psychology, which 'is well established all over Spain' (Peiró, 2008, p. 67). Consequently, scholarly research focusing on personnel selection issues in Spain has the potential to be used in educating and training the next generation of W&O psychologists as well as influencing practice not only in Spain but also in other EU countries. The second reason for focusing on Spain is that, in contrast to the United States, legislation regarding EEO is more recent and still ongoing. Thus, Spain provides a natural research site to study how such legislation may affect personnel selection practices in almost real time. Such research is no longer possible in countries with a longer history and tradition of EEO legislation such as the United States and the United Kingdom (Aguinis, 2009).

1.2. Science-based knowledge on the social context of e-recruitment

Although completing an online application form does not involve a human interface, the social context still plays an important role in e-recruitment (Cascio & Aguinis, 2011, Chapter 8; Sylva & Mol, 2009). Specifically, from the perspective of applicants, the information collected through online job applications could be used to make decisions that are procedurally unfair regardless of the actual outcome of the hiring process (Bell, Ryan, & Wiechmann, 2004). For example, information such as place of birth, nationality, marital status, age, and disability status has high potential to be used for procedurally unfair decisions and also motivate applicants to initiate litigation (Goldman, 2001). In addition to information that could be used in making unfair decisions, other information included on online application forms can be intrusive (Anderson, 2003) and constitute an invasion of privacy (Eddy, Stone, & Stone-Romero, 1999). Such information can include requesting an applicant's photograph and asking about an applicant's number of children. Empirical evidence also suggests that collecting information seen as intrusive and violating an applicant's privacy leads to negative applicant reactions (Bauer *et al.*, 2006; Cascio & Aguinis, 2011, Chapter 8; Stone-Romero & Stone, 2005). In short, there is abundant scholarly research providing evidence that e-recruitment practices that are potentially illegal and perceived to be unfair, intrusive, and invasive of applicants' privacy are associated with negative reactions ranging from negative perceptions and emotions to actually initiating legal action against the recruiting firm.

2. Method

2.1. Sample

We initially targeted the 181 companies listed on the Spanish Stock Exchange (i.e., *Bolsa de Madrid*) between March and May 2005. As general background information, to be listed, companies need to fulfill several requirements such as having >€1,202,025 in capital and at least 100 shareholders with an individual share percentage of <25%. Thus, the companies we targeted are large, well-known, and influential. Moreover, these are organizations that potentially have the financial and other types of resources to be able to make human resource investments (Priem & Butler, 2001). Thus, although not necessarily representative of all large firms in Spain, compared with other firms, the largest and richest publicly traded firms are likely to be able to, if they so wish, implement best science-based e-recruitment practices.

Of the 181 companies listed in 2005, 30 were part of consortia that shared a website and only 151 had their own websites. Thus, we focused on the 151 companies

that had their own websites because shared websites include e-recruitment content that may be affected not only by EU and Spanish legislation and practices, but also by those in other parts of the world (e.g., Latin American countries). Of the 151 companies, 76 (50.33%) included application forms that could be completed online or completed offline and emailed to an address provided on the website. So, our sample for the first wave of data collection (i.e., year 2005) included these 76 companies. The largest industry groups were consumer goods ($n=20$); raw materials, manufacturing, and building ($n=18$); consumer services ($n=13$); financial services and real estate ($n=12$); and oil and energy ($n=9$). Note that each firm had one generic application form for all advertised jobs.

The second wave of data collection took place between March and May 2009. The targeted population included all 76 companies from which we obtained job application forms in 2005. Some of the original 76 companies merged or changed their stock composition and were no longer listed on the Spanish Stock Exchange. Others no longer made online job applications available. As a result of the 2009 data collection effort, we were able to obtain job applications from 66 of the original 76 companies. The relative representation of industry groups comparing the 2005 sample with the 2009 sample was very similar and, consequently, we do not see the attrition rate of only 13.16% as an important threat to our analysis (Rogelberg & Stanton, 2007).

Our research design purposefully included two waves of data collection from the same organizations 4 years apart to allow us to examine the extent to which the information required on online job application forms changed over time. We specifically chose the 2005 to 2009 time window given the passage of important EEO legislation in Spain in 2007 and the possibility that this legal change may have affected e-recruitment practices. EEO legislation in Spain includes both EU and Spanish regulations. Although there are EU Directives dating back to 2000 (i.e., 2000/78/EC of November 2000 establishing a general framework for equal treatment in employment and occupation), the more recent Spanish Constitutional Act 3/2007 of March 2007 prohibits sex-based discrimination. A comprehensive and in-depth review of these and other regulations is provided by García-Izquierdo and García-Izquierdo (2007).

2.2. Procedures, coding, and qualitative data-analytic approach

We captured the entire text of all job application forms from each of the companies in our samples in 2005 and then again in 2009. The content analysis was conducted following recommendations offered by Duriau, Reger, and Pfarrer (2007) and also following content analyses conducted in personnel selection (e.g., Aguinis, Michaelis, & Jones, 2005) as well as other areas (e.g., Aguinis, Pierce,

Bosco, & Muslin, 2009). The first step in the coding process involved creating a list of categories of information required on the application forms based on legal (e.g., national origin, sex) and social context issues (i.e., fairness, intrusiveness, and privacy). This led to an initial coding protocol including, among others, categories such as age or date of birth, nationality, marital status, photograph requirement, number of children, and disability status.

Using the initial coding protocol, we conducted a thematic analysis using NVIVO 2.0, which allows researchers to input text (i.e., online job application forms in our study) as well as key terms and phrases. NVIVO scans all text and outputs the frequency of appearance of each key term and phrase. Using NVIVO speeds up and automates the process of conducting frequency counts for qualitative data. However, this counting process does not necessarily identify additional key phrases that may be included on the application forms and may also be of interest in our study. After the initial frequency counts of the categories we had identified and a manual examination of the application forms, it quickly became apparent that the text we analyzed included several additional categories of information directly pertaining to legal and social context issues that were not initially included in our coding protocol. Thus, as suggested by Duriau *et al.* (2007), we engaged in an iterative process including the concurrent content analysis and the revision and refinement of the coding protocol.

Once the final coding protocol was created, which included a total of 24 different categories of information, two raters independently coded the information on the application forms. After the coding process was completed, we computed κ , which is an indicator of the degree of agreement between two raters who independently classify items into mutually exclusive categories. A heuristic that is frequently used is that κ from .60 to .79 suggests substantial agreement and $\kappa > .80$ suggests outstanding agreement (Landis & Koch, 1977). Our obtained κ was .77. Although this value is considered satisfactory, the two raters discussed each of the classifications on which they did not agree. Subsequently, the raters recoded all of these items. We then computed κ after the second coding stage was completed and the resulting value was .93.

3. Results and discussion

The final list of the 24 information categories, percentages, and frequency counts for 2005 and 2009 are included in Table 1. As shown in Table 1, results for 2005 indicate that at least 50% of companies required information regarding age or date of birth, identity card number, nationality, sex, willingness to commute to work, willingness to travel, marital status, and place of birth. A remarkably high percentage (i.e., about 20%) required a photograph, about 11% required information on the applicants' number of children, and about 7% required

Table 1. Categories, percentages, and frequency counts for information required on online application forms in 2005 and 2009

Category	Year 2005 (n = 76)	Year 2009 (n = 66)	Change from 2005 to 2009
1. Age or date of birth	88.16% (67)	86.36% (57)	Binomial $p = 1.00$
2. Identity card number	78.95% (60)	90.91% (60)	Binomial $p = 1.00$
3. Nationality	59.21% (45)	62.12% (41)	Binomial $p = .73$
4. Sex	57.89% (44)	66.67% (44)	Binomial $p = .38$
5. Willingness to commute to work	53.95% (41)	62.12% (41)	Binomial $p = 1.00$
6. Willingness to travel	53.95% (41)	62.12% (41)	Binomial $p = 1.00$
7. Marital status	51.31% (39)	45.45% (30)	Binomial $p = .38$
8. Place of birth	50.00% (38)	63.64% (42)	Binomial $p = .38$
9. Driver's license number	48.68% (37)	56.06% (37)	Binomial $p = 1.00$
10. Passport number	43.42% (33)	50.00% (33)	Binomial $p = 1.00$
11. Photograph	19.74% (15)	25.76% (17)	Binomial $p = .63$
12. Permanent residency card number	19.74% (15)	22.73% (15)	Binomial $p = 1.00$
13. Number of children	10.53% (8)	12.12% (8)	Binomial $p = 1.00$
14. Work permit number	7.89% (6)	9.09% (6)	Binomial $p = 1.00$
15. Disability status	6.58% (5)	9.09% (6)	Binomial $p = 1.00$
16. Relatives working at hiring organization	6.58% (5)	6.06% (4)	Binomial $p = 1.00$
17. Parents' names	3.95% (3)	4.54% (3)	a
18. Social security number	3.95% (3)	4.54% (3)	a
19. Military service	3.95% (3)	3.03% (2)	a
20. European Union card number	2.63% (2)	3.03% (2)	a
21. Height	2.63% (2)	0.00% (0)	a
22. Weight	1.31% (1)	0.00% (0)	a
23. Parents' address	1.31% (1)	0.00% (0)	a
24. Date of last medical examination	1.31% (1)	0.00% (0)	a

Notes: Percentages and frequency counts refer to companies. ^aWe did not conduct statistical significance tests for these categories due to the low frequency counts.

information on disability status and the applicants' number of relatives working at the hiring organization. Results for 2005 also revealed additional information categories that could potentially be used for illegal discrimination and/or is intrusive and violates applicants' privacy such height, weight, and parents' names.

A perusal of Table 1 suggests that the relative frequency of the 24 information categories has been stable between 2005 and 2009. To assess consistency over time more formally, we conducted a nonparametric dependent-sample sign test, which computes the differences in proportions from 2005 to 2009 for all types of information combined and classifies the differences as positive, negative, or tied. If the proportions are similarly distributed in 2005 compared with 2009, the number of positive and negative differences will not differ significantly. Results indicated that changes from 2005 to 2009 were not statistically significant (i.e., binomial $p = .15$), providing evidence of stability from 2005 to 2009. As a second step in our analyses, we conducted follow-up tests to assess possible changes in proportions regarding the individual types of information (note that we conducted these follow up tests regarding the 16 categories for which we had sufficient data). Results summarized in Table 1 including tests using the binomial distribution suggest that the type of information requested on online application forms regarding specific categories has remained stable from 2005 to 2009.

We were also interested in examining whether the type of information required on job application forms varies across industries (see Tables 2 and 3). The small sample

sizes in some of the industry-based categories do not allow us to conduct tests of statistical significance. However, at a descriptive level, a rank-order the percentages of firms requesting various types of information suggests that those in the financial services and real estate and oil and energy categories request information most frequently that is potentially discriminatory and unfair, intrusive, and invasive of applicants' privacy. In contrast, firms in the consumer goods category requested such information least frequently both in 2005 and in 2009.

Our results document an important science–practice gap in e-recruitment, which is a finding consistent with a generalized science–practice gap found in the field of industrial/organizational psychology (Cascio & Aguinis, 2008). Specifically, there is ample and convincing empirical evidence on the negative effects of requiring job applicants to provide information that could be used for illegal discrimination hiring, information that may be seen as intrusive, and information that may be seen as violating applicants' privacy (Anderson, 2003; Bauer *et al.*, 2006; Bell *et al.*, 2004; Eddy *et al.*, 1999; Stone-Romero & Stone, 2005). Nevertheless, many of the organizations included in our study use online application forms that require information that fit this profile including age and date of birth, marital status, photograph, number of children, and disability status, among others. Our results provide evidence regarding a science–practice gap particularly in the area of e-recruitment. We acknowledge that it may be too early to expect the websites to reflect changes due to 2007 legislation. Thus, it may be that websites will not be

Table 2. Categories, percentages, and frequency counts for information required on online application forms sorted by industry (2005)

Category	Industry							Total
	Raw materials, manufacturing and building	Consumer goods	Financial services and real estate	Consumer services	Oil and energy	Technology and telecommunications		Total
1. Age or date of birth	94.44% (17)	80.00% (16)	91.67% (11)	92.31% (12)	88.89% (8)	75.00% (3)		88.16% (67)
2. Identity card number	88.89% (16)	55.00% (11)	91.67% (11)	92.31% (12)	88.89% (8)	50.00% (2)		78.95% (60)
3. Nationality	55.55% (10)	50.00% (10)	66.67% (8)	61.54% (8)	77.78% (7)	50.00% (2)		59.21% (45)
4. Sex	61.11% (11)	60.00% (12)	66.67% (8)	46.15% (6)	55.55% (5)	50.00% (2)		57.89% (44)
5. Willingness to commute to work	50.00% (9)	35.00% (7)	75.00% (9)	53.85% (7)	77.78% (7)	50.00% (2)		53.95% (41)
6. Willingness to travel	50.00% (9)	35.00% (7)	75.00% (9)	53.85% (7)	77.78% (7)	50.00% (2)		53.95% (41)
7. Marital status	66.67% (12)	40.00% (8)	41.67% (5)	61.54% (8)	55.55% (5)	25.00% (1)		51.31% (39)
8. Place of birth	50.00% (9)	35.00% (7)	66.67% (8)	53.85% (7)	55.55% (5)	50.00% (2)		50.00% (38)
9. Driver's license number	44.44% (8)	35.00% (7)	50.00% (6)	69.23% (9)	66.67% (6)	25.00% (1)		48.68% (37)
10. Passport number	50.00% (9)	15.00% (3)	58.33% (7)	46.15% (6)	77.78% (7)	25.00% (1)		43.42% (33)
11. Photograph	5.55% (1)	20.00% (4)	16.67% (2)	53.85% (7)	11.11% (1)	0.00% (0)		19.74% (15)
12. Permanent residency card number	22.22% (4)	15.00% (3)	8.33% (1)	23.08% (3)	33.33% (3)	25.00% (1)		19.74% (15)
13. Number of children	11.11% (2)	5.00% (1)	8.33% (1)	30.77% (4)	0.00% (0)	0.00% (0)		10.53% (8)
14. Work permit number	5.55% (1)	5.00% (1)	8.33% (1)	7.69% (1)	22.22% (2)	0.00% (0)		7.89% (6)
15. Disability status	5.55% (1)	20.00% (4)	8.33% (1)	0.00% (0)	11.11% (1)	0.00% (0)		6.58% (5)
16. Relatives working at hiring organization	11.11% (2)	0.00% (0)	0.00% (0)	7.69% (1)	22.22% (2)	0.00% (0)		6.58% (5)
17. Parents' names	11.11% (2)	0.00% (0)	8.33% (1)	0.00% (0)	0.00% (0)	0.00% (0)		3.95% (3)
18. Social security number	11.11% (2)	0.00% (0)	0.00% (0)	0.00% (0)	11.11% (1)	0.00% (0)		3.95% (3)
19. Military service	5.55% (1)	5.00% (1)	8.33% (1)	0.00% (0)	0.00% (0)	0.00% (0)		3.95% (3)
20. European Union card number	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)	22.22% (2)	0.00% (0)		2.63% (2)
21. Height	5.55% (1)	0.00% (0)	0.00% (0)	7.69% (1)	0.00% (0)	0.00% (0)		2.63% (2)
22. Weight	5.55% (1)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)		1.31% (1)
23. Parents' address	5.55% (1)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)		1.31% (1)
24. Date of last medical examination	0.00% (0)	0.00% (0)	0.00% (0)	7.69% (1)	0.00% (0)	0.00% (0)		1.31% (1)

Note: N = 76. Percentages and frequency counts refer to companies.

Table 3. Categories, Percentages, and Frequency Counts for Information Required on Online Application Forms Sorted by Industry (2009)

Category	Industry							Total
	Raw materials, manufacturing and building	Consumer goods	Financial services and real estate	Consumer services	Oil and energy	Technology and telecommunications		
1. Age or date of birth	93.33% (14)	78.95% (15)	100.00% (10)	90.91% (10)	88.89% (8)	100.00% (2)		89.39% (59)
2. Identity card number	86.67% (13)	52.63% (10)	100.00% (10)	90.91% (10)	88.89% (8)	100.00% (2)		80.30% (53)
3. Nationality	80.00% (12)	52.63% (10)	60.00% (6)	72.73% (8)	77.78% (7)	50.00% (1)		66.67% (44)
4. Sex	60.00% (9)	63.16% (12)	80.00% (8)	63.64% (7)	77.78% (7)	50.00% (1)		66.67% (44)
5. Willingness to commute to work	46.67% (7)	36.84% (7)	80.00% (8)	54.55% (6)	77.78% (7)	100.00% (2)		56.06% (37)
6. Willingness to travel	40.00% (6)	42.11% (8)	60.00% (6)	27.27% (3)	66.67% (6)	100.00% (2)		46.97% (31)
7. Marital status	40.00% (6)	42.10% (8)	50.00% (5)	63.64% (7)	55.56% (5)	0.00% (0)		46.97% (31)
8. Place of birth	66.67% (10)	42.10% (8)	80.00% (8)	54.55% (6)	66.67% (6)	50.00% (1)		59.09% (39)
9. Driver's license number	33.33% (5)	36.84% (7)	50.00% (5)	72.73% (8)	66.67% (6)	50.00% (1)		48.48% (32)
10. Passport number	60.00% (9)	10.53% (2)	60.00% (6)	54.55% (6)	77.78% (7)	50.00% (1)		46.97% (31)
11. Photograph	13.33% (2)	15.79% (3)	20.00% (2)	54.55% (6)	11.11% (1)	50.00% (1)		22.73% (15)
12. Permanent residency card number	6.67% (1)	0.00% (0)	0.00% (0)	9.09% (1)	22.22% (2)	0.00% (0)		6.06% (4)
13. Number of children	6.67% (1)	15.79% (3)	10.00% (1)	27.27% (3)	0.00% (0)	0.00% (0)		12.12% (8)
14. Work permit number	6.67% (1)	5.26% (1)	0.00% (0)	9.09% (1)	22.22% (2)	0.00% (0)		7.58% (5)
15. Disability status	6.67% (1)	15.79% (3)	10.00% (1)	0.00% (0)	11.11% (1)	0.00% (0)		9.09% (6)
16. Relatives working at hiring organization	6.67% (1)	0.00% (0)	0.00% (0)	9.09% (1)	22.22% (2)	0.00% (0)		6.06% (4)
17. Parents' names	0.00% (0)	0.00% (0)	10.00% (1)	0.00% (0)	22.22% (2)	0.00% (0)		4.55% (3)
18. Social security number	6.67% (1)	0.00% (0)	0.00% (0)	0.00% (0)	11.11% (1)	0.00% (0)		3.03% (2)
19. Military service	0.00% (0)	10.53% (2)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)		3.03% (2)
20. European Union card number	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)	22.22% (2)	0.00% (0)		3.03% (2)
21. Height	0.00% (0)	0.00% (0)	0.00% (0)	9.09% (1)	0.00% (0)	0.00% (0)		1.52% (1)
22. Weight	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)		0.00% (0)
23. Parents' address	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)	0.00% (0)		0.00% (0)
24. Date of last medical examination	0.00% (0)	0.00% (0)	0.00% (0)	9.09% (1)	0.00% (0)	0.00% (0)		1.52% (1)

Note: N = 66. Percentages and frequency counts refer to companies.

revised or updated until after costly lawsuits take place. If this speculation is correct, it would serve as yet additional evidence regarding a science–practice gap because it would mean that practitioners do not follow best science-based practices unless there is legal pressure to do so.

We believe our results regarding the presence of a science–practice gap in e-recruitment create an opportunity, however. Because of the increasing visibility of W&O psychology research and practice in Spain and other European countries, e-recruitment can be an area that could be targeted as a good collaboration topic between scientists and practitioners. Moreover, given its increased prevalence as a medium for job seekers to complete application forms worldwide, such researcher–practitioner collaborations can make important contributions with the potential to help bridge the science–practice gap.

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